Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR)

Data Manual

Part 2: Human Error Probability (HEP) Data

Manuscript Completed: March 1994
Date Published: September 1994

Prepared by
W. J. Reece, B. G. Gilbert, R. E. Richards

Idaho National Engineering Laboratory
Managed by the U.S. Department of Energy

EG&G Idaho, Inc.
Idaho Falls, ID 83415

Prepared for
Division of Systems Research
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
NRC FIN A6854
Under DOE Contract No. DE-AC07-76ID01570

MASTER *AS*

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

ABSTRACT

This data manual contains a hard copy of the information in the Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR) Version 3.5 database, which is sponsored by the U.S. Nuclear Regulatory Commission. NUCLARR was designed as a tool for risk analysis. Many of the nuclear reactors in the U.S. and several outside the U.S. are represented in the NUCLARR database. NUCLARR includes both human error probability estimates for workers at the plants and hardware failure data for nuclear reactor equipment. Aggregations of these data yield valuable reliability estimates for probabilistic risk assessments and human reliability analyses. The data manual is organized to permit manual searches of the information if the computerized version is not available. Originally, the manual was published in three parts. In this revision the introductory material located in the original Part 1 has been incorporated into the text of Parts 2 and 3. The user can now find introductory material either in the original Part 1, or in Parts 2 and 3 as revised. Part 2 contains the human error probability data, and Part 3, the hardware component reliability data.

 

CONTENTS

ABSTRACT	iii
EXECUTIVE SUMMARY	vii
ACRONYMS	ix
1. INTRODUCTION	1
2. HOW TO USE THIS DOCUMENT	3
3. ORGANIZATION	4
Organization of Appendix A	4
Organization of Appendix B	5
4. REFERENCES	7
Appendix A—Aggregated Data	A-1
Appendix B—HEP Raw Data	B-1
Appendix C—HEP Codes	C-1
Appendix D—Statistics	D-1

 

EXECUTIVE SUMMARY

The *Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR) Volume 5: Data Manual* is a hard copy of the data and related information residing in Version 3.5 of the NUCLARR database. Sponsored by the U.S. Nuclear Regulatory Commission, NUCLARR was designed to assemble hardware failure and human error data for risk analysis. The document was originally organized in three parts. Part 1, which contained introductory material, was not revised. Part 2 now contains the introductory material and the human error probability (HEP) data; Part 3 contains the introductory material and the hardware component failure rate data. Parts 2 and 3 present tables of data with reliability estimates that are based on information gathered primarily from sources within the United States. Some international data are also represented in NUCLARR.

The equipment taxonomies and data structures for NUCLARR are designed specifically to support probabilistic risk assessment (PRA) techniques currently used. The NUCLARR system can provide the risk analyst with accurate and relevant data, whether from the online database or from manually searching the tables in this document.

HEP data are tabulated to provide quantitative probability estimates that can be used to assess the impact of undesirable human actions on nuclear power plant operation and safety. Two forms of errors are possible: commission and omission. The commission error probabilities stored in NUCLARR represent actions that are performed either incorrectly or inappropriately. Errors of omission include probabilities for oversights or errors where tasks are not performed, as well as probabilities for failure to accomplish a task within a specified time.

For both omission and commission data, all HEPs are classified according to the human action verb describing the task to be performed and the equipment involved in the task. Three possible levels of equipment may be referenced: systems, components, and parts of components that operators interact with (i.e., displays, instruments, and controls).

In addition to the classification of HEP data by omission and commission, data are characterized by determining whether recovery was considered or not in the derivation of the HEP values [recovery considered (RC) or recovery not considered (RNC)]. When available, the relevant performance shaping factors (PSFs) are also coded into the NUCLARR system.

The emphasis for hardware data is on specific component failures, not general losses of function. For example, data for equipment in an improper state (command faulted), and therefore unavailable as a result of human error, is located in the HEP portion of the NUCLARR system. The hardware failure events of interest are events in which the components require repair, replacement, or adjustment.

To the extent possible, component failure rates are confined to the equipment itself and any closely related or dedicated auxiliary equipment. This definition includes equipment that is physically coupled, such as pumps with their drivers or valves with their operators. This definition also includes dedicated control circuits and circuit breakers associated with pump motors, valve operators, and diesel generators. For diesel generators, dedicated air starting systems and dedicated batteries are

also included. Similarly, lube oil cooling failures are presented with the data set for the components that provide their own lube oil cooling function.

For operating equipment, the focus is on failures that occurred during operation. Failures that have no effect on the components during operation (such as failures detected and corrected during preoperational testing) are generally not considered.

Secondary failures are excluded when computing NUCLARR component failure rates. Secondary failures result from events outside the boundary of the component and produce conditions exceeding the component's design basis. Failures that are caused by common support systems or improper inputs are not included in the failure rates because these are modeled separately in most risk assessments. The ideal failure rate data depend only on the component and its immediate environment and application, and are independent of the specific plant and system designs.

In addition to providing a format for viewing and comparing individual data records from a variety of sources, NUCLARR provides statistics for data combinations. This hard copy includes the results of routines used to aggregate values and bounds of sets of data from like components or human action and equipment combinations.

For HEP data, individual error probabilities from various sources are automatically combined first to describe tasks. Task probabilities not only have a common action verb and equipment designation but also a similar performance shaping factor that describes similar conditions. Data representing a single task are expected to be homogeneous. Therefore, pooling the number of errors and the numbers of opportunities for error is used as the statistical method for generating task statement aggregations. Data that are not homogeneous are omitted. These calculation methods are also applied to the user-defined aggregations.

Typically, HEP data are submitted to NUCLARR as counts of errors (E) and opportunities for error (N), or as calculated probabilities. The NUCLARR system stores both types of data (counts and probabilities). NUCLARR can compute HEP point estimates and confidence bounds from count data. Conversely, given probabilities (i.e., a HEP and its upper confidence bound), NUCLARR can estimate the count data that would give rise to these results. All of these calculations and relationships are based on an assumed binomial distribution for the number of errors in N opportunities. In these calculations, the assumption is that a fixed but unknown probability of error for each trial is being estimated.

NUCLARR also considers uncertainty distributions for the HEPs. From the uncertainty distribution perspective, each HEP is a random quantity that takes on stated values with stated probabilities, instead of an unknown constant binomial distribution parameter. Following common usage for small probability values that must be positive, each uncertainty distribution in NUCLARR is taken to be lognormal. From count data, a particular lognormal distribution is selected by using the data to estimate two lognormal distribution parameters. NUCLARR matches the lognormal distribution 95th percentile to the upper confidence bound, and the median to the HEP point estimate. This choice preserves the error factor as the ratio of the upper uncertainty bound to the point estimate. From the fitted lognormal distribution, a mean HEP value is also computed.

ACRONYMS

CRO	control room operator
E	number of errors
EF	error factor
EO	equipment operator
HCFD	hardware component failure data
HEP	human error probability
HHRAG	Human and Hardware Reliability Analysis Group
HRA	human reliability analysis
INEL	Idaho National Engineering Laboratory
LCB	lower confidence bound
LOCA	loss-of-coolant accident
MT	maintenance technician
N	number of opportunities for error
NRC	U.S. Nuclear Regulatory Commission
NSSS	nuclear steam supply system
NUCLARR	Nuclear Computerized Library for Assessing Reactor Reliability
OJT	on-the-job training
PC	personal computer
PRA	probabilistic risk assessment
PSF	performance shaping factor
UCB	upper confidence bound

Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR)

Volume 5: Data Manual

Part 2: Human Error Probability (HEP) Data

1. INTRODUCTION

The Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR) is an automated data management system used to process, store, and retrieve human and hardware reliability data in a ready-to-use format. The NUCLARR system was developed by the U.S. Nuclear Regulatory Commission (NRC) to provide a repository of reliability data to support a variety of risk assessment activities. This document contains a hard copy of the data and information in the NUCLARR Version 3.5 database.

The data manual is arranged in three parts. *Part 1: Summary Description* contains a brief introduction to the database. *Part 2: Human Error Probability (HEP) Data* contains all HEP data records and related information from the NUCLARR software program. *Part 3: Hardware Component Failure Data* presents the hardware component failure data side of NUCLARR. The hard copy data in Parts 2 and 3 are organized into appendices covering aggregated data, raw data, and lists of the codes used in NUCLARR.

The data manual is one of five reports that document the NUCLARR program,^a which are described as follows:

- *Volume 1: Summary and Description*¹ presents a general introduction to the NUCLARR program. This document describes the background and history of the program. Information regarding the organization and key features of the NUCLARR system are also summarized. This report serves as a top-level overview of NUCLARR's functions and capabilities.
- *Volume 2: Programmer's Guide*² provides information necessary to maintain the software programming for the NUCLARR system. The Guide provides descriptions of the database structure, support libraries, main menus, programs, and computer environment. The NUCLARR software engineers use this Guide as a reference for maintaining and modifying the system.
- *Volume 3: Guide to Data Processing and Revision*³ provides the procedures used by NUCLARR Clearinghouse personnel for extracting suitable data from documents and entering the information into the NUCLARR system. This report is also a resource for the review group responsible for processing data items for entry into the database.

a. Volumes 2 and 3 are currently being revised. Please contact the NUCLARR Clearinghouse to obtain the latest revision.

Introduction

- *Volume 4: User's Guide*⁴ presents a detailed description of the NUCLARR database, including computations performed by NUCLARR and definitions of the data fields.

In addition to these volumes, a *Quick Reference Guide*⁵ is distributed with the software. The guide provides step-by-step examples for locating, reviewing, and aggregating data using the NUCLARR Version 3.5 software.

Support services for software maintenance, documentation, and database management reside at the Idaho National Engineering Laboratory (INEL). All data input and software management for NUCLARR are performed by NUCLARR Clearinghouse personnel. Detailed procedures are followed for all aspects of screening the data sources and data entry. These steps are presented in NUREG/CR-4639, *Volume 3: Guide to Data Processing and Revision*.³ The Clearinghouse is also the primary interface between data suppliers and end users of the NUCLARR system. Clearinghouse personnel obtain data for NUCLARR, distribute the NUCLARR software, and consult with users as-needed.

The INEL staff is assisted by a panel of experts external to the NUCLARR program, who review the data sources for suitability. The Human and Hardware Reliability Analysis Group (HHRAG) personnel have expertise in one or more of the following disciplines: nuclear power plant operations, human reliability analysis, probabilistic risk assessment (PRA), system reliability, or generic safety issues. The HHRAG is also responsible for helping to improve data processing procedures and ensuring valid treatment of data.

2. HOW TO USE THIS DOCUMENT

This document organizes human error probability (HEP) data into tables within two appendices. Supporting information is provided in subsequent appendices. A more detailed organization of each appendix is located in Section 3. Instructions for using the tables to find information are located at the beginning of each data table appendix.

To find the human error probability for a particular human action, you will first need to make note of the equipment involved in the action. HEP data are sorted by combinations of equipment and human actions. These combinations are presented in aggregations and individual data records.

Aggregated HEP data estimates are presented in Appendix A. Scan the table in this appendix to locate aggregations of data for specific combinations of equipment and human actions.

Individual HEP data records are presented in Appendix B. In this appendix you will find descriptions of human errors and the probabilities associated with them. Data from source documents is provided, in addition to NUCLARR calculated values.

For descriptions of NUCLARR HEP data codes, see Appendix C.

For information about the statistical methods used in NUCLARR, see Appendix D. Additional detail is also provided in the *User's Guide*, Volume 4.⁴

3. ORGANIZATION

The individual HEP data records, the aggregated values, and data coding lists are presented in a series of appendices. Each appendix has an introduction that provides an outline of the information presented on the data pages, including definitions for each data field. This section contains a brief overview of the organization of the following appendices, with special emphasis on Appendices A and B:

- Appendix A presents data aggregated by NUCLARR.
- Appendix B presents the raw data information contained in NUCLARR.
- Appendix C provides NUCLARR code descriptions in a series of sections:
 - C-1 lists the equipment and human action combinations in NUCLARR
 - C-2 explains the coding for performance shaping factors used by NUCLARR
 - C-3 lists the codes for the nuclear power plants
 - C-4 provides bibliographic information about the NUCLARR data sources.
- Appendix D provides a summary of statistics used in NUCLARR.

Organization of Appendix A

The aggregated data presented in Appendix A are initially sorted by vendor, then job title of the individual performing the action, then equipment, and finally human action. The first column on the left side of the table (Vend Eqlv) identifies the nuclear steam supply system (NSSS) vendor and specific component or instrumentation in the following order:

(GE)	General Electric
(WE)	Westinghouse
(CE)	Combustion Engineering
(BW)	Babcock & Wilcox
(COMP)	Component
(D/I/C)	Display, Instrumentation, or Control

Data are then sorted by an entry in the second column (Job Title) to identify the individual involved in the action or error, as follows:

(CRO)	Control room operator
(EO)	Equipment operator
(MT)	Maintenance technician

The fourth column (Equipment Class) lists the specific type of equipment involved in the HEP. These are sorted in an order recognized by the NUCLARR software. The equipment taxonomies and data structures for NUCLARR are designed to support PRA techniques currently used. Because they are not necessarily in alphabetical order, you will need to scan this column to locate the specific equipment of interest.

Data records that are the same in the first, second, and fourth columns are sorted further by an entry in the third column (Human Action Verb). This column lists the action identified with the HEP. These are also sorted in an order recognized by the NUCLARR software. Because they are not necessarily in alphabetical order, you will need to scan this column to locate the specific action of interest.

The fifth column (Error Type) identifies whether the HEP was classified as an error of omission (OM) or commission (COMM).

If data are available for a selected combination of the first five columns, then aggregations are presented in the remaining columns. These remaining columns identify whether or not recovery actions were considered in the calculation of the HEP.

The first five subcolumns present error estimates for HEPs with Recovery Considered. The second five list the same information for HEPs with Recovery Not Considered. The subcolumns are as follows, as presented left to right in the table:

MEDIAN	(Median HEP estimate)
MEAN	(Mean HEP estimate)
EF	(Error Factor)
UCB	(Upper Confidence Bound)
LCB	(Lower Confidence Bound)

Organization of Appendix B

Appendix B presents each of the individual HEP data records contained in NUCLARR. "Raw data" in this appendix were input directly from the original source document. (This is different from the statistical definition of "raw data," i.e., data in the form of counts and opportunities.)

The data in Appendix B are first sorted by vendor and component or instrumentation, then by the individual performing the action, then by human action, and finally by situation. The additional columns contain data values by source and by estimate, performance shaping factors, and finally information about the source of the data. The first column (Vend Eqly) identifies the NSSS vendor and specific component or instrumentation, as follows:

(GE)	General Electric
(WE)	Westinghouse
(CE)	Combustion Engineering
(BW)	Babcock & Wilcox
(COMP)	Component
(D/I/C)	Display, Instrumentation, or Control

Data are then sorted by an entry in the second column (Job Title) to identify the individual involved in the action or error, as follows:

(CRO)	Control room operator
(EO)	Equipment operator
(MT)	Maintenance technician

Organization

Data records that have identical entries in the first two columns are then sorted by the equipment and human action. This information is presented in the third column (Task Description) in the form of a statement, with the human action verb presented first in capital letters followed by the equipment involved. Because this information is not necessarily listed in alphabetical order, you will need to scan this column for the equipment and human action combination of interest. A complete list of the equipment and human action combinations in NUCLARR is presented as a matrix in Appendix C, Section C-1.

The third column also presents a statement summarizing the situation involving the HEP. This information is listed in the second and third lines of the entry for each data record, as appropriate. The fourth line identifies the error type (omission or commission), and recovery (considered or not considered) for each record.

The next column (Data Values) lists the mean, median, error factor (EF), upper and lower confidence bounds (UCB, LCB), number of errors (E) and number of opportunities (N) for each data record. This information is presented in two sections. The first shows the data as provided by the source (Raw); the second shows the data estimated by the NUCLARR system (NUCLARR calc). Appendix D contains information about the statistical routines.

The next column lists information about the performance shaping factors (PSFs) for each HEP. Section C-2 of Appendix C explains each of the following PSFs coded in NUCLARR:

ATime	(Available Time)
PTime	(Performance Time)
Experience	
Feedback	
Procedure	
Staffing	
Stress	
Supervision	
Tagging	
Training	

The Document Information column presents the following about the data sources:

(Document)	Identification of the source document.
(Origin)	Description of the type of data.
(Reference)	Identification of a reference used by the source (if any).
(PlantCode)	Identification of the facility at which the data was collected.

4. REFERENCES

1. D. I. Gertman, W. E. Gilmore, W. J. Galyean, M. R. Groh, C. D. Gentillon, B. G. Gilbert, and W. J. Reece, *Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR), Volume 1: Summary Description*, EGG-2458, NUREG/CR-4639, May 1990.
2. O. J. Call and J. A. Jacobson, *Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR), Volume 2: Programmer's Guide*, NUREG/CR-4639, EGG-2458, September 1988.
3. W. E. Gilmore, D. I. Gertman, B. G. Gilbert, and W. J. Reece, *Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR), Volume 3: Guide to Data Processing and Revision*, NUREG/CR-4639, EGG-2458, February 1988.
4. W. E. Gilmore, C. D. Gentillon, D. I. Gertman, W. J. Galyean, B. G. Gilbert, and W. J. Reece, *Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR), Volume 4: User's Guide*, NUREG/CR-4639, EGG-2458, October 1990.
5. B. G. Gilbert, R. E. Richards, W. J. Reece, and D. I. Gertman, *Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR) Version 3.5 Quick Reference Guide*, EGG-HFRU-10214, October 1992.

Appendix A
Aggregated Data

 

Appendix A

Aggregated Data

Appendix A presents data aggregated by NUCLARR. A brief description of all fields and their information is included here to help you find the appropriate data. Each field is identified by the abbreviation used in the data table. They are presented in the order of appearance (reading from left to right) in the table.

VEND EQLV (Vendor/Equipment Level)

GE	=	General Electric systems
WE	=	Westinghouse systems
CE	=	Combustion Engineering systems
BW	=	Babcock & Wilcox systems
Comp	=	Specified component data
D/I/C	=	Specified displays/instruments/controls

JOB TTL (Job Title)

CRO	=	Control Room Operator
EO	=	Equipment Operator
MT	=	Maintenance Technician
Subj	=	Subject (no specific title)

HUMAN ACTION VERB

This field displays the human action involved. See Appendix C, Section C-1, for a matrix of all human actions and equipment combinations in NUCLARR.

EQUIPMENT CLASS

This field identifies the system, component, or instrument involved with the human error probability.

ERROR TYPE

HEP data are identified as involving either errors of omission or errors of commission. The following NUCLARR error type codes are displayed in this field:

OM	-	An omission error is defined either as a failure to perform the task (or a step within a task), or a failure to perform a task within a stated time period.
COMM	-	A commission error occurs when a task is attempted but is not successfully accomplished for any reason (e.g., selection of wrong control or position, sequence, command or information, or an error in time or level of performance).

Aggregated Data

RECOVERY CONSIDERED

This category identifies data in which actions to recover from an error were considered in the calculation of the HEP. Recovery considered errors typically include situations where some type of corrective action was taken. This category may also include cases where, even though recovery actions were attempted, it was never feasible to actually recover from the error.

RECOVERY NOT CONSIDERED

Data in this category involve errors where recovery was not a considered factor in the calculation of the HEP. These human errors simply happened, with no documented or suspected attempt or opportunity for recovery by an operator or crew.

"Recovery considered" and "recovery not considered" data are never combined.

The following data fields are presented for both "recovery considered" and "recovery not considered" data records:

- Median - The 50th percentile of the aggregated lognormal HEP data distribution, presented in scientific notation (e.g., 2.68E-4 for a 0.000268 probability of error).
- Mean - The average probability estimate, presented in scientific notation.
- EF - Error Factor. A value used to assess the characteristics of the data distribution, defined as the upper bound divided by the median HEP.
- UCB - Upper Confidence Bound. The 95th percentile of the fitted lognormal distribution that describes variation in tasks within the categorization as well as statistical variation in the HEPs. This value is presented in scientific notation.
- LCB - Lower Confidence Bound. The 5th percentile of the fitted lognormal distribution that describes variation in the HEPs. This value is presented in scientific notation.

See Appendix D for a summary description of the statistics used in NUCLARR.

APPENDIX A. AGGREGATED REP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
GE	CRO	OPERATES	Instrument Air System	ON						9.2E-2	1.1E-1	3	2.9E-1	2.9E-2
GE	CRO	MONITORS	Instrument Air System	COMM						6.0E-2	1.1E-1	6	3.6E-1	1.0E-2
GE	CRO	DIAGNOSES	Instrument Air System	ON						1.6E-2	3.5E-2	8	1.3E-1	1.9E-3
GE	CRO	OPERATES	Communication Systems	COMM						2.6E-2	5.7E-2	8	2.0E-1	3.3E-3
GE	CRO	OPERATES	Condensate Systems	ON	7.5E-4	2.0E-3	10	7.5E-3	7.5E-5					
GE	CRO	OPERATES	Containment Systems	COMM	4.7E-2	4.7E-2	1	6.4E-2	3.4E-2	3.4E-3	9.0E-3	10	3.2E-2	3.5E-4
GE	CRO	DIAGNOSES	Containment Systems	ON						3.9E-2	5.5E-2	4	1.7E-1	8.9E-3
GE	CRO	OPERATES	Containment Penetration/Isolation System	COMM	7.5E-4	2.0E-3	10	7.5E-3	7.5E-5	2.1E-3	2.2E-2	35	7.5E-2	6.0E-5
GE	CRO	OPERATES	Containment Spray (RHR) System	ON	7.5E-4	2.0E-3	10	7.5E-3	7.5E-5					
GE	CRO	MONITORS	Standby Gas Treatment System	COMM						1.9E-2	4.1E-2	8	1.5E-1	2.3E-3
GE	CRO	OPERATES	Suppression Pool Support System	ON	8.3E-3	9.1E-3	2	1.4E-2	5.0E-3					
GE	CRO	OPERATES	Control Rod Drive Systems	COMM	3.7E-2	4.0E-2	2	6.0E-2	2.3E-2					
GE	CRO	DIAGNOSES	Control Rod Drive Systems	ON						5.7E-3	1.0E-2	6	3.2E-2	1.0E-3
GE	CRO	OPERATES	Electrical Distribution Systems	COMM	1.1E-1	1.1E-1	1	1.4E-1	8.1E-2	6.0E-2	1.6E-1	10	6.0E-3	6.0E-3
GE	CRO	OPERATES	Plant AC Distribution System	ON	1.1E-3	1.7E-3	5	5.4E-3	2.1E-4					
GE	CRO	OPERATES	Emergency Core Cooling Systems	COMM	8.1E-2	8.8E-2	2	1.3E-1	4.8E-2	1.3E-1	1.9E-1	4	3.1E-2	3.1E-2
GE	CRO	DIAGNOSES	Emergency Core Cooling Systems	ON						1.9E-2	3.0E-2	5	8.7E-2	4.1E-3
GE	CRO	OPERATES	High Pressure Coolant Injection System	COMM	6.0E-3	9.7E-3	5	3.0E-2	1.2E-3	3.1E-2	3.9E-2	3	8.8E-2	1.1E-2
GE	CRO	MONITORS	High Pressure Coolant Injection System	ON	7.0E-2	1.0E-1	4	3.1E-1	1.6E-2					
GE	CRO	OPERATES	High Pressure Core Spray System	COMM	4.0E-2	8.9E-2	8	3.0E-1	5.3E-3					
GE	CRO	OPERATES	Low Pressure Core Spray System	ON	6.5E-3	7.0E-3	2	1.6E-2	2.6E-3					
GE	CRO	MONITORS	Low Pressure Core Spray System	COMM	7.5E-4	2.0E-3	10	7.5E-3	7.5E-5					
GE	CRO	OPERATES	Residual Heat Removal/Low Press Coolant Inject Syst	ON	6.1E-4	8.7E-4	4	2.6E-3	1.4E-4					
GE	CRO	OPERATES	Generator H2 Cooling/CO2 Purge System	COMM						6.5E-3	9.3E-3	4	1.7E-3	1.7E-3

Aggregated Data

APPENDIX A. AGGREGATED HEP DATA

Yard EqLv	Job Tit	Human Action Verb	Equipment Class	Error Type	Recovery		Considered		LCB	Recovery		Not Considered		LCB
					Median	Mean	EF	LCB		Median	Mean	EF	LCB	
GE	CRO	OPERATES	Heating, Ventilation & Air Conditioning Systems	ON COMM	3.5E-2	5.6E-2	5	1.8E-1	6.8E-3					
GE	CRO	OPERATES	Reactor Protection System	ON COMM	2.0E-4	3.2E-4	5	1.0E-3	4.0E-5					
GE	CRO	OPERATES	Neutron Monitoring System	ON COMM	8.0E-4	2.3E-3	11	9.0E-3	7.1E-5					
GE	CRO	OPERATES	Automatic Depressurization System	ON COMM	9.2E-4	1.3E-3	4	3.6E-3	2.4E-4					
GE	CRO	OPERATES	Feedwater Control System	ON COMM	1.8E-2	2.0E-2	2	3.4E-2	9.2E-3					
GE	CRO	DIAGNOSES	Extraction Steam System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3						
GE	CRO	OPERATES	Water Systems	ON COMM	7.3E-3	9.1E-3	3	2.0E-2	2.6E-3					
GE	CRO	DIAGNOSES	Circulating Water System	ON COMM	1.4E-3	3.1E-3	8	1.1E-2	1.8E-4					
GE	CRO	OPERATES	Station Service Water System	ON COMM	7.5E-4	2.0E-3	10	7.5E-3	7.5E-5					
GE	CRO	OPERATES	Reactor Coolant Systems and Connected Systems	ON COMM	2.6E-3	6.9E-3	10	2.6E-2	2.6E-4					
GE	CRO	OPERATES	Reactor Core Isolation Cooling System	ON COMM	8.1E-2	8.1E-2	1	1.1E-1	6.1E-2					
GE	CRO	OPERATES	Standby Liquid Control System	ON COMM	1.0E-3	1.6E-3	5	5.0E-3	2.0E-4					
GE	CRO	OPERATES	Standby Diesel Generator Systems	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5	2.8E-2	7.5E-2	10	2.8E-3	2.8E-3
GE	CRO	OPERATES	Main Steam System	ON COMM	4.7E-2	5.2E-2	2	8.4E-2	2.7E-2					
GE	CRO	OPERATES	Instrument Air System	ON COMM	1.8E-2	2.0E-2	2	3.4E-2	9.2E-3					
GE	EO	OPERATES	Condensate Systems	ON COMM	7.5E-4	2.0E-3	10	7.5E-3	7.5E-5					
GE	EO	MAINTAINS	Containment Systems	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
GE	EO	OPERATES	Containment Systems	ON COMM	4.7E-2	4.7E-2	1	6.4E-2	3.4E-2					
GE	EO	MAINTAINS	Containment Systems	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
GE	EO	MAINTAINS	Containment Penetration/Isolation System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
GE	EO	MAINTAINS	Containment Spray (EHR) System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
GE	EO	OPERATES	Suppression Pool Support System	ON COMM	1.8E-2	2.0E-2	2	3.4E-2	9.2E-3					
GE	EO	OPERATES	Control Rod Drive Systems	ON COMM	1.1E-1	1.2E-1	2	1.8E-1	6.8E-2					
GE	EO	OPERATES	Electrical Distribution Systems	ON COMM	9.0E-2	9.0E-2	1	1.2E-1	6.6E-2					
GE	EO	MAINTAINS	Electrical Distribution Systems	ON COMM	6.3E-2	6.8E-2	2	1.3E-1	3.1E-2					

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered			Recovery Not Considered			EF	Recovery Not Considered		
					Median	Mean	UCB	LCB	Median	Mean		UCB	LCB	
GE	EO	OPERATES	DC Power System	ON COMM	2.2E-1	2.5E-1	2	4.0E-1	1.1E-1	5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
GE	EO	MAINTAINS	DC Power System	ON COMM						4.4E-3	4.0E-3	2	7.7E-3	2.6E-3
GE	EO	INSPECTS	DC Power System	ON COMM						3.0E-3	3.0E-3	3	9.0E-3	1.0E-3
GE	EO	OPERATES	Plant AC Distribution System	ON COMM	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2	5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
GE	EO	MAINTAINS	Plant AC Distribution System	ON COMM	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2	4.4E-3	4.0E-3	2	7.7E-3	2.6E-3
GE	EO	INSPECTS	Plant AC Distribution System	ON COMM						3.0E-3	3.0E-3	3	9.0E-3	1.0E-3
GE	EO	OPERATES	Emergency Core Cooling Systems	ON COMM	8.1E-2	8.8E-2	2	1.3E-1	4.8E-2	5.9E-2	6.4E-2	2	1.2E-1	2.9E-2
GE	EO	MAINTAINS	Emergency Core Cooling Systems	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6	3.0E-2	1.0E-1	13	2.3E-3	2.3E-3
GE	EO	OPERATES	High Pressure Coolant Injection System	ON COMM										
GE	EO	MAINTAINS	High Pressure Coolant Injection System	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
GE	EO	OPERATES	High Pressure Core Spray System	ON COMM	1.5E-3	4.0E-3	10	1.5E-2	1.5E-4					
GE	EO	MAINTAINS	High Pressure Core Spray System	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
GE	EO	OPERATES	Low Pressure Core Spray System	ON COMM	1.1E-1	1.2E-1	2	2.0E-1	5.9E-2					
GE	EO	MAINTAINS	Low Pressure Core Spray System	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
GE	EO	OPERATES	Residual Heat Removal/Low Press Coolant Inject Syst	ON COMM	1.1E-2	1.2E-2	2	2.1E-2	5.5E-3					
GE	EO	MAINTAINS	Residual Heat Removal/Low Press Coolant Inject Syst	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
GE	EO	MAINTAINS	Automatic Depressurization System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
GE	EO	MAINTAINS	Containment Atmosphere Monitoring System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
GE	EO	OPERATES	Feedwater Control System	ON COMM						8.7E-3	1.4E-2	5	4.7E-2	1.6E-3
GE	EO	MAINTAINS	Feedwater System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
GE	EO	OPERATES	Reactor Core Isolation Cooling System	ON COMM	5.6E-2	5.6E-2	1	7.7E-2	4.1E-2					
GE	EO	MAINTAINS	Reactor Core Isolation Cooling System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
GE	EO	OPERATES	Standby Diesel Generator Systems	ON COMM	4.7E-2	5.2E-2	2	8.4E-2	2.7E-2					
GE	EO	OPERATES	Main Steam System	ON COMM	1.8E-2	2.0E-2	2	3.4E-2	9.2E-3					

Aggregated Data

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
GE	EO	MAINTAINS	Main Steam System	ON COMM	1.3E-2	1.7E-2	3	3.4E-2	5.3E-3					
GE	EO	INSPECTS	Process Sampling Systems	ON COMM						1.2E-2	3.2E-2	10	1.2E-1	1.2E-3
GE	MT	MAINTAINS	Condensate Systems	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
GE	MT	MAINTAINS	Containment Systems	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
GE	MT	MAINTAINS	Containment Penetration/Isolation System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
GE	MT	MAINTAINS	Containment Spray (RMR) System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
GE	MT	TESTS	Suppression Pool Support System	ON COMM	3.0E-3	8.0E-3	10	3.0E-2	3.0E-4					
GE	MT	TESTS	Control Rod Drive Systems	ON COMM	3.0E-3	8.0E-3	10	3.0E-2	3.0E-4					
GE	MT	TESTS	DC Power System	ON COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
GE	MT	MAINTAINS	DC Power System	ON COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
GE	MT	TESTS	Plant AC Distribution System	ON COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
GE	MT	MAINTAINS	Plant AC Distribution System	ON COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
GE	MT	MAINTAINS	Emergency Core Cooling Systems	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
GE	MT	MAINTAINS	High Pressure Coolant Injection System	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
GE	MT	MAINTAINS	High Pressure Core Spray System	ON COMM	1.9E-1	2.4E-1	3	6.6E-1	5.7E-2					
GE	MT	MAINTAINS	Low Pressure Core Spray System	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
GE	MT	MAINTAINS	Residual Heat Removal/Low Press Coolant Inject Syst	ON COMM	3.0E-3	8.0E-3	10	3.0E-2	3.0E-4					
GE	MT	MAINTAINS	Residual Heat Removal/Low Press Coolant Inject Syst	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
GE	MT	TESTS	Instrumentation and Control Systems	ON COMM	3.0E-4	8.0E-4	10	3.0E-3	3.0E-5					
GE	MT	MAINTAINS	Instrumentation and Control Systems	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
GE	MT	MAINTAINS	Automatic Depressurization System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
GE	MT	MAINTAINS	Containment Atmosphere Monitoring System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
GE	MT	MAINTAINS	Station Service Water System	ON COMM						1.0E-3	2.7E-3	10	1.0E-2	1.0E-4
GE	MT	MAINTAINS	Feedwater System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
GE	MT	MAINTAINS	Reactor Core Isolation Cooling System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
GE	MT	TESTS	Standby Liquid Control System	ON COMM	2.2E-3	2.8E-3	3	7.0E-3	7.2E-4					
WE	CRO	OPERATES	Air Systems	ON COMM	6.0E-3	1.2E-2	7	4.2E-2	8.6E-4					
WE	CRO	OPERATES	Instrument Air System	ON COMM	8.0E-4	2.1E-3	10	8.0E-3	8.0E-5	9.2E-2	1.2E-1	3	2.9E-1	2.9E-2
WE	CRO	MONITORS	Instrument Air System	ON COMM						6.0E-2	1.1E-1	6	3.6E-1	1.0E-2
WE	CRO	DIAGNOSES	Instrument Air System	ON COMM						1.6E-2	3.5E-2	8	1.3E-1	1.9E-3
WE	CRO	OPERATES	Communication Systems	ON COMM						2.6E-2	5.7E-2	8	2.0E-1	3.3E-3
WE	CRO	OPERATES	Condensate Systems	ON COMM	3.0E-2	3.7E-2	3	7.4E-2	1.2E-2					
WE	CRO	MONITORS	Condensate Systems	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
WE	CRO	OPERATES	Containment Systems	ON COMM	2.7E-3	7.1E-3	10	2.7E-2	2.7E-4	2.1E-3	2.2E-2	35	7.5E-2	6.0E-5
WE	CRO	DIAGNOSES	Containment Systems	ON COMM						3.9E-2	5.5E-2	4	1.7E-1	8.9E-3
WE	CRO	OPERATES	Containment Isolation System	ON COMM	2.6E-4	6.9E-4	10	2.6E-3	2.6E-5	3.1E-5	8.3E-5	10	3.1E-6	3.1E-6
WE	CRO	TESTS	Containment Spray System	ON COMM						3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
WE	CRO	OPERATES	Containment Spray System	ON COMM	4.9E-4	1.3E-3	10	4.9E-3	4.9E-5	1.5E-3	2.2E-3	4	4.1E-4	4.1E-4
WE	CRO	MONITORS	Containment Spray System	ON COMM						3.4E-3	9.0E-3	10	3.2E-2	3.5E-4
WE	CRO	OPERATES	Control Rod Drive Systems	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5	3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
WE	CRO	DIAGNOSES	Control Rod Drive Systems	ON COMM						5.7E-3	1.0E-2	6	3.2E-2	1.0E-3
WE	CRO	OPERATES	Electrical Distribution Systems	ON COMM	1.0E-5	2.7E-5	10	1.0E-4	1.0E-6					
WE	CRO	MONITORS	Electrical Distribution Systems	ON COMM	8.0E-3	1.0E-2	3	2.1E-2	3.0E-3					
WE	CRO	OPERATES	Plant AC Distribution System	ON COMM	1.5E-3	4.0E-3	10	1.5E-2	1.5E-4					
WE	CRO	TESTS	Emergency Core Cooling Systems	ON COMM						6.9E-4	1.1E-3	5	1.4E-4	1.4E-4
WE	CRO	OPERATES	Emergency Core Cooling Systems	ON COMM	2.7E-3	2.9E-3	2	6.1E-3	1.2E-3	3.1E-3	4.4E-3	4	8.2E-4	8.2E-4
WE	CRO	MONITORS	Emergency Core Cooling Systems	ON COMM	1.0E-2	1.4E-2	4	4.0E-2	2.5E-3	1.9E-2	3.0E-2	5	8.7E-2	4.1E-3
WE	CRO	DIAGNOSES	Emergency Core Cooling Systems	ON COMM	1.0E-2	1.6E-2	5	5.0E-2	2.0E-3	3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
WE	CRO	OPERATES	High Pressure Safety Injection System	ON COMM	2.1E-3	2.3E-3	2	3.6E-3	1.2E-3	3.1E-2	3.9E-2	3	8.6E-2	1.1E-2
WE	CRO	OPERATES		ON COMM	2.5E-3	4.5E-3	5	1.4E-2	5.5E-4	3.5E-3	9.3E-3	10	3.5E-4	3.5E-4
										3.0E-4	6.0E-4	10	3.0E-3	3.0E-5

APPENDIX A. AGGREGATED KEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
WE	CRO	OPERATES	Residual Heat Removal/Low Press Safety Inject Syst	ON COMM	2.6E-5	3.7E-5	4	9.9E-5	6.9E-6	3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
WE	CRO	DIAGNOSES	Residual Heat Removal/Low Press Safety Inject Syst	ON COMM	7.0E-3	1.3E-2	6	4.2E-2	1.2E-3	3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
WE	CRO	OPERATES	Feedwater Systems	ON COMM	7.5E-4	8.2E-4	2	1.8E-3	3.1E-4					
WE	CRO	MONITORS	Feedwater Systems	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
WE	CRO	DIAGNOSES	Feedwater Systems	ON COMM	5.0E-2	1.3E-1	10	5.0E-1	5.0E-3					
WE	CRO	OPERATES	Auxiliary Feedwater System	ON COMM	8.2E-3	9.0E-3	2	1.8E-2	3.8E-3	1.0E+0	1.0E+0	1	1.0E+0	1.0E+0
WE	CRO	MONITORS	Auxiliary Feedwater System	ON COMM	2.4E-3	6.4E-3	10	2.4E-2	2.4E-4					
WE	CRO	DIAGNOSES	Auxiliary Feedwater System	ON COMM						1.1E-2	2.9E-2	10	1.1E-3	1.1E-3
WE	CRO	OPERATES	Main Feedwater System	ON COMM	2.8E-3	4.0E-3	4	1.1E-2	7.5E-4					
WE	CRO	MONITORS	Main Feedwater System	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
WE	CRO	DIAGNOSES	Heating, Ventilation & Air Conditioning Systems	ON COMM						6.0E-4	1.6E-3	10	6.0E-5	6.0E-5
WE	CRO	OPERATES	Instrumentation and Control Systems	ON COMM	6.6E-3	7.2E-3	2	1.2E-2	3.5E-3					
WE	CRO	MONITORS	Instrumentation and Control Systems	ON COMM	5.2E-3	5.7E-3	2	1.0E-2	2.7E-3					
WE	CRO	DIAGNOSES	Instrumentation and Control Systems	ON COMM	8.3E-3	9.1E-3	2	1.9E-2	3.7E-3					
WE	CRO	OPERATES	Electrohydraulic Control (Turbine Control) System	ON COMM						5.4E-4	1.4E-3	10	5.4E-3	5.4E-3
WE	CRO	OPERATES	Engineered Safeguards Actuation and Logic System	ON COMM	2.2E-2	2.4E-2	2	4.8E-2	1.0E-2	3.6E-2	5.8E-2	5	7.2E-3	7.2E-3
WE	CRO	OPERATES	Pressurizer Level Control System	ON COMM	1.2E-2	1.9E-2	5	6.0E-2	2.3E-3	5.4E-4	1.4E-3	10	5.4E-3	5.4E-3
WE	CRO	OPERATES	Pressurizer Pressure Control System	ON COMM	6.5E-3	8.2E-3	3	1.8E-2	2.3E-3					
WE	CRO	MONITORS	Pressurizer Pressure Control System	ON COMM	2.0E-3	5.3E-3	10	2.0E-2	2.0E-4					
WE	CRO	OPERATES	Reactor Protection System	ON COMM	3.9E-4	6.3E-4	5	2.0E-3	7.7E-5	5.4E-4	1.4E-3	10	5.4E-3	5.4E-3
WE	CRO	OPERATES	Steam Generator Water Level Control System	ON COMM	4.0E-3	8.9E-3	8	3.2E-2	5.0E-4					
WE	CRO	MONITORS	Steam Generator Water Level Control System	ON COMM	7.0E-3	1.0E-2	4	2.8E-2	1.8E-3					
WE	CRO	DIAGNOSES	Steam Generator Water Level Control System	ON COMM	8.9E-5	1.4E-4	5	4.5E-4	1.7E-5					
WE	CRO	OPERATES	Reactor Coolant Systems	ON COMM	1.4E-2	1.5E-2	2	2.5E-2	7.7E-3					

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery		Considered			Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
WE	CRO	MONITORS	Reactor Coolant Systems	ON	2.1E-3	2.3E-3	2	5.1E-3	8.7E-4					
WE	CRO	DIAGNOSES	Reactor Coolant Systems	COMM	8.4E-3	1.2E-2	4	3.6E-2	2.0E-3					
WE	CRO	OPERATES	Chemical And Volume Control System	ON	2.8E-3	3.4E-3	3	8.7E-3	8.7E-4					
WE	CRO	DIAGNOSES	Chemical And Volume Control System	COMM	9.3E-3	2.5E-2	10	9.3E-2	9.3E-4					
WE	CRO	OPERATES	Spent Fuel Pit Cooling System	ON	1.9E-4	5.1E-4	10	1.9E-3	1.9E-5					
WE	CRO	OPERATES	Turbine Systems	COMM	3.8E-4	1.0E-3	10	3.8E-3	3.8E-5					
WE	CRO	DIAGNOSES	Turbine Systems	ON	1.0E-3	2.7E-3	10	1.0E-2	1.0E-4					
WE	CRO	MONITORS	Extraction Steam System	COMM						1.9E-2	4.1E-2	8	1.5E-1	2.5E-3
WE	CRO	OPERATES	Component Cooling Water System	ON	2.1E-3	3.0E-3	4	8.1E-3	5.4E-4					
WE	CRO	OPERATES	Nuclear Service Water System	COMM	5.9E-2	1.6E-1	10	5.9E-1	5.9E-3					
WE	CRO	OPERATES	Main Steam System	ON	3.1E-3	3.8E-3	3	7.9E-3	1.2E-3	1.0E+0	1.0E+0	1	1.0E+0	1.0E+0
WE	CRO	MONITORS	Main Steam System	COMM	1.5E-3	2.4E-3	5	7.6E-3	2.9E-4					
WE	EO	MAINTAINS	Condensate Systems	ON	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
WE	EO	MAINTAINS	Containment Systems	COMM	6.7E-5	1.8E-4	10	6.7E-4	6.6E-6					
WE	EO	MAINTAINS	Containment/Reactor Building Penetration System	ON	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
WE	EO	MAINTAINS	Containment Fan Cooling System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
WE	EO	MAINTAINS	Containment Isolation System	ON	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
WE	EO	MAINTAINS	Containment Spray System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
WE	EO	OPERATES	DC Power System	ON						5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
WE	EO	MAINTAINS	DC Power System	COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
WE	EO	INSPECTS	DC Power System	ON						3.0E-3	3.8E-3	3	9.0E-3	1.0E-3
WE	EO	OPERATES	Plant AC Distribution System	COMM	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2	5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
WE	EO	MAINTAINS	Plant AC Distribution System	ON	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2	4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
WE	EO	INSPECTS	Plant AC Distribution System	COMM						3.0E-3	3.8E-3	3	9.0E-3	1.0E-3

Aggregated Data

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery		Considered		LCB	Recovery Not		Considered		LCB
					Median	Mean	EF	UCB		Median	Mean	EF	UCB	
WE	EO	OPERATES	Emergency Core Cooling Systems	OM						5.9E-2	6.4E-2	2	1.2E-1	2.9E-2
WE	EO	MAINTAINS	Emergency Core Cooling Systems	OM										
WE	EO	MAINTAINS	High Pressure Safety Injection System	COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
WE	EO	MAINTAINS	Residual Heat Removal/Low Press Safety Inject Syst	COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
WE	EO	MAINTAINS	Feedwater Systems	COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
WE	EO	MAINTAINS	Auxiliary Feedwater System	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
WE	EO	MAINTAINS	Main Feedwater System	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
WE	EO	OPERATES	Reactor Coolant Systems	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
WE	EO	INSPECTS	Process Sampling Systems	OM						8.7E-3	1.4E-2	5	4.7E-2	1.6E-3
WE	NT	MAINTAINS	Condensate Systems	COMM						1.2E-2	3.2E-2	10	1.2E-1	1.2E-3
WE	NT	MAINTAINS	Containment Systems	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
WE	NT	MAINTAINS	Containment/Reactor Building Penetration System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
WE	NT	MAINTAINS	Containment Fan Cooling System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
WE	NT	MAINTAINS	Containment Isolation System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
WE	NT	TESTS	Containment Spray System	COMM	1.0E-3	2.7E-3	10	1.0E-2	1.0E-4					
WE	NT	MAINTAINS	Containment Spray System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5	1.0E-3	2.7E-3	10	1.0E-2	1.0E-4
WE	NT	TESTS	DC Power System	COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
WE	NT	CHECKS	DC Power System	COMM						5.0E-3	6.2E-3	3	1.5E-2	1.7E-3
WE	NT	MAINTAINS	DC Power System	COMM						3.7E-3	4.0E-3	2	6.0E-3	2.2E-3
WE	NT	TESTS	Plant AC Distribution System	COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
WE	NT	CHECKS	Plant AC Distribution System	COMM						5.0E-3	6.2E-3	3	1.5E-2	1.7E-3
WE	NT	MAINTAINS	Plant AC Distribution System	COMM						3.7E-3	4.0E-3	2	6.0E-3	2.2E-3
WE	NT	MAINTAINS	Emergency Core Cooling Systems	OM	1.9E-5	3.1E-5	5	1.0E-4	3.7E-6					
WE	NT	MAINTAINS	High Pressure Safety Injection System	COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
WE	NT	MAINTAINS		COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					

APPENDIX A. AGGREGATED NEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
WE	MT	TESTS	Residual Heat Removal/Low Press Safety Inject Syst	ON COMM	1.1E-5	2.9E-5	10	1.1E-4	1.1E-6					
WE	MT	MAINTAINS	Residual Heat Removal/Low Press Safety Inject Syst	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
WE	MT	MAINTAINS	Feedwater Systems	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
WE	MT	MAINTAINS	Auxiliary Feedwater System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
WE	MT	MAINTAINS	Main Feedwater System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
WE	MT	MAINTAINS	Engineered Safeguards Actuation and Logic System	ON COMM	4.9E-5	1.3E-4	10	4.9E-4	4.9E-6					
WE	MT	TESTS	Component Cooling Water System	ON COMM	1.2E-3	3.2E-3	10	1.2E-2	1.2E-4					
WE	MT	TESTS	Nuclear Service Water System	ON COMM	3.8E-5	1.0E-4	10	3.8E-4	3.8E-6					
CE	CRO	OPERATES	Instrument Air System	ON COMM	5.7E-5	9.3E-5	5	2.9E-4	1.1E-5					
CE	CRO	MONITORS	Instrument Air System	ON COMM						9.2E-2	1.1E-1	3	2.9E-1	2.9E-2
CE	CRO	DIAGNOSES	Instrument Air System	ON COMM						6.0E-2	1.1E-1	6	3.6E-1	1.0E-2
CE	CRO	MONITORS	Annunciator Systems	ON COMM	3.0E-3	3.2E-3	2	7.0E-3	1.3E-3	1.6E-2	3.5E-2	8	1.3E-1	1.9E-3
CE	CRO	OPERATES	Communication Systems	ON COMM						2.6E-2	5.7E-2	8	2.0E-1	3.3E-3
CE	CRO	OPERATES	Condensate Systems	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
CE	CRO	MONITORS	Condensate Systems	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
CE	CRO	OPERATES	Containment Systems	ON COMM						2.1E-3	2.2E-2	35	7.5E-2	6.0E-5
CE	CRO	MONITORS	Containment Systems	ON COMM	1.2E-2	1.5E-2	3	3.6E-2	4.0E-3					
CE	CRO	DIAGNOSES	Containment Systems	ON COMM						3.9E-2	5.5E-2	4	1.7E-1	8.9E-3
CE	CRO	OPERATES	Containment Spray System	ON COMM						3.4E-3	9.0E-3	10	3.2E-2	3.5E-4
CE	CRO	OPERATES	Plant AC Power System	ON COMM	1.5E-3	4.0E-3	10	1.5E-2	1.5E-4					
CE	CRO	TESTS	Emergency Core Cooling Systems	ON COMM						3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
CE	CRO	OPERATES	Emergency Core Cooling Systems	ON COMM	1.0E-2	2.7E-2	10	1.0E-1	1.0E-3	3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
CE	CRO	MONITORS	Emergency Core Cooling Systems	ON COMM						1.9E-2	3.0E-2	5	8.7E-2	4.1E-3
CE	CRO	DIAGNOSES	Emergency Core Cooling Systems	ON COMM						3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
CE	CRO	DIAGNOSES	Emergency Core Cooling Systems	ON COMM	3.3E-1	3.6E-1	2	6.7E-1	1.7E-1	3.1E-2	3.9E-2	3	8.8E-2	1.1E-2

Aggregated Data

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
CE	CRO	OPERATES	High Pressure Safety Injection System	ON COMM	2.7E-3	4.4E-3	5	1.4E-2	5.4E-4					
CE	CRO	OPERATES	Low Press Safety Injection/Shutdown Cooling System	ON COMM	6.7E-2	6.7E-2	1	9.6E-2	4.7E-2					
CE	CRO	OPERATES	Feedwater Systems	ON COMM	3.0E-3	3.7E-3	3	8.9E-3	9.9E-4					
CE	CRO	MONITORS	Feedwater Systems	ON COMM	6.6E-3	1.1E-2	5	3.3E-2	1.3E-3					
CE	CRO	OPERATES	Main Feedwater System	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
CE	CRO	MONITORS	Main Feedwater System	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
CE	CRO	OPERATES	Auxiliary/Emergency Feedwater System	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
CE	CRO	MONITORS	Pressurizer Level Control System	ON COMM	3.4E-2	4.9E-2	4	1.3E-1	9.1E-3					
CE	CRO	MONITORS	Pressurizer Pressure Control System	ON COMM	5.3E-2	5.8E-2	2	1.2E-1	2.5E-2					
CE	CRO	MONITORS	Steam Generator Water Level Control System	ON COMM	6.0E-3	6.5E-3	2	1.3E-2	2.7E-3					
CE	CRO	MONITORS	Liquid Radwaste System	ON COMM	1.2E-2	1.5E-2	3	3.6E-2	4.0E-3					
CE	CRO	OPERATES	Chemical And Volume Control System	ON COMM	6.0E-3	7.4E-3	3	1.8E-2	2.0E-3					
CE	CRO	MONITORS	Extraction Steam System	ON COMM	5.0E-2	1.3E-1	10	5.0E-1	5.0E-3					
CE	CRO	OPERATES	Water Systems	ON COMM	1.0E-1	2.7E-1	10	1.0E+0	1.0E-2	1.9E-2	4.1E-2	8	1.5E-1	2.3E-3
CE	CRO	OPERATES	Main Steam System	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
CE	CRO	MONITORS	Main Steam System	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
CE	EO	MAINTAINS	Condensate Systems	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	EO	MAINTAINS	Condensate Storage System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	EO	MAINTAINS	Containment Systems	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	EO	MAINTAINS	Containment Isolation System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	EO	MAINTAINS	Containment Spray System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	EO	MAINTAINS	Containment Cooling System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	EO	OPERATES	DC Power System	ON COMM						5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
CE	EO	MAINTAINS	DC Power System	ON COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3

APPENDIX A. AGGREGATED HEP DATA

Vend Eqly	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
CE	EO	INSPECTS	DC Power System	ON										
CE	EO	OPERATES	Plant AC Power System	COMM	3.2E-2	4.5E-2	4	1.1E-1	8.8E-3	3.0E-3	3.8E-3	3	9.0E-3	1.0E-3
CE	EO	MAINTAINS	Plant AC Power System	COMM	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2	5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
CE	EO	INSPECTS	Plant AC Power System	COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
CE	EO	OPERATES	Emergency Core Cooling Systems	COMM						3.0E-3	3.8E-3	3	9.0E-3	1.0E-3
CE	EO	MAINTAINS	Emergency Core Cooling Systems	COMM						5.9E-2	6.4E-2	2	1.2E-1	2.9E-2
CE	EO	MAINTAINS	High Pressure Safety Injection System	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	EO	MAINTAINS	Low Press Safety Injection/Shutdown Cooling System	COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
CE	EO	MAINTAINS	Feedwater Systems	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	EO	MAINTAINS	Main feedwater System	COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
CE	EO	MAINTAINS	Auxiliary/Emergency Feedwater System	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	EO	OPERATES	Reactor Coolant Systems	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	EO	MAINTAINS	Main Steam System	COMM						8.7E-3	1.4E-2	5	4.7E-2	1.6E-3
CE	EO	INSPECTS	Process Sampling Systems	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	MT	MAINTAINS	Condensate Systems	COMM						1.2E-2	3.2E-2	10	1.2E-1	1.2E-3
CE	MT	MAINTAINS	Condensate Storage System	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	MT	MAINTAINS	Containment Systems	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	MT	MAINTAINS	Containment Isolation System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	MT	MAINTAINS	Containment Spray System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	MT	MAINTAINS	Containment Cooling System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	MT	TESTS	DC Power System	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	MT	CHECKS	DC Power System	COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
CE	MT	MAINTAINS	DC Power System	COMM						5.0E-3	6.2E-3	3	1.5E-2	1.7E-3
CE	MT	TESTS	Plant AC Power System	COMM	5.0E-4	1.3E-3	10	5.0E-3	5.0E-5	3.7E-3	4.0E-3	2	6.0E-3	2.2E-3
				COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3

Aggregated Data

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery		Considered		LCB	Recovery Not		Considered		LCB
					Median	Mean	EF	UCB		Median	Mean	EF	UCB	
CE	NT	CHECKS	Plant AC Power System	ON										
CE	MT	MAINTAINS	Plant AC Power System	COMM	5.0E-3	1.3E-2	10	5.0E-2	5.0E-4	5.0E-3	6.2E-3	3	1.5E-2	1.7E-3
CE	MT	MAINTAINS	Emergency Core Cooling Systems	ON						3.7E-3	4.0E-3	2	6.0E-3	2.2E-3
CE	MT	MAINTAINS	High Pressure Safety Injection System	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	MT	MAINTAINS	Low Press Safety Injection/Shutdown Cooling System	ON	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
CE	MT	MAINTAINS	Feedwater Systems	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
CE	MT	MAINTAINS	Main Feedwater System	ON	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	MT	TESTS	Auxiliary/Emergency Feedwater System	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
CE	MT	MAINTAINS	Auxiliary/Emergency Feedwater System	ON	2.0E-4	5.3E-4	10	2.0E-3	2.0E-5					
CE	MT	MAINTAINS	Main Steam System	COMM	2.0E-2	3.2E-2	5	1.0E-1	3.9E-3					
CE	MT	MAINTAINS	Main Steam System	ON	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
BW	CRO	OPERATES	Air Systems	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
BW	CRO	OPERATES	Instrument Air System	ON	8.6E-3	1.1E-2	3	2.7E-2	2.7E-3					
BW	CRO	MONITORS	Instrument Air System	COMM	3.1E-2	3.8E-2	3	9.6E-2	9.7E-3	9.2E-2	1.1E-1	3	2.9E-1	2.9E-2
BW	CRO	DIAGNOSES	Instrument Air System	ON						6.0E-2	1.1E-1	6	3.6E-1	1.0E-2
BW	CRO	OPERATES	Communication Systems	COMM						1.6E-2	3.5E-2	8	1.3E-1	1.9E-3
BW	CRO	OPERATES	Condensate Systems	ON	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4	2.6E-2	5.7E-2	8	2.0E-1	3.3E-3
BW	CRO	MONITORS	Condensate Systems	COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
BW	CRO	OPERATES	Containment Systems	ON						2.1E-3	2.2E-2	35	7.5E-2	6.0E-5
BW	CRO	DIAGNOSES	Containment Systems	COMM						3.9E-2	5.5E-2	4	1.7E-1	8.9E-3
BW	CRO	OPERATES	Reactor Building Spray System	ON	5.0E-1	5.0E-1	1	5.0E-1	5.0E-1					
BW	CRO	DIAGNOSES	Control Rod Drive Systems	COMM										
BW	CRO	OPERATES	Plant AC Power System	ON	1.5E-3	4.0E-3	10	1.5E-2	1.5E-4	5.7E-3	1.0E-2	6	3.2E-2	1.0E-3
BW	CRO	TESTS	Emergency Core Cooling Systems	COMM						3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
BW	CRO	OPERATES	Emergency Core Cooling Systems	ON	5.0E-1	5.0E-1	1	5.0E-1	5.0E-1	3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
				COMM						1.9E-2	3.0E-2	5	8.7E-2	4.1E-3

APPENDIX A. AGGREGATED HEP DATA

Vend Eqly	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
BV	CRO	MONITORS	Emergency Core Cooling Systems	ON COMM						3.0E-3	8.0E-3	10	3.0E-4	3.0E-4
BV	CRO	DIAGNOSES	Emergency Core Cooling Systems	ON COMM						3.2E-2	4.0E-2	3	8.9E-2	1.2E-2
BV	CRO	OPERATES	High Pressure Safety Injection System	ON COMM	6.9E-3	7.5E-3	2	1.5E-2	3.2E-3					
BV	CRO	MONITORS	High Pressure Safety Injection System	ON COMM	5.0E-2	1.3E-1	10	5.0E-1	5.0E-3					
BV	CRO	DIAGNOSES	High Pressure Safety Injection System	ON COMM	3.1E-5	4.4E-5	4	1.2E-4	7.4E-6					
BV	CRO	OPERATES	Decay Heat Removal/Core Flooding System	ON COMM	3.7E-3	7.5E-3	7	2.6E-2	5.3E-4					
BV	CRO	OPERATES	Decay Heat Removal/Low Press Safety Inject System	ON COMM	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2					
BV	CRO	MONITORS	Decay Heat Removal/Low Press Safety Inject System	ON COMM	1.3E-3	1.6E-3	3	3.5E-3	4.5E-4					
BV	CRO	DIAGNOSES	Decay Heat Removal/Low Press Safety Inject System	ON COMM	7.5E-4	2.0E-3	10	7.5E-3	7.5E-5					
BV	CRO	OPERATES	Feedwater Systems	ON COMM	7.6E-6	1.1E-5	4	3.1E-5	1.9E-6					
BV	CRO	MONITORS	Feedwater Systems	ON COMM	3.7E-3	7.5E-3	7	2.6E-2	5.3E-4					
BV	CRO	OPERATES	Main Feedwater System	ON COMM	2.1E-3	3.3E-3	5	1.1E-2	4.1E-4					
BV	CRO	MONITORS	Main feedwater System	ON COMM	2.5E-1	2.7E-1	2	4.1E-1	1.5E-1					
BV	CRO	OPERATES	Emergency Feedwater System	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
BV	CRO	OPERATES	Water Systems	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
BV	CRO	OPERATES	Low Pressure Service Water System	ON COMM	1.0E-2	2.7E-2	10	1.0E-1	1.0E-3					
BV	CRO	OPERATES	Main Steam System	ON COMM	1.0E-1	2.7E-1	10	1.0E+0	1.0E-2					
BV	CRO	MONITORS	Main Steam System	ON COMM	1.0E-3	2.7E-3	10	1.0E-2	1.0E-4					
BV	EO	MAINTAINS	Condensate Systems	ON COMM	1.3E-2	3.5E-2	10	1.3E-1	1.3E-3					
BV	EO	MAINTAINS	Containment Systems	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
BV	EO	MAINTAINS	Containment Isolation System	ON COMM	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
BV	EO	OPERATES	Reactor Building Spray System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
BV	EO	OPERATES	DC Power System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
BV	EO	MAINTAINS	DC Power System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
BV	EO	MAINTAINS	DC Power System	ON COMM						5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
BV	EO	MAINTAINS	DC Power System	ON COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3

Aggregated Data

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery			Considered			Recovery Not Considered				
					Median	Mean		EF	UCB	LCB	Median	Mean	EF	UCB	LCB
BW	EO	INSPECTS	DC Power System	ON COMM							3.0E-3	3.8E-3	3	9.0E-3	1.0E-3
BW	EO	OPERATES	Plant AC Power System	ON COMM	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2		5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
BW	EO	MAINTAINS	Plant AC Power System	ON COMM	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2		4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
BW	EO	INSPECTS	Plant AC Power System	ON COMM							3.0E-3	3.8E-3	3	9.0E-3	1.0E-3
BW	EO	OPERATES	Emergency Core Cooling Systems	ON COMM							5.9E-2	6.4E-2	2	1.2E-1	2.9E-2
BW	EO	MAINTAINS	Emergency Core Cooling Systems	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6						
BW	EO	TESTS	High Pressure Safety Injection System	ON COMM	7.5E-4	2.0E-3	10	7.5E-3	7.5E-5						
BW	EO	MAINTAINS	High Pressure Safety Injection System	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6						
BW	EO	MAINTAINS	Decay Heat Removal/Core Flooding System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5						
BW	EO	OPERATES	Decay Heat Removal/Low Press Safety Inject System	ON COMM							3.0E-3	3.8E-3	3	1.0E-3	1.0E-3
BW	EO	MAINTAINS	Decay Heat Removal/Low Press Safety Inject System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6						
BW	EO	MAINTAINS	Feedwater Systems	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6						
BW	EO	MAINTAINS	Main Feedwater System	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6						
BW	EO	MAINTAINS	Emergency Feedwater System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6						
BW	EO	MAINTAINS	Safety Features Actuation System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5						
BW	EO	OPERATES	Reactor Coolant Systems	ON COMM							8.7E-3	1.4E-2	5	4.7E-2	1.6E-3
BW	EO	MAINTAINS	Steam Systems	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5						
BW	EO	INSPECTS	Process Sampling Systems	ON COMM							1.2E-2	3.2E-2	10	1.2E-1	1.2E-3
BW	NT	MAINTAINS	Condensate Systems	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6						
BW	NT	MAINTAINS	Containment Systems	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5						
BW	NT	MAINTAINS	Containment Isolation System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5						
BW	NT	MAINTAINS	Reactor Building Spray System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5						
BW	NT	TESTS	DC Power System	ON COMM							4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
BW	NT	CHECKS	DC Power System	ON COMM							5.0E-3	6.2E-3	3	1.5E-2	1.7E-3

APPENDIX A. AGGREGATED NEP DATA

Vend EqLv	Job Tit	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
BW	MT	MAINTAINS	DC Power System	ON COMM						3.7E-3	4.0E-3	2	6.0E-3	2.2E-3
BW	MT	TESTS	Plant AC Power System	ON COMM						4.4E-3	4.8E-3	2	7.7E-3	2.6E-3
BW	MT	CHECKS	Plant AC Power System	ON COMM						5.0E-3	6.2E-3	3	1.5E-2	1.7E-3
BU	MT	MAINTAINS	Plant AC Power System	ON COMM						3.7E-3	4.0E-3	2	6.0E-3	2.2E-3
BW	MT	MAINTAINS	Emergency Core Cooling Systems	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
BW	MT	MAINTAINS	High Pressure Safety Injection System	ON COMM	5.0E-5	8.1E-5	5	2.5E-4	9.8E-6					
BU	MT	MAINTAINS	Decay Heat Removal/Core Flooding System	ON COMM	1.0E-4	1.6E-4	5	5.1E-4	2.0E-5					
BU	MT	MAINTAINS	Decay Heat Removal/Low Press Safety Inject System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
BW	MT	MAINTAINS	Feedwater Systems	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
BW	MT	MAINTAINS	Main Feedwater System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
BU	MT	MAINTAINS	Emergency feedwater System	ON COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
BU	MT	MAINTAINS	Safety Features Actuation System	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
BW	MT	MAINTAINS	Steam Systems	ON COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
COMP	CRO	OPERATES	Circuit Breaker	ON COMM	2.4E-3	6.4E-3	10	2.4E-2	2.4E-4					
COMP	CRO	OPENS/CLOSES	Circuit Breaker	ON COMM	2.2E-2	2.8E-2	3	7.0E-2	7.1E-3	5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
COMP	CRO	OPERATES	Switch	ON COMM	6.0E-3	1.1E-2	5	3.5E-2	1.3E-3					
COMP	CRO	OPENS/CLOSES	Switchgear	ON COMM	1.5E-3	4.0E-3	10	1.5E-2	1.5E-4					
COMP	CRO	OPERATES	Control Instruments	ON COMM	1.1E-3	2.9E-3	10	1.1E-2	1.1E-4					
COMP	CRO	DIAGNOSES	Flow Control Instrument	ON COMM	2.6E-1	3.2E-1	3	7.7E-1	8.5E-2					
COMP	CRO	MONITORS	Flow Control Instrument	ON COMM	3.0E-3	3.7E-3	3	8.9E-3	9.9E-4					
COMP	CRO	OPERATES	Flow Control Instrument	ON COMM	2.6E-1	3.2E-1	3	7.7E-1	8.5E-2	1.3E-1	1.5E-1	2	2.4E-1	7.4E-2
COMP	CRO	MONITORS	Flux Control Instrument	ON COMM	8.7E-3	9.5E-3	2	1.6E-2	4.6E-3					
COMP	CRO	OPERATES	Flux Control Instrument	ON COMM	1.0E-3	2.7E-3	10	1.0E-2	1.0E-4	1.3E-1	1.5E-1	2	2.4E-1	7.4E-2
COMP	CRO	DIAGNOSES	Level Control Instrument	ON COMM	9.0E-2	9.9E-2	2	1.6E-1	5.1E-2					
				ON COMM	8.9E-3	1.1E-2	3	2.7E-2	3.0E-3					

Aggregated Data

APPENDIX A. AGGREGATED NEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
COMP	CRO	MONITORS	Level Control Instrument	ON						1.3E-1	1.5E-1	2	2.4E-1	7.4E-2
COMP	CRO	MONITORS	Pressure Control Instrument	COMM						1.3E-1	1.5E-1	2	2.4E-1	7.4E-2
COMP	CRO	OPERATES	Control Rod Drive Mechanisms	ON	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5	3.0E-4	6.0E-4	7	4.5E-5	4.5E-5
COMP	CRO	STARTS/STOPS	Electrical Equipment	ON	1.1E-3	1.8E-3	5	5.6E-3	2.2E-4					
COMP	CRO	OPERATES	Pumps	ON	3.0E-2	5.5E-2	4	1.5E-1	1.0E-2					
COMP	CRO	STARTS/STOPS	Pumps	COMM	1.6E-2	2.6E-2	5	8.2E-2	3.2E-3					
COMP	CRO	STARTS/STOPS	Centrifugal Pump	ON	6.3E-4	1.0E-3	5	3.2E-3	1.2E-4					
COMP	CRO	MONITORS	Pressure Sensor	COMM	1.0E-3	1.3E-3	3	3.3E-3	3.3E-4					
COMP	CRO	MONITORS	Radiation Sensor	ON	3.0E-1	3.3E-1	2	5.0E-1	1.9E-1					
COMP	CRO	OPERATES	Steam Generators	COMM	1.2E-2	1.5E-2	3	3.6E-2	4.0E-3					
COMP	CRO	OPERATES	Turbines	ON	3.4E-3	9.1E-3	10	3.4E-2	3.4E-4					
COMP	CRO	MONITORS	Valves	COMM	6.4E-3	9.2E-3	4	2.4E-2	1.7E-3					
COMP	CRO	OPERATES	Valves	ON	4.3E-3	1.1E-2	10	4.3E-2	4.3E-4					
COMP	CRO	OPERATES	Valves	COMM	2.7E-3	4.4E-3	5	1.4E-2	5.4E-4	3.1E-3	5.1E-3	5	6.2E-4	6.2E-4
COMP	CRO	OPENS/CLOSES	Valves	ON	9.0E-2	1.2E-1	3	3.1E-1	3.1E-2	1.1E-4	1.8E-4	5	2.2E-5	2.2E-5
COMP	CRO	OPENS/CLOSES	Relief Valve	COMM	1.0E-5	2.7E-5	10	1.0E-4	1.0E-6	3.0E-4	8.0E-4	10	3.0E-3	3.0E-5
COMP	CRO	OPERATES	Valve Operators	ON	5.9E-2	1.6E-1	10	5.9E-1	5.9E-3					
COMP	CRO	OPERATES	Electric Motor-AC	COMM	8.8E-3	9.6E-3	2	1.6E-2	4.8E-3					
COMP	EO	INSPECTS	Circuit Breaker	ON	1.5E-3	4.0E-3	10	1.5E-2	1.5E-4					
COMP	EO	OPERATES	Circuit Breaker	COMM	2.5E-1	3.6E-1	4	1.0E+0	5.0E-2					
COMP	EO	OPENS/CLOSES	Circuit Breaker	ON	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2	4.0E-3	4.4E-3	2	8.4E-3	1.9E-3
COMP	EO	OPENS/CLOSES	Disconnect	COMM	1.0E-2	1.5E-2	4	3.8E-2	2.9E-3	8.7E-3	9.5E-3	2	1.9E-2	4.0E-3
COMP	EO	OPERATES	Flow Control Instrument	ON	3.0E-3	6.0E-3	7	2.0E-2	4.5E-4	3.0E-3	3.8E-3	3	9.0E-3	1.0E-3
COMP	EO	OPERATES	Level Control Instrument	COMM						6.8E-3	2.1E-2	12	8.3E-2	5.5E-4
COMP	EO	OPERATES	Pressure Control Instrument	ON						6.8E-3	2.1E-2	12	8.3E-2	5.5E-4
COMP	EO	OPERATES		COMM						6.8E-3	2.1E-2	12	8.3E-2	5.5E-4

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Tcl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
COMP	EO	OPERATES	Temperature Control Instrument	ON										
COMP	EO	OPERATES	Electrical Equipment	COMM	2.3E-1	2.5E-1	2	4.8E-1	1.1E+1	6.8E-3	2.1E-2	12	8.3E-2	5.5E-4
COMP	EO	OPERATES	Generator	COMM	1.0E-2	2.7E-2	10	1.0E-1	1.0E-3					
COMP	EO	INSPECTS	Centrifugal Pump	COMM	1.5E-3	4.0E-3	10	1.5E-2	1.5E-4					
COMP	EO	STARTS/STOPS	Centrifugal Pump	COMM	3.0E-2	4.8E-2	5	1.5E-1	6.0E-3					
COMP	EO	INSPECTS	Level Sensor	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
COMP	EO	INSPECTS	Pressure Sensor	COMM	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5					
COMP	EO	INSPECTS	Valves	COMM	3.0E-3	1.0E-2	13	4.0E-2	2.3E-4					
COMP	EO	OPERATES	Valves	COMM	3.0E-2	1.0E-1	13	3.9E-1	2.3E-3					
COMP	EO	OPENS/CLOSES	Valves	COMM	1.0E-1	1.3E-1	3	3.0E-1	3.3E-2					
COMP	EO	OPERATES	Gate Valve	COMM	2.8E-3	4.6E-3	5	1.4E-2	5.5E-4					
COMP	EO	OPENS/CLOSES	Gate Valve	COMM	1.3E-3	1.4E-3	2	3.1E-3	5.6E-4					
COMP	EO	OPERATES	Electric Motor-AC	COMM	1.1E-2	1.4E-2	3	2.9E-2	4.5E-3					
COMP	EO	OPERATES	Pneumatic	COMM	1.5E-3	4.0E-3	10	1.5E-2	1.5E-4					
COMP	EO	INSPECTS	Vessels/Tanks	COMM						3.0E-2	7.3E-2	9	3.3E-3	3.3E-3
COMP	EO	INSPECTS	Tank	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
COMP	NT	MAINTAINS	Circuit Breaker	COMM	2.5E-5	6.7E-5	10	2.5E-4	2.5E-6					
COMP	NT	REPAIRS	Circuit Breaker	COMM	4.1E-2	6.7E-2	5	2.1E-1	8.3E-3	5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
COMP	NT	TESTS	Circuit Breaker	COMM						5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
COMP	NT	MAINTAINS	Disconnect	COMM						5.0E-3	5.5E-3	2	9.5E-3	2.7E-3
COMP	NT	REPAIRS	Disconnect	COMM						3.0E-3	3.8E-3	3	9.0E-3	1.0E-3
COMP	NT	TESTS	Disconnect	COMM						3.0E-3	3.8E-3	3	9.0E-3	1.0E-3
COMP	NT	TESTS	Switch	COMM	1.5E-2	1.8E-2	3	4.0E-2	5.4E-3	3.0E-3	3.8E-3	3	9.0E-3	1.0E-3
COMP	NT	CALIBRATES	Flow Control Instrument	COMM						3.0E-2	6.1E-2	7	2.0E-1	4.6E-3

Aggregated Data

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Ttl	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
COMP	NT	DIAGNOSES	Flow Control Instrument	ON	7.6E-2	8.3E-2	2	1.5E-1	3.8E-2					
COMP	NT	CALIBRATES	Level Control Instrument	COMM										
COMP	NT	CALIBRATES	Pressure Control Instrument	ON	1.0E-4	2.7E-4	10	1.0E-3	1.0E-5	3.0E-2	6.1E-2	7	2.0E-1	4.6E-3
COMP	NT	CALIBRATES	Temperature Control Instrument	COMM						3.0E-2	6.1E-2	7	2.0E-1	4.6E-3
COMP	NT	DIAGNOSES	Voltage Control Instrument	ON	1.7E-1	1.9E-1	2	3.4E-1	8.5E-2	3.0E-2	6.1E-2	7	2.0E-1	4.6E-3
COMP	NT	CALIBRATES	Electrical Equipment	COMM										
COMP	NT	DIAGNOSES	Electrical Equipment	ON	1.5E-1	1.7E-1	2	3.1E-1	7.7E-2					
COMP	NT	TESTS	Electrical Equipment	COMM										
COMP	NT	TESTS	Generator	ON	1.8E-1	1.9E-1	2	2.9E-1	1.1E-1					
COMP	NT	TESTS	Equipment - Nonspecific	COMM										
COMP	NT	MAINTAINS	Pumps	ON	1.5E-1	1.6E-1	2	2.6E-1	8.4E-2					
COMP	NT	TESTS	Sensors	COMM										
COMP	NT	TESTS	Sensors	ON	5.0E-4	1.3E-3	10	5.0E-3	5.0E-5					
COMP	NT	CALIBRATES	Level Sensor	COMM										
COMP	NT	CALIBRATES	Pressure Sensor	ON	5.7E-2	5.7E-2	1	8.5E-2	3.9E-2	1.0E-3	2.7E-3	10	1.0E-2	1.0E-4
COMP	NT	DIAGNOSES	Valves	COMM										
COMP	NT	MAINTAINS	Valves	ON	1.1E-4	2.9E-4	10	1.1E-3	1.1E-5					
COMP	NT	TESTS	Valves	COMM										
COMP	NT	TESTS	Pneumatic	ON	5.7E-5	8.2E-5	4	2.2E-4	1.5E-5					
COMP	NT	TESTS	Qualitative Displays	COMM										
COMP	NT	TESTS	Valves	ON	4.9E-5	1.3E-4	10	4.9E-4	4.9E-6	2.3E-3	2.5E-3	2	4.3E-3	1.3E-3
COMP	NT	TESTS	Valves	COMM										
COMP	NT	TESTS	Valves	ON	3.2E-4	4.0E-4	3	1.0E-3	1.0E-4					
COMP	NT	TESTS	Valves	COMM										
COMP	NT	TESTS	Valves	ON	2.0E-1	2.1E-1	2	3.9E-1	9.8E-2					
COMP	NT	TESTS	Valves	COMM										
COMP	NT	TESTS	Valves	ON	5.6E-4	7.0E-4	3	1.8E-3	1.8E-4					
COMP	NT	TESTS	Valves	COMM										
COMP	NT	TESTS	Valves	ON	5.1E-3	5.6E-3	2	8.1E-3	3.2E-3					
COMP	NT	TESTS	Pneumatic	COMM										
COMP	NT	TESTS	Pneumatic	ON	5.7E-5	9.3E-5	5	2.9E-4	1.1E-5					
COMP	NT	TESTS	Pneumatic	COMM										
COMP	NT	TESTS	Pneumatic	ON	2.9E-3	3.2E-3	2	4.7E-3	1.8E-3					
COMP	NT	TESTS	Pneumatic	COMM										
COMP	NT	TESTS	Pneumatic	ON	2.6E-3	2.9E-3	2	4.3E-3	1.6E-3					
COMP	NT	TESTS	Pneumatic	COMM										
COMP	NT	TESTS	Pneumatic	ON	2.6E-2	2.8E-2	2	4.6E-2	1.5E-2					
COMP	NT	TESTS	Pneumatic	COMM										
COMP	NT	TESTS	Pneumatic	ON	3.1E-2	3.4E-2	2	5.3E-2	1.8E-2					
COMP	NT	TESTS	Pneumatic	COMM										

APPENDIX A. AGGREGATED HEP DATA

Vend EqLv	Job Tit	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
D/I/C	Subj	READS	Quantitative Displays	OM						3.2E-1	3.5E-1	2	7.1E-1	1.6E-1
D/I/C	Subj	READS	Counter-Digital Readout	COMM										
D/I/C	Subj	READS	Meter	OM	5.0E-5	1.1E-3	61	3.0E-3	8.0E-7	6.1E-4	6.6E-4	2	1.0E-3	3.6E-4
D/I/C	Subj	MONITORS	Meter	COMM	1.9E-3	2.0E-3	2	3.7E-3	9.3E-4					
D/I/C	Subj	MONITORS	Meter	OM	5.8E-3	6.3E-3	2	1.4E-2	2.4E-3					
D/I/C	Subj	READS	Chart Recorder	COMM						1.8E-3	2.0E-3	2	3.4E-3	9.6E-4
D/I/C	Subj	MONITORS	Chart Recorder	OM	3.2E-3	4.0E-3	3	1.1E-2	9.1E-4					
D/I/C	Subj	MONITORS	CRT Graphic Display	COMM						3.5E-3	3.8E-3	2	7.5E-3	1.6E-3
D/I/C	Subj	MONITORS	CRT Alphabetic Display	OM	7.5E-2	2.0E-1	10	7.5E-1	7.5E-3	1.3E-1	2.8E-1	8	1.0E+0	1.6E-2
D/I/C	Subj	POSITIONS	Two-Position Switches	COMM	3.1E-2	3.4E-2	2	5.3E-2	1.8E-2					
D/I/C	Subj	SELECTS	Two-Position Switches	OM										
D/I/C	Subj	SELECTS	Push-Button (Illuminated Legend)	COMM	7.9E-4	2.1E-3	10	7.9E-3	7.9E-5	4.6E-3	5.8E-3	3	1.4E-2	1.6E-3
D/I/C	Subj	SELECTS	Push-Button (Other)	OM	1.6E-3	2.0E-3	3	4.5E-3	5.6E-4					
D/I/C	Subj	SELECTS	Toggle Switch/Two-Position	COMM						1.9E-4	2.1E-4	2	3.0E-4	1.2E-4
D/I/C	Subj	POSITIONS	Knob	OM						7.3E-4	7.9E-4	2	1.2E-3	4.5E-4
D/I/C	Subj	SELECTS	Keylock	COMM						2.0E-4	2.2E-4	2	3.2E-4	1.2E-4
D/I/C	Subj	POSITIONS	Multiposition Selectors	OM	1.4E-3	3.8E-3	10	1.4E-2	1.4E-4					
D/I/C	Subj	POSITIONS	J-Handle Switch	COMM	3.0E-3	8.0E-3	10	3.0E-2	3.0E-4	2.0E-4	2.2E-4	2	3.2E-4	1.3E-4
D/I/C	Subj	POSITIONS	Rotary Switch	OM	1.8E-3	2.5E-3	4	7.9E-3	4.0E-4					
D/I/C	Subj	ADJUSTS	Continuously Variable Controls	COMM	2.7E-3	7.1E-3	10	2.7E-2	2.7E-4					
D/I/C	Subj	WRITES	Printed Communications	OM	5.0E-4	1.1E-3	8	4.0E-3	6.3E-5	8.4E-3	1.1E-2	3	2.1E-2	3.3E-3
D/I/C	Subj	WRITES	Log Book	COMM						2.7E-3	2.9E-3	2	5.8E-3	1.2E-3
D/I/C	Subj	WRITES	Tag	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										
D/I/C	Subj	WRITES	Log Book	OM										
D/I/C	Subj	WRITES	Log Book	COMM										

APPENDIX A. AGGREGATED NEP DATA

Vend EqLv	Job Tit	Human Action Verb	Equipment Class	Error Type	Recovery Considered					Recovery Not Considered				
					Median	Mean	EF	UCB	LCB	Median	Mean	EF	UCB	LCB
D/I/C	Subj	WRITES	Administrative Procedure	ON						3.0E-3	4.8E-3	5	6.0E-4	6.0E-4
				COMM						3.0E-3	4.8E-3	5	1.5E-2	6.0E-4
D/I/C	Subj	USES	Operating Procedure	ON						7.1E-3	1.0E-2	4	2.0E-3	2.0E-3
				COMM										
D/I/C	Subj	SELECTS	Operating Procedure	ON	1.0E-2	1.3E-2	3	2.9E-2	3.7E-3					
				COMM										
D/I/C	Subj	VERIFIES	Operating Procedure	ON	2.7E-1	3.0E-1	2	4.3E-1	1.7E-1					
				COMM										
D/I/C	Subj	WRITES	Operating Procedure	ON						3.0E-3	4.8E-3	5	6.0E-4	6.0E-4
				COMM						3.0E-3	4.8E-3	5	1.5E-2	6.0E-4
D/I/C	Subj	USES	Maintenance Procedure	ON						3.0E-1	3.8E-1	3	9.0E-2	9.0E-2
				COMM										
D/I/C	Subj	WRITES	Maintenance Procedure	ON						3.0E-3	4.8E-3	5	6.0E-4	6.0E-4
				COMM						3.0E-3	4.8E-3	5	1.5E-2	6.0E-4
D/I/C	Subj	USES	Test Or Calibration Procedure	ON						5.0E-2	8.1E-2	5	1.0E-2	1.0E-2
				COMM										
D/I/C	Subj	WRITES	Test Or Calibration Procedure	ON						3.0E-3	4.8E-3	5	6.0E-4	6.0E-4
				COMM						3.0E-3	4.8E-3	5	1.5E-2	6.0E-4
D/I/C	Subj	READS	Graph	ON										
				COMM	7.0E-3	1.0E-2	4	3.0E-2	1.6E-3					
D/I/C	Subj	READS	Label	ON										
				COMM						4.9E-4	5.4E-4	2	8.8E-4	2.8E-4
D/I/C	Subj	POSITIONS	Equipment - Nonspecific	ON										
				COMM						6.3E-4	6.9E-4	2	1.1E-3	3.6E-4

Appendix B
HEP Raw Data

Appendix B

HEP Raw Data

Appendix B presents the raw data contained in NUCLARR. For this appendix, the term "raw data" refers to data as they exist in the source or reference document.

The following data fields are presented in this appendix. Each field is identified by the abbreviation used in the data table and presented in the order of appearance (reading from left to right) in the table.

VEND EQLV (Vender/Equipment Level)

- GE = General Electric systems
- WE = Westinghouse systems
- CE = Combustion Engineering systems
- BW = Babcock & Wilcox systems
- Comp = Component data
- D/I/C = Displays/instruments/controls

JOB TTL (Job Title)

- CRO = Control Room Operator
- EO = Equipment Operator
- MT = Maintenance Technician
- Subj = Subject (no specific title)

TASK DESCRIPTION

These statements describe the activity for which HEP data are provided. The first line presents the human action and the system, component, or instrument upon which it is performed (see Appendix C, Section C-1, for a matrix of all equipment/human action combinations in NUCLARR).

The remaining lines present additional information about the data points, including whether the data point is omission or commission and whether or not recovery was considered.

- OM - An omission error is defined either as a failure to perform the task (or a step within a task), or a failure to perform a task within a stated time period.
- COMM - A commission error occurs when a task is attempted but is not successfully accomplished for any reason (e.g., selection of wrong control or position, sequence, command or information, or an error in time or level of performance).

RECOVERY CONSIDERED errors typically include those situations where some type of corrective action was taken. It may also include cases where, even though recovery actions were attempted, it was never feasible to actually recover from the error.

HEP Raw Data

RECOVERY NOT CONSIDERED human errors are those that simply happened, with no documented or suspected attempt or opportunity for recovery by an operator or crew.

DATA VALUES—RAW

These are the data values noted within the source document. Fields are listed for the following types of information:

- Mean - The average probability estimate, presented in scientific notation (e.g., 2.89E-4).
- Median - The 50th percentile value of the HEP data distribution, presented in scientific notation.
- EF - Error Factor. A value used to assess the characteristics of the data distribution.
- UCB - Upper Confidence Bound. The statistically determined upper limit of a 90% confidence interval for an HEP estimate. The value is presented in scientific notation.
- LCB - Lower Confidence Bound. The statistically determined lower limit of a 90% confidence interval for an HEP estimate. The value is presented in scientific notation.
- E - The number of errors.
- N - The number of opportunities for error.

DATA VALUES—NUCLARR CALC (NUCLARR Calculated)

NUCLARR stores the input data values, and calculates any remaining statistical values. In cases where NUCLARR has recalculated values, both the raw data and the recalculated values are shown. Fields are listed for the following types of information:

- Mean - The average probability estimate, presented in scientific notation (e.g., 2.89E-4).
- Median - The 50th percentile value of the HEP data distribution, presented in scientific notation.
- EF - Error Factor. A value used to assess the characteristics of the data distribution.
- UCB - Upper Confidence Bound. The statistically determined upper limit of a 90% confidence interval for an HEP estimate. The value is presented in scientific notation.
- LCB - Lower Confidence Bound. The statistically determined lower limit of a 90% confidence interval for an HEP estimate. The value is presented in scientific notation.

- E - The number of errors.
- N - The number of opportunities for error.

PSFs (Performance Shaping Factors)

PSFs are environmental or intrapersonal factors that affect human performance. Although there may be many PSFs suitable for analysis, only a limited number have been selected for inclusion in the NUCLARR system. Any other PSFs noted in the source document are identified in the task description. See Appendix C, Section C-2, for explanations of the PSF ratings used in NUCLARR.

DOCUMENT INFORMATION

Fields are listed for each of the following types of information to describe the data source document:

- Document** - The document identification number is coded as XXX-YR, where XXX is a unique identification number and YR is the last two digits of the calendar year in which the data were collected or published. See Appendix C, Section C-4, for a complete listing of NUCLARR documents.
- Origin** - This identifies the data origin, and may be one of the following:
- Analytic data
 - Consensus expert judgment
 - Field data
 - Laboratory data
 - Simulation modeling data
 - Subjective data
 - Training simulator data
- Reference** - This field is used when an HEP identified in the source document was referenced from another document. The reference number identifies the original data source with a document identification number (XXX-YR). A complete listing of documents can be found in Appendix C, Section C-4.
- Plant Code** - This is a four-character alphanumeric code that identifies the facility from which the data were derived. See Appendix C, Section C-3 for a complete listing of plant codes.

APPENDIX B. RAW DATA

Vend Eqty	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Instrument Air System Common mode: poor judge becuz proc/P&IDs/operat convent don't match motiv= 6, workload= 7, commu= 8; local; pre-IE, HRA= INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.9E-1 LCB: 2.9E-2 E: N:	1.2E-1 9.2E-2 3 2.0 21.8	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 6 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
GE	CRO	MONITORS the Instrument Air System Tolerate an out of range situation w/potentially moderate consequenc motiv = 8, workload = 9, commu = 7; local; pre-IE, HRA = INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 3.6E-1 LCB: 1.0E-2 E: N:	1.1E-1 6.0E-2 6 1.0 16.6	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
GE	CRO	DIAGNOSES the Instrument Air System Crews consult inappropriate resources in emergency motiv= 7, workload=10, commu= 9; local; Post-IE,ROP,HRA= INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.3E-1 LCB: 1.9E-3 E: N:	3.6E-2 1.6E-2 8 0.5 31.8	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
GE	CRO	OPERATES the Communication Systems Inadequate communication results in improper actions motiv= 8, workload= 9, commu=13; local; Post-IE,ROP,HRA= INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.0E-1 LCB: 3.3E-3 E: N:	5.6E-2 2.6E-2 8 0.5 19.4	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Yard EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Condensate Systems Operator fails to operate condensate system in LPI mode Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: N:	2.0E-3 --- 0.1 133.3	ATime: 02:00:00 PTime: 00:06:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 202 Origin: Psychological Scaling Reference: 4-87 PlantCode: 6031
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 8 UCB: LCB: E: N:	2.4E-2 --- 8.0E-2 1.4E-3 0.5 45.4	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.6E-3 EF: 10 UCB: LCB: E: N:	2.0E-2 --- 7.6E-2 7.6E-4 0.1 13.1	ATime: 01:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto system when auto oper challeng crit paramet Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-2 EF: 6 UCB: LCB: E: N:	2.9E-2 --- 9.6E-2 2.7E-3 1.0 62.5	ATime: 00:50:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.5E-2 EF: 5 UCB: LCB: E: N:	4.0E-2 --- 1.3E-1 5.0E-3 1.0 40.0	ATime: 00:40:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:--- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-2 EF: 4 UCB: LCB: E: N:	6.1E-2 --- 1.7E-1 1.1E-2 1.5 34.8	ATime: 00:30:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:--- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.4E-2 EF: 3 UCB: LCB: E: N:	1.1E-1 --- 2.5E-1 2.0E-2 2.0 23.8	ATime: 00:20:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:--- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.1E-1 EF: 2 UCB: LCB: E: N:	2.3E-1 --- 4.2E-1 1.1E-1 6.0 28.5	ATime: 00:10:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:--- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.7E-1 EF: 1 UCB: LCB: E: N:	8.7E-1 --- 8.7E-1 8.7E-1 20.0 22.9	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.6E-3 EF: 10 UCB: LCB: E: N:	2.0E-2 --- 7.6E-2 7.6E-4 0.1 13.1	ATime: 01:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 8 UCB: LCB: E: N:	2.4E-2 --- 8.8E-2 1.4E-3 0.5 45.4	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-2 EF: 6 UCB: LCB: E: N:	2.9E-2 --- 9.6E-2 2.7E-3 1.0 62.5	ATime: 00:50:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSPs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.5E-2 EF: 5 UCB: LCB: E: N:	4.0E-2 --- 1.3E-1 5.0E-3 1.0 40.0	ATime: 00:40:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-2 EF: 4 UCB: LCB: E: N:	6.1E-2 --- 1.7E-1 1.1E-2 1.5 34.8	ATime: 00:30:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.4E-2 EF: 3 UCB: LCB: E: N:	1.1E-1 --- 2.5E-1 2.8E-2 2.0 23.8	ATime: 00:20:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.1E-1 EF: 2 UCB: LCB: E: N:	2.3E-1 --- 4.2E-1 1.1E-1 6.0 28.5	ATime: 00:10:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Verid EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Containment Systems Failure to restore vessel pressure after drywell isolation Model; man override of auto system when auto oper challenges crit para Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.7E-1 EF: --- UCB: 9.6E-1 LCB: E: N:	8.7E-1 1 7.9E-1 20.0 22.9	ATime: 00:01:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: M Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:--- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model; man override of auto syst when auto oper challeng crit parametr Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.6E-3 EF: 10 UCB: LCB: E: N:	2.0E-2 --- 7.6E-2 7.6E-4 0.1 13.1	ATime: 01:10:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:--- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model; man override of auto syst when auto oper challeng crit parametr Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 8 UCB: LCB: E: N:	2.4E-2 --- 8.8E-2 1.4E-3 0.5 45.4	ATime: 01:00:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:--- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model; man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-2 EF: 6 UCB: LCB: E: N:	2.9E-2 --- 9.6E-2 2.7E-3 1.0 62.5	ATime: 00:50:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:--- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
GE	CRO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.5E-2 EF: 5 UCB: LCB: E: N:	4.0E-2 --- 1.3E-1 5.0E-3 1.0 40.0	ATime: 00:40:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-2 EF: 4 UCB: LCB: E: N:	6.1E-2 --- 1.7E-1 1.1E-2 1.5 34.8	ATime: 00:30:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.4E-2 EF: 3 UCB: LCB: E: N:	1.1E-1 --- 2.5E-1 2.8E-2 2.0 23.8	ATime: 00:20:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.1E-1 EF: 2 UCB: LCB: E: N:	2.3E-1 --- 4.2E-1 1.1E-1 6.0 28.5	ATime: 00:10:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
GE	CRO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model,man override of auto syst when auto oper challng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.7E-1 EF: --- UCB: 9.6E-1 LCB: 7.9E-1 E: 20.0 N: 22.9	6.7E-1 1 7.9E-1 20.0 22.9	ATime: 00:01:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Containment Systems Circumvent procedure with a minor consequence, e.g., a minor ISLOCA motiv= 7,workload= 9,commun= 8;local;seq=ISLOCA;Post-IE;ROP,HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 8.6E-2 LCB: 3.3E-4 E: --- N: ---	2.2E-2 5.3E-3 16 8.6E-2 3.3E-4 0.1 18.7	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
GE	CRO	OPERATES the Containment Systems Circumvent proc w/potential catastrophic conseq, e.g. major ISLOCA motiv= 7,workload= 8,commun= 7;local;seq=ISLOCA;Pre-IE;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 7.5E-2 LCB: 6.0E-5 E: --- N: ---	2.2E-2 2.1E-3 39 7.5E-2 6.0E-5 0.1 47.1	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
GE	CRO	DIAGNOSES the Containment Systems Competing goal states leads to wrong conclusion motiv= 9,workload=10,commun= 6;local;Post-IE;ROP,HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.7E-1 LCB: 8.9E-3 E: --- N: ---	5.8E-2 3.9E-2 6 1.7E-1 8.9E-3 1.0 25.7	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP

APPENDIX 8. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			RAM	NUCLEAR calc		
GE	CRO	OPERATES the Containment Penetration/Isolation System Operator fails to vent containment to avoid containment failure reduce the HEP; seq=11; local; ev=post-i.e., pos; th=rp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 06:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 203, #1 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	CRO	OPERATES the Containment Penetration/Isolation System Circumvent proc w/potential catastrophic conseq, e.g. major ISLOCA motiv= 7, workload= 8, comm= 7; local; seq=ISLOCA; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 7.5E-2 LCB: 6.0E-5 E: N:	2.2E-2 2.1E-3 35 --- 0.1 47.1	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
GE	CRO	OPERATES the Containment Spray (RHR) System Operator fails to actuate containment spray system Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 20:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 203, #2 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	CRO	MONITORS the Standby Gas Treatment System Tolerate an out of range situation with potentially minor consequences motiv= 7, workload= 9, comm= 7; local; Pre -IE; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.5E-1 LCB: 2.3E-3 E: N:	4.2E-2 1.9E-2 8 --- 0.5 26.9	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Suppression Pool Support System Operator fails to actuate suppression pool cooling of RHR Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-4 EF: --- UCB: 3.0E-3 LCB: 2.0E-5 E: N:	7.8E-4 15 1.3E-5 0.1 500.0	ATime: ---:--:-- PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: 1 Stress : U Supervision: U Tagging: 1 Training: U	Document: 2-84 pg C-4, item 4 Origin: Psychological Scaling Reference: ----- PlantCode: INR
GE	CRO	OPERATES the Suppression Pool Support System Failure to actuate SPM valve reduce the HEP; seqmail; local; ev=post ie, pos; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 12:00:00 PTime: 00:06:00 Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 206, #3 Origin: Analytic Reference: 4-87 PlantCode: GBS1
GE	CRO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after RX trip Seq=H/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 7 UCB: LCB: E: N:	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 3-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after RX trip local, Seq=MA; Post=J.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.7E-1 EF: 1 UCB: LCB: E: N:	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after Rx trip Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.8E-2 EF: 2 UCB: LCB: E: N:	3.1E-2 --- 5.6E-2 1.4E-2 6.0 214.2	ATime: 00:10:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after Rx trip Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.5E-3 EF: 4 UCB: LCB: E: N:	6.4E-3 --- 1.8E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after DG1A load Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.8E-2 EF: 2 UCB: LCB: E: N:	3.1E-2 --- 5.6E-2 1.4E-2 6.0 214.2	ATime: 00:10:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after DG1A load Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.5E-3 EF: 4 UCB: LCB: E: N:	6.4E-3 --- 1.8E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLV	Job Titl	Task Description	Data Values		PSPs	Document Information
			Raw	MUCLARR calc		
GE	CRO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after DGIA load Seq=M/A; EvnPost; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 7 UCB: 8.4E-3 LCB: 1.7E-4 E: 0.5 N: 416.6	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after DGIA load Local, Seq=M/A; Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.7E-1 EF: 1 UCB: 6.7E-1 LCB: 6.7E-1 E: 20.0 N: 29.8	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Control Rod Drive Systems Operator fails to manually insert rods to shut down reactor Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-4 EF: --- UCB: 2.0E-3 LCB: 2.0E-5 E: 0.5 N: 1666.6	5.8E-4 7 4.5E-5 0.5 1666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-5, Item 11 Origin: Psychological Scaling Reference: --- PlantCode: GMR
GE	CRO	OPERATES the Control Rod Drive Systems Operator fails to operate control rod drive system for Injection reduce the HEP; seq=tquv,tqux; local; evnpost-I.E.; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N: 133.3	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 06:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 203, #2 Origin: Analytic Reference: 4-87 PlantCode: GSS1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.6E-2 EF: 5 UCB: LCB: E: N:	7.4E-2 --- 2.3E-1 9.2E-3 1.0 21.7	ATime: 00:50:00 PTime: --: --: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt Remote; Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.1E-2 EF: 4 UCB: LCB: E: N:	1.0E-1 --- 2.8E-1 1.8E-2 1.5 21.1	ATime: 00:40:00 PTime: --: --: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt Remote; Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-1 EF: 3 UCB: LCB: E: N:	1.4E-1 --- 3.3E-1 3.7E-2 2.0 18.1	ATime: 00:30:00 PTime: --: --: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt Remote; Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.9E-1 EF: 2 UCB: LCB: E: N:	2.1E-1 --- 3.8E-1 9.5E-2 6.0 31.5	ATime: 00:20:00 PTime: --: --: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

B-19

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tct	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Control Rod Drive Systems Failure to send 8-man to close SDV valves after scram reset attempt remote Seq=NA; Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.9E-1 EF: 2 UCB: LCB: E: N:	4.3E-1 --- 7.8E-1 2.0E-1 6.0 15.3	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Control Rod Drive Systems Failure to send 8-man to close SDV valves after scram reset attempt remote Seq=NA; Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.6E-1 EF: --- UCB: 1.0E+0 LCB: E: N:	9.6E-1 1 9.2E-1 20.0 20.8	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Control Rod Drive Systems Failure to send 8-man to close SDV valves after scram reset attempt Remote; Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.4E-2 EF: 8 UCB: LCB: E: N:	5.3E-2 --- 1.9E-1 3.0E-3 0.5 20.8	ATime: 01:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Control Rod Drive Systems Failure to send 8-man to close SDV valves after scram reset attempt Remote; Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.3E-2 EF: 6 UCB: LCB: E: N:	6.0E-2 --- 2.0E-1 5.5E-3 1.0 30.3	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
GE	CRO	DIAGNOSES the Control Rod Drive Systems Correct actions taken during the wrong plant evaluation motiv= 5, workload=10, commun= 9; local; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 3.2E-2 LCB: 1.0E-3 E: N:	9.9E-3 5.7E-3 6 1.0 176.7	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ---:---:--- PlantCode: ALLP
GE	CRO	OPERATES the Electrical Distribution Systems Operator fails to maintain RPV water level to top of active fuel sequatus(tc); local; ev=post ie, rop; sll Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.0E-2 EF: 10 UCB: LCB: 6.0E-3 E: N:	1.6E-1 --- 6.0E-1 6.0E-3 0.1 1.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 6 Staffing: U Stress: 4 Supervision: U Tagging: U Training: 4	Document: 1-85 pg 29 Origin: Subjective Reference: ---:---:--- PlantCode: PSS2
GE	CRO	OPERATES the Electrical Distribution Systems Operator fails to restore switchgear room cooling Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: 1.5E-4 E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 06:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 206, #5 Origin: Analytic Reference: 4-87 PlantCode: 08S1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.3E-2 EF: 5 UCB: LCB: 7.0E-3 E: N:	5.6E-2 --- 1.0E-1 7.0E-3 1.0 28.5	ATime: 01:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-2 EF: 4 UCB: LCB: E: N:	6.0E-2 --- 1.9E-1 1.2E-2 1.5 31.2	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.9E-2 EF: 3 UCB: LCB: E: N:	8.6E-2 --- 2.1E-1 2.3E-2 2.0 28.9	ATime: 00:50:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 2 UCB: LCB: E: N:	1.1E-1 --- 2.0E-1 5.0E-2 6.0 60.0	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-1 EF: 2 UCB: LCB: E: N:	1.7E-1 --- 3.2E-1 8.0E-2 6.0 37.5	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Ren	NUCLARR calc		
GE	CRO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, Seq=MA; Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.8E-1 EF: 2 UCB: LCB: E: N:	3.1E-1 --- 5.6E-1 1.4E-1 6.0 21.4	ATime: 00:20:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, Seq=MA; Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.4E-1 EF: 1 UCB: LCB: E: N:	5.4E-1 --- 5.4E-1 5.4E-1 20.0 37.0	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, Seq=MA; Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.8E-1 EF: --- UCB: 1.0E+0 LCB: E: N:	9.8E-1 1 9.6E-1 20.0 20.4	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip Local, Seq=MA; Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.9E-1 EF: --- UCB: 1.0E+0 LCB: E: N:	9.9E-1 1 9.8E-1 20.0 20.2	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

Vend EqLV	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip Local, Seq=NA; Post=I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.4E-1 EF: 1 UCB: 5.4E-1 LCB: 5.4E-1 E: 20.0 N: 37.0	5.4E-1 --- 5.4E-1 5.4E-1 20.0 37.0	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip Local, Seq=NA; Post=J.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-1 EF: 2 UCB: 5.6E-1 LCB: 1.4E-1 E: 6.0 N: 21.4	3.1E-1 --- 5.6E-1 1.4E-1 6.0 21.4	ATime: 00:20:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-1 EF: 2 UCB: 3.2E-1 LCB: 8.0E-2 E: 6.0 N: 37.5	1.7E-1 --- 3.2E-1 8.0E-2 6.0 37.5	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 2 UCB: 2.0E-1 LCB: 5.0E-2 E: 6.0 N: 60.0	1.1E-1 --- 2.0E-1 5.0E-2 6.0 60.0	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFa	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip SeqM/A; EvPost; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.9E-2 EF: 3 UCB: LCB: E: N:	8.6E-2 --- 2.1E-1 2.3E-2 2.0 28.9	ATime: 00:50:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip SeqM/A; EvPost; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.8E-2 EF: 4 UCB: LCB: E: N:	6.8E-2 --- 1.9E-1 1.2E-2 1.5 31.2	ATime: 01:00:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip SeqM/A; EvPost; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.5E-2 EF: 5 UCB: LCB: E: N:	5.6E-2 --- 1.8E-1 7.0E-3 1.0 28.5	ATime: 01:10:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip SeqM/A; EvPost; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.6E-2 EF: 6 UCB: LCB: E: N:	4.7E-2 --- 1.6E-1 4.3E-3 1.0 35.4	ATime: 01:20:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

B-25

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Plant AC Distribution System Operator fails to operate condensate system in LPI mode	Mean: Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: N:	2.0E-3 --- 0.1 133.3	ATime: 02:00:00 PTime: 00:06:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 202 Origin: Analytic Reference: 4-87 PlantCode: 00S1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	OPERATES the Plant AC Distribution System Operator fails to reconnect stub-bus after LOSP	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 207 Origin: Subjective Reference: 4-87 PlantCode: SPS1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	OPERATES the Emergency Core Cooling Systems Op fails to maint RPV #20 level at top of act fuel while at to press	Mean: Median: 1.3E-1 EF: 10 UCB: LCB: E: N:	2.8E-1 8 1.0E+0 1.7E-2 0.5 3.8	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 6 Staffing: U Stress: 4 Supervision: U Tagging: U Training: 4	Document: 1-85 pg 35, para 3 Origin: Subjective Reference: ---:---:--- PlantCode: P8S2
		Error Type: OMISSION Recovery: NOT CONSIDERED				
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout	Mean: Median: 3.4E-2 EF: 9 UCB: LCB: E: N:	8.3E-2 --- 3.1E-1 3.8E-3 0.5 14.7	ATime: 01:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.2E-2 EF: 8 UCB: LCB: E: N:	9.3E-2 --- 3.4E-1 5.3E-3 0.5 11.9	ATime: 01:20:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.7E-2 EF: 7 UCB: LCB: E: N:	9.5E-2 --- 3.3E-1 6.7E-3 0.5 10.6	ATime: 01:10:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.4E-2 EF: 6 UCB: LCB: E: N:	9.8E-2 --- 3.2E-1 9.0E-3 1.0 10.5	ATime: 01:00:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.3E-2 EF: 6 UCB: LCB: E: N:	1.1E-1 --- 3.0E-1 1.1E-2 1.0 15.8	ATime: 00:50:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: --- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ytl	Task Description	Data Values		PSfs	Document Information
			Raw	NUCLEAR calc		
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.6E-2 EF: 5 UCB: LCB: E: N:	1.2E-1 --- 3.8E-1 1.5E-2 1.0 13.1	ATime: 00:40:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ---:---: PlantCode: LSC1
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.6E-2 EF: 4 UCB: LCB: E: N:	1.4E-1 --- 3.8E-1 2.4E-2 1.5 15.6	ATime: 00:30:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ---:---: PlantCode: LSC1
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.3E-1 EF: 3 UCB: LCB: E: N:	1.6E-1 --- 3.9E-1 4.3E-2 2.0 15.3	ATime: 00:20:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ---:---: PlantCode: LSC1
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-1 EF: 3 UCB: LCB: E: N:	2.5E-1 --- 6.0E-1 6.7E-2 2.0 10.0	ATime: 00:10:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ---:---: PlantCode: LSC1

APPENDIX B. RAW DATA

Vend Eq.Ly	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout	Mean: Median: 5.6E-1 EF: 1 UCB: LCB: E: N:	5.6E-1 --- 5.6E-1 5.6E-1 20.0 35.7	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout	Mean: Median: 3.8E-2 EF: 9 UCB: LCB: E: N:	9.3E-2 --- 3.4E-1 4.2E-3 0.5 13.1	ATime: 01:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	OPERATES the Emergency Core Cooling Systems Right conclus/wrong act path select. Capture seq based on respon set	Mean: Median: EF: --- UCB: 2.2E-1 LCB: 3.9E-3 E: N:	6.2E-2 2.9E-2 8 0.9 17.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
		motive 7, workload=11, commune 8; local; Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED				
GE	CRO	OPERATES the Emergency Core Cooling Systems Multiple fault situation, crew solves the more minor fault	Mean: Median: EF: --- UCB: 1.2E-1 LCB: 1.2E-3 E: N:	3.2E-2 1.2E-2 10 0.1 8.3	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
		motive 7, workload= 9, commune=11; local; Post-IE;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED				

APPENDIX B. RAW DATA

Vand EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
GE	CRO	OPERATES the Emergency Core Cooling Systems Op fails to maint RPV #20 level at top of act fuel while at to press be used; RHR spray pump may be used Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: 3.5E-1 Median: 1.3E-1 EF: 10 UCB: 1.0E+0 LCB: 1.7E-2 E: 0.5 N: 3.5	2.8E-1 8 1.0E+0 1.7E-2 0.5 3.5	ATime: ---- PTime: ---- Experience: U Feedback: U Procedure: 6 Staffing: U Stress: 4 Supervision: U Tagging: U Training: 4	Document: 1-85 pg 35, para 3 Origin: Subjective Reference: ----- PlantCode: PBS
GE	CRO	DIAGNOSES the Emergency Core Cooling Systems Symptoms noticed, but incorrect interpretation motiv= 8, workload=18, commu= 7; local; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.0E-1 LCB: 4.2E-3 E: N:	3.3E-2 2.0E-2 5 1.0 48.8	ATime: ---- PTime: ---- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
GE	CRO	DIAGNOSES the Emergency Core Cooling Systems Misdiagnose given like symptoms. Capture sequence based on stimuli motiv= 8, workload=11, commu= 8; local; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.8E-1 LCB: 1.3E-2 E: N:	6.7E-2 4.8E-2 4 1.5 31.0	ATime: ---- PTime: ---- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
GE	CRO	OPERATES the High Pressure Coolant Injection System Operator fails to switch from sup pool to CSI Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.0E-3 EF: 12 UCB: 3.0E-2 LCB: 2.0E-4 E: N:	9.7E-3 5 1.2E-3 1.0 166.6	ATime: ---- PTime: ---- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-5, item 7 Origin: Psychological Scaling Reference: ----- PlantCode: Bulk

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
GE	CRO	MONITORS the High Pressure Coolant Injection System Operator doesn't notice hi suppression pool temp could fail HPCI Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.0E-2 EF: 7 UCB: 3.1E-1 LCB: 7.0E-3 E: N:	1.1E-1 4 1.6E-2 1.0 14.2	ATime: --- PTime: --- Experience: 0 Feedback: 0 Procedure: 0 Staffing: 1 Stress: 3 Supervision: 0 Tagging: 0 Training: 0	Document: 2-84 pg C-4, item 6 Origin: Psychological Scaling Reference: --- PlantCode: BMR
GE	CRO	OPERATES the High Pressure Core Spray System Operator fails to initiate alternate room cooling emphasis Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-2 EF: --- UCB: 3.0E-1 LCB: 5.0E-3 E: N:	8.5E-2 7 5.3E-3 0.5 12.5	ATime: 05:00:00 PTime: --- Experience: 3 Feedback: 0 Procedure: 0 Staffing: 1 Stress: 3 Supervision: 0 Tagging: 0 Training: 0	Document: 2-84- pg C-3, item 8 Origin: Psychological Scaling Reference: --- PlantCode: BMR
GE	CRO	OPERATES the Low Pressure Core Spray System Operator fails to operate LPCS valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 20:00:00 PTime: 00:06:00 Experience: 0 Feedback: 0 Procedure: 0 Staffing: 0 Stress: 0 Supervision: 0 Tagging: 0 Training: 0	Document: 1-87 ch IV, pg 205, #3 Origin: Analytic Reference: 4-87 PlantCode: G6S1
GE	CRO	OPERATES the Low Pressure Core Spray System Operator fails to actuate LPCS Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 20:00:00 PTime: --- Experience: 0 Feedback: 0 Procedure: 0 Staffing: 0 Stress: 0 Supervision: 0 Tagging: 0 Training: 0	Document: 1-87 ch IV, pg 205, #1 Origin: Analytic Reference: 4-87 PlantCode: G6S1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSfs	Document Information
			Row	NUCLARR calc		
GE	CRO	OPERATES the Low Pressure Core Spray System Failure to inject LP after RCIC failure	Mean: Median: 2.7E-2 EF: 9 UCB: 2.4E-1 LCB: 3.0E-3 E: 0.5 N: 18.5	6.6E-2 --- 2.4E-1 3.0E-3 0.5 18.5	ATime: 00:15:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 20 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	OPERATES the Low Pressure Core Spray System Failure to inject LP after RCIC failure	Mean: Median: 9.8E-1 EF: --- UCB: 1.0E+0 LCB: --- E: 20.0 N: 20.4	9.8E-1 --- 1 9.6E-1 20.0 20.4	ATime: 00:05:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 20 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
		local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	MONITORS the Low Pressure Core Spray System Operator fails to operate LPCS valve	Mean: Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N: 133.3	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 20:00:00 PTime: 00:06:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #3 Origin: Unknown Reference: 4-87 PlantCode: GGS1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	OPERATES the Residual Heat Removal/Low Press Coolant Inject Syst Operator fails to restore RHR cooling within 10 min after pump trip	Mean: Median: 5.0E-4 EF: --- UCB: 3.0E-3 LCB: 4.0E-5 E: 1.0 N: 2000.0	9.0E-4 --- 6 8.3E-5 1.0 2000.0	ATime: 00:10:00 PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-6, item 14 Origin: Psychological scaling Reference: ---:---:--- PlantCode: BWR
		Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend Eq.V	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Residual Heat Removal/Low Press Coolant Inject Syst Failure to align & actuate SPC reduce the MEP; seq-all; local; ev=port la,pos; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-3 0.1 133.3	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 0 Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 206, #2 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	CRO	OPERATES the Generator H2 Cooling/CO2 Purge System Operator fails to employ SRVS to achieve manual depressurization Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-2 EF: 10 UCB: LCB: E: N:	1.3E-1 --- 5.0E-1 5.0E-3 0.1 2.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 6 Staffing: U Stress: 4 Supervision: U Tagging: U Training: 4	Document: 1-85 pg 32, table 1 Origin: Subjective Reference: ---:---:--- PlantCode: P852
GE	CRO	OPERATES the Generator H2 Cooling/CO2 Purge System Operator fails to defeat ADS Initiation Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 8.0E-3 EF: 10 UCB: LCB: E: N:	2.1E-2 --- 8.0E-2 8.0E-4 0.1 12.5	ATime: 00:08:00 PTime: 00:04:00 Experience: U Feedback: U Procedure: 1 Staffing: U Stress: 4 Supervision: U Tagging: U Training: 1	Document: 1-85 pg 26, para 3 Origin: Subjective Reference: ---:---:--- PlantCode: P852
GE	CRO	OPERATES the Generator H2 Cooling/CO2 Purge System Operator fails to manually activate automatic depressurization syst Error type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.0E-4 EF: --- UCB: 8.0E-3 LCB: 6.0E-5 E: N:	2.1E-3 11 6.1E-5 0.1 142.8	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-3, item 1 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: BMR

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRD	OPERATES the Heating, Ventilation & Air Conditioning Systems AUX operator fails to locally open air operated valves Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-2 EF: --- UCB: 3.9E-1 LCB: 5.0E-3 E: N:	1.0E-1 13 2.3E-3 0.1 3.3	ATime: 01:00:00 PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-6, item 15 Origin: Psychological Scaling Reference: ----- PlantCode: BWR
GE	CRD	OPERATES the Heating, Ventilation & Air Conditioning Systems Operator fails to initiate alternate room cooling Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-2 EF: --- UCB: 3.0E-1 LCB: 5.0E-3 E: N:	8.5E-2 7 5.3E-3 0.5 12.5	ATime: 05:00:00 PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-5, item 8 Origin: Psychological Scaling Reference: ----- PlantCode: BWR
GE	CRD	OPERATES the Reactor Protection System Operator fails to manually insert rods Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-4 EF: --- UCB: 1.0E-3 LCB: 3.0E-5 E: N:	3.2E-4 5 4.0E-5 1.0 5000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-4, item 5 Origin: Psychological Scaling Reference: ----- PlantCode: BWR
GE	CRD	OPERATES the Neutron Monitoring System Fail to operate nuclear instrumentation system correctly Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-4 EF: --- UCB: 9.0E-3 LCB: 7.0E-5 E: N:	2.4E-3 11 7.1E-5 0.1 125.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-4, item 3 Origin: Psychological Scaling Reference: ----- PlantCode: BWR

APPENDIX B. RAW DATA

Vend EqLV	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Automatic Depressurization System Operator fails to manually activate automatic depressurization syst Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.0E-4 EF: --- UCB: 8.0E-3 LCB: 6.0E-5 E: N:	2.1E-3 11 6.1E-5 0.1 142.8	ATime: 00:10:00 PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-3, item 1 Origin: Psychological Scaling Reference: ----- PlantCode: 8WR
GE	CRO	OPERATES the Automatic Depressurization System Operator fails to provide alternate depressurization via SRV Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: N:	2.0E-3 --- 0.1 133.3	ATime: 02:00:00 PTime: 00:06:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 202 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	CRO	OPERATES the Automatic Depressurization System Operator fails to provide alternate depressurization via SRV Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: 1.5E-2 LCB: 1.5E-4 E: N:	4.0E-3 --- 0.1 66.6	ATime: 00:40:00 PTime: 00:06:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 202 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	CRO	OPERATES the Feedwater Control System Failure to close PV valve 1A after level 7 alarm local, Seq=NA, Post-1.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-2 EF: 3 UCB: 8.4E-2 LCB: 9.3E-3 E: N:	3.5E-2 --- 8.4E-2 9.3E-3 2.0 71.4	ATime: 00:10:00 PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
GE	CRO	OPERATES the Feedwater Control System Failure to close FW valve 1A after level 7 alarm Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.7E-1 EF: 1 UCB: LCB: E: N:	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Feedwater Control System Failure to close FW valve 1A after level 7 alarm Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.5E-3 EF: 4 UCB: LCB: E: N:	6.4E-3 --- 1.8E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Feedwater Control System Failure to close FW valve 1A after level 7 alarm Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 7 UCB: LCB: E: N:	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Water Systems Operator fails to realign & operate the high pressure service water Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-2 EF: 10 UCB: LCB: E: N:	1.0E-1 --- 3.8E-1 3.8E-3 0.1 2.6	ATime: 00:40:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: P852

APPENDIX B. RAW DATA

Vend EgLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARE calc		
GE	CRO	OPERATES the Water Systems Operator fails to realign & operate the high pressure service water Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 10 UCB: LCB: E: N:	2.9E-2 --- 1.1E-1 1.1E-3 0.1 9.0	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: PBS2
GE	CRO	OPERATES the Water Systems Operator fails to realign & operate the high pressure service water Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 10 UCB: LCB: E: N:	2.9E-2 --- 1.1E-1 1.1E-3 0.1 9.0	ATime: 04:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: PBS2
GE	CRO	OPERATES the Water Systems Operator fails to realign & operate the high pressure service water Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 10 UCB: LCB: E: N:	2.9E-2 --- 1.1E-1 1.1E-3 0.1 9.0	ATime: 08:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: PBS2
GE	CRO	OPERATES the Water Systems Operator fails to realign & operate the high pressure service water Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-4 EF: 10 UCB: LCB: E: N:	1.1E-3 --- 4.0E-3 4.0E-5 0.1 250.0	ATime: 23:59:59 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: PBS2

B-37

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	DIAGNOSES the Circulating Water System Operator fails to manually initiate RHRSW Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-5 EF: --- UCB: 3.0E-2 LCB: 9.0E-5 E: --- N: ---	8.5E-3 30 3.3E-5 0.1 100.0	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-6, item 12 Origin: Psychological Scaling Reference: --- PlantCode: BWR
GE	CRO	DIAGNOSES the Circulating Water System Operator fails to manually initiate RHRSW operator failed to respond to hi sup pool temp alarm & begin RHRSW Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-3 EF: --- UCB: 2.0E-2 LCB: 1.0E-4 E: --- N: ---	5.3E-3 10 2.0E-4 0.1 50.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-6, item 13 Origin: Psychological Scaling Reference: --- PlantCode: BWR
GE	CRO	OPERATES the Station Service Water System Operator fails to align & actuate standby service water x-tie reduce the REP; seq-all; local; evapost ie; thorp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: --- LCB: 7.5E-5 E: 0.1 N: ---	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 12:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 206, #4 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	CRO	OPERATES the Reactor Coolant Systems and Connected Systems Failure to restore power conversion system Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.6E-3 EF: 10 UCB: --- LCB: 2.6E-4 E: 0.1 N: ---	6.9E-3 --- 2.6E-2 2.6E-4 0.1 38.4	ATime: 20:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #5 Origin: Field Data Reference: 4-87 PlantCode: GGS1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Operator fails to operate RCIC system to maintain react water level isolation cooling Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: --- UCB: 5.0E-3 LCB: 2.0E-4 E: N:	1.0E-3 5 1.0 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress : 3 Supervision: U Tagging: U Training: U	Document: 2-B4 pg C-4, item 2 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: BAR
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Operator fails to initiate alternate room cooling Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-2 EF: --- UCB: 3.0E-1 LCB: 5.0E-3 E: N:	6.5E-2 7 5.3E-3 0.5 12.5	ATime: 05:00:00 PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress : 3 Supervision: U Tagging: U Training: U	Document: 2-B4 pg C-5, item 8 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: BAR
GE	CRO	OPERATES the Reactor Core Isolation Cooling System AUX operator fails to locally open air operated valves Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-2 EF: --- UCB: 3.0E-1 LCB: 5.0E-3 E: N:	1.0E-1 13 2.3E-3 0.1 3.3	ATime: 01:00:00 PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress : 3 Supervision: U Tagging: U Training: U	Document: 2-B4 pg C-6, item 15 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: BAR
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to initiate RCIC after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-2 EF: 2 UCB: 5.0E-2 LCB: 1.4E-2 E: N:	3.1E-2 --- 5.0E-2 1.4E-2 6.0 214.2	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 3-B7 vol 2, pg 19 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSF#	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to initiate RCIC after station blackout	Mean: Median: 4.5E-3 EF: 4 UCB: 1.8E-2 LCB: 1.1E-3 E: 1.5 N: 333.3	6.4E-3 --- 1.8E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to initiate RCIC after station blackout	Mean: Median: 1.2E-3 EF: 7 UCB: 8.4E-3 LCB: 1.7E-4 E: 0.5 N: 416.6	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to initiate RCIC after station blackout	Mean: Median: 6.7E-1 EF: 1 UCB: 6.7E-1 LCB: 6.7E-1 E: 20.0 N: 29.8	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
		Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED				
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to send B-man to open RCIC injection valve	Mean: Median: 2.3E-1 EF: 2 UCB: 4.6E-1 LCB: 1.2E-1 E: 6.0 N: 26.0	2.5E-1 --- 4.6E-1 1.2E-1 6.0 26.0	ATime: 00:05:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
		Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to send B-man to open RCIC injection valve Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.9E-2 EF: 4 UCB: 1.6E-1 LCB: 9.8E-3 E: 1.5 N: 38.4	5.6E-2 --- 1.6E-1 9.8E-3 1.5 38.4	ATime: 00:15:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to send B-man to open RCIC injection valve Remote; Seq=NA; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.4E-2 EF: 2 UCB: 1.7E-1 LCB: 4.2E-2 E: 6.0 N: 71.4	9.2E-2 --- 1.7E-1 4.2E-2 6.0 71.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to send B-man to open RCIC injection valve Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.8E-1 EF: --- UCB: 9.0E-1 LCB: 6.8E-1 E: 20.0 N: 25.6	7.8E-1 1 9.0E-1 6.8E-1 20.0 25.6	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to reset RCIC isolation after DQIA loads Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.3E-1 EF: 2 UCB: 4.6E-1 LCB: 1.2E-1 E: 6.0 N: 26.0	2.5E-1 --- 4.6E-1 1.2E-1 6.0 26.0	ATime: 00:05:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to reset RCIC isolation after DGIA loads Local; Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.9E-2 EF: 4 UCB: LCB: E: N:	5.6E-2 --- 1.6E-1 9.8E-3 1.5 38.4	ATime: 00:15:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to reset RCIC isolation after DGIA loads Local; Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.4E-2 EF: 2 UCB: LCB: E: N:	9.2E-2 --- 1.7E-1 4.2E-2 6.0 71.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to reset RCIC isolation after DGIA loads Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.8E-1 EF: --- UCB: 9.0E-1 LCB: E: N:	7.8E-1 1 6.8E-1 20.0 25.6	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to request RCIC investigation after RCIC fails Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.3E-1 EF: 2 UCB: LCB: E: N:	2.5E-1 --- 4.6E-1 1.2E-1 6.0 26.0	ATime: 00:05:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to request RCIC investigation after RCIC fails Local; Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.9E-2 EF: 4 UCB: 1.6E-1 LCB: 9.8E-3 E: 1.5 N: 38.4	5.6E-2 --- 1.6E-1 9.8E-3 1.5 38.4	ATime: 00:15:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to request RCIC investigation after RCIC fails Local; Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: --- Median: 8.4E-2 EF: 2 UCB: 1.7E-1 LCB: 4.2E-2 E: 6.0 N: 71.4	9.2E-2 --- 1.7E-1 4.2E-2 6.0 71.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Reactor Core Isolation Cooling System Failure to request RCIC investigation after RCIC fails Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.8E-1 EF: --- UCB: 9.0E-1 LCB: --- E: 20.0 N: 25.6	7.8E-1 1 9.0E-1 6.8E-1 20.0 25.6	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Standby Liquid Control System Operator fails to provide SLC within 5-10 min Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-4 EF: --- UCB: 1.0E-3 LCB: 1.0E-5 E: --- N: 1000.0	2.7E-4 10 0.1 1000.0	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-5, item 9 Origin: Psychological Scaling Reference: ----- PlantCode: BWR

HEP RAW Data

B-43

NUREG/CR-4639

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Standby Liquid Control System Operator fails to initiate SLCs within 2 minutes after ATWS out/crc Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: 7.5E-2 Median: 2.8E-2 EF: 10 UCB: 2.8E-1 LCB: 2.8E-3 E: 0.1 N: 3.5	---	ATime: 00:02:00 PTime: 00:00:20 Experience: U Feedback: U Procedure: 1 Staffing: U Stress: 4 Supervision: U Tagging: U Training: 1	Document: 1-85 pg 21, para 3 Origin: Simulation Modeling Reference: ----- PlantCode: PBS2
GE	CRO	OPERATES the Standby Diesel Generator Systems Failure to request DGO repair after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: 6.6E-1 Median: 6.6E-1 EF: 1 UCB: 6.6E-1 LCB: 6.6E-1 E: 20.0 N: 30.3	6.6E-1 ---	ATime: 00:01:00 PTime: ----- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Standby Diesel Generator Systems Failure to request DGO repair after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.4E-3 Median: 3.4E-3 EF: 10 UCB: 3.4E-2 LCB: 3.4E-4 E: 0.1 N: 29.4	9.1E-3 ---	ATime: 00:10:00 PTime: ----- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	CRO	OPERATES the Standby Diesel Generator Systems Failure to request DGB repair after station blackout Local, SeqEMA, Post-1, E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: 6.6E-1 Median: 6.6E-1 EF: 1 UCB: 6.6E-1 LCB: 6.6E-1 E: 20.0 N: 30.3	6.6E-1 ---	ATime: 00:01:00 PTime: ----- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Standby Diesel Generator Systems Failure to request DGIB repair after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
GE	CRO	OPERATES the Standby Diesel Generator Systems Failure to recover DGIA after DGIA trouble Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.6E-1 EF: 1 UCB: LCB: E: N:	6.6E-1 --- 6.6E-1 6.6E-1 20.0 30.3	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
GE	CRO	OPERATES the Standby Diesel Generator Systems Failure to recover DGIA after DGIA trouble Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
GE	CRO	OPERATES the Standby Diesel Generator Systems Failure to request DGA investigation after DCA failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1

B-45

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Standby Diesel Generator Systems Failure to request DGA investigation after DCA failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.6E-1 EF: 1 UCB: LCB: E: N:	6.6E-1 --- 6.6E-1 6.6E-1 20.0 30.3	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Main Steam System Failure to close MSIVs after level 7 alarm local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.8E-2 EF: 3 UCB: LCB: E: N:	3.5E-2 --- 8.4E-2 9.3E-3 2.0 71.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Main Steam System Failure to close MSIVs after level 7 alarm local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.5E-3 EF: 4 UCB: LCB: E: N:	6.4E-3 --- 1.8E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	CRO	OPERATES the Main Steam System Failure to close MSIVs after level 7 alarm local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 7 UCB: LCB: E: N:	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: --- PlantCode: LSC1

APPENDIX B. RAW DATA

Yand EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	CRO	OPERATES the Main Steam System Failure to close MSIVs after level 7 alarm Local, SeqMA, Post-T.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: 6.7E-1 Median: 6.7E-1 EF: 1 UCB: 6.7E-1 LCB: 6.7E-1 E: 20.0 M: 29.8	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Instrument Air System Operator fails to restore instrument air reduce the HEP; seqfail; remote; evspos ic,rop; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: 7.5E-4 Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 M: 133.3	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 04:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #5 Origin: Analytic Reference: 4-87 PlantCode: BGS1
GE	EO	MAINTAINS the Condensate Systems Common cause miscalibration of CST low level sensors Local; seqma; evspos; ASEP; Error Type: OMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 M: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PMS
GE	EO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: 7.6E-3 Median: 7.6E-3 EF: 20 UCB: 7.6E-2 LCB: 7.6E-4 E: 0.1 M: 13.1	2.0E-2 --- 7.6E-2 7.6E-4 0.1 13.1	ATime: 01:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

B-47

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			RBN	NUCLARR calc		
GE	EO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 8 UCB: LCB: E: N:	2.4E-2 --- 8.8E-2 1.4E-3 0.5 45.4	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-2 EF: 5 UCB: LCB: E: N:	2.9E-2 --- 9.6E-2 2.7E-3 1.0 62.5	ATime: 00:50:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.5E-2 EF: 5 UCB: LCB: E: N:	4.0E-2 --- 1.3E-1 5.0E-3 1.0 40.0	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-2 EF: 4 UCB: LCB: E: N:	6.1E-2 --- 1.7E-1 1.1E-2 1.5 34.8	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challenge crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.4E-2 EF: 3 UCB: LCB: E: N:	1.1E-1 --- 2.5E-1 2.8E-2 2.0 23.8	ATime: 00:20:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---: PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challenge crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.1E-1 EF: 2 UCB: LCB: E: N:	2.3E-1 --- 4.2E-1 1.1E-1 6.0 28.5	ATime: 00:10:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---: PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to jumper vessel pressure after drywell isolation Model,man override of auto syst when auto oper challenge crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.7E-1 EF: --- UCB: 9.6E-1 LCB: E: N:	8.7E-1 1 7.9E-1 20.0 22.9	ATime: 00:01:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---: PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after drywell isolation Model,man override of auto syst when auto oper challenge crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.6E-3 EF: 10 UCB: LCB: E: N:	2.0E-2 --- 7.6E-2 7.6E-4 0.1 13.1	ATime: 01:10:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---: PlantCode: LSC1

B-49

NUREG/OR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Verif EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 8 UCB: LCB: E: 0.5 N:	2.4E-2 --- 8.8E-2 1.4E-3 45.4	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-2 EF: 6 UCB: LCB: E: 1.0 N:	2.9E-2 --- 9.6E-2 2.7E-3 62.5	ATime: 00:50:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.5E-2 EF: 5 UCB: LCB: E: 1.0 N:	4.0E-2 --- 1.3E-1 5.0E-3 40.0	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-2 EF: 4 UCB: LCB: E: 1.5 N:	6.1E-2 --- 1.7E-1 1.1E-2 34.6	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.4E-2 EF: 3 UCB: -- LCB: 2.8E-2 E: 2.0 N: 23.8	1.1E-1 --- 2.5E-1 2.8E-2 2.0 23.8	Atime: 00:20:00 PTime: ---- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.1E-1 EF: 2 UCB: -- LCB: 1.1E-1 E: 6.0 N: 28.5	2.3E-1 --- 4.2E-1 1.1E-1 6.0 28.5	Atime: 00:10:00 PTime: ---- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after drywell isolation Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.7E-1 EF: --- UCB: 9.6E-1 LCB: -- E: 20.0 N: 22.9	8.7E-1 1 7.9E-1 20.0 22.9	Atime: 00:01:00 PTime: ---- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power OC-A failure Model,man override of auto syst when auto oper challeng crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.6E-3 EF: 10 UCB: -- LCB: 7.6E-4 E: 0.1 N: 13.1	2.0E-2 --- 7.6E-2 7.6E-4 0.1 13.1	Atime: 01:10:00 PTime: ---- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vand EqLv	Job Tcl	Task Description	Data Values		PBFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Containment Systems	Mean:	2.4E-2	ATime: 01:00:00	Document: 5-87
		Failure to restore vessel pressure after emer power DC-A failure	Median: 1.1E-2		PTime: -----	vol 2, pg 27-28
		Model,man override of auto syst when auto oper challeng crit parameter	EF: 8	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 8.8E-2		Feedback: U	Simulation Modeling
GE	EO	OPERATES the Containment Systems	Median: 1.6E-2	2.9E-2	ATime: 00:50:00	Document: 5-87
		Failure to restore vessel pressure after emer power DC-A failure	EF: 6	---	PTime: -----	vol 2, pg 27-28
		Model,man override of auto syst when auto oper challeng crit parameter	UCB: 9.6E-2		Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	LCB: 2.7E-3		Feedback: U	Simulation Modeling
GE	EO	OPERATES the Containment Systems	Mean:	4.0E-2	ATime: 00:40:00	Document: 5-87
		Failure to restore vessel pressure after emer power DC-A failure	Median: 2.5E-2		PTime: -----	vol 2, pg 27-28
		Model,man override of auto syst when auto oper challeng crit parameter	EF: 5	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 1.3E-1		Feedback: U	Simulation Modeling
GE	EO	OPERATES the Containment Systems	Mean:	6.1E-2	ATime: 00:30:00	Document: 5-87
		Failure to restore vessel pressure after emer power DC-A failure	Median: 4.3E-2		PTime: -----	vol 2, pg 27-28
		Model,man override of auto syst when auto oper challeng crit parameter	EF: 4	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 1.7E-1		Feedback: U	Simulation Modeling

APPENDIX B. RAW DATA

Vand EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model,man override of auto syst when auto oper challang crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.4E-2 EF: 3 UCB: LCB: E: N:	1.1E-1 --- 2.5E-1 2.8E-2 2.0 23.8	ATime: 00:20:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model,man override of auto syst when auto oper challang crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.1E-1 EF: 2 UCB: LCB: E: N:	2.3E-1 --- 4.2E-1 1.1E-1 6.0 28.5	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
GE	EO	OPERATES the Containment Systems Failure to restore vessel pressure after emer power DC-A failure Model,man override of auto syst when auto oper challang crit parameter Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.7E-1 EF: --- UCB: 9.6E-1 LCB: E: N:	8.7E-1 1 7.9E-1 20.0 22.9	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 27-28 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
GE	EO	MAINTAINS the Containment Systems Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ---:---:--- PlantCode: PBS

APPENDIX B. RAW DATA

Vand EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	MAINTAINS the Containment Penetration/Isolation System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-3 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-3 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P85
GE	EO	MAINTAINS the Containment Spray (RHR) System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., MRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P85
GE	EO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after DGIA load local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.5E-2 Median: 2.8E-2 EF: 3 UCB: 8.4E-2 LCB: 9.3E-3 E: 2.0 N: 71.4	3.5E-2 --- 8.4E-2 9.3E-3 2.0 71.4	ATime: 00:10:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after DGIA load local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: 6.4E-3 Median: 4.5E-3 EF: 4 UCB: 1.8E-2 LCB: 1.1E-3 E: 1.5 N: 333.3	6.4E-3 --- 1.8E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		Psf's	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after DBIA load Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 7 UCB: LCB: E: N:	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-B7 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after DBIA load Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.7E-1 EF: 1 UCB: LCB: E: N:	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-B7 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after Rx trip Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 7 UCB: LCB: E: N:	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-B7 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after Rx trip Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.5E-3 EF: 4 UCB: LCB: E: N:	6.4E-3 --- 1.8E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-B7 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

B-55

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after Rx trip Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.7E-1 EF: 1 UCB: LCB: E: N:	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Suppression Pool Support System Failure to initiate SP cooling after Rx trip Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.8E-2 EF: 3 UCB: LCB: E: N:	3.5E-2 --- 8.4E-2 9.3E-3 2.0 71.4	ATime: 00:10:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt remote SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.4E-2 EF: 8 UCB: LCB: E: N:	5.5E-2 --- 1.9E-1 3.0E-3 0.5 20.8	ATime: 01:10:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt remote SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.3E-2 EF: 7 UCB: LCB: E: N:	6.6E-2 --- 2.3E-1 4.7E-3 0.5 15.1	ATime: 01:00:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Tct	Task Description	Data Values		P8Fs	Document Information
			Raw	MUCLAMP calc		
GE	EO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt remote Seq=NA, Post-1.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.6E-2 EF: 5 UCB: LCB: E: N:	7.4E-2 --- 2.3E-1 9.2E-3 1.0 21.7	ATime: 00:50:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: S-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt remote Seq=NA, Post-1.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.1E-2 EF: 4 UCB: LCB: E: N:	1.0E-1 --- 2.8E-1 1.8E-2 1.5 21.1	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: S-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt remote Seq=NA, Post-1.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-1 EF: 3 UCB: LCB: E: N:	1.4E-1 --- 3.3E-1 3.7E-2 2.0 18.1	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: S-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt remote Seq=NA, Post-1.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.9E-1 EF: 2 UCB: LCB: E: N:	2.1E-1 --- 3.8E-1 9.5E-2 6.0 31.5	ATime: 00:20:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: S-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

B-57

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt remote Seq=RA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.9E-1 EF: 1 UCB: LCB: E: N:	3.9E-1 --- 3.9E-1 3.9E-1 20.0 51.2	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
GE	EO	OPERATES the Control Rod Drive Systems Failure to send B-man to close SDV valves after scram reset attempt remote Seq=RA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.6E-1 EF: --- UCB: 1.0E+0 LCB: E: N:	9.6E-1 1 9.2E-1 20.0 20.8	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 32-33 Origin: Simulation Modeling Reference: ---:---:--- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore offsite power Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-1 EF: 10 UCB: LCB: E: N:	2.7E-1 9 1.0E+0 1.2E-2 0.5 4.5	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #4 Origin: Field Data Reference: 3-87 PlantCode: GGS1
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore offsite power Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-2 EF: 10 UCB: LCB: E: N:	2.0E-1 7.5E-2 7.5E-3 0.1 1.3	ATime: 04:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #4 Origin: Field Data Reference: 3-87 PlantCode: GGS1

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore offsite power	Mean: Median: 1.5E-2 EF: 10 UCB: LCB: E: N:	4.0E-2 --- 1.5E-1 1.5E-3 0.1 5.6	Atime: 08:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #4 Origin: Field Data Reference: 3-87 PlantCode: GGS1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore offsite power	Mean: Median: 7.5E-3 EF: 10 UCB: LCB: E: N:	2.0E-2 --- 7.5E-2 7.5E-4 0.1 13.3	Atime: 12:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #4 Origin: Field Data Reference: 3-87 PlantCode: GGS1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore offsite power	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 263.1	Atime: 20:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #4 Origin: Field Data Reference: 3-87 PlantCode: GGS1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore offsite power	Mean: Median: 1.5E-1 EF: 10 UCB: LCB: E: N:	2.9E-1 7 1.0E+0 2.3E-2 0.5 3.3	Atime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #4 Origin: Field Data Reference: 3-87 PlantCode: GGS1
		Error Type: OMISSION Recovery: CONSIDERED				

B-59

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.5E-2 EF: 5 UCB: LCB: E: N:	9.6E-2 --- 1.8E-1 7.0E-3 1.0 28.5	ATime: 01:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.8E-2 EF: 4 UCB: LCB: E: N:	6.8E-2 --- 1.9E-1 1.2E-2 1.5 31.2	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.9E-2 EF: 3 UCB: LCB: E: N:	8.6E-2 --- 2.1E-1 2.3E-2 2.0 28.9	ATime: 00:50:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PGFs	Document Information
			Raw	NUCLART calc		
GE	EO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, SeqMNA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-1 EF: 2 UCB: LCB: E: N:	1.7E-1 --- 3.2E-1 6.0E-2 6.0 37.5	ATime: 00:36:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, SeqMNA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.8E-1 EF: 2 UCB: LCB: E: N:	3.1E-1 --- 5.6E-1 1.4E-1 6.0 21.4	ATime: 00:20:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, SeqMNA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.4E-1 EF: 1 UCB: LCB: E: N:	5.4E-1 --- 5.4E-1 5.4E-1 20.0 37.0	ATime: 00:10:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to request X-tie after SAT failure Local, SeqMNA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.9E-1 EF: --- UCB: 1.0E+0 LCB: E: N:	9.9E-1 1 9.8E-1 20.0 20.2	ATime: 00:01:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

B-61

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.9E-1 EF: --- UCB: 1.0E+0 LCB: E: N:	9.9E-1 1 9.8E-1 20.0 20.2	ATime: 00:01:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.4E-1 EF: 1 UCB: LCB: E: N:	5.4E-1 --- 5.4E-1 5.4E-1 20.0 37.0	ATime: 00:10:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.8E-1 EF: 2 UCB: LCB: E: N:	3.1E-1 --- 5.6E-1 1.4E-1 6.0 21.4	ATime: 00:20:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-1 EF: 2 UCB: LCB: E: N:	1.7E-1 --- 3.2E-1 8.0E-2 6.0 37.5	ATime: 00:30:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.9E-2 EF: 3 UCB: LCB: E: N:	8.6E-2 --- 2.1E-1 2.3E-2 2.0 20.9	ATime: 00:50:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Electrical Distribution Systems Failure to restore BUS 151 locally after Rx trip Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.8E-2 EF: 4 UCB: LCB: E: N:	6.8E-2 --- 1.9E-1 1.2E-2 1.5 31.2	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 24-25 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	MAINTAINS the Electrical Distribution Systems Operator fails to restore affate power Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-1 EF: --- UCB: 1.0E+0 LCB: 1.0E-1 E: N:	4.7E-1 3 1.6E-1 3.0 7.5	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: PSS2

B-63

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PBFs	Document Information
			Raw	NUCLARR calc		
GE	EO	MAINTAINS the Electrical Distribution Systems Operator fails to restore offsite power	Mean: Median: 3.0E-1 EF: --- UCB: 1.0E+0 LCB: 1.0E-1 E: N:	3.9E-1 3 9.0E-2 2.0 6.6	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: P852
		Error Type: OMISSION Recovery: CONSIDERED				
GE	EO	MAINTAINS the Electrical Distribution Systems Operator fails to restore offsite power	Mean: Median: 2.0E-1 EF: --- UCB: 1.0E+0 LCB: 1.0E-1 E: N:	3.2E-1 5 4.0E-2 1.0 5.0	ATime: 06:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: P852
		Error Type: OMISSION Recovery: CONSIDERED				
GE	EO	MAINTAINS the Electrical Distribution Systems Operator fails to restore offsite power	Mean: Median: 4.0E-2 EF: --- UCB: 2.0E-1 LCB: 4.0E-3 E: N:	6.5E-2 5 8.0E-3 1.0 25.0	ATime: 08:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: P852
		Error Type: OMISSION Recovery: CONSIDERED				
GE	EO	MAINTAINS the Electrical Distribution Systems Operator fails to restore offsite power	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: 23:59:59 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Analytic Reference: 4-87 PlantCode: P852
		Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX 3. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the DC Power System Operator fails to restore DC battery from hardware failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-1 EF: 10 UCB: LCB: E: N:	3.9E-1 3 1.0E+0 9.0E-2 2.0 6.6	ATime: 00:40:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #2 Origin: Field Data Reference: 4-87 PlantCode: GGS1
GE	EO	OPERATES the DC Power System Operator fails to restore DC battery from hardware failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-2 EF: 10 UCB: LCB: E: N:	2.0E-1 --- 7.5E-1 7.5E-3 0.1 1.3	ATime: 04:00:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #2 Origin: Field Data Reference: 4-87 PlantCode: GGS1
GE	EO	OPERATES the DC Power System Operator fails to recover DC battery from common mode failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-1 EF: 10 UCB: LCB: E: N:	4.5E-1 3 1.0E+0 1.4E-1 3.0 8.0	ATime: 00:40:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #1 Origin: Field Data Reference: 4-87 PlantCode: GGS1
GE	EO	OPERATES the DC Power System Operator fails to recover DC battery from common mode failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-1 EF: 10 UCB: LCB: E: N:	3.9E-1 3 1.0E+0 9.0E-2 2.0 6.6	ATime: 04:00:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #1 Origin: Field Data Reference: 4-87 PlantCode: GGS1

B-65

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
GE	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group remote Seq=NA, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP
GE	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
GE	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
GE	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq=NA, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq#N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: - LCB: 5.7E-4 E: 2.0 N: 1176.4	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
GE	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: - LCB: 5.0E-3 E: 2.0 N: 133.3	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
GE	EO	MAINTAINS the DC Power System Subject improperly mates electrical connector Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: - LCB: 1.0E-3 E: 2.0 N: 666.6	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
GE	EO	INSPECTS the DC Power System Subject improperly mates electrical connector Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: - LCB: 1.0E-3 E: 2.0 N: 666.6	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action: remote; Sq: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 480.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
GE	EO	OPERATES the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 4-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: MEE3
GE	EO	OPERATES the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Sq: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
GE	EO	OPERATES the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action: remote; Sq: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq-NA, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origins: Field Data Reference: --- PlantCode: ALLP
GE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 17 Origins: Subjective Reference: 1-83 PlantCode: REE3
GE	EO	MAINTAINS the Plant AC Distribution System Subject improperly mates electrical connector Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origins: Field Data Reference: --- PlantCode: ALLP
GE	EO	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq-NA, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origins: Field Data Reference: --- PlantCode: ALLP

B-69

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		P&Fs	Document Information
			Raw	NUCLARR calc		
GE	EO	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote SeqRA, Post-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP
GE	EO	INSPECTS the Plant AC Distribution System Subject improperly mates electrical connector remote SeqRA, Post-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: --- PlantCode: ALLP
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout local, SeqRA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.6E-1 EF: 1 UCB: LCB: E: N:	5.6E-1 --- 5.6E-1 5.6E-1 20.0 35.7	ATime: 00:01:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: --- PlantCode: LSC1
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout local, SeqRA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-1 EF: 3 UCB: LCB: E: N:	2.5E-1 --- 6.0E-1 6.7E-2 2.0 10.0	ATime: 00:10:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: --- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		Pafa	Document Information
			Raw	NUCLARK calc		
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.3E-1 EF: 3 UCB: LCB: E: N:	1.6E-1 --- 3.9E-1 4.3E-2 2.0 15.3	ATime: 00:20:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.6E-2 EF: 4 UCB: LCB: E: N:	1.4E-1 --- 3.8E-1 2.4E-2 1.5 15.6	ATime: 00:30:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.6E-2 EF: 5 UCB: LCB: E: N:	1.2E-1 --- 3.8E-1 1.5E-2 1.0 13.1	ATime: 00:40:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.3E-2 EF: 6 UCB: LCB: E: N:	1.1E-1 --- 3.8E-1 1.1E-2 1.0 15.8	ATime: 00:50:00 PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			RAW	NUCLARR calc		
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.4E-2 EF: 6 UCB: LCB: E: N:	9.8E-2 --- 3.2E-1 9.0E-3 1.0 18.5	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.7E-2 EF: 7 UCB: LCB: E: N:	9.5E-2 --- 3.3E-1 6.7E-3 0.5 10.6	ATime: 01:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.2E-2 EF: 8 UCB: LCB: E: N:	9.3E-2 --- 3.4E-1 5.3E-3 0.5 11.9	ATime: 01:20:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-2 EF: 9 UCB: LCB: E: N:	8.3E-2 --- 3.1E-1 3.0E-3 0.5 14.7	ATime: 01:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 29-31 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Emergency Core Cooling Systems Failure to request diesel fire pump after station blackout Local, SeqMA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-2 EF: 9 UCB: LCB: E: 0.5 N: 13.1	9.3E-2 --- 3.4E-1 4.2E-3 13.1	ATime: 01:30:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pp 29-31 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Emergency Core Cooling Systems Excessive task duration results in poor judgement motiv=9,workload=11,commu=7;remote;Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 9.0E-2 LCB: 1.6E-2 E: N:	6.4E-2 3.8E-2 2 4.0 105.4	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
GE	EO	OPERATES the Emergency Core Cooling Systems Excessive task demands result in poor judgement motiv=7,workload=13,commu=9;remote;Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.9E-1 LCB: 2.9E-2 E: N:	1.2E-1 9.2E-2 3 2.0 21.8	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
GE	EO	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

B-73

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	EO	OPERATES the High Pressure Coolant Injection System ADJ operator fails to locally open air operated valves sequence; remote; evs post event, pos; super judge Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: 3.0E-2 Median: 3.0E-2 EF: 13 UCB: 3.9E-1 LCB: 5.0E-3 E: 0.1 N: 3.3	1.0E-1 13 2.3E-3 0.1 3.3	ATime: 01:00:00 PTime: ---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-6, item 15 Origin: Psychological Scaling Reference: ----- PlantCode: ALLP
GE	EO	MAINTAINS the High Pressure Coolant Injection System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	EO	MAINTAINS the High Pressure Coolant Injection System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the High Pressure Core Spray System Operator fails to restore NPC's pump room cooling Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.5E-3 Median: 1.5E-3 EF: 10 UCB: 1.5E-2 LCB: 1.5E-4 E: 0.1 N: 66.6	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 20:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #4 Origin: Analytic Reference: 4-87 PlantCode: 6681
GE	EO	MAINTAINS the High Pressure Core Spray System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P65
GE	EO	MAINTAINS the High Pressure Core Spray System Common cause miscalibration of CST low level sensors check, local, sequence = N/A, Pre-J.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P65
GE	EO	OPERATES the Low Pressure Core Spray System Operator fails to restore LPC's pump room cooling reduce the NEP; seq'all; remote; evnpost in, pos; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.5E-3 Median: 1.5E-3 EF: 10 UCB: 1.5E-2 LCB: 1.5E-4 E: 0.1 N: 66.6	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 06:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #2 Origin: Analytic Reference: 4-87 PlantCode: 6681

B-75

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Yend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Low Pressure Core Spray System Failure to inject LP after RCIC failure Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E+0 EF: 1 UCB: 1.0E+0 LCB: E: N:	1.0E+0 --- 1.0E+0 20.0 20.0	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 20 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Low Pressure Core Spray System Failure to inject LP after RCIC failure Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.3E-1 EF: 2 UCB: LCB: E: N:	3.6E-1 --- 6.6E-1 1.7E-1 6.0 18.1	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 20 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Low Pressure Core Spray System Failure to inject LP after RCIC failure Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.0E-1 EF: --- UCB: 1.0E+0 LCB: E: N:	9.8E-1 1 9.6E-1 20.0 20.4	ATime: 00:05:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 20 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Low Pressure Core Spray System Failure to inject LP after RCIC failure Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-2 EF: 9 UCB: LCB: E: N:	6.6E-2 --- 2.4E-1 3.0E-3 0.5 18.5	ATime: 00:15:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 20 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend Eqty	Job Tit	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
GE	EO	MAINTAINS the Low Pressure Core Spray System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	EO	MAINTAINS the Low Pressure Core Spray System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	EO	OPERATES the Residual Heat Removal/Low Press Coolant Inject Syst Operator fails to restore RHR pump room cooling Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: 1.5E-4 E: 0.1 N: 66.6	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 20:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 206, #1 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	EO	OPERATES the Residual Heat Removal/Low Press Coolant Inject Syst Failure to initiate RHR after ATWS Local; Seqn/A; EvnPost; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 7 UCB: LCB: 1.7E-4 E: 0.5 N: 416.6	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

B-77

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Yend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Residual Heat Removal/Low Press Coolant Inject Syst Failure to initiate RHR after ATWS Local; Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: 4.5E-3 Median: 4.5E-3 EF: 4 UCB: 1.8E-2 LCB: 1.1E-3 E: 1.5 N: 333.3	6.4E-3 --- 1.8E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Residual Heat Removal/Low Press Coolant Inject Syst Failure to initiate RHR after ATWS Local; Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.8E-2 Median: 2.8E-2 EF: 2 UCB: 5.6E-2 LCB: 1.4E-2 E: 6.0 N: 214.2	3.1E-2 --- 5.6E-2 1.4E-2 6.0 214.2	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Residual Heat Removal/Low Press Coolant Inject Syst Failure to initiate RHR after ATWS Local, Seq=M/A, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: 6.7E-1 Median: 6.7E-1 EF: 1 UCB: 6.7E-1 LCB: 6.7E-1 E: 20.0 N: 29.8	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	MAINTAINS the Residual Heat Removal/Low Press Coolant Inject Syst Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-6 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-6 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	MAINTAINS the Residual Heat Removal/Low Press Coolant Inject Syst Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--:-- PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	EO	MAINTAINS the Automatic Depressurization System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--:-- PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	EO	MAINTAINS the Containment Atmosphere Monitoring System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--:-- PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	EO	OPERATES the Feedwater Control System Violate procedure and devise own formula Motiv - 9, workload - 8, commun - 5; remote/pre-IE, HRA - INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 4.7E-2 LCB: 1.6E-3 E: N:	1.5E-2 5.7E-3 5 1.0 115.3	ATime: ---:--:-- PTime: ---:--:-- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PEFs	Document Information
			RAM	MUCLARR calc		
GE	EO	MAINTAINS the Feedwater System Common cause miscalibration of CST low level sensors check, local, sequence = n/s, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--:-- PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P99
GE	EO	OPERATES the Reactor Core Isolation Cooling System Operator fails to restore RCIC pump room cooling Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: 1.5E-2 LCB: 1.5E-4 E: 0.1 N: 66.6	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 12:08:00 PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 203, #6 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to initiate RCIC after station blackout Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.8E-2 EF: 2 UCB: 5.6E-2 LCB: 1.4E-2 E: 6.0 N: 214.2	3.1E-2 --- 5.6E-2 1.4E-2 6.0 214.2	ATime: 00:10:00 PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to initiate RCIC after station blackout Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.5E-3 EF: 4 UCB: 1.8E-2 LCB: 1.1E-3 E: 1.5 N: 333.3	6.4E-3 --- 1.8E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to initiate RCIC after station blackout Seq=MA; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 7 UCB: LCB: E: N:	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to initiate RCIC after station blackout Local, Seq=MA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.7E-1 EF: 1 UCB: LCB: E: N:	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to send B-man to open RCIC injection valve remote Seq=MA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.3E-1 EF: 2 UCB: LCB: E: N:	2.5E-1 --- 4.6E-1 1.2E-1 6.0 26.0	ATime: 00:05:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to send B-man to open RCIC injection valve Remote; Seq=MA; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.9E-2 EF: 4 UCB: LCB: E: N:	9.6E-2 --- 1.6E-1 9.8E-3 1.5 38.4	ATime: 00:15:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to send B-man to open RCIC injection valve Remote; Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.4E-2 EF: 2 UCB: LCB: E: N: --	9.2E-2 --- 1.7E-1 4.2E-2 6.0 79.6	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to send B-man to open RCIC injection valve remote Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.8E-1 EF: --- UCB: 9.0E-1 LCB: E: N:	7.8E-1 1 6.8E-1 20.0 25.6	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to reset RCIC isolation after DGIA loads Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.3E-1 EF: 2 UCB: LCB: E: N:	2.5E-1 --- 4.6E-1 1.2E-1 6.0 26.0	ATime: 00:05:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to reset RCIC isolation after DGIA loads Local; Seq=M/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.9E-2 EF: 4 UCB: LCB: E: N:	5.6E-2 --- 1.6E-1 9.8E-3 1.5 38.4	ATime: 00:15:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to reset RCIC isolation after DGIA loads Local; Seq=N/A; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.6E-2 EF: 2 UCB: LCB: E: N:	9.2E-2 --- 1.7E-1 4.2E-2 6.0 71.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Reactor Core Isolation Cooling System Failure to reset RCIC isolation after DGIA loads Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.8E-1 EF: --- UCB: 9.0E-1 LCB: E: N:	7.8E-1 1 6.8E-1 20.0 25.6	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 21-22 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	MAINTAINS the Reactor Core Isolation Cooling System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: LCB: E: N:	6.7E-5 --- 2.5E-4 2.5E-6 6.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P8S
GE	EO	OPERATES the Standby Diesel Generator Systems Failure to request DGA investigation after DGA failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFa	Document Information
			Row	NUCLARR calc		
GE	EO	OPERATES the Standby Diesel Generator Systems Failure to request DGA investigation after DCA failure	Mean: Median: 6.6E-1 EF: 1 UCB: 6.6E-1 LCB: 6.6E-1 E: 20.0 N: 30.3	6.6E-1 --- 6.6E-1 6.6E-1 20.0 30.3	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	EO	OPERATES the Standby Diesel Generator Systems Failure to request DGA investigation after DCA failure	Mean: Median: 3.4E-3 EF: 10 UCB: 3.4E-2 LCB: 3.4E-4 E: 0.1 N: 29.4	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	EO	OPERATES the Standby Diesel Generator Systems Failure to recover DGIA after DGIA trouble	Mean: Median: 6.6E-1 EF: 1 UCB: 6.6E-1 LCB: 6.6E-1 E: 20.0 N: 30.3	6.6E-1 --- 6.6E-1 6.6E-1 20.0 30.3	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				
GE	EO	OPERATES the Standby Diesel Generator Systems Failure to request DGIB repair after station blackout local, SeqMA, Post-1.E., Sandia Recovery Model	Mean: Median: 3.4E-3 EF: 10 UCB: 3.4E-2 LCB: 3.4E-4 E: 0.1 N: 29.4	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.4	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
		Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
GE	EO	OPERATES the Standby Diesel Generator Systems Failure to request DG10 repair after station blackout Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.6E-1 EF: 1 UCB: LCB: E: N:	6.6E-1 --- 6.6E-1 6.6E-1 28.0 39.3	ATime: 00:01:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Standby Diesel Generator Systems Failure to request DG0 repair after station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.4	ATime: 00:10:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Standby Diesel Generator Systems Failure to request DG0 repair after station blackout Local; Seq=NA; Ev=Post; Sandia Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.6E-1 EF: 2 UCB: LCB: E: N:	6.8E-1 --- 1.0E+0 4.4E-1 15.0 22.7	ATime: 00:01:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 23 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Main Steam System Failure to close MATVs after level 7 alarm Local, Seq=NA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.8E-2 EF: 3 UCB: LCB: E: N:	3.5E-2 --- 8.4E-2 9.3E-3 2.0 71.4	ATime: 00:10:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1

B-85

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Rev	MUCLARK calc		
GE	EO	OPERATES the Main Steam System Failure to close MSIVs after level 7 alarm Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.5E-3 EF: 4 UCB: LCB: E: N:	6.4E-3 --- 1.0E-2 1.1E-3 1.5 333.3	ATime: 00:20:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Main Steam System Failure to close MSIVs after level 7 alarm Local, Seq-MA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 7 UCB: LCB: E: N:	2.4E-3 --- 8.4E-3 1.7E-4 0.5 416.6	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	OPERATES the Main Steam System Failure to close MSIVs after level 7 alarm Local, Seq-MA, Post-I.E., Sandia Recovery Model Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.7E-1 EF: 1 UCB: LCB: E: N:	6.7E-1 --- 6.7E-1 6.7E-1 20.0 29.8	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-87 vol 2, pg 19 Origin: Simulation Modeling Reference: ----- PlantCode: LSC1
GE	EO	MAINTAINS the Main Steam System Aux op fails to restore PCS (power conversion system) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.6E-1 EF: 5 UCB: 1.0E+0 LCB: 1.0E-1 E: N:	6.0E-1 2 3.1E-1 8.0 14.2	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Unknown Reference: 4-87 PlantCode: PBS2

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	MAINTAINS the Main Steam System Aux op fails to restore PCS (power conversion system) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-2 EF: 10 UCB: LCB: E: N:	5.3E-2 --- 2.0E-1 2.0E-3 0.1 5.0	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Unknown Reference: 4-87 PlantCode: PBS2
GE	EO	MAINTAINS the Main Steam System Aux op fails to restore PCS (power conversion system) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	1.0E-2 --- 3.0E-2 3.0E-4 0.1 26.3	ATime: 04:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Unknown Reference: 4-87 PlantCode: PBS2
GE	EO	MAINTAINS the Main Steam System Aux op fails to restore PCS (power conversion system) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-3 EF: 10 UCB: LCB: E: N:	1.0E-2 --- 3.0E-2 3.0E-4 0.1 26.3	ATime: 08:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Unknown Reference: 4-87 PlantCode: PBS2
GE	EO	MAINTAINS the Main Steam System Aux op fails to restore PCS (power conversion system) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.6E-3 EF: 10 UCB: LCB: E: N:	6.9E-3 --- 2.6E-2 2.6E-4 0.1 30.4	ATime: 23:59:59 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 188 Origin: Unknown Reference: 4-87 PlantCode: PBS2

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	EO	INSPECTS the Process Sampling Systems Checkers performing OA tolerate a discrepancy motiv - 9, workload -10, commun - 6; remote ;pre-IE, HRA - INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: --- Median: --- EF: --- UCB: 1.2E-1 LCB: 1.2E-3 E: --- N: ---	3.2E-2 1.2E-2 10 --- 0.1 8.3	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
GE	NT	MAINTAINS the Condensate Systems Common cause miscalibration of CST low level sensors local; seq-W/A; av=pre ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: --- LCB: --- E: --- N: ---	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P88
GE	NT	MAINTAINS the Containment Systems Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: --- LCB: --- E: --- N: ---	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P85
GE	NT	MAINTAINS the Containment Penetration/Isolation System Common cause miscalibration of high drywell pressure sensors Error type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: --- LCB: --- E: --- N: ---	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P85

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	NT	MAINTAINS the Containment Spray (RRR) System Common cause miscalibration of CST low level sensors local; seq=N/A; evmpre ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P85
GE	NT	TESTS the Suppression Pool Support System SPH mode selector switch A not left in auto position Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.0E-3 Median: 3.0E-3 EF: 10 UCB: 3.0E-2 LCB: 3.0E-4 E: 0.1 N: 33.3	8.0E-3 --- 0.1 33.3	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #13 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	NT	TESTS the Control Rod Drive Systems Failure to restore valve after test/maintenance (CRD) seq=ns; remote; evmpre ie,poa; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.0E-3 Median: 3.0E-3 EF: 10 UCB: 3.0E-2 LCB: 3.0E-4 E: 0.1 N: 33.3	8.0E-3 --- 0.1 33.3	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #1 Origin: Analytic Reference: 4-87 PlantCode: GGS1
GE	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq.:N/A; Pre-E.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.7E-3 Median: 1.7E-3 EF: 3 UCB: 5.7E-3 LCB: 5.7E-4 E: 2.0 N: 1176.4	2.1E-3 --- 5.7E-3 5.7E-4 2.0 1176.4	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: 2.0 N: 408.0	4.2E-3 --- 1.5E-2 1.7E-3 2.0 408.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
GE	NT	TESTS the DC Power System Subject improperly mates electrical connector remote Seq: MA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: 2.0 N: 666.6	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
GE	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq: MA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: 2.0 N: 133.3	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
GE	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: 2.0 N: 1176.4	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ftl	Task Description	Data Values		PSFs	Document Information
			Rmr	MUCLARR calc		
GE	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
GE	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq=MA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
GE	NT	MAINTAINS the DC Power System Subject improperly mates electrical connector remote Seq=MA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.0E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
GE	NT	TESTS the Plant AC Distribution System Subject improperly mates electrical connector remote Seq=MA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.0E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP

B-91

NUREG/CR-4639

HER RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	MT	TESTS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq=NA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP
GE	MT	TESTS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action:remote; Sq;:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
GE	MT	TESTS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq=NA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP
GE	MT	MAINTAINS the Plant AC Distribution System Subject improperly mates electrical connector remote Seq=NA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
GE	MT	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq=NA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ---:--- PlantCode: ALLP
GE	MT	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ---:--- PlantCode: ALLP
GE	MT	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq=NA, Pre-I.E. Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ---:--- PlantCode: ALLP
GE	MT	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ---:--- PlantCode: PSS

B-93

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFa	Document Information
			Raw	NUCLARR calc		
GE	MT	MAINTAINS the Emergency Core Cooling System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., WEA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5	6.7E-5	ATime: ---:--:--	Document: 4-87
			Median: 2.5E-5		PTime: ---:--:--	
			EF: 10	---	Experience: U	Origin:
			UCB: 2.5E-4		Feedback: U	Analytic
GE	MT	MAINTAINS the High Pressure Coolant Injection System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., WEA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	LCB: 2.5E-6		Procedure: U	Reference: -----
			E: 0.1		Staffing: U	PlantCode: P88
			N: 4080.0		Stress: U	
					Supervision: U	
GE	MT	MAINTAINS the High Pressure Coolant Injection System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., WEA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5	6.7E-5	ATime: ---:--:--	Document: 4-87
			Median: 2.5E-5		PTime: ---:--:--	
			EF: 10	---	Experience: U	Origin:
			UCB: 2.5E-4		Feedback: U	Analytic
GE	MT	MAINTAINS the High Pressure Coolant Injection System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	LCB: 2.5E-6		Procedure: U	Reference: -----
			E: 0.1		Staffing: U	PlantCode: P88
			N: 4080.0		Stress: U	
					Supervision: U	
GE	MT	MAINTAINS the High Pressure Core Spray System Fail to restore NPCB pump to service when out for maintenance seq=tquv,tqux; remote; evapost-i.e.,rop; Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.7E-4	2.7E-4	ATime: ---:--:--	Document: 4-87
			Median: 1.0E-4		PTime: ---:--:--	
			EF: 10	---	Experience: U	Origin:
			UCB: 1.0E-3		Feedback: U	Analytic
GE	MT	MAINTAINS the High Pressure Core Spray System Fail to restore NPCB pump to service when out for maintenance seq=tquv,tqux; remote; evapost-i.e.,rop; Error Type: OMISSION Recovery: CONSIDERED	LCB: 1.0E-5		Procedure: U	Reference: -----
			E: 0.1		Staffing: U	PlantCode: P88
			N: 1000.0		Stress: U	
					Supervision: U	
GE	MT	MAINTAINS the High Pressure Core Spray System Fail to restore NPCB pump to service when out for maintenance seq=tquv,tqux; remote; evapost-i.e.,rop; Error Type: OMISSION Recovery: CONSIDERED	Mean: 4.2E-1	4.2E-1	ATime: 00:40:00	Document: 1-87
			Median: 3.4E-1		PTime: ---:--:--	ch IV, pg 204, #5
			EF: 10	3	Experience: U	Origin:
			UCB: 1.0E+0		Feedback: U	Analytic
GE	MT	MAINTAINS the High Pressure Core Spray System Fail to restore NPCB pump to service when out for maintenance seq=tquv,tqux; remote; evapost-i.e.,rop; Error Type: OMISSION Recovery: CONSIDERED	LCB: 1.2E-1		Procedure: U	Reference: 1-75
			E: 2.5		Staffing: U	PlantCode: 6881
			N: 7.3		Stress: U	
					Supervision: U	
GE	MT	MAINTAINS the High Pressure Core Spray System Fail to restore NPCB pump to service when out for maintenance seq=tquv,tqux; remote; evapost-i.e.,rop; Error Type: OMISSION Recovery: CONSIDERED			Tagging: U	
					Training: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PGFs	Document Information
			Raw	NUCLEAR calc		
GE	NT	MAINTAINS the High Pressure Core Spray System Fail to restore NPCS pump to service when out for maintenance seq=tquv,tqux; remote; ev=post-i.e.,rop; Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-1 EF: 10 UCB: LCB: E: N:	2.7E-1 9 1.0E+0 1.2E-2 0.5 4.5	ATime: 20:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #3 Origin: Analytic Reference: 1-75 PlantCode: GGS1
GE	NT	MAINTAINS the High Pressure Core Spray System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-i.e., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: LCB: E: N:	6.7E-5 --- 2.5E-4 2.5E-4 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	NT	MAINTAINS the High Pressure Core Spray System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-3 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	NT	MAINTAINS the Low Pressure Core Spray System Failure to restore LPCS pump A suction valve after test/maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: 3.0E-2 LCB: 3.0E-4 E: N:	8.0E-3 --- 0.1 33.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #2 Origin: Analytic Reference: 4-87 PlantCode: GGS1

B-95

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
GE	NT	MAINTAINS the Low Pressure Core Spray System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	NT	MAINTAINS the Low Pressure Core Spray System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	NT	MAINTAINS the Residual Heat Removal/Low Press Coolant Inject Syst Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	NT	MAINTAINS the Residual Heat Removal/Low Press Coolant Inject Syst Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend Eqlv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
GE	NT	TESTS the Instrumentation and Control Systems Common mode miscalibration of level sensors (ESF) sequence; remote; evspre la, pos; sharp Error Type: COMMISSION Recovery: CONSIDERED	Mean: 8.0E-4 Median: 3.0E-4 EF: 10 UCB: 3.0E-3 LCB: 3.0E-5 E: 0.1 N: 333.3	8.0E-4 ---	ATime: 23:59:59 PTime: ----- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #5 Origin: Analytic Reference: 4-87 PlantCode: Q051
GE	NT	MAINTAINS the Instrumentation and Control Systems Maintenance tech miscalculates RX pressure instruments Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 ---	ATime: ----- PTime: ----- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 107 Origin: Analytic Reference: 4-87 PlantCode: PBS2
GE	NT	MAINTAINS the Automatic Depressurization System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 ---	ATime: ----- PTime: ----- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
GE	NT	MAINTAINS the Containment Atmosphere Monitoring System Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 ---	ATime: ----- PTime: ----- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
GE	MT	MAINTAINS the Station Service Water System MT fails to calibrate containment spray activation sensors properly Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: --- Median: 1.0E-3 EF: --- UCB: 1.0E-2 LCB: 1.0E-4 E: --- N: ---	2.7E-3 10 0.1 100.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SSW1
GE	MT	MAINTAINS the Feedwater System Common cause miscalibration of CST low level sensors check, local, sequence = n/a, Pre-f.E., HRA Method = ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PWS
GE	MT	MAINTAINS the Reactor Core Isolation Cooling System Common cause miscalibration of CST low level sensors local; seqn/A; evapre-f.e.; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PWS
GE	MT	TESTS the Standby Liquid Control System Maintenance tech fails to restore SLCV valve after test Error Type: OMISSION Recovery: CONSIDERED	Mean: --- Median: 7.0E-3 EF: 4 UCB: 2.0E-2 LCB: 1.0E-3 E: --- N: ---	8.6E-3 3 2.5E-3 2.5 357.1	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 187 Origin: Analytic Reference: 4-87 PlantCode: PWS2

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLAR calc		
GE	NT	TESTS the Standby Liquid Control System Failure to restore test suction valve after test sequence; remote; ev-pre is,pos; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.0E-4 EF: 10 UCB: 9.0E-3 LCB: 9.0E-5 E: N:	2.4E-3 --- 0.1 111.1	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #12 Origin: Analytic Reference: 4-87 PlantCode: 6081
GE	NT	TESTS the Standby Liquid Control System Failure to restore both valves in SLC test return line after test sequence; remote; ev-pre is,pos; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.8E-3 EF: 10 UCB: 1.8E-2 LCB: 1.8E-4 E: N:	4.8E-3 --- 0.1 55.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #11 Origin: Analytic Reference: 4-87 PlantCode: 6081
WE	CRO	OPERATES the Air System Operator fails to restore air tion; SGR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.0E-3 EF: 7 UCB: LCB: E: N:	1.2E-2 --- 4.2E-2 8.6E-4 0.5 83.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 27 Origin: Simulation Modeling Reference: 3-85 PlantCode: 58K1
WE	CRO	OPERATES the Instrument Air System Operator fails to establish instrument air to containment post-IE, POA, SLIM-MNUO, Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.0E-4 EF: 10 UCB: LCB: E: N:	2.1E-3 --- 8.0E-3 8.0E-5 0.1 125.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: 3 Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-88 group 1, test 38 Origin: Simulation Modeling Reference: 1-86 PlantCode: OPS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARM calc		
WE	CRO	OPERATES the Instrument Air System Common mode: gear judge becuz proc/P&IDs/operat convent don't match motive=6,workload=7,communs=8;local;Pre-IE;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.9E-1 LCB: 2.9E-2 E: N:	1.2E-1 9.2E-2 3 2.0 21.7	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 6 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	CRO	MONITORS the Instrument Air System Tolerate an out of range situation w/potentially moderate consequenc motive=8,workload=9,communs=7;local;pre-IE;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 3.6E-1 LCB: 1.0E-2 E: N:	1.1E-1 6.0E-2 6 - 1.0 16.6	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	CRO	DIAGNOSES the Instrument Air System Crews consult inappropriate resources in emergency motive=7,workload=10,communs=9;local;Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.3E-1 LCB: 1.9E-3 E: N:	3.6E-2 1.6E-2 8 0.5 31.6	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	CRO	OPERATES the Communication Systems Inadequate communication results in improper actions motive=8,workload=9,communs=13;local;Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.0E-1 LCB: 3.3E-3 E: N:	5.6E-2 2.6E-2 8 0.5 19.4	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the Condensate Systems Fail to isolate condensers after station blackout seqst, loop; locat; evmpoa; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E+0 EF: 1 UCB: LCB: E: N:	1.0E+0 --- 1.0E+0 1.0E+0 20.0 20.0	ATime: 00:30:00 PTime: 00:30:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 206 Origin: Analytic Reference: 4-87 PlantCode: SP31
WE	CRO	OPERATES the Condensate Systems Operator fails to establish condensate flow into the SG Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-2 EF: 10 UCB: LCB: E: N:	8.9E-2 --- 3.4E-1 3.4E-3 0.1 2.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 group 3, task 28 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
WE	CRO	OPERATES the Condensate Systems Operator fails to establish FW flow from condensate system Slim-Moud Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: LCB: E: N:	7.2E-3 --- 2.7E-2 2.7E-4 0.1 37.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: 2	Document: 2-86 group 5, task 24 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
WE	CRO	OPERATES the Condensate Systems Operator fails to close main condensor isolation valves Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.9E-2 EF: 10 UCB: LCB: E: N:	1.6E-1 --- 5.9E-1 5.9E-3 0.1 1.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-86 table 4.9-4, #27 Origin: Analytic Reference: ----- PlantCode: SPS1

APPENDIX B. RAW DATA

Yeml EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
WE	CRO	OPERATES the Condensate Systems Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: --- LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: 3 Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
WE	CRO	MONITORS the Condensate Systems Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: --- LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
WE	CRO	OPERATES the Containment Systems Operator fails to recover CLCS actuation Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: --- LCB: 2.7E-4 E: 0.1 N: 37.5	7.1E-3 --- 2.7E-2 2.7E-4 0.1 37.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-6, #7-9 Origin: Analytic Reference: ----- PlantCode: SP51
WE	CRO	OPERATES the Containment Systems Circumvent proc w/potential catastrophic conseq, e.g. major ISLOCA motive 7, workload 8, comm 7; local; seq ISLOCA; pre-IE ;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 7.5E-2 LCB: 6.0E-5 E: --- N: ---	2.2E-2 2.1E-3 35 7.5E-2 6.0E-5 0.1 47.1	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLAAR calc		
WE	CND	DIAGNOSES the Containment Systems Competing goal states leads to wrong conclusion motive 9, workload=10, commu= 6; local; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.7E-1 LCB: 8.9E-3 E: N:	5.0E-2 3.9E-2 4 1.0 25.7	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	CRO	OPERATES the Containment Isolation System Operator fails to close 3 CSIS valves Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.1E-5 EF: 10 UCB: LCB: E: N:	6.3E-5 --- 3.1E-4 3.1E-6 0.1 3225.8	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the Containment Isolation System Operator fails to reset containment isolate post-IE, POA, SLIM-NAUD, Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.6E-4 EF: 10 UCB: LCB: E: N:	6.9E-4 --- 2.6E-3 2.6E-5 0.1 384.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: 3 Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 group 1, task 32 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
WE	CRO	TESTS the Containment Spray System Operator fails to reopen valve in EGRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the Containment Spray System Failure to switchover CSS from injection to recirculation Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.9E-4 EF: 10 UCB: LCB: E: N:	1.3E-3 --- 4.9E-3 4.9E-5 0.1 204.0	ATime: 00:15:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: 1 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 197, #3 Origin: Analytic Reference: 4-87 PlantCode: SMP1
WE	CRO	OPERATES the Containment Spray System Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the Containment Spray System Operator fails to close RUST valve in CSIS Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.0E-4 EF: 10 UCB: LCB: E: N:	1.1E-3 --- 4.0E-3 4.0E-5 0.1 250.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the Containment Spray System Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1

APPENDIX B. RAW DATA

Vend EqLv	Job ttl	Task Description	Data Values		PSfs	Document Information
			Raw	NUCLARR calc		
WE	ORO	OPERATES the Containment Spray System Circumvent proc w/potential catastrophic conseq, e.g. major ISLOCA motive=7, workload=8, commu=7; local; seq=ISLOCA; Post-IE; ROP; HRA=187ENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 7.5E-2 LCB: 6.0E-3 E: N:	2.2E-2 2.1E-3 33 0.1 47.1	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	ORO	OPERATES the Containment Spray System Circumvent procedure with a minor consequence, e.g., a minor ISLOCA motive=7, workload=9, commu=8; local; seq=ISLOCA; Post-IE; ROP; HRA=187ENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 8.6E-2 LCB: 3.3E-4 E: N:	2.2E-2 3.3E-3 16 0.1 18.7	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	ORO	MONITORS the Containment Spray System Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1
WE	ORO	OPERATES the Control Rod Drive Systems Operator fails to insert rods post-IE, POA, SLEM-NAUD, calibration task, moderate monitoring Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-3 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-88 group 2, task 4 Origin: Subjective Reference: 1-86 PlantCode: CPS

B-105

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSfs	Document Information
			Raw	NUCLARR calc		
WE	CRO	<p>DIAGNOSES the Control Rod Drive Systems</p> <p>Correct actions taken during the wrong plant evaluation</p> <p>motive 8, workload=10, comm= 9; local; Post-IE; EOP; NRA=INTENT</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 9.9E-3</p> <p>Median: 5.7E-3</p> <p>EF: ---</p> <p>UCB: 3.2E-2</p> <p>LCB: 1.0E-3</p> <p>E: 1.0</p> <p>N: 176.7</p>	<p>9.9E-3</p> <p>5.7E-3</p> <p>6</p> <p>1.0</p> <p>176.7</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: 3</p> <p>Feedback: 0</p> <p>Procedure: 5</p> <p>Staffing: 0</p> <p>Stress: 3</p> <p>Supervision: 3</p> <p>Tagging: 0</p> <p>Training: 4</p>	<p>Document: 2-90</p> <p>table 2</p> <p>Origin: Analytic</p> <p>Reference: ---:---</p> <p>PlantCode: ALLP</p>
WE	CRO	<p>OPERATES the Electrical Distribution Systems</p> <p>Operator fails to restore site power</p> <p>tion; SGTR, local, post-IE, POA, MAPPS simulation; 50/50 = success</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 2.7E-5</p> <p>Median: 1.0E-5</p> <p>EF: 10</p> <p>UCB: 1.0E-4</p> <p>LCB: 1.0E-6</p> <p>E: 0.1</p> <p>N: 10000.0</p>	<p>2.7E-5</p> <p>1.0E-4</p> <p>1.0E-6</p> <p>0.1</p> <p>10000.0</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: 0</p> <p>Feedback: 0</p> <p>Procedure: 0</p> <p>Staffing: 0</p> <p>Stress: 3</p> <p>Supervision: 0</p> <p>Tagging: 0</p> <p>Training: 0</p>	<p>Document: 1-85</p> <p>subtask 30</p> <p>Origin: Simulation Modeling</p> <p>Reference: 3-85</p> <p>PlantCode: SBK1</p>
WE	CRO	<p>MONITORS the Electrical Distribution Systems</p> <p>Operator fails to check power to PORV blocks</p> <p>tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 1.3E-2</p> <p>Median: 8.0E-3</p> <p>EF: 5</p> <p>UCB: 4.0E-2</p> <p>LCB: 1.6E-3</p> <p>E: 1.0</p> <p>N: 125.0</p>	<p>1.3E-2</p> <p>4.0E-2</p> <p>1.6E-3</p> <p>1.0</p> <p>125.0</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: 0</p> <p>Feedback: 0</p> <p>Procedure: 0</p> <p>Staffing: 0</p> <p>Stress: 3</p> <p>Supervision: 0</p> <p>Tagging: 0</p> <p>Training: 0</p>	<p>Document: 1-85</p> <p>subtask 17</p> <p>Origin: Simulation Modeling</p> <p>Reference: 3-85</p> <p>PlantCode: SBK1</p>
WE	CRO	<p>MONITORS the Electrical Distribution Systems</p> <p>Operator fails to verify power source</p> <p>tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 1.0E-2</p> <p>Median: 8.0E-3</p> <p>EF: 3</p> <p>UCB: 2.4E-2</p> <p>LCB: 2.7E-3</p> <p>E: 2.0</p> <p>N: 250.0</p>	<p>1.0E-2</p> <p>2.4E-2</p> <p>2.7E-3</p> <p>2.0</p> <p>250.0</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: 0</p> <p>Feedback: 0</p> <p>Procedure: 0</p> <p>Staffing: 0</p> <p>Stress: 3</p> <p>Supervision: 0</p> <p>Tagging: 0</p> <p>Training: 0</p>	<p>Document: 1-85</p> <p>subtask 28</p> <p>Origin: Simulation Modeling</p> <p>Reference: 3-85</p> <p>PlantCode: SBK1</p>

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
WE	CRO	OPERATES the Plant AC Distribution System Operator fails to reconnect stub-bus after LOSP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 207 Origin: Subjective Reference: 4-87 PlantCode: SMP1
WE	CRO	TESTS the Emergency Core Cooling Systems Operator fails to restore LPRS after test & maintenance Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.6E-4 EF: 10 UCB: LCB: E: N:	4.3E-4 --- 1.6E-3 1.6E-5 0.1 625.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1
WE	CRO	TESTS the Emergency Core Cooling Systems Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the Emergency Core Cooling Systems Failure to isolate ECCS from RWST Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.5E-4 EF: 10 UCB: LCB: E: N:	1.2E-3 --- 4.5E-3 4.5E-5 0.1 222.2	ATime: 00:15:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: 1 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 197, #2 Origin: Analytic Reference: 4-87 PlantCode: SMP1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
WE	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to align CSRS valves Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.3E-3 EF: 10 UCB: LCB: E: N:	8.8E-3 --- 3.3E-2 3.3E-4 0.1 30.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to trip SI during LOSP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YCR1
WE	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to block SI signals past-IE, POA, SLIN-MAUD, Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.5E-4 EF: 10 UCB: LCB: E: N:	6.7E-4 --- 2.5E-3 2.5E-5 0.1 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: 3 Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 group 1, task 26 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS

APPENDIX B. RAW DATA

Yend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
ME	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to activate SI post-IE, POA, SLIM-MAUD, Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-4 EF: 10 UCB: LCB: E: N:	5.3E-4 --- 2.0E-3 2.0E-5 0.1 500.0	ATime: --- PTime: --- Experience: U Feedback: 3 Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-88 group 1, task 29 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
ME	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to reset SI post-IE, POA, SLIM-MAUD, Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.4E-4 EF: 10 UCB: LCB: E: N:	6.4E-4 --- 2.4E-3 2.4E-5 0.1 416.6	ATime: --- PTime: --- Experience: U Feedback: 3 Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-88 group 1, task 31 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
ME	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to establish feed & bleed cooling Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.1E-2 EF: 10 UCB: LCB: E: N:	1.9E-1 --- 7.1E-1 7.1E-3 0.1 1.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #18 Origin: Analytic Reference: --- PlantCode: SPS1
ME	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to cross connect unit 2 CST Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.4E-2 EF: 10 UCB: LCB: E: N:	1.7E-1 --- 6.4E-1 6.4E-3 0.1 1.5	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #2 Origin: Analytic Reference: --- PlantCode: SPS1

B-109

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ftl	Task Description	Data Values		PSTs	Document Information
			Raw	NUCLAB calc		
WE	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to establish feed & bleed cooling Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 10 UCB: --- LCB: 1.1E-3 E: 0.1 N: 9.0	2.9E-2 --- 1.1E-1 1.1E-3 0.1 9.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #18 Origin: Analytic Reference: ----- PlantCode: SPS1
WE	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to reopen valve in ECBS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: --- LCB: 3.0E-4 E: 0.1 N: 33.3	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the Emergency Core Cooling Systems Right conclus/wrong act path select. Capture seq based on respon set motiv= 7,workload=11,commu= 8;local;Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.2E-1 LCB: 3.9E-3 E: N:	6.2E-2 2.9E-2 8 --- 8.5 17.0	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	CRO	OPERATES the Emergency Core Cooling Systems Multiple fault situation, crew solves the more minor fault motiv= 7,workload= 9,commu=11;local;Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.2E-1 LCB: 1.2E-3 E: N:	3.2E-2 1.2E-2 10 --- 0.1 8.3	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
ME	CRO	MONITORS the Emergency Core Cooling Systems Operator fails to check for ECCS termination tion; SGTR, local, post-IE, PCA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 4 UCB: LCB: E: N:	1.4E-2 --- 4.0E-2 2.5E-3 1.5 150.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 42 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
ME	CRO	MONITORS the Emergency Core Cooling Systems Operator fails to reopen valve in ECCS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1
ME	CRO	DIAGNOSES the Emergency Core Cooling Systems Operator fails to check ECCS reinitiation criteria tion; SGTR, local, post-IE, PCA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 5 UCB: LCB: E: N:	1.6E-2 --- 5.0E-2 2.0E-3 1.0 100.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 44 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
ME	CRO	DIAGNOSES the Emergency Core Cooling Systems Misdiagnose given like symptoms. Capture sequence based on stimuli motiv= 8, workload=11, comm= 8; local; Post-IE; ROP; MRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.8E-1 LCB: 1.3E-2 E: N:	6.7E-2 4.0E-2 4 1.5 31.0	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ---:--- PlantCode: MLP

B-111

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Yard EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	DIAGNOSES the Emergency Core Cooling Systems Symptoms noticed, but incorrect interpretation motiv= 8, workload=10, comman= 7; local; Post-1E; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 3.3E-2 Median: 2.0E-2 EF: --- UCB: 1.0E-1 LCB: 4.2E-3 E: --- N: 48.6	3.3E-2 2.0E-2 5 1.0 48.6	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ---:---:--- PlantCode: ALLP
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to manually start pump C Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.0E-3 Median: 3.8E-4 EF: 10 UCB: 3.8E-3 LCB: 3.8E-5 E: 0.1 N: 263.1	1.0E-3 3.8E-4 --- 3.8E-3 3.8E-5 0.1 263.1	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 5 Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 200 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to start HPI for feed and bleed Error Type: OMISSION Recovery: CONSIDERED	Mean: 4.0E-4 Median: 1.5E-4 EF: 10 UCB: 1.5E-3 LCB: 1.5E-5 E: 0.1 N: 666.6	4.0E-4 1.5E-4 --- 1.5E-3 1.5E-5 0.1 666.6	ATime: 00:45:00 PTime: 00:10:00 Experience: 1 Feedback: U Procedure: 1 Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 204 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to restore HPI (given AC restored) Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.0E-2 Median: 4.0E-3 EF: 10 UCB: 4.0E-2 LCB: 4.0E-4 E: 0.1 N: 25.0	1.0E-2 4.0E-3 --- 4.0E-2 4.0E-4 0.1 25.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 206 Origin: Analytic Reference: 4-87 PlantCode: SPS1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to restore HPI (given AC restored) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.0E-3 EF: 10 UCB: LCB: E: N:	2.4E-2 --- 9.0E-2 9.0E-4 0.1 11.1	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 206 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to open alternate injection path for HPI Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-4 EF: 10 UCB: LCB: E: N:	1.1E-3 --- 4.0E-3 4.0E-5 0.1 250.0	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 242 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to cross-connect HPI from other unit Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 201 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to cross-connect HPI from other unit Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: 01:00:00 PTime: 00:20:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 201 Origin: Analytic Reference: 4-87 PlantCode: SPS1

B-113

NUREG/CR-4639

HEP RAW DATA

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
WE	CRO	OPERATES the High Pressure Safety Injection System Fail to initiate feed and bleed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: 00:45:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: 3 Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 197, #7 Origin: Analytic Reference: 4-87 PlantCode: SMP1
WE	CRO	OPERATES the High Pressure Safety Injection System Fail to switchover MPI to HPR Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.9E-4 EF: 10 UCB: LCB: E: N:	1.3E-3 --- 4.9E-3 4.9E-5 0.1 204.0	ATime: 00:15:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: 1 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 197, #1 Origin: Analytic Reference: 4-87 PlantCode: SMP1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to open HPIS valve Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.5E-3 EF: 10 UCB: LCB: E: N:	9.3E-3 --- 3.5E-2 3.5E-4 0.1 20.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator inadvertently closes MPIS valve seq=all; local; ev=pre-ia; 4-loop pwr (plant WSSS=Westinghouse) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-4 EF: 10 UCB: LCB: E: N:	8.0E-4 --- 3.0E-3 3.0E-5 0.1 333.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to restart bleed and feed pump (HPFP) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.2E-3 EF: 10 UCB: LCB: E: N:	1.4E-2 --- 5.2E-2 5.2E-4 0.1 19.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to manually initiate SI Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-3 EF: 10 UCB: LCB: E: N:	1.0E-2 --- 3.8E-2 3.8E-4 0.1 26.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator restarts the bleed and feed pumps improperly Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 5.2E-3 EF: 10 UCB: LCB: E: N:	1.4E-2 --- 5.2E-2 5.2E-4 0.1 19.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator restarts the emergency bleed and feed improperly Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to recover failure of HPI discharge motor op. valves Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.2E-2 EF: 10 UCB: LCB: E: N:	8.5E-2 --- 3.2E-1 3.2E-3 0.1 3.1	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 5-88 table 4.9-4, #16-17 Origin: Analytic Reference: ----- PlantCode: SPS1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to recover failure of HPI discharge motor op. valves Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: LCB: E: N:	7.1E-3 --- 2.7E-2 2.7E-4 0.1 37.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 5-88 table 4.9-4, #14-17 Origin: Analytic Reference: ----- PlantCode: SPS1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to cross connect HPI to unit 2 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-3 EF: 10 UCB: LCB: E: N:	5.2E-3 --- 2.0E-2 2.0E-4 0.1 50.7	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 5-88 table 4.9-4, #24 Origin: Analytic Reference: ----- PlantCode: SPS1
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to cross connect HPI to unit 2 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.1E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.1E-2 4.1E-4 0.1 24.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 5-88 table 4.9-4, #23 Origin: Analytic Reference: ----- PlantCode: SPS1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to cross connect HPI to unit 2 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-2 EF: 10 UCB: LCB: E: N:	9.1E-2 --- 3.4E-1 3.4E-3 0.1 2.9	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #22 Origin: Analytic Reference: ----- PlantCode: SP51
WE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to cross connect HPI to unit 2 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	3.9E-3 --- 1.5E-2 1.5E-4 0.1 65.9	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #20 Origin: Analytic Reference: ----- PlantCode: SP51
WE	CRO	OPERATES the High Pressure Safety Injection System Maint tech fails to restore SIAS circuit breaker to closed position Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-82 PlantCode: YKR1
WE	CRO	OPERATES the Residual Heat Removal/Low Press Safety Inject Syst Operator fails to align RHR to hot-leg recirculation Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-5 EF: 10 UCB: LCB: E: N:	8.0E-5 --- 3.0E-4 3.0E-6 0.1 3333.3	ATime: 16:00:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 207 Origin: Analytic Reference: 4-87 PlantCode: SP51

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the Residual Heat Removal/Low Press Safety Inject Syst Failure to reconfigure LPR to hot leg recirculation prevent long term boron buildup; seq=all; local & remote; evapos; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-5 EF: 10 UCB: LCB: E: N:	4.0E-5 1.5E-4 1.5E-6 0.1 6666.6	ATime: 15:00:00 PTime: ---:--- Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 197, #5 Origin: Analytic Reference: 4-87 PlantCode: SMP1
WE	CRO	OPERATES the Residual Heat Removal/Low Press Safety Inject Syst Operator fails to start recirc (within the LPRS) Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the Residual Heat Removal/Low Press Safety Inject Syst Operator fails to align for hot leg recirculation Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-5 EF: 10 UCB: LCB: E: N:	1.1E-4 4.0E-4 4.0E-6 0.1 2500.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #25 Origin: Analytic Reference: ----- PlantCode: SPS1
WE	CRO	DIAGNOSES the Residual Heat Removal/Low Press Safety Inject Syst Operator fails to realign the LPRS system for injection Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1

APPENDIX B. RAW DATA

Vend EqLv	Job Tct	Task Description	Data Values		PSFs	Document Information
			Est	NUCLARR calc		
ME	CRO	DIAGNOSES the Residual Heat Removal/Low Press Safety Inject Syst Operator fails to check RNR secure criteria tion; SGTR, local, post-IE, PCA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.0E-3 EF: 6 UCB: LCB: E: N:	1.3E-2 --- 4.2E-2 1.2E-3 1.0 142.8	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-85 subtask 31 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
ME	CRO	OPERATES the Feedwater Systems Operator fails to shut FW MOVs and Baileys during LOSP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	1.0E-2 --- 3.0E-2 3.0E-4 0.1 26.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
ME	CRO	OPERATES the Feedwater Systems Operator fails to achieve delay heat removal via main feedwater Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
ME	CRO	OPERATES the Feedwater Systems Operator fails to establish DHR via main FW system Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-5 EF: 10 UCB: LCB: E: N:	1.0E-4 --- 3.0E-4 3.0E-6 0.1 2631.5	ATime: 03:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
ME	CRO	OPERATES the Feedwater Systems Operator fails to achieve OHR by Power Conversion System Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-5 EF: 10 UCB: LCB: E: N:	1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
ME	CRO	OPERATES the Feedwater Systems Operator fails to isolate steam to TDEFW pump tion: SGTR, local, post-1E, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-3 EF: 4 UCB: LCB: E: N:	7.1E-3 --- 2.0E-2 1.3E-3 1.5 300.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 14 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
ME	CRO	OPERATES the Feedwater Systems Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
ME	CRO	MONITORS the Feedwater Systems Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS

APPENDIX B. RAM DATA

Vand EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
WE	CRO	DIAGNOSES the Feedwater System Operator fails to verify feed path SLIM-MAUD calibration task Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-2 EF: 10 UCB: LCB: E: N:	1.3E-1 --- 5.0E-1 5.0E-3 0.1 2.0	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 group 6, task 30 Origin: Subjective Reference: 1-86 PlantCode: CPS
WE	CRO	OPERATES the Auxiliary Feedwater System Operator fails to manually start aux feed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 263.1	ATime: 00:01:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 203 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	OPERATES the Auxiliary Feedwater System Operator fails to cross-connect AFM from other unit Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 00:30:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 242 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	OPERATES the Auxiliary Feedwater System Operator fails to dispatch AI to successfully restore AFM flow SLIM-MAUD Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-2 EF: 10 UCB: LCB: E: N:	4.2E-2 --- 1.6E-1 1.6E-3 0.1 6.3	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 group 3, task 20 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS

B-121

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
ME	CRO	OPERATES the Auxiliary Feedwater System Operator fails to establish AFW flow to 1 SG Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	4.0E-2 --- 1.8E-1 1.8E-3 0.1 5.5	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 19 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
ME	CRO	OPERATES the Auxiliary Feedwater System Operator fails to cross connect AFW, transients Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.3E-2 EF: 10 UCB: LCB: E: N:	8.8E-2 --- 3.3E-1 3.3E-3 0.1 3.0	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #6 Origin: Analytic Reference: ----- PlantCode: SPS1
ME	CRO	OPERATES the Auxiliary Feedwater System Operator fails to cross connect AFW; Station blackout @ units 1 & 2 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-2 EF: 10 UCB: LCB: E: N:	2.0E-1 --- 7.5E-1 7.5E-3 0.1 1.3	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #5 Origin: Analytic Reference: ----- PlantCode: SPS1
ME	CRO	OPERATES the Auxiliary Feedwater System Operator fails to cross connect AFW; Station blackout @ unit 1 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.8E-2 EF: 10 UCB: LCB: E: N:	1.3E-1 --- 4.8E-1 4.8E-3 0.1 2.0	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #4 Origin: Analytic Reference: ----- PlantCode: SPS1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Volume		PSfs	Document Information
			Raw	NUCLARR calc		
ME	CRO	OPERATES the Auxiliary Feedwater System Operator fails to manually actuate AFV Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: LCB: E: M:	7.1E-3 --- 2.7E-2 2.7E-4 0.1 37.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #3 Origin: Analytic Reference: ----- PlantCode: SPS1
ME	CRO	OPERATES the Auxiliary Feedwater System Operator fails to terminate flow from APW TDP steam line during SSTR Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: M:	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #29 Origin: Analytic Reference: ----- PlantCode: SPS1
ME	CRO	OPERATES the Auxiliary Feedwater System CRO fails to complete post loca cooldown & depressur w/in time allow seq = medium loca; post-l.e.; HRA method = ONE/HCR Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E+0 EF: 1 UCB: LCB: E: M:	1.0E+0 --- 1.0E+0 1.0E+0 20.0 20.0	ATime: 00:55:00 PTime: 00:36:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-91 0.3,3.22 Origin: Analytic Reference: 3-90 PlantCode: SPS
ME	CRO	MONITORS the Auxiliary feedwater System Operator fails to verify AFV flow Slim-Maud;look at flow for all 4 SGTs Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.4E-3 EF: 10 UCB: LCB: E: M:	6.4E-3 --- 2.4E-2 2.4E-4 0.1 41.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: 2	Document: 2-88 group 5, task 6 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS

B-123

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
ME	CRO	DIAGNOSES the Auxiliary Feedwater System Operator fails to restore AFWS after test & maintenance Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.1E-2 EF: 10 UCB: LCB: E: 0.1 N:	2.9E-2 --- 1.1E-1 1.1E-3 0.1 9.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: 6MP1
ME	CRO	OPERATES the Main Feedwater System Operator fails to establish MFW flow to 1 SB Slim-Kaud calib. task Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-3 EF: 10 UCB: LCB: E: 0.1 N:	5.3E-3 --- 2.0E-2 2.0E-4 0.1 50.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: 2	Document: 2-88 group 5, task 23 Origin: Subjective Reference: 1-86 PlantCode: CPS
ME	CRO	OPERATES the Main Feedwater System Failure to restore main feed water Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: LCB: E: 0.1 N:	7.1E-3 --- 2.7E-2 2.7E-4 0.1 37.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #26 Origin: Analytic Reference: ---:--- PlantCode: 6PS1
ME	CRO	OPERATES the Main Feedwater System Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: 0.1 N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFa	Document Information
			Raw	NUCLARR calc		
WE	CRO	MONITORS the Main Feedwater System Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---- PTime: ---- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-85 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
WE	CRO	DIAGNOSES the Heating, Ventilation & Air Conditioning Systems Operator fails to align CHES valves Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.0E-4 EF: 10 UCB: LCB: E: N:	1.6E-3 --- 6.0E-3 6.0E-3 0.1 166.6	ATime: ---- PTime: ---- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SMP1
WE	CRO	OPERATES the Instrumentation and Control Systems Operator fails to adjust SG relief setpoint tion; SGTR, local, post-IE, POA, NAPPs simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.0E-3 EF: 5 UCB: LCB: E: N:	9.7E-3 --- 3.0E-2 1.2E-3 1.0 166.6	ATime: ---- PTime: ---- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-85 subtask 3 Origin: Simulation Modeling Reference: 3-85 PlantCode: SBK1
WE	CRO	OPERATES the Instrumentation and Control Systems Operator fails to restore normal charging tion; SGTR, local, post-IE, POA, NAPPs simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.0E-3 EF: 4 UCB: LCB: E: N:	8.6E-3 --- 2.4E-2 1.5E-3 1.5 250.0	ATime: ---- PTime: ---- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-86 subtask 43 Origin: Simulation Modeling Reference: 3-85 PlantCode: SBK1

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			RAW	NUCLEAR calc		
ME	CRO	OPERATES the Instrumentation and Control Systems Operator fails to establish lardown tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.0E-3 EF: 4 UCB: LCB: E: N:	8.6E-3 --- 2.4E-2 1.5E-3 1.5 250.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 47 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
ME	CRO	OPERATES the Instrumentation and Control Systems Operator fails to align CCP to VCT tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-3 EF: 2 UCB: LCB: E: N:	5.5E-3 --- 1.0E-2 2.5E-3 6.0 1200.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 48 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
ME	CRO	OPERATES the Instrumentation and Control Systems Operator fails to control RCS-SG leakage tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 4 UCB: LCB: E: N:	1.4E-2 --- 4.0E-2 2.5E-3 1.5 150.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 49 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
ME	CRO	OPERATES the Instrumentation and Control Systems Operator fails cont. attempts to est. secondary heat sink in 1 SG SLIN-NAUD calibration task Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-2 EF: 10 UCB: LCB: E: N:	1.3E-1 --- 5.0E-1 5.0E-3 0.1 2.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 3, task 36 Origin: Subjective Reference: 1-86 PlantCode: CPS

APPENDIX 9. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc.		
ME	CRO	OPERATES the Instrumentation and Control Systems Operator fails to dispatch AO to successfully perform Rx trip local SLIM-MAUD calibration task Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCS: LCS: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 group 3, task 10 Origin: Subjective Reference: 1-85 PlantCode: CPS
ME	CRO	MONITORS the Instrumentation and Control Systems Operator fails to check PORV closed In PORV step seq;SSTR,local,post-IE,PQA,NAPPS simulation-50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.0E-3 EF: 3 UCS: LCS: E: N:	1.1E-2 --- 2.7E-2 3.0E-3 2.0 222.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-85 subtask 20 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
ME	CRO	MONITORS the Instrumentation and Control Systems Operator fails to check pressure & level of intact SS tion; SSTR, local, post-IE, PQA, NAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.0E-3 EF: 5 UCS: LCS: E: N:	1.1E-2 --- 3.5E-2 1.4E-3 1.0 142.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-85 subtask 26 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
ME	CRO	MONITORS the Instrumentation and Control Systems Operator fails to check RSG press tion; SSTR, local, post-IE, PQA, NAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 4 UCS: LCS: E: N:	1.4E-2 --- 4.0E-2 2.5E-3 1.5 130.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-85 subtask 32 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1

B-127

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tti	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	MONITORS the Instrumentation and Control Systems Operator fails to check VCI makeup tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 4 UCB: LCB: E: N:	1.4E-2 --- 4.0E-2 2.5E-3 1.5 150.0	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 45 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
WE	CRO	MONITORS the Instrumentation and Control Systems Operator fails to check charging status SLIN-MAUD, moderate monitoring Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.1E-4 EF: 10 UCB: LCB: E: N:	8.3E-4 --- 3.1E-3 3.1E-5 0.1 322.5	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-88 group 2, task 22 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
WE	CRO	MONITORS the Instrumentation and Control Systems Operator fails to check RSG press tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 6 UCB: LCB: E: N:	1.8E-2 --- 6.0E-2 1.7E-3 1.0 100.0	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 34 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
WE	CRO	DIAGNOSES the Instrumentation and Control Systems Operator fails to ensure a PORV block open in PORV step seq; SGTR, local, post-IE, POA, MAPPS simulation-50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.0E-3 EF: 5 UCB: LCB: E: N:	9.7E-3 --- 3.0E-2 1.2E-3 1.0 166.6	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 25 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR catc		
WE	CRO	<p>DIAGNOSES the Instrumentation and Control Systems Operator fails to check letdown initiation criteria</p> <p>tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 1.6E-2</p> <p>Median: 1.1E-2</p> <p>EF: 4</p> <p>UCB: 4.4E-2</p> <p>LCB: 2.8E-3</p> <p>E: 1.5</p> <p>N: 136.3</p>	<p>1.6E-2</p> <p>---</p> <p>4.4E-2</p> <p>2.8E-3</p> <p>1.5</p> <p>136.3</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: U</p> <p>Feedback: U</p> <p>Procedure: U</p> <p>Staffing: U</p> <p>Stress: 3</p> <p>Supervision: U</p> <p>Tagging: U</p> <p>Training: U</p>	<p>Document: 1-88</p> <p>subtask 46</p> <p>Origin: Simulation Modeling</p> <p>Reference: 3-85</p> <p>PlantCode: SBK1</p>
WE	CRO	<p>DIAGNOSES the Instrumentation and Control Systems Operator fails to identify ruptured SE</p> <p>tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 1.6E-2</p> <p>Median: 1.0E-2</p> <p>EF: 5</p> <p>UCB: 5.0E-2</p> <p>LCB: 2.0E-3</p> <p>E: 1.0</p> <p>N: 100.0</p>	<p>1.6E-2</p> <p>---</p> <p>5.0E-2</p> <p>2.0E-3</p> <p>1.0</p> <p>100.0</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: U</p> <p>Feedback: U</p> <p>Procedure: U</p> <p>Staffing: U</p> <p>Stress: 3</p> <p>Supervision: U</p> <p>Tagging: U</p> <p>Training: U</p>	<p>Document: 1-88</p> <p>subtask 2</p> <p>Origin: Simulation Modeling</p> <p>Reference: 3-85</p> <p>PlantCode: SBK1</p>
WE	CRO	<p>DIAGNOSES the Instrumentation and Control Systems Operator fails to verify Rx trip</p> <p>Stim-Maud</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 4.5E-3</p> <p>Median: 1.7E-3</p> <p>EF: 10</p> <p>UCB: 1.7E-2</p> <p>LCB: 1.7E-4</p> <p>E: 0.1</p> <p>N: 56.8</p>	<p>4.5E-3</p> <p>---</p> <p>1.7E-2</p> <p>1.7E-4</p> <p>0.1</p> <p>56.8</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: U</p> <p>Feedback: U</p> <p>Procedure: U</p> <p>Staffing: U</p> <p>Stress: 1</p> <p>Supervision: U</p> <p>Tagging: U</p> <p>Training: U</p>	<p>Document: 2-88</p> <p>group 6, task 2</p> <p>Origin: Simulation Modeling</p> <p>Reference: 1-86</p> <p>PlantCode: CPS</p>
WE	CRO	<p>DIAGNOSES the Instrumentation and Control Systems Operator fails to verify Rx subcritical</p> <p>Stim-Maud</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 1.6E-2</p> <p>Median: 5.9E-3</p> <p>EF: 10</p> <p>UCB: 5.9E-2</p> <p>LCB: 5.9E-4</p> <p>E: 0.1</p> <p>N: 16.9</p>	<p>1.6E-2</p> <p>---</p> <p>5.9E-2</p> <p>5.9E-4</p> <p>0.1</p> <p>16.9</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: U</p> <p>Feedback: U</p> <p>Procedure: U</p> <p>Staffing: U</p> <p>Stress: 1</p> <p>Supervision: U</p> <p>Tagging: U</p> <p>Training: U</p>	<p>Document: 2-88</p> <p>group 6, task 16</p> <p>Origin: Simulation Modeling</p> <p>Reference: 1-86</p> <p>PlantCode: CPS</p>

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
WE	CRO	<p>DIAGNOSES the Instrumentation and Control System</p> <p>Operator fails to review Critical Safety Function status tree (CSFS)</p> <p>Sim-Moud calib. task; determine if red path on heat sink exists</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 5.0E-2</p> <p>Median: 10</p> <p>EF: 10</p> <p>UCB: 5.0E-1</p> <p>LCB: 5.0E-3</p> <p>E: 0.1</p> <p>M: 2.0</p>	<p>1.3E-1</p> <p>---</p> <p>5.0E-1</p> <p>5.0E-3</p> <p>0.1</p> <p>2.0</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: U</p> <p>Feedback: U</p> <p>Procedure: U</p> <p>Staffing: U</p> <p>Stress: 1</p> <p>Supervision: U</p> <p>Tagging: U</p> <p>Training: 2</p>	<p>Document: 2-88</p> <p>group 3, task 17</p> <p>Origin: Subjective</p> <p>Reference: 1-86</p> <p>PlantCode: CPS</p>
WE	CRO	<p>OPERATES the Electrohydraulic Control (Turbine Control) System</p> <p>CRO FAILS TO MANUALLY TRIP TURBINE</p> <p>error (domin-THERP); seq = ATWS; post-i.e.; HRA method = THERP/ORE-HRA-</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 1.4E-3</p> <p>Median: 5.4E-4</p> <p>EF: 10</p> <p>UCB: 5.4E-3</p> <p>LCB: 5.4E-5</p> <p>E: 0.1</p> <p>M: 185.1</p>	<p>1.4E-3</p> <p>---</p> <p>5.4E-3</p> <p>5.4E-5</p> <p>0.1</p> <p>185.1</p>	<p>ATime: 00:01:20</p> <p>PTime: 00:00:04</p> <p>Experience: U</p> <p>Feedback: U</p> <p>Procedure: U</p> <p>Staffing: U</p> <p>Stress: U</p> <p>Supervision: U</p> <p>Tagging: U</p> <p>Training: U</p>	<p>Document: 2-91</p> <p>D.3.3.34</p> <p>Origin: Analytic</p> <p>Reference: 1-85</p> <p>PlantCode: SPS</p>
WE	CRO	<p>OPERATES the Engineered Safeguards Actuation and Logic System</p> <p>Operator fails to manually activate CLCS</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 1.5E-3</p> <p>Median: 10</p> <p>EF: 10</p> <p>UCB: 1.5E-2</p> <p>LCB: 1.5E-4</p> <p>E: 0.1</p> <p>M: 66.6</p>	<p>4.0E-3</p> <p>---</p> <p>1.5E-2</p> <p>1.5E-4</p> <p>0.1</p> <p>66.6</p>	<p>ATime: ---:---:---</p> <p>PTime: ---:---:---</p> <p>Experience: U</p> <p>Feedback: U</p> <p>Procedure: U</p> <p>Staffing: U</p> <p>Stress: U</p> <p>Supervision: U</p> <p>Tagging: U</p> <p>Training: U</p>	<p>Document: 2-86</p> <p>ch IV, pg 207</p> <p>Origin: Analytic</p> <p>Reference: 4-87</p> <p>PlantCode: SPS1</p>
WE	CRO	<p>OPERATES the Engineered Safeguards Actuation and Logic System</p> <p>Manually back up auto system (BMTS)</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 9.3E-2</p> <p>Median: 10</p> <p>EF: 10</p> <p>UCB: 9.3E-1</p> <p>LCB: 9.3E-3</p> <p>E: 0.1</p> <p>M: 1.0</p>	<p>2.5E-1</p> <p>---</p> <p>9.3E-1</p> <p>9.3E-3</p> <p>0.1</p> <p>1.0</p>	<p>ATime: 00:05:00</p> <p>PTime: ---:---:---</p> <p>Experience: U</p> <p>Feedback: U</p> <p>Procedure: U</p> <p>Staffing: U</p> <p>Stress: 4</p> <p>Supervision: U</p> <p>Tagging: U</p> <p>Training: U</p>	<p>Document: 2-86</p> <p>ch IV, pg 207</p> <p>Origin: Analytic</p> <p>Reference: 4-87</p> <p>PlantCode: SPS1</p>

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the Engineered Safeguards Actuation and Logic System Operator fails to manually back up auto system (BMTS) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-2 EF: 10 UCB: LCB: E: N:	1.0E-1 --- 3.8E+1 3.8E-3 0.1 2.6	ATime: 00:09:08 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 207 Origin: Analytic Reference: 4-87 PlantCode: SP51
WE	CRO	OPERATES the Engineered Safeguards Actuation and Logic System Oper. fails to manually init. the safety inject. actuat. syst (SIAS) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-1 EF: 10 UCB: LCB: E: N:	4.5E-1 3 1.0E+0 1.4E-1 3.0 8.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : 4 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YK1
WE	CRO	OPERATES the Engineered Safeguards Actuation and Logic System Operator fails to recover SIS actuation failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: LCB: E: N:	7.1E-3 --- 2.7E-2 2.7E-2 0.1 37.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #46-48 Origin: Analytic Reference: ----- PlantCode: SP51
WE	CRO	OPERATES the Engineered Safeguards Actuation and Logic System Operator fails to recover RMT actuation failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.4E-2 EF: 10 UCB: LCB: E: N:	1.7E-1 --- 6.4E-1 6.4E-3 0.1 1.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #43 Origin: Analytic Reference: ----- PlantCode: SP51

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the Engineered Safeguards Actuation and Logic System Operator fails to recover RMT actuation failure Error Type: OMISSION Recovery: CONSIDERED	Mean: --- Median: 6.4E-2 EF: 10 UCB: --- LCB: 6.4E-3 E: 0.1 N: 1.5	1.7E-1 --- 6.4E-1 6.4E-3 0.1 1.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #44 Origin: Analytic Reference: --- PlantCode: SPS1
WE	CRO	OPERATES the Engineered Safeguards Actuation and Logic System Operator fails to recover RMT actuation failure Error Type: OMISSION Recovery: CONSIDERED	Mean: --- Median: 2.7E-3 EF: 10 UCB: --- LCB: 2.7E-4 E: 0.1 N: 37.5	7.1E-3 --- 2.7E-2 2.7E-4 0.1 37.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #45 Origin: Analytic Reference: --- PlantCode: SPS1
WE	CRO	OPERATES the Engineered Safeguards Actuation and Logic System CRO fails to correctly manually initiate safety injection comm error; seq = Small LOCA; Post-i.e.; HRA Method = HCR/DRE & THERP Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.4E-3 Median: 5.4E-4 EF: 10 UCB: --- LCB: 5.4E-5 E: 0.1 N: 105.1	1.4E-3 --- 5.4E-3 5.4E-5 0.1 105.1	ATime: 01:00:00 PTime: 00:00:30 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-91 D.3.3.2 (Ref=3-90) Origin: Analytic Reference: 1-83 PlantCode: SPS
WE	CRO	OPERATES the Engineered Safeguards Actuation and Logic System CRO fails to transfer to cold leg recirculation value @ 5.59E-2; Seq = Small LOCA; Post-i.e.; HRA Method = DRE/HCR Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: 5.8E-2 Median: 3.0E-2 EF: 5 UCB: --- LCB: 7.2E-3 E: 1.0 N: 27.7	5.8E-2 --- 1.0E-1 7.2E-3 1.0 27.7	ATime: 00:06:00 PTime: 00:00:05 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-91 D.3.3.24 Origin: Analytic Reference: 3-90 PlantCode: SPS

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
WE	CRO	OPERATES the Pressurizer Level Control System Operator fails to isolate stuck open PORV Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.7E-2 EF: 10 UCB: LCB: E: N:	9.9E-2 --- 3.7E-1 3.7E-3 0.1 2.7	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 205 Origin: Analytic Reference: 4-87 PlantCode: SP51
WE	CRO	OPERATES the Pressurizer Level Control System Operator fails to isolate stuck open PORV Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.7E-3 EF: 10 UCB: LCB: E: N:	9.9E-3 --- 3.7E-2 3.7E-4 0.1 27.0	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 205 Origin: Analytic Reference: 4-87 PlantCode: SP51
WE	CRO	OPERATES the Pressurizer Pressure Control System Operator fails to open valve to allow emergency boration Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 203 Origin: Analytic Reference: 4-87 PlantCode: SP51
WE	CRO	OPERATES the Pressurizer Pressure Control System Operator fails to open PORV block valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.4E-2 EF: 10 UCB: LCB: E: N:	2.5E-1 --- 9.4E-1 9.4E-3 0.1 1.0	ATime: 00:02:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 203 Origin: Analytic Reference: 4-87 PlantCode: SP51

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSfs	Document Information
			Rm	NUCLARR calc		
ME	CRO	OPERATES the Pressurizer Pressure Control System Operator fails to open PORV for feed and bleed operations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 00:45:00 PTime: 00:10:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 204 Origin: Analytic Reference: 4-87 PlantCode: SPS1
ME	CRO	OPERATES the Pressurizer Pressure Control System Operator fails to control primary pressure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
ME	CRO	OPERATES the Pressurizer Pressure Control System Operator fails to operate primary pressure control Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-2 EF: 10 UCB: LCB: E: N:	1.0E-1 --- 3.8E-1 3.8E-3 0.1 2.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
ME	CRO	MONITORS the Pressurizer Pressure Control System Operator fails to check PZR pres < 2335 tion task Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-3 EF: 10 UCB: LCB: E: N:	5.3E-3 --- 2.0E-2 2.0E-4 0.1 50.8	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 9 Origin: Subjective Reference: 1-86 PlantCode: CPS

APPENDIX B. RAM DATA

Vend Eq/v	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
WE	CRO	OPERATES the Reactor Protection System Operator fails to manually scram RX	Mean: 1.0E-3 Median: 3.0E-4 EF: 10 UCB: 3.0E-3 LCB: 3.0E-5 E: 0.1 N: 263.1	1.0E-3 --- 3.0E-3 3.0E-5 0.1 263.1	ATime: 00:02:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 203 Origin: Analytic Reference: 4-87 PlantCode: SP61
		Error Type: OMISSION Recovery: CONSIDERED				
WE	CRO	OPERATES the Reactor Protection System Failure to manually trip RX	Mean: 1.1E-3 Median: 4.0E-4 EF: 10 UCB: 4.0E-3 LCB: 4.0E-5 E: 0.1 N: 250.0	1.1E-3 --- 4.0E-3 4.0E-5 0.1 250.0	ATime: 00:02:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 197, 98 Origin: Analytic Reference: 4-87 PlantCode: SMP1
		Error Type: OMISSION Recovery: CONSIDERED				
WE	CRO	OPERATES the Reactor Protection System Failure to manually trip RX	Mean: 1.4E-3 Median: 5.4E-4 EF: 10 UCB: 5.4E-3 LCB: 5.4E-5 E: 0.1 N: 185.1	1.4E-3 --- 5.4E-3 5.4E-5 0.1 185.1	ATime: 00:01:20 PTime: 00:00:04 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-91 D.3.3.1 (THERP #4) Origin: Analytic Reference: 1-83 PlantCode: SP6
		THERP (is dominant); Seq = ATWS; Post-i.e.; WRA Method: ORE/NER-THERP Error Type: COMMISSION Recovery: NOT CONSIDERED				
WE	CRO	OPERATES the Steam Generator Water Level Control System Operator fails to isolate SG BD and drains	Mean: 8.0E-3 Median: 4.0E-3 EF: 8 UCB: 3.2E-2 LCB: 5.0E-4 E: 0.5 N: 125.0	8.0E-3 --- 3.2E-2 5.0E-4 0.5 125.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 15 Origin: Simulation Modeling Reference: 3-85 PlantCode: SMC1
		tion: SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
WE	CRO	MONITORS the Steam Generator Water Level Control System Operator fails to check SG relief position tlong: SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.0E-3 EF: 7 UCB: LCB: E: N:	1.4E-2 --- 4.9E-2 1.0E-3 0.5 71.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 7 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
WE	CRO	MONITORS the Steam Generator Water Level Control System Operator fails to check ruptured SG level tlong: SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.0E-3 EF: 7 UCB: LCB: E: N:	1.4E-2 --- 4.9E-2 1.0E-3 0.5 71.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 16 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
WE	CRO	DIAGNOSES the Steam Generator Water Level Control System Operator fails to identify faulty SGs SLIN-NAUD, guard against inc.Rx, moderate label, require, high monitoring Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.9E-4 EF: 10 UCB: LCB: E: N:	2.1E-3 --- 7.9E-3 7.9E-5 0.1 126.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 2, task 15 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
WE	CRO	DIAGNOSES the Steam Generator Water Level Control System Operator fails to verify SG relief shuts to ck. SG relief position, SGTR, local, post-IE, POA, MAPPS 50/50=success Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-5 EF: 10 UCB: LCB: E: N:	2.7E-5 --- 1.0E-4 1.0E-6 0.1 10000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 9 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1

APPENDIX B. RAW DATA

Vend EqLv	Job Tct	Task Description	Data Values		PSFs	Document Information
			Raw	MUCLARR calc		
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to perform RCS cooldown tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-3 EF: 5 UCB: 2.5E-2 LCB: 1.0E-3 E: 1.0 N: 200.0	8.1E-3 --- --- --- 1.0 200.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 33 Origin: Simulation Modeling Reference: 3-85 PlantCode: SBK1
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to depressurize RCS - spray tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.0E-3 EF: 5 UCB: 3.0E-2 LCB: 1.2E-3 E: 1.0 N: 166.6	9.7E-3 --- --- --- 1.0 166.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 36 Origin: Simulation Modeling Reference: 3-85 PlantCode: SBK1
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to depressurize RCS - PORV tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-3 EF: 4 UCB: 2.0E-2 LCB: 1.3E-3 E: 1.5 N: 300.0	7.1E-3 --- --- --- 1.5 300.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 38 Origin: Simulation Modeling Reference: 3-85 PlantCode: SBK1
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to depressurize the RCS post-IE, POA, SLIN-MAUD, calibration task Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-3 EF: 10 UCB: 5.0E-2 LCB: 5.0E-4 E: 0.1 N: 20.0	1.3E-2 --- --- --- 0.1 20.0	ATime: --- PTime: --- Experience: U Feedback: 3 Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 1, task 25 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS

APPENDIX B. RAW DATA

Vend Eqly	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to maintain RCS heat removal SLIM-MAUD, moderate monitoring, calibration task Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 group 2, task 35 Origin: Subjective Reference: 1-86 PlantCode: CPS
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to establish RCS bleed path Slim-Maud Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-2 EF: 10 UCB: LCB: E: N:	4.3E-2 --- 1.6E-1 1.6E-3 0.1 6.2	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: 2	Document: 2-88 group 5, task 34 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to depressurize/cool RCS Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.2E-2 EF: 10 UCB: LCB: E: N:	5.9E-2 --- 2.2E-1 2.2E-3 0.1 4.5	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #38 Origin: Analytic Reference: ----- PlantCode: SPS1
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to depressurize/cool RCS during SGTR Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.9E-2 EF: 10 UCB: LCB: E: N:	7.7E-2 --- 2.9E-1 2.9E-3 0.1 3.4	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #39 Origin: Analytic Reference: ----- PlantCode: SPS1

APPENDIX B. RAW DATA

Vend Eqv	Job Ttl	Task Description	Data Values		PGFs	Document Information
			Raw	NUCLEAR calc		
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to depressurize/cool RCS during 17 D1 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-1 EF: 10 UCB: 1.8E+0 LCB: 1.6E-1 E: 3.0 N: 7.4	4.7E-1 2 1.8E+0 1.6E-1 3.0 7.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #40 Origin: Analytic Reference: ----- PlantCode: SP81
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to depressurize RCS in recovery PH 8GTR Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.4E-2 EF: 10 UCB: 1.4E-1 LCB: 1.4E-3 E: 0.1 N: 7.1	3.7E-2 --- 1.4E-1 1.4E-3 0.1 7.1	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #41 Origin: Analytic Reference: ----- PlantCode: SP81
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to close RCS PORV block valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: 2.7E-2 LCB: 2.7E-4 E: 0.1 N: 37.5	7.1E-3 --- 2.7E-2 2.7E-4 0.1 37.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #33 Origin: Analytic Reference: ----- PlantCode: SP81
WE	CRO	OPERATES the Reactor Coolant Systems Operator fails to depressurize RCS during 880 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.4E-2 EF: 10 UCB: 4.4E-1 LCB: 4.4E-3 E: 0.1 N: 2.2	1.2E-1 --- 4.4E-1 4.4E-3 0.1 2.2	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #31 Origin: Analytic Reference: ----- PlantCode: SP81

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	MONITORS the Reactor Coolant Systems Operator fails to check RCS subcooling tion; SGTR, local, post-IE, POA, NAPPs simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.0E-3 EF: 5 UCB: LCB: E: 1.0 N: 125.0	1.3E-2 --- 4.0E-2 1.0E-3 1.0 125.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 35 Origin: Simulation Modeling Reference: 3-85 PlantCode: SBK1
WE	CRO	MONITORS the Reactor Coolant Systems Operator fails to check RCS pressure tion; SGTR, local, post-IE, POA, NAPPs simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.0E-3 EF: 3 UCB: LCB: E: 2.0 N: 250.0	1.0E-2 --- 2.4E-2 2.7E-3 2.0 250.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 41 Origin: Simulation Modeling Reference: 3-85 PlantCode: SBK1
WE	CRO	MONITORS the Reactor Coolant Systems Operator fails to check RCS temperature for increase in reactivity IE, POA, SLIM-MAUD, moderate labelling requirements, high monitoring Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-4 EF: 10 UCB: LCB: E: 0.1 N: 666.6	4.0E-4 --- 1.5E-3 1.5E-5 0.1 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-88 group 2, task 13 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
WE	CRO	MONITORS the Reactor Coolant Systems Operator fails to check RCS temperature SLIM-MAUD, high monitoring, core exit thermocouple, RCS hotleg decrease Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.3E-4 EF: 10 UCB: LCB: E: 0.1 N: 107.5	2.5E-3 --- 9.3E-3 9.3E-5 0.1 107.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-88 group 2, task 38 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS

APPENDIX B. EAU DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	MONITORS the Reactor Coolant Systems Operator fails to check for adequate secondary heat sink SLEN-MAUD, high monitoring Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.6E-3 EF: 10 UCB: LCB: E: N:	1.2E-2 --- 4.6E-2 4.6E-4 0.1 21.7	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-88 group 2, task 37 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
WE	CRO	DIAGNOSES the Reactor Coolant Systems Operator fails to check RCP trip criteria tion; SSTR, local, post-IE, PGA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.0E-3 EF: 6 UCB: LCB: E: N:	1.6E-2 --- 5.4E-2 1.5E-3 1.0 111.1	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 1 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
WE	CRO	DIAGNOSES the Reactor Coolant Systems Operator fails to check if secondary heat sink required Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.9E-3 EF: 10 UCB: LCB: E: N:	2.1E-2 --- 7.9E-2 7.9E-4 0.1 12.6	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 10 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
WE	CRO	OPERATES the Chemical And Volume Control System Operator fails to perform emergency boration Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.5E-3 EF: 10 UCB: LCB: E: N:	1.2E-2 --- 4.5E-2 4.5E-4 0.1 22.2	ATime: 00:10:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 203 Origin: Analytic Reference: 4-87 PlantCode: SPS1

B-141

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
ME	CRO	OPERATES the Chemical And Volume Control System Failure to initiate emergency boration Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.9E-3 EF: 10 UCB: LCB: E: N:	5.1E-3 --- 1.9E-2 1.9E-4 0.1 52.6	ATime: 00:10:00 PTime: 00:01:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 197, #9 Origin: Analytic Reference: 4-87 PlantCode: SMP1
ME	CRO	OPERATES the Chemical And Volume Control System Operator fails to accomplish rapid boration of RCS valve, verify bor. flow; seq-ATWS, local, post-TE, POA, Slim-Maud Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.7E-3 EF: 10 UCB: LCB: E: N:	1.0E-2 --- 6.7E-2 6.7E-4 0.1 14.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 8 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
ME	CRO	OPERATES the Chemical And Volume Control System Operator fails to correctly emergency borate Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-88 table 4.9-4, #34 Origin: Analytic Reference: ----- PlantCode: SPS1
ME	CRO	DIAGNOSES the Chemical And Volume Control System Operator fails to verify dilution paths are isolated Slim-Maud Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.3E-3 EF: 10 UCB: LCB: E: N:	2.5E-2 --- 9.3E-2 9.3E-4 0.1 10.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 6, task 12 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSfm	Document Information
			RAM	NUCLEAR calc:		
WE	CRO	OPERATES the Spent Fuel Pit Cooling System Failure to transfer spent fuel pit cooling loads to unit 2 CCM train Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.9E-4 EF: 10 UCB: LCB: E: N:	5.1E-4 --- 1.9E-3 1.9E-5 0.1 526.3	ATime: 01:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 197, #6 Origin: Analytic Reference: 4-87 PlantCode: SMP1
WE	CRO	OPERATES the Turbine Systems Operator fails to manually trip turbine Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 263.1	ATime: 00:01:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 203 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	DIAGNOSES the Turbine Systems Operator fails to verify turbine trip Steam-Maud calibration task Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-88 group 6, task 5 Origin: Subjective Reference: 1-86 PlantCode: CPS
WE	CRO	MONITORS the Extraction Steam System Tolerate an out of range situation with potentially minor consequences motive=7, workload=9, comm=7; local; pre-IE ; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.5E-1 LCB: 2.3E-3 E: N:	4.2E-2 1.9E-2 8 0.5 26.9	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ---:---:--- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the Component Cooling Water System Operator fails to realign NPI service water Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-2 EF: 10 UCB: LCB: E: N:	1.0E-1 --- 3.8E-1 3.8E-3 0.1 2.6	ATime: 00:10:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 207 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	OPERATES the Component Cooling Water System Failure to supply CCM to RHR heat exchangers Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.9E-6 EF: 10 UCB: LCB: E: N:	5.0E-6 --- 1.9E-5 1.0E-7 0.1 52631.5	ATime: 01:00:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 197, #4 Origin: Analytic Reference: 4-87 PlantCode: SPS1
WE	CRO	OPERATES the Component Cooling Water System Operator fails to cool RCP seals during station blackout Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.3E-1 EF: 10 UCB: LCB: E: N:	2.8E-1 8 1.0E+0 1.6E-2 0.5 4.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #42 Origin: Analytic Reference: ----- PlantCode: SPS1
WE	CRO	OPERATES the Nuclear Service Water System Operator fails to align CPC SW to Unit 2 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.9E-2 EF: 10 UCB: LCB: E: N:	1.6E-1 --- 5.9E-1 5.9E-3 0.1 1.7	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #11 Origin: Analytic Reference: ----- PlantCode: SPS1

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	OPERATES the Main Steam System Operator isolates SG MOV and Bailey improperly Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 2-B5 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
WE	CRO	OPERATES the Main Steam System Operator inadvertently isolates the SG Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 2-B5 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
WE	CRO	OPERATES the Main Steam System Operator fails to isolate main SL tion; SGTR, local, post-IE, POA, MAPPS simulation - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-3 EF: 3 UCB: LCB: E: N:	5.0E-3 --- 1.2E-2 1.3E-3 2.0 500.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-B8 subtask 4 Origin: Simulation Modeling Reference: 3-85 PlantCode: SBK1
WE	CRO	OPERATES the Main Steam System Operator fails to isolate main SL alt fail to iso. main SL; SGTR, local, post-IE, POA, MAPPS sim. 50/50=success Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-5 EF: 10 UCB: LCB: E: N:	2.7E-5 --- 1.0E-4 1.0E-6 0.1 10000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-B8 subtask 6 Origin: Simulation Modeling Reference: 3-85 PlantCode: SBK1

B-145

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLV	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
WE	CRO	OPERATES the Main Steam System Operator fails to depressurize at least 1 SG to 345 psi calibration task Error type: OMISSION Recovery: CONSIDERED	Mean: 5.0E-2 Median: 5.0E-2 EF: 10 UCB: 5.0E-1 LCB: 5.0E-3 E: 0.1 N: 2.0	1.3E-1 --- 5.0E-1 5.0E-3 0.1 2.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 27 Origin: Subjective Reference: 1-86 PlantCode: CPS
WE	CRO	OPERATES the Main Steam System Operator fails to terminate flow from stuck open SG PORV Error type: OMISSION Recovery: CONSIDERED	Mean: 3.2E-2 Median: 3.2E-2 EF: 10 UCB: 3.2E-1 LCB: 3.2E-3 E: 0.1 N: 3.1	8.5E-2 --- 3.2E-1 3.2E-3 0.1 3.1	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #28 Origin: Analytic Reference: --- PlantCode: SP51
WE	CRO	OPERATES the Main Steam System Failure to depressurize intake steam generators within time available Seq = Medium LOCA; Post-i.e.; MRA Method = ORE/MOR; Perf Time >20 min Error type: OMISSION Recovery: NOT CONSIDERED	Mean: 1.0E+0 Median: 1.0E+0 EF: 1 UCB: 1.0E+0 LCB: 1.0E+0 E: 20.0 N: 20.0	--- 1.0E+0 1.0E+0 20.0 20.0	ATime: 00:30:00 PTime: 00:20:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-91 D.3.3.28 Origin: Analytic Reference: 3-90 PlantCode: SP5
WE	CRO	OPERATES the Main Steam System Operator fails to check main steam isolation & bypass valves closed Operator Act, MRA Method = Slim Maud. Error type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 4.3E-3 EF: 10 UCB: 4.3E-2 LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS

APPENDIX B. RAW DATA

Yend EqLV	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	CRO	MONITORS the Main Steam System Operator fails to check main steam isolation & bypass valves closed Operator Act, HRA Method = Slim Naud. Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 4.3E-3 EF: 10 UCB: 4.3E-2 LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
WE	EO	MAINTAINS the Condensate Systems Common cause miscalibration of water tank low level sensors local; seq=N/A; evapre ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 6.7E-5 EF: 10 UCB: 6.7E-4 LCB: 6.6E-6 E: 0.1 N: 1503.7	1.8E-4 --- 6.7E-4 6.6E-6 0.1 1503.7	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
WE	EO	MAINTAINS the Containment Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
WE	EO	MAINTAINS the Containment/Reactor Building Penetration System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSfs	Document Information
			Raw	NUCLARR calc		
ME	EO	MAINTAINS the Containment Fan Cooling System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: --- U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	EO	MAINTAINS the Containment Isolation System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: --- U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	EO	MAINTAINS the Containment Spray System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: --- U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	EO	OPERATES the OC Power System Subject selects wrong circuit breaker from dense group Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 6.2E-3 Median: 5.0E-3 EF: 3 UCB: 1.5E-2 LCB: 1.7E-3 E: 2.0 N: 400.0	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALUP

APPENDIX B. RAW DATA

Yend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
WE	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: --- Subjective Reference: --- PlantCode: ALLP
WE	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq.:N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: --- Subjective Reference: --- PlantCode: ALLP
WE	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq.:N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: --- Field Data Reference: --- PlantCode: ALLP
WE	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: --- Field Data Reference: --- PlantCode: ALLP

B-149

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
WE	EO	MAINTAINS the DC Power System Subject improperly mates electrical connector Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
WE	EO	INSPECTS the DC Power System Subject improperly mates electrical connector Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.0E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	EO	OPERATES the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend Eqlv	Job Tti	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
WE	EO	OPERATES the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote SeqM/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	6.2E-3	ATime: ---:--:--	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
			Median: 5.0E-3		PTime: ---:--:--	
			EF: 3	---	Experience: U	
			UCB: 1.5E-2		Feedback: U	
WE	EO	OPERATES the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	LCB: 1.7E-3		Procedure: U	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			E: 2.0		Staffing: 1	
			N: 400.0		Stress: 1	
					Supervision: U	
WE	EO	OPERATES the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	1.3E-1	ATime: ---:--:--	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
			Median: 1.0E-1		PTime: ---:--:--	
			EF: 3	---	Experience: U	
			UCB: 3.0E-1		Feedback: U	
WE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	LCB: 3.3E-2		Procedure: U	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			E: 2.0		Staffing: 1	
			N: 133.3		Stress: 1	
					Supervision: U	
WE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.9E-2	ATime: ---:--:--	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
			Median: 1.5E-2		PTime: ---:--:--	
			EF: 3	---	Experience: U	
			UCB: 4.5E-2		Feedback: U	
WE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	LCB: 5.0E-3		Procedure: U	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			E: 2.0		Staffing: 1	
			N: 133.3		Stress: 1	
					Supervision: U	
WE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.3E-1	ATime: ---:--:--	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			Median: 1.0E-1		PTime: ---:--:--	
			EF: 3	---	Experience: U	
			UCB: 3.0E-1		Feedback: U	
WE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	LCB: 3.3E-2		Procedure: U	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			E: 2.0		Staffing: 1	
			N: 133.3		Stress: 1	
					Supervision: U	
WE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.3E-1	ATime: ---:--:--	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			Median: 1.0E-1		PTime: ---:--:--	
			EF: 3	---	Experience: U	
			UCB: 3.0E-1		Feedback: U	
WE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	LCB: 3.3E-2		Procedure: U	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			E: 2.0		Staffing: 1	
			N: 133.3		Stress: 1	
					Supervision: U	
WE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.3E-1	ATime: ---:--:--	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			Median: 1.0E-1		PTime: ---:--:--	
			EF: 3	---	Experience: U	
			UCB: 3.0E-1		Feedback: U	
WE	EO	MAINTAINS the Plant AC Distribution System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	LCB: 3.3E-2		Procedure: U	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			E: 2.0		Staffing: 1	
			N: 133.3		Stress: 1	
					Supervision: U	

B-151

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	WUCLARR calc		
WE	EO	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq=M/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	EO	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq=M/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	EO	MAINTAINS the Plant AC Distribution System Subject improperly mates electrical connector Action:remote; Seq:M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	EO	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action:remote; Seq:M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	EO	INSPECTS the Plant AC Distribution System Subject improperly mates electrical connector Action: remote; Seq.: N/A; Pre-1.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 3.0E-3 Median: 3.0E-3 EF: 3 UCB: 9.0E-3 LCB: 1.0E-3 E: 2.0 N: 666.6	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	EO	OPERATES the Emergency Core Cooling Systems Excessive task duration results in poor judgement motive=9, workload=11, comm=7; remote; Post-1E; ROP; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 4.4E-2 Median: 3.8E-2 EF: 2 UCB: 9.0E-2 LCB: 1.6E-2 E: 4.0 N: 105.4	4.4E-2 3.8E-2 2 9.0E-2 1.6E-2 4.0 105.4	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	EO	OPERATES the Emergency Core Cooling Systems Excessive task demands result in poor judgement motive=7, workload=13, comm=9; remote; Post-1E; ROP; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.2E-1 Median: 9.2E-2 EF: 3 UCB: 2.9E-1 LCB: 2.9E-2 E: 2.0 N: 21.8	1.2E-1 9.2E-2 3 2.9E-1 2.9E-2 2.0 21.8	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	EO	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of water tank low level sensors local; seq=N/A; evmp=ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P88

B-153

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	EO	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P88
WE	EO	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P88
WE	EO	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of water tank low level sensors daily check, local, sequence = n/a, Pre-I.E., NRA Method = ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P88
WE	EO	MAINTAINS the Residual Heat Removal/Low Press Safety Inject Syst Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P88

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLART calc		
ME	EO	MAINTAINS the Residual Heat Removal/Low Press Safety Inject Syst Common cause miscalibration of water tank low level sensors daily check, local, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	EO	MAINTAINS the Feedwater Systems Common cause miscalibration of water tank low level sensors local; seq#4/A; everpre ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	EO	MAINTAINS the Auxiliary Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	EO	MAINTAINS the Main Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

B-155

NUREG/CR-4639

HRR RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	EO	OPERATES the Reactor Coolant Systems Violate procedure and devise own formula motiv= 9, workload= 8, comm= 5; remote; Post-IE; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 4.7E-2 LCB: 1.6E-3 E: N:	1.9E-2 8.7E-3 5 1.0 115.3	ATime: ---:---: PTime: ---:---: Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress : 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	EO	INSPECTS the Process Sampling Systems Checkers performing QA tolerate a discrepancy motiv= 9, workload=10, comm= 6; remote; Pre-IE; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.2E-1 LCB: 1.2E-3 E: N:	3.2E-2 1.2E-2 10 0.1 8.3	ATime: ---:---: PTime: ---:---: Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress : 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
WE	NT	MAINTAINS the Condensate Systems Common cause miscalibration of water tank low level sensors local; seqm/A; ev=pre ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: LCB: E: N:	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
WE	NT	MAINTAINS the Containment Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vand EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Rev	NUCLARR calc		
ME	MT	MAINTAINS the Containment/Reactor Building Penetration System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	MT	MAINTAINS the Containment Fan Cooling System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	MT	MAINTAINS the Containment Isolation System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	MT	TESTS the Containment Spray System Maintenance tech fails to restore valve after pump test Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: 1.0E-4 E: 0.1 N: 100.0	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: 1 Training: U	Document: 2-86 ch IV, pg 193 Origin: Analytic Reference: 4-87 PlantCode: SP&1

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSPs	Document Information
			Row	NUCLARR Calc		
WE	NT	MAINTAINS the Containment Spray System NT fails to calibrate containment spray activation sensors properly Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	2.7E-3	ATime: ---:--:--	Document: 2-85
			Median: 1.0E-3		PTime: ---:--:--	Brookhaven db file
			EF: 10	---	Experience: U	Origin: Analytic
			UCB: 1.0E-2		Feedback: U	Reference: 1-81
			LCB: 1.0E-4		Procedure: U	PlantCode: SMP1
			E: 0.1		Staffing: U	
			N: 100.0		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
WE	NT	MAINTAINS the Containment Spray System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4	2.7E-4	ATime: ---:--:--	Document: 4-87
			Median: 1.0E-4		PTime: ---:--:--	
			EF: 10	---	Experience: U	Origin: Analytic
			UCB: 1.0E-3		Feedback: U	Reference: -----
			LCB: 1.0E-5		Procedure: U	PlantCode: PBS
			E: 0.1		Staffing: U	
			N: 1000.0		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
WE	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	2.1E-3	ATime: ---:--:--	Document: 1-83
			Median: 1.7E-3		PTime: ---:--:--	pg 20-28, item 11
			EF: 3	---	Experience: U	Origin: Field Data
			UCB: 5.1E-3		Feedback: U	Reference: -----
			LCB: 5.7E-4		Procedure: U	PlantCode: ALLP
			E: 2.0		Staffing: 1	
			N: 1176.4		Stress: 1	
					Supervision: U	
					Tagging: 1	
					Training: U	
WE	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq.: N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	1.9E-2	ATime: ---:--:--	Document: 1-83
			Median: 1.5E-2		PTime: ---:--:--	pg 20-28, item 11
			EF: 3	---	Experience: U	Origin: Field Data
			UCB: 4.5E-2		Feedback: U	Reference: -----
			LCB: 5.0E-3		Procedure: U	PlantCode: ALLP
			E: 2.0		Staffing: 1	
			N: 133.3		Stress: 1	
					Supervision: U	
					Tagging: 3	
					Training: U	

APPENDIX III. RAW DATA

Vend EqLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
ME	NT	TESTS the DC Power System Subject improperly mates electrical connector Action:remote; Seq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
ME	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.8E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
ME	NT	MAINTAINS the DC Power System Subject improperly mates electrical connector Action:remote; Seq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.8E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
ME	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP

B-159

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	MT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq:M/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: 2.0 N: 133.3	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	MT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq.:M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: 2.0 N: 400.0	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	NT	TESTS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action:remote; Seq.:M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: 2.0 N: 1176.4	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	NT	TESTS the Plant AC Distribution System Subject improperly mates electrical connector Action:remote; Seq.:M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: 2.0 N: 666.6	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
ME	NT	TESTS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
ME	NT	TESTS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP
ME	NT	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP
ME	NT	MAINTAINS the Plant AC Distribution System Subject improperly mates electrical connector Action: remote; Seq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: --- PlantCode: ALLP

B-161

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend Eq.v	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	NT	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group remote SeqM/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: 2.0 N: 133.3	1.9E-2 --- 4.5E-2 5.0E-3 133.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 28-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	NT	MAINTAINS the Plant AC Distribution System Subject selects wrong circuit breaker from dense group Action: remote; Seq.: M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: 2.0 N: 406.0	6.2E-3 --- 1.5E-2 1.7E-3 406.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 28-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
WE	NT	MAINTAINS the Emergency Core Cooling Systems Maintenance tech fails to calibrate RMT sensors properly seq=M/A; local; ev=PI; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-4 EF: 10 UCB: LCB: E: 0.1 N: 909.0	2.9E-4 --- 1.1E-3 1.1E-5 909.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: 1 Training: U	Document: 2-86 ch IV, pg 193 Origin: Analytic Reference: 4-87 PlantCode: SP81
WE	NT	MAINTAINS the Emergency Core Cooling Systems Failure to remove refueling cavity drain plug after refueling seq=local's; remote; ev=pre-ie,pos; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-6 EF: 10 UCB: LCB: E: 0.1 N: 29411.7	9.0E-6 --- 3.4E-5 3.0E-7 29411.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 1 Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 196, #1 Origin: Analytic Reference: 4-87 PlantCode: SPM1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	MT	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
WE	MT	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of water tank low level sensors daily check, local, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
WE	MT	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
WE	MT	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of water tank low level sensors daily check, local, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EQLV	Job Tit	Task Description	Data Values		PSFs	Document Information
			RAW	NUCLARR calc		
ME	MT	TESTS the Residual Heat Removal/Low Press Safety Inject Syst MT fails to restore LPI manual valve from test & maintenance Error Type: COMMISSION Recovery: CONSIDERED	Mean: 1.1E-5 Median: 1.1E-5 EF: 10 UCB: 1.1E-4 LCB: 1.1E-6 E: 0.1 N: 9090.9	2.9E-5 --- 1.1E-4 1.1E-6 0.1 9090.9	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 2-87 ck IV, pg 196, #2 Origin: Analytic Reference: 4-87 PlantCode: 6WP1
ME	MT	MAINTAINS the Residual Heat Removal/Low Press Safety Inject Syst Common cause miscalibration of water tank low level sensors daily check, local, sequence = n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	MT	MAINTAINS the Residual Heat Removal/Low Press Safety Inject Syst Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
ME	MT	MAINTAINS the Feedwater Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend Eqb.V	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
WE	NT	MAINTAINS the Feedwater System Common cause miscalibration of water tank low level sensors daily check, locat, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origins: Analytic Reference: ----- PlantCode: PBS
WE	NT	MAINTAINS the Auxiliary Feedwater System Common cause miscalibration of water tank low level sensors daily check, locat, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origins: Analytic Reference: ----- PlantCode: PBS
WE	NT	MAINTAINS the Main Feedwater System Common cause miscalibration of water tank low level sensors daily check, locat, sequence = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origins: Analytic Reference: ----- PlantCode: PBS
WE	NT	MAINTAINS the Engineered Safeguards Actuation and Logic System Maint. tech fails to calibrate SIAS-A pressure detector properly Error Type: COMMISSION Recovery: CONSIDERED	Mean: 1.2E-3 Median: 1.2E-3 EF: 10 UCB: 1.2E-2 LCB: 1.2E-4 E: 0.1 N: 83.3	3.2E-3 --- 1.2E-2 1.2E-4 0.1 83.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 @Brookhaven db file Origins: Analytic Reference: 1-82 PlantCode: YK01

B-165

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
WE	NT	MAINTAINS the Engineered Safeguards Actuation and Logic System Maint. tech fails to calibrate 2 SIAS pressure detectors Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.3E-4	ATime: --:--:--	Document: 2-85
			Median: 4.9E-5	---	PTime: --:--:--	Brookhaven db file
			EF: 10	---	Experience: U	Origin:
			UCB: 4.9E-4	4.9E-4	Feedback: U	Analytic
			LCB: 4.9E-6	4.9E-6	Procedure: U	Reference: 1-82
			E: 0.1	0.1	Staffing: U	PlantCode: YX01
			N: 2048.8	2048.8	Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
WE	NT	TESTS the Component Cooling Water System Fail to restore CCW manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.0E-4	ATime: --:--:--	Document: 2-87
			Median: 3.8E-5	---	PTime: --:--:--	ch IV, pg 196, #5
			EF: 10	---	Experience: U	Origin:
			UCB: 3.8E-4	3.8E-4	Feedback: U	Analytic
			LCB: 3.8E-6	3.8E-6	Procedure: U	Reference: 4-87
			E: 0.1	0.1	Staffing: U	PlantCode: SMP1
			N: 2631.5	2631.5	Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
WE	NT	TESTS the Nuclear Service Water System Fail to restore service water manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean:	8.0E-4	ATime: --:--:--	Document: 2-87
			Median: 3.0E-4	---	PTime: --:--:--	ch IV, pg 196, #6
			EF: 10	---	Experience: U	Origin:
			UCB: 3.0E-3	3.0E-3	Feedback: U	Analytic
			LCB: 3.0E-5	3.0E-5	Procedure: U	Reference: 4-87
			E: 0.1	0.1	Staffing: U	PlantCode: SMP1
			N: 333.3	333.3	Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
WE	NT	TESTS the Nuclear Service Water System Fail to restore service water air operated valve from test & maint Error Type: OMISSION Recovery: CONSIDERED	Mean:	2.9E-5	ATime: --:--:--	Document: 2-87
			Median: 1.1E-5	---	PTime: --:--:--	ch IV, pg 196, #5
			EF: 10	---	Experience: U	Origin:
			UCB: 1.1E-4	1.1E-4	Feedback: U	Analytic
			LCB: 1.1E-6	1.1E-6	Procedure: U	Reference: 4-87
			E: 0.1	0.1	Staffing: U	PlantCode: SMP1
			N: 9090.9	9090.9	Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARK calc		
CE	CRO	OPERATES the Instrument Air System Common mode: poor judge becuz proc/P&IDs/operat convent don't match motiv=6,workload=7,commun=8;local;Pre-IE;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.9E-1 LCB: 2.9E-2 E: N:	1.2E-1 9.2E-2 3 2.0 21.8	ATime: --- PTime: --- Experience: 3 Feedback: 0 Procedure: 6 Staffing: 0 Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
CE	CRO	MONITORS the Instrument Air System Tolerate an out of range situation w/potentially moderate consequenc motiv=8,workload=9,commun=7;remote;Pre-IE;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 3.6E-1 LCB: 1.0E-2 E: N:	1.1E-1 6.0E-2 6 1.0 16.6	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
CE	CRO	DIAGNOSES the Instrument Air System Crews consult inappropriate resources in emergency motiv=7,workload=10,commun=9;local;Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.3E-1 LCB: 1.9E-3 E: N:	3.6E-2 1.6E-2 8 0.5 31.8	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
CE	CRO	MONITORS the Annunciator Systems CRO fails to detect pressurizer low level alarms Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.8E-1 Median: 2.4E-1 EF: 3 UCB: LCB: E: N:	3.0E-1 7.2E-1 7.9E-2 2.0 8.3	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 CI-D (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	CRD	MONITORS the Annunciator Systems CRD fails to detect pressurizer low pressure alarms Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.0E-1 Median: 2.4E-1 EF: 3 UCB: 7.2E-1 LCB: 7.9E-2 E: 2.0 N: 6.3	3.0E-1 --- 7.2E-1 7.9E-2 2.0 6.3	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C1-B (THERP #1a) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRD	MONITORS the Annunciator Systems CRD fails to detect Pressurizer III low-level alarm Seq = FTD (ISLOCA; Seq. 5); NRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C13-B (THERP #2a) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRD	MONITORS the Annunciator Systems CRD fails to detect RAB radiation alarm NRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 5.3E-4 Median: 2.0E-4 EF: 10 UCB: 2.0E-3 LCB: 2.0E-5 E: 0.1 N: 500.0	5.3E-4 --- 2.0E-3 2.0E-5 0.1 500.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C15-B (THERP #2a) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRD	MONITORS the Annunciator Systems CRD fails to detect Safeguards Room Flooded alarm Post -i.e.; NRA Method: THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 5.3E-4 Median: 2.0E-4 EF: 10 UCB: 2.0E-3 LCB: 2.0E-5 E: 0.1 N: 500.0	5.3E-4 --- 2.0E-3 2.0E-5 0.1 500.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C15-A (THERP #2a) Origin: Analytic Reference: 1-83 PlantCode: CE

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	CRO	OPERATES the Communication Systems Inadequate communication results in improper actions motiv= 8, workload= 9, commun=13; local; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.0E-1 LCB: 5.3E-3 E: N:	5.6E-2 2.6E-2 6 0.5 19.4	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	CRO	OPERATES the Condensate Systems Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: 4.3E-4 E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
CE	CRO	MONITORS the Condensate Systems Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: 4.3E-4 E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
CE	CRO	OPERATES the Containment Systems Circumvent proc w/potential catastrophic conseq, e.g. major ISLOCA motiv= 7, workload= 8, commun= 7; local; seq=ISLOCA; Pre -IE; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 7.5E-2 LCB: 6.0E-5 E: N:	2.2E-2 2.1E-3 35 0.1 47.1	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP

B-169

NUREG/CR-4639

HEP RAW Data

APPENDIX B. BAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	CRO	MONITORS the Containment Systems CRO fails to determine that containment pressure is not rising MRA Method = TIERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.5E-2 Median: 1.2E-2 EF: 5 UCB: 3.6E-2 LCB: 4.0E-3 E: 2.0 N: 168.0	1.5E-2 ---	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 CS-C (TIERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	DIAGNOSES the Containment Systems Competing goal states leads to wrong conclusion Motive = 9, workload = 10, commun = 6; local; Post-IE; ROP; MRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: --- Median: --- EF: --- UCB: 1.7E-1 LCB: 8.0E-3 E: --- N: ---	5.0E-2 3.9E-2 4 1.0 25.7	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	CRO	OPERATES the Containment Spray System Circumvent procedure with a minor consequence, e.g., a minor ISLOCA Motive = 7, workload = 9, commun = 8; local; seq=ISLOCA; Post-IE; ROP; MRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: --- Median: --- EF: --- UCB: 8.6E-2 LCB: 3.3E-4 E: --- N: ---	2.2E-2 5.3E-3 16 0.1 18.7	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	CRO	OPERATES the Containment Spray System Circumvent proc w/potential catastrophic conseq, e.g. major ISLOCA Motive = 7, workload = 8, commun = 7; local; seq=ISLOCA; Post-IE; ROP; MRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: --- Median: --- EF: --- UCB: 7.5E-2 LCB: 6.0E-5 E: --- N: ---	2.2E-2 2.1E-3 35 0.1 47.1	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	CR0	OPERATES the Plant AC Power System Operator fails to reconnect stub-bus after LOSP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 01:08:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 207 Origin: Subjective Reference: 1-87 PlantCode: SPS1
CE	CR0	TESTS the Emergency Core Cooling Systems Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SPS1
CE	CR0	OPERATES the Emergency Core Cooling Systems Operator fails to realign ESF valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCM1
CE	CR0	OPERATES the Emergency Core Cooling Systems Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SPS1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
CE	CRO	OPERATES the Emergency Core Cooling Systems Multiple fault situation, crew solves the more minor fault motive=7, workload=9, commune=11; local; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.2E-1 LCB: 1.2E-3 E: N:	3.2E-2 1.2E-2 10 0.1 8.3	ATime: ---:-- PTime: ---:-- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	CRO	OPERATES the Emergency Core Cooling Systems Right conclus/wrong act path select. Capture seq based on respon set motive=7, workload=11, commune=8; local; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.2E-1 LCB: 3.9E-3 E: N:	6.2E-2 2.9E-2 8 0.5 17.0	ATime: ---:-- PTime: ---:-- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	CRO	MONITORS the Emergency Core Cooling Systems Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SWP1
CE	CRO	DIAGNOSES the Emergency Core Cooling Systems Misdiagnose given like symptoms. Capture sequence based on stimuli motive=8, workload=11, commune=8; local; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.8E-1 LCB: 1.3E-2 E: N:	6.7E-2 4.8E-2 4 1.5 31.0	ATime: ---:-- PTime: ---:-- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSTa	Document Information
			Raw	NUCLARR calc		
CE	CRO	DIAGNOSES the Emergency Core Cooling Systems Symptoms noticed, but incorrect interpretation motiv= 8, workload=10, commu= 7; local; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.0E-1 LCB: 4.2E-3 E: N:	3.3E-2 2.0E-2 5 1.0 48.8	Atime: ---:---: PTime: ---:---: Experience: 3 Feedback: 0 Procedure: 5 Staffing: 0 Stress: 4 Supervision: 3 Tagging: 0 Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	CRO	DIAGNOSES the Emergency Core Cooling Systems CRO fails to diagnose correct location of break HRA Method = MCR (knowledge); Error Factor = 2.1 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.6E-1 Median: 3.3E-1 EF: 2 UCB: 6.7E-1 LCB: 1.7E-1 E: 6.0 N: 18.0	3.6E-1 --- 6.7E-1 1.7E-1 6.0 18.0	Atime: ---:---: PTime: ---:---: Experience: 3 Feedback: 0 Procedure: 3 Staffing: 3 Stress: 2 Supervision: 3 Tagging: 4 Training: 2	Document: 2-92 CP-G (THERP) Origin: Analytic Reference: ----- PlantCode: CE
CE	CRO	OPERATES the High Pressure Safety Injection System Operator fails to start RPIS (given small loca) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: 1.0E-1 LCB: 1.0E-3 E: 0.1 N: 10.0	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	Atime: ---:---: PTime: ---:---: Experience: 0 Feedback: 0 Procedure: 0 Staffing: 0 Stress: 0 Supervision: 0 Tagging: 0 Training: 0	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CEM1
CE	CRO	OPERATES the High Pressure Safety Injection System Maint tech fails to restore SIAS circuit breaker to closed position Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N: 133.3	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	Atime: ---:---: PTime: ---:---: Experience: 0 Feedback: 0 Procedure: 0 Staffing: 0 Stress: 0 Supervision: 0 Tagging: 0 Training: 0	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-82 PlantCode: YKRI

APPENDIX 8. RAW DATA

Vend EQLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	CRO	OPERATES the Low Press Safety Injection/Shutdown Cooling System CRO fails to close shutdown cooling loop suction isolation valve(SI) post-i.e.; HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 8.9E-3 EF: 3 UCB: 2.7E-2 LCB: 3.0E-3 E: 2.0 N: 224.0	1.1E-2 --- 2.7E-2 3.0E-3 2.0 224.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: 0 Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: # Training: 2	Documents: 2-92 C17-A (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	OPERATES the Low Press Safety Injection/Shutdown Cooling System CRO fails to remind other operator to close safety injection valve HRA Method: THERP; Error Factor 2.2 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.5E-1 Median: 3.2E-1 EF: 2 UCB: 6.5E-1 LCB: 1.6E-1 E: 6.0 N: 18.4	3.5E-1 --- 6.5E-1 1.6E-1 6.0 18.4	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: 0 Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: # Training: 2	Documents: 2-92 C17-B (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	OPERATES the Low Press Safety Injection/Shutdown Cooling System CRO fails to remind othr op to close SI on init operating SDC train HRA Method: THERP; EF=2.2 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.5E-1 Median: 3.2E-1 EF: 2 UCB: 6.5E-1 LCB: 1.6E-1 E: 6.0 N: 18.4	3.5E-1 --- 6.5E-1 1.6E-1 6.0 18.4	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: 0 Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: # Training: 2	Documents: 2-92 C17-M (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	OPERATES the Low Press Safety Injection/Shutdown Cooling System CRO fails to close SI valve on initially open shutdown cooling train Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 8.9E-3 EF: 3 UCB: 2.7E-2 LCB: 3.0E-3 E: 2.0 N: 224.0	1.1E-2 --- 2.7E-2 3.0E-3 2.0 224.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: 0 Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: # Training: 2	Documents: 2-92 C17-N (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
CE	CRO	OPERATES the Low Press Safety Injection/Shutdown Cooling System CRO fails to verify other op placed correct SOC train in service Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.0E-1 Median: 2.0E-1 EF: 3 UCB: 7.7E-1 LCB: 8.5E-2 E: 2.0 N: 7.0	3.2E-1 --- 7.7E-1 8.5E-2 2.0 7.0	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C17-L (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	OPERATES the Low Press Safety Injection/Shutdown Cooling System CRO places incorrect shutdown cooling train in service HRA Method = THERP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 3.7E-3 Median: 3.0E-3 EF: 3 UCB: 8.9E-3 LCB: 9.9E-4 E: 2.0 N: 672.2	3.7E-3 --- 8.9E-3 9.9E-4 2.0 672.2	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C17-K (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	OPERATES the Low Press Safety Injection/Shutdown Cooling System CRO fails to remind other oper to put standby SOC train in service HRA Method = THERP; Error factor = 2.2 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.5E-1 Median: 3.2E-1 EF: 2 UCB: 6.5E-1 LCB: 1.6E-1 E: 6.0 N: 10.4	3.5E-1 --- 6.5E-1 1.6E-1 6.0 10.4	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C17-J (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	OPERATES the Low Press Safety Injection/Shutdown Cooling System CRO fails to place isolated train in service HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.7E-2 Median: 6.9E-3 EF: 3 UCB: 2.7E-2 LCB: 3.0E-3 E: 2.0 N: 224.0	1.4E-2 --- 2.7E-2 3.0E-3 2.0 224.0	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C7-I (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE

APPENDIX B. RAW DATA

Vand EqLv	Job Tct	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
CE	CRO	OPERATES the Feedwater Systems Operator fails to increase SG flow Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCR1
CE	CRO	OPERATES the Feedwater Systems Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-85 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
CE	CRO	MONITORS the Feedwater Systems Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-85 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
CE	CRO	OPERATES the Main Feedwater System Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-85 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARM calc		
CE	CRO	MONITORS the Main Feedwater System Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: 4.3E-2 LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E+2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedures: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-85 PlantCode: CPS
CE	CRO	OPERATES the Auxiliary/Emergency Feedwater System Operator fails to operate cross feed from AFM unit 2 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 10 UCB: 1.0E+0 LCB: 1.0E-2 E: 0.1 N: 1.0	2.7E-1 --- 1.0E+0 1.0E-2 0.1 1.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCN1
CE	CRO	OPERATES the Auxiliary/Emergency Feedwater System Operator fails to lock out the AFM pump Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-2 EF: 10 UCB: 4.0E-1 LCB: 4.0E-3 E: 0.1 N: 2.5	1.1E-1 --- 4.0E-1 4.0E-3 0.1 2.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCN1
CE	CRO	OPERATES the Auxiliary/Emergency Feedwater System Operator fails to increase SG flow Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: 1.0E-1 LCB: 1.0E-3 E: 0.1 N: 10.0	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCN1

B-177

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	CRO	MONITORS the Pressurizer Level Control System CRO fails to detect dropping pressurizer level Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.5E-2 Median: 1.2E-2 EF: 3 UCB: 3.6E-2 LCB: 4.0E-3 E: 2.0 N: 168.0	1.5E-2 --- 3.6E-2 4.0E-3 2.0 168.0	ATime: --- PTime: --- Experience: 3 Feedback: 0 Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C1-C (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	MONITORS the Pressurizer Level Control System CRO fails to detect pressurizer low-low level alarm Post-Fat.; HRA Method = THERP; Error Factor = 2.5 Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.8E-1 Median: 2.4E-1 EF: 3 UCB: 7.2E-1 LCB: 8.0E-2 E: 2.0 N: 8.3	5.0E-1 --- 7.2E-1 8.0E-2 2.0 8.3	ATime: --- PTime: --- Experience: 3 Feedback: 0 Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C15-C (THERP #2b) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	MONITORS the Pressurizer Pressure Control System CRO fails to detect decreasing pressurizer pressure and level HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.7E-3 Median: 3.0E-3 EF: 3 UCB: 8.9E-3 LCB: 9.9E-4 E: 2.0 N: 672.2	3.7E-3 --- 8.9E-3 9.9E-4 2.0 672.2	ATime: --- PTime: --- Experience: 3 Feedback: 0 Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C13-A (THERP #4) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	MONITORS the Pressurizer Pressure Control System CRO fails to detect dropping pressurizer pressure Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.5E-2 Median: 1.2E-2 EF: 3 UCB: 3.6E-2 LCB: 4.0E-3 E: 2.0 N: 168.0	1.5E-2 --- 3.6E-2 4.0E-3 2.0 168.0	ATime: --- PTime: --- Experience: 3 Feedback: 0 Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C1-A (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE

APPENDIX B. RAW DATA

Vend Eq/LV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Ran	NUCLEAR calc		
CE	CRO	MONITORS the Steam Generator Water Level Control System CRO fails to determine SG pressure not abnormally low or dropping HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.5E-2 Median: 1.2E-2 EF: 3 UCB: 3.6E-2 LCB: 4.0E-3 E: 2.0 N: 168.0	1.5E-2 ---	ATime: ---:-- PTime: ---:-- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 CS-A (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	MONITORS the Liquid Radwaste System CRO fails to detect increasing waste tank level HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 7.5E-3 Median: 6.0E-3 EF: 3 UCB: 1.0E-2 LCB: 2.0E-3 E: 2.0 N: 336.0	7.4E-3 ---	ATime: ---:-- PTime: ---:-- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 CIS-C (THERP #4) Origin: Analytic Reference: 1-83 PlantCode: CE
CE	CRO	OPERATES the Chemical And Volume Control System Operator fails to start boration Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-2 EF: 10 UCB: LCB: E: N:	1.3E-1 ---	ATime: 00:20:00 PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCH1
CE	CRO	MONITORS the Extraction Steam System Tolerate an out of range situation with potentially minor consequenc motive 7, workload 9, commu 7; local; Pre -JE; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.5E-4 LCB: 2.3E-3 E: N:	4.2E-2 1.9E-2 8 0.5 26.9	ATime: ---:-- PTime: ---:-- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALIP

B-179

NUREG/CR-4639

HIP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	BUCLARR calc		
CE	DRO	OPERATES the Water System Operator fails to open the service water system valve Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.0E-1 Median: 1.0E-1 EF: 10 UCB: 1.0E+0 LCB: 1.0E-2 E: 0.1 N: 1.0	2.7E-1 --- 1.0E+0 1.0E-2 0.1 1.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 2-85 Brookhaven db file Origin: Analytic Reference: 4-86 PlantCode: CCN1
CE	DRO	OPERATES the Main Steam System Operator fails to check main steam isolation & bypass valves closed Operator Action, HRA Method = Slim Maud. Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 4.3E-3 EF: 10 UCB: 4.3E-2 LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Documents: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
CE	DRO	MONITORS the Main Steam System Operator fails to check main steam isolation & bypass valves closed Operator Act, HRA Method = Slim Maud. Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 4.3E-3 EF: 10 UCB: 4.3E-2 LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Documents: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
CE	EO	MAINTAINS the Condensate Systems Common cause miscalibration of water tank low level sensors LOCAL; SeqM/A; EvPre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	EO	MAINTAINS the Condensate Storage System Common cause miscalibration of water tank low level sensors daily check, local, sequence = n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PSS
CE	EO	MAINTAINS the Containment Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PSS
CE	EO	MAINTAINS the Containment Isolation System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PSS
CE	EO	MAINTAINS the Containment Spray System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PSS

B-181

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vand EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
CE	EO	MAINTAINS the Containment Cooling System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.; N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: 1.5E-2 LCB: 1.7E-3 E: 2.0 N: 400.0	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
CE	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: 5.1E-3 LCB: 5.7E-4 E: 2.0 N: 1176.4	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
CE	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.; N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: 4.5E-2 LCB: 5.0E-3 E: 2.0 N: 133.3	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	BUCLAR calc		
CE	EO	MAINTAINS the DC Power System Subject improperly mates electrical connector Action:remote; Seq:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.0E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
CE	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
CE	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
CE	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP

B-183

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	MUCLARA calc		
CE	EO	INSPECTS the DC Power System Subject improperly mates electrical connector Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: --- PlantCode: ALLP
CE	EO	OPERATES the Plant AC Power System Aux operator fails to align diesel generator Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCM1
CE	EO	OPERATES the Plant AC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
CE	EO	OPERATES the Plant AC Power System Subject selects wrong circuit breaker from dense group remote Seq: N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	MUCLARR calc		
CE	EO	OPERATES the Plant AC Power System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: WEE3
CE	EO	OPERATES the Plant AC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
CE	EO	MAINTAINS the Plant AC Power System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: WEE3
CE	EO	MAINTAINS the Plant AC Power System Subject improperly mates electrical connector Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP

B-185

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	EO	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
CE	EO	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group Remote Seq:N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
CE	EO	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action:remote; Seq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
CE	EO	INSPECTS the Plant AC Power System Subject improperly mates electrical connector Action:remote; Seq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.0E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
CE	EO	OPERATES the Emergency Core Cooling Systems Excessive task demands result in poor judgement motiv= 7, workload=13, commun= 9; remote; Post-1E; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.2E-1 Median: 9.2E-2 EF: --- LCB: 2.9E-1 LCB: 2.9E-2 E: N:	1.2E-1 9.2E-2 3 2.0 21.8	Atime: ---:-- PTime: ---:-- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	EO	OPERATES the Emergency Core Cooling Systems Excessive task duration results in poor judgement motiv= 9, workload=11, commun= 7; remote; Post-1E; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 4.4E-2 Median: 3.8E-2 EF: --- LCB: 9.0E-2 LCB: 1.6E-2 E: N:	4.4E-2 3.8E-2 2 4.0 105.4	Atime: ---:-- PTime: ---:-- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	EO	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of water tank low level sensors Local; Seq=N/A; Ev=Pre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 LCB: 2.5E-4 LCB: 2.5E-6 E: N:	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	Atime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	EO	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of water tank low level sensors daily check, local, seq. = n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 LCB: 2.5E-4 LCB: 2.5E-6 E: N:	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	Atime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	EO	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS
CE	EO	MAINTAINS the Low Press Safety Injection/Shutdown Cooling System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS
CE	EO	MAINTAINS the Feedwater Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS
CE	EO	MAINTAINS the Feedwater Systems Common cause miscalibration of water tank low level sensors daily check, Local, sequ'n/s, Pre-I.E., HRA Method = ASEP, Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	EO	MAINTAINS the Main Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, seq'n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P86
CE	EO	MAINTAINS the Auxiliary/Emergency Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, seq'n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P86
CE	EO	OPERATES the Reactor Coolant Systems Violate procedure and devise own formula motive=9, workload=8, commute=5; remote; Pre-IE; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: --- Median: --- EF: --- UCB: 4.7E-2 LCB: 1.6E-3 E: --- N: ---	1.5E-2 8.7E-3 5 --- 1.0 115.3	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	EO	MAINTAINS the Main Steam System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P86

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
CE	EO	INSPECTS the Process Sampling System Checkers performing QA tolerate a discrepancy motive 9, workload=10, comsur=6; remote; Pre-IE; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 3.2E-2 Median: 1.2E-2 EF: --- UCB: 1.2E-1 LCB: 1.2E-3 E: 0.1 N: 8.3	3.2E-2 1.2E-2 10 0.1 8.3	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
CE	MT	MAINTAINS the Condensate Systems Common cause miscalibration of water tank low level sensors Local; Seq=M/A; Ev=Pre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 2.5E-5 10 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	MT	MAINTAINS the Condensate Storage System Common cause miscalibration of water tank low level sensors daily check, local, seq=n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 2.5E-5 10 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	MT	MAINTAINS the Containment Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1800.0	2.7E-4 1.0E-4 10 1.0E-3 1.0E-5 0.1 1800.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	MT	MAINTAINS the Containment Isolation System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	MT	MAINTAINS the Containment Spray System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	MT	MAINTAINS the Containment Cooling System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	MT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-1.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: 4.5E-2 LCB: 5.0E-3 E: 2.0 N: 133.3	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-20, item f1 Origin: Field Data Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq-M/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
CE	NT	TESTS the DC Power System Subject improperly mates electrical connector Action:remote; Sq.:M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
CE	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
CE	NT	MAINTAINS the DC Power System Subject improperly mates electrical connector Action:remote; Sq.:M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP

APPENDIX 5. RAM DATA

Yard EqLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			RAM	NUCLARR calc		
CE	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group remote SeqM/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item t1 Origin: Field Data Reference: --- PlantCode: ALLP
CE	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item t1 Origin: Field Data Reference: --- PlantCode: ALLP
CE	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item t1 Origin: Field Data Reference: --- PlantCode: ALLP
CE	NT	TESTS the Plant AC Power System Maintenance tech fails to restore diesel generator after test Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-4 EF: 10 UCB: LCB: E: N:	1.3E-3 --- 5.0E-3 5.0E-5 0.1 200.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCM1

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLAR calc		
CE	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Tharp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP
CE	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Tharp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP
CE	NT	TESTS the Plant AC Power System Subject improperly mates electrical connector Action: remote; Sq.: N/A; Pre-I.E.; Tharp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: --- PlantCode: ALLP
CE	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Tharp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Rmr	NUCLARR calc		
CE	NT	MAINTAINS the Plant AC Power System Maintenance tech fails to restore AC (via generators) after testing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-3 EF: 10 UCB: LCB: E: N:	1.5E-2 --- 5.0E-2 5.0E-4 0.1 20.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CON1
CE	NT	MAINTAINS the Plant AC Power System Subject improperly mates electrical connector Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
CE	NT	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
CE	NT	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend Eqly	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	MT	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 5.0E-3 Median: 5.0E-3 EF: 5 UCB: 1.5E-2 LCB: 1.7E-3 E: 2.0 N: 400.0	6.2E-5 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, Item 11 Origin: Field Data Reference: --- PlantCode: ALLP
CE	MT	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of water tank low level sensors Local; Seq=N/A; Ev=Pre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS
CE	MT	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS
CE	MT	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of water tank low level sensors daily check, local, seq=n/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PBFs	Document Information
			Raw	NUCLARR calc		
CE	NT	MAINTAINS the Low Press Safety Injection/Shutdown Cooling System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	NT	MAINTAINS the Feedwater Systems Common cause miscalibration of water tank low level sensors Local; Seqm/A; EvnPre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	NT	MAINTAINS the Main Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, seqm/a, Pre-1.E., HRA Method = ASEP, Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
CE	NT	TESTS the Auxiliary/Emergency Feedwater System Maintenance tech fails to restore APW after testing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-4 EF: 10 UCB: LCB: E: 0.1 N: 500.0	5.3E-4 --- 2.0E-3 2.0E-5 0.1 500.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCN1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
CE	NT	MAINTAINS the Auxiliary/Emergency Feedwater System Maintenance tech fails to test/restore APW pump after testing Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.0E-2 Median: 1.0E-2 EF: 10 UCB: 1.0E-1 LCB: 1.0E-3 E: 0.1 N: 10.0	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCN1
CE	NT	MAINTAINS the Auxiliary/Emergency Feedwater System Maintenance tech fails to maintain APW Error Type: OMISSION Recovery: CONSIDERED	Mean: 4.0E-2 Median: 4.0E-2 EF: 10 UCB: 4.0E-1 LCB: 4.0E-3 E: 0.1 N: 2.5	1.1E-1 --- 4.0E-1 4.0E-3 0.1 2.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCN1
CE	NT	MAINTAINS the Auxiliary/Emergency Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, seq-r/s, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P88
CE	NT	MAINTAINS the Main Steam System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P88

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	CRO	OPERATES the Air Systems Operator fails to restore power to load shed IA compressors	Mean: Median: 1.2E-2 EF: 10	3.2E-2	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 18 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Ample amount of time	UCB: LCB: E: N:	1.2E-1 1.2E-3 0.1 8.3		
		Error Type: OMISSION				
		Recovery: CONSIDERED				
BW	CRO	OPERATES the Air Systems Operator fails to restore power to load shed IA compressors	Mean: Median: 3.1E-2 EF: 10	8.3E-2	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 18 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Ample amount of time	UCB: LCB: E: N:	3.1E-1 3.1E-3 0.1 3.2		
		Error Type: OMISSION				
		Recovery: CONSIDERED				
BW	CRO	OPERATES the Air Systems Operator fails to restore power to load shed IA compressors	Mean: Median: 1.8E-3 EF: 10	4.8E-3	ATime: 12:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 18 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Ample amount of time	UCB: LCB: E: N:	1.8E-2 1.8E-4 0.1 55.5		
		Error Type: OMISSION				
		Recovery: CONSIDERED				
BW	CRO	OPERATES the Air Systems Operator fails to restore power to load shed IA compressors	Mean: Median: 8.1E-3 EF: 10	2.2E-2	ATime: 12:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 18 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Ample amount of time	UCB: LCB: E: N:	8.1E-2 8.1E-4 0.1 12.3		
		Error Type: OMISSION				
		Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARM calc		
BW	CRO	OPERATES the Instrument Air System Operator fails to recover Instrument air	Mean: Median: 3.0E-1 EF: 3 UCB: LCB: E: N:	3.0E-1 --- 9.0E-1 1.0E-1 2.0 6.6	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 5 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: COMMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the Instrument Air System Common mode: poor judge becuZ proc/P&IDs/operat convent don't match motive 6,workload 7,commu 8;local;Pre -IE;HRA=INTENT	Mean: Median: EF: --- UCB: 2.9E-1 LCB: 2.9E-2 E: N:	1.2E-1 9.2E-2 3 2.0 21.8	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 6 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
		Error Type: COMMISSION Recovery: NOT CONSIDERED				
BW	CRO	OPERATES the Instrument Air System Operator fails to recover Instrument air	Mean: Median: 4.0E-2 EF: 10 UCB: LCB: E: N:	1.1E-1 --- 4.0E-1 4.0E-3 9.1 2.5	ATime: 06:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 5 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: COMMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the Instrument Air System Operator fails to recover instrument air	Mean: Median: 2.4E-3 EF: 10 UCB: LCB: E: N:	6.4E-3 --- 2.4E-2 2.4E-4 0.1 41.6	ATime: 12:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 5 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: COMMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PGFs	Document Information
			Raw	NUCLEAR calc		
BW	CRO	MONITORS the Instrument Air System Tolerate an out of range situation w/potentially moderate consequent motiv= 8,workload= 9,commun= 7;remote;Pre -1E;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 3.6E-1 LCB: 1.0E-2 E: N:	1.1E-1 6.0E-2 6 1.0 16.6	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: 0 Procedure: 5 Staffing: 0 Stress: 3 Supervision: 3 Tagging: 0 Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
			Mean: Median: EF: --- UCB: 1.3E-1 LCB: 1.9E-3 E: N:	3.6E-2 1.6E-2 8 0.5 31.8	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: 0 Procedure: 5 Staffing: 0 Stress: 4 Supervision: 3 Tagging: 0 Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
BW	CRO	DIAGNOSES the Instrument Air System Crews consult inappropriate resources in emergency motiv= 7,workload=10,commun= 9;local;Post-1E;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.0E-1 LCB: 3.3E-3 E: N:	5.6E-2 2.6E-2 8 0.5 19.4	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: 0 Procedure: 5 Staffing: 0 Stress: 3 Supervision: 3 Tagging: 0 Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
			Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:--- PTime: ---:--- Experience: 0 Feedback: 0 Procedure: 2 Staffing: 0 Stress: 3 Supervision: 0 Tagging: 0 Training: 0	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS

B-201

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	CRO	MONITORS the Condensate Systems Operator fails to check main steam isolation & bypass valves closed	Mean: Median: 4.3E-3 EF: 10 UCB: 4.3E-2 LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
		Error Type: OMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the Containment Systems Circumvent proc w/potential catastrophic conseq, e.g. major ISLOCA Motiv = 7, workload= 8, commu= 7; local; seq=ISLOCA; pre-IE, HRA= INTENT	Mean: Median: EF: --- UCB: 7.5E-2 LCB: 6.0E-5 E: N:	2.2E-2 2.1E-3 35 7.5E-2 6.0E-5 0.1 47.1	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
		Error Type: COMMISSION Recovery: NOT CONSIDERED				
BW	CRO	DIAGNOSES the Containment Systems Competing goal states leads to wrong conclusion motive 9, workload=10, commu= 6; local; Post-IE, ROP; HRA= INTENT	Mean: Median: EF: --- UCB: 1.7E-1 LCB: 8.9E-3 E: N:	5.8E-2 3.9E-2 4 1.7E-1 8.9E-3 1.0 25.7	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
		Error Type: COMMISSION Recovery: NOT CONSIDERED				
BW	CRO	OPERATES the Reactor Building Spray System Operator fails to terminate RB spray	Mean: Median: 5.0E-1 EF: 1 UCB: 5.0E-1 LCB: 5.0E-1 E: 20.0 N: 40.0	5.0E-1 --- 5.0E-1 5.0E-1 20.0 40.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 1 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			RAW	NUCLARR calc		
BU	CRO	<p>DIAGNOSES the Control Rod Drive Systems Correct actions taken during the wrong plant evaluation</p> <p>motive 8, workload=10, comm= 9; local; Post-IE; rop; HRA=INTENT</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 9.9E-3 Median: 5.7E-3 EF: --- UCB: 3.2E-2 LCB: 1.0E-3 E: 1.0 N: 176.7</p>	<p>9.9E-3 5.7E-3 6 3.2E-2 1.0E-3 1.0 176.7</p>	<p>ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4</p>	<p>Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP</p>
BU	CRO	<p>OPERATES the Plant AC Power System Operator fails to reconnect stub-bus after LOSP</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 4.0E-3 Median: 1.5E-3 EF: 10 UCB: 1.5E-2 LCB: 1.5E-4 E: 0.1 N: 66.6</p>	<p>4.0E-3 1.5E-3 --- 1.5E-2 1.5E-4 0.1 66.6</p>	<p>ATime: 01:00:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 2-86 ch IV, pg 207 Origin: Subjective Reference: 4-87 PlantCode: SP91</p>
BU	CRO	<p>TESTS the Emergency Core Cooling Systems Operator fails to reopen valve in ECRS or CSRS system</p> <p>Error Type: OMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 8.0E-3 Median: 3.0E-3 EF: 10 UCB: 3.0E-2 LCB: 3.0E-4 E: 0.1 N: 33.3</p>	<p>8.0E-3 3.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3</p>	<p>ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1</p>
BU	CRO	<p>OPERATES the Emergency Core Cooling Systems Operator fails to refill BMST after SGTR</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: 5.0E-1 Median: 5.0E-1 EF: 1 UCB: 5.0E-1 LCB: 5.0E-1 E: 20.0 N: 40.0</p>	<p>5.0E-1 5.0E-1 --- 5.0E-1 5.0E-1 20.0 40.0</p>	<p>ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U</p>	<p>Document: 3-84 pg 6-34, item 14 Origin: Analytic Reference: 1-83 PlantCode: MBE3</p>

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
SW	CRO	OPERATES the Emergency Core Cooling Systems Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1
SW	CRO	OPERATES the Emergency Core Cooling Systems Right conclus/wrong act path select. Capture seq based on reason set motive=7,workload=11,commu=5;local;Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.2E-1 LCB: 3.9E-3 E: N:	6.2E-2 2.9E-2 5 0.5 17.0	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
SW	CRO	OPERATES the Emergency Core Cooling Systems Multiple fault situation, crew solves the more minor fault motive=7,workload=9,commu=11;local;Post-IE;ROP;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 1.2E-1 LCB: 1.2E-3 E: N:	3.2E-2 1.2E-2 10 0.1 8.3	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
SW	CRO	MONITORS the Emergency Core Cooling Systems Operator fails to reopen valve in ECRS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
BW	CRO	OPERATES the High Pressure Safety Injection System Operator fails to provide RCP seal injection from SSF	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: 2.0 N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 11 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: OMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the High Pressure Safety Injection System Operator fails to allow standby HPI pump to remain idle	Mean: Median: 5.0E-2 EF: 10 UCB: LCB: E: 0.1 N:	1.3E-1 --- 5.0E-1 5.0E-3 0.1 2.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 19 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: COMMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the High Pressure Safety Injection System Operator fails to recover HPI pump cooling before pump failure	Mean: Median: 5.0E-2 EF: 10 UCB: LCB: E: 0.1 N:	1.3E-1 --- 5.0E-1 5.0E-3 0.1 2.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 26 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: OMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the High Pressure Safety Injection System Operator fails to recover LPSW to the HPI pumps	Mean: Median: 4.0E-2 EF: 10 UCB: LCB: E: 0.1 N:	1.1E-1 --- 4.0E-1 4.0E-3 0.1 2.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 10 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
BM	CRO	OPERATES the High Pressure Safety Injection System Maint tech fails to restore SIAS circuit breaker to closed position Error Type: OMISSION Recovery: CONSIDERED	Mean: 7.5E-4 Median: 10 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N: 133.3	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-82 PlantCode: YOR1
BM	CRO	OPERATES the High Pressure Safety Injection System CRO fails to operate HPSI System Seq = ISLOCA; HRA Method = INTENT; Error Factor = 7.5 Error Type: OMISSION Recovery: CONSIDERED	Mean: 8.0E-3 Median: 3.6E-3 EF: 8 UCB: 2.9E-2 LCB: 4.5E-4 E: 0.5 N: 138.7	8.0E-3 --- 2.9E-2 4.5E-4 0.5 138.7	ATime: ---:-- PTime: ---:-- Experience: 2 Feedback: 4 Procedure: 6 Staffing: 5 Stress: 3 Supervision: 1 Tagging: M Training: U	Document: 1-92 9, D-12, H12-MU Origin: Psychological Scaling Reference: 2-98 PlantCode: BM
BM	CRO	OPERATES the High Pressure Safety Injection System Operator fails to initiate NPR after small LOCA Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.0E-4 Median: 10 EF: 10 UCB: 3.0E-3 LCB: 3.0E-5 E: 0.1 N: 533.3	8.0E-4 --- 3.0E-3 3.0E-5 0.1 533.3	ATime: 12:00:00 PTime: 00:05:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, Item 2a Origin: Analytic Reference: 1-83 PlantCode: MEE3
BM	CRO	MONITORS the High Pressure Safety Injection System CRO fails to detect abnormal conditions Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.0E-5 Median: 1.2E-5 EF: 5 UCB: 6.2E-5 LCB: 2.4E-6 E: 1.0 N: 80645.1	2.0E-5 1.2E-5 --- 6.2E-5 2.4E-6 1.0 80645.1	ATime: ---:-- PTime: ---:-- Experience: 2 Feedback: 2 Procedure: M Staffing: 5 Stress: 3 Supervision: 3 Tagging: M Training: U	Document: 1-92 10, D-17, H02-MP Origin: Analytic Reference: 1-83 PlantCode: BM

B-207

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	CRO	MONITORS the High Pressure Safety Injection System CRO fails to detect abnormal signature of ISLOCA MPI interface Seq = MPI-MU; ISLOCA; 6 indicators available; NRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.0E-4		ATime: ---:--:--	Document: 1-92 7, D-11, MD2-MU Origin: Analytic Reference: 1-83 PlantCode: BW
			Median: 7.5E-5		PTime: ---:--:--	
			EF: 10		Experience: 2	
			UCB: 7.5E-4		Feedback: 2	
BW	CRO	DIAGNOSES the High Pressure Safety Injection System CRO/SS fails to diagnose ISLOCA - MPI system NRA Method = THERP; Decision-based error. Error Type: OMISSION Recovery: CONSIDERED	LCB: 7.5E-6		Procedure: 6	Document: 1-92 8, D-11, MD2-MU Origin: Analytic Reference: 1-83 PlantCode: BW
			E: 0.1		Staffing: 5	
			M: 1331.5		Stress: 3	
					Supervision: 3	
BW	CRO	OPERATES the Decay Heat Removal/Core Flooding System Operator fails to locally open suction valves Error Type: OMISSION Recovery: CONSIDERED	Mean: 7.5E-3	7.5E-3	ATime: ---:--:--	Document: 1-92 8, D-11, MD2-MU Origin: Analytic Reference: 1-83 PlantCode: BW
			Median: 3.7E-3		PTime: ---:--:--	
			EF: 7		Experience: 2	
			UCB: 2.6E-2		Feedback: 4	
BW	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System Operator fails to throttle injection valves to prevent pump runout Error Type: OMISSION Recovery: CONSIDERED	LCB: 5.3E-4		Procedure: 6	Document: 3-84 pg 6-34, item 16 Origin: Analytic Reference: 1-83 PlantCode: NEE3
			E: 0.5		Staffing: 5	
			M: 134.0		Stress: 3	
					Supervision: U	
BW	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System Operator fails to throttle injection valves to prevent pump runout Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.0E-1	1.3E-1	ATime: ---:--:--	Document: 3-84 pg 6-34, item 12 Origin: Analytic Reference: 1-83 PlantCode: NEE3
			Median: 3		PTime: ---:--:--	
			EF: 3		Experience: U	
			UCB: 3.0E-1		Feedback: U	
BW	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System Operator fails to throttle injection valves to prevent pump runout Error Type: OMISSION Recovery: CONSIDERED	LCB: 3.3E-2		Procedure: U	Document: 3-84 pg 6-34, item 12 Origin: Analytic Reference: 1-83 PlantCode: NEE3
			E: 2.0		Staffing: U	
			M: 20.0		Stress: 3	
					Supervision: U	
BW	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System Operator fails to throttle injection valves to prevent pump runout Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.0E-3	6.0E-3	ATime: ---:--:--	Document: 3-84 pg 6-34, item 12 Origin: Analytic Reference: 1-83 PlantCode: NEE3
			Median: 10		PTime: ---:--:--	
			EF: 10		Experience: U	
			UCB: 3.0E-2		Feedback: U	
BW	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System Operator fails to throttle injection valves to prevent pump runout Error Type: OMISSION Recovery: CONSIDERED	LCB: 3.0E-4		Procedure: U	Document: 3-84 pg 6-34, item 12 Origin: Analytic Reference: 1-83 PlantCode: NEE3
			E: 0.1		Staffing: U	
			M: 33.3		Stress: 3	
					Supervision: U	
BW	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System Operator fails to throttle injection valves to prevent pump runout Error Type: OMISSION Recovery: CONSIDERED			Tagging: U	Document: 3-84 pg 6-34, item 12 Origin: Analytic Reference: 1-83 PlantCode: NEE3
					Training: U	

APPENDIX B. RAW DATA

Vand Eqv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	MUCLAMP calc		
BN	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System Operator fails to achieve LPR after large break LOCA Error Type: OMISSION Recovery: CONSIDERED	Mean: 5.0E-3 Median: 5.0E-3 EF: 10 UCB: 5.0E-2 LCB: 5.0E-4 E: 0.1 N: 20.0	1.3E-2 --- 5.0E-2 5.0E-4 0.1 20.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 13 Origin: Analytic Reference: 1-83 PlantCode: NEE3
BN	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System CRO fails to close DNR isolation bypass valves Error Type: OMISSION Recovery: CONSIDERED	Mean: 7.0E-3 Median: 1.7E-3 EF: 16 UCB: 2.7E-2 LCB: 1.1E-4 E: 0.1 N: 50.0	7.0E-3 --- 2.7E-2 1.1E-4 0.1 50.0	ATime: --- PTime: --- Experience: 2 Feedback: 4 Procedure: 1 Staffing: 4 Stress: 1 Supervision: 1 Tagging: U Training: 1	Document: 1-92 2 (V 1, #2) Origin: Psychological Scaling Reference: 1-83 PlantCode: BSW
BN	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System CRO prematurely opens DNR system valves crew circumvents procedures) HRA Method = TNERP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.0E-3 Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N: 133.0	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.0	ATime: --- PTime: --- Experience: 2 Feedback: 2 Procedure: 4 Staffing: 4 Stress: 2 Supervision: 1 Tagging: M Training: 3	Document: 1-92 11, D-21, DMI-SD(CR20) Origin: Analytic Reference: 1-83 PlantCode: BSW
BN	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System CRO fails to isolate (DNR shutdown) ISLOCA HRA Method = TNERP/INTENT; Error Factor = 4.7 Error Type: OMISSION Recovery: CONSIDERED	Mean: 9.0E-5 Median: 5.6E-5 EF: 5 UCB: 2.8E-4 LCB: 1.1E-5 E: 1.0 N: 17009.0	9.0E-5 --- 2.8E-4 1.1E-5 1.0 17009.0	ATime: --- PTime: --- Experience: 2 Feedback: 3 Procedure: M Staffing: 4 Stress: 3 Supervision: 1 Tagging: M Training: 1	Document: 1-92 4 Origin: Analytic Reference: 1-83 PlantCode: BSW

B-209

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BN	CRO	OPERATES the Decay Heat Removal/Low Press Safety Inject System CRO fails to close DHR system letdown isolation valves Seq = ISLOCA; MBA Method = THERP; Error Factor = Unknown Error Type: OMISSION Recovery: CONSIDERED	Mean: 6.0E-3 Median: 2.3E-3 EF: 10 UCB: --- LCB: 2.3E-4 E: 0.1 N: 44.3	6.0E-3 --- 2.3E-2 2.3E-4 0.1 44.3	ATime: ---:---:--- PTime: ---:---:--- Experience: 2 Feedback: 3 Procedure: 2 Staffing: 4 Stress: 1 Supervision: 1 Tagging: N Training: 1	Document: 1-92 3 Origin: Analytic Reference: 1-83 PlantCode: B&W
BN	CRO	MONITORS the Decay Heat Removal/Low Press Safety Inject System CRO fails to detect abnormal DHR indication Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.1E-5 Median: 9.4E-6 EF: 8 UCB: 7.5E-5 LCB: 1.1E-6 E: 0.5 N: 53191.4	2.1E-5 --- 7.5E-5 1.1E-6 0.5 53191.4	ATime: ---:---:--- PTime: ---:---:--- Experience: 2 Feedback: 2 Procedure: N Staffing: 3 Stress: 3 Supervision: 1 Tagging: N Training: 1	Document: 1-92 5 Origin: Analytic Reference: 1-83 PlantCode: B&W
BN	CRO	MONITORS the Decay Heat Removal/Low Press Safety Inject System CRO fails to detect over pressurization in DHR system Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.0E-5 Median: 6.2E-6 EF: 6 UCB: 3.7E-5 LCB: 1.0E-6 E: 1.0 N: 161290.3	1.1E-5 --- 3.7E-5 1.0E-6 1.0 161290.3	ATime: ---:---:--- PTime: ---:---:--- Experience: 2 Feedback: 2 Procedure: N Staffing: 4 Stress: 3 Supervision: 3 Tagging: N Training: 1	Document: 1-92 1 Origin: Analytic Reference: 1-83 PlantCode: B&W
BN	CRO	DIAGNOSES the Decay Heat Removal/Low Press Safety Inject System CRO/SS fails to diagnose ISLOCA - DHR system MBA Method = THERP-INTENT; Error Factor = 7.3; Decision-based error. Error Type: OMISSION Recovery: CONSIDERED	Mean: 7.5E-3 Median: 3.7E-3 EF: 7 UCB: 2.6E-2 LCB: 5.3E-4 E: 0.5 N: 134.0	7.5E-3 --- 2.6E-2 5.3E-4 0.5 134.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 2 Feedback: 2 Procedure: 6 Staffing: 4 Stress: 3 Supervision: 1 Tagging: N Training: 3	Document: 1-92 12, D-24, DDA1-80 Origin: Analytic Reference: 1-83 PlantCode: B&W

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	BUCLARR calc		
BW	CRO	OPERATES the Feedwater Systems Operator fails to recover feedwater	Mean: Median: 5.0E-1 EF: 1 UCB: LCB: E: N:	5.0E-1 --- 5.0E-1 5.0E-1 20.0 40.0	Atime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : 4 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 4 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: COMMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the Feedwater Systems Operator fails to recover feedwater	Mean: Median: 3.0E-1 EF: 3 UCB: LCB: E: N:	3.0E-1 --- 9.0E-1 1.0E-1 2.0 6.6	Atime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 4 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: COMMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the Feedwater Systems Operator fails to recover feedwater	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	Atime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 4 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: COMMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the Feedwater Systems Op fails to init aux serv water from the standby shutdown facility	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	Atime: 12:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 20 Origin: Analytic Reference: 1-83 PlantCode: NEE3
		Error Type: OMISSION Recovery: CONSIDERED				

B-211

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	CRO	OPERATES the Feedwater System Operator fails to check main steam isolation & bypass valves closed	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
		Error Type: OMISSION Recovery: CONSIDERED				
BW	CRO	MONITORS the Feedwater System Operator fails to check main steam isolation & bypass valves closed	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
		Error Type: OMISSION Recovery: CONSIDERED				
BW	CRO	OPERATES the Main Feedwater System Operator fails to check main steam isolation & bypass valves closed	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
		Error Type: OMISSION Recovery: CONSIDERED				
BW	CRO	MONITORS the Main Feedwater System Operator fails to check main steam isolation & bypass valves closed	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
		Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR scale		
BU	CRO	OPERATES the Emergency Feedwater System Operator fails to recover feedwater from other unit or the SSF power Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 10 UCB: LCB: E: N:	2.7E-1 --- 1.0E+0 1.0E-2 0.1 1.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 6 Origin: Analytic Reference: 1-83 PlantCode: NEE3
BU	CRO	OPERATES the Emergency Feedwater System Operator fails to maintain suction supply to TDP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 7 Origin: Analytic Reference: 1-83 PlantCode: NEE3
BU	CRO	OPERATES the Water Systems Op fails to init aux serv water from the standby shutdown facility Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: 12:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 20 Origin: Analytic Reference: 1-83 PlantCode: NEE3
BU	CRO	OPERATES the Low Pressure Service Water System Operator fails to recover LPSW from another unit Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.3E-2 EF: 10 UCB: LCB: E: N:	3.5E-2 --- 1.3E-1 1.3E-3 0.1 7.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 9 Origin: Analytic Reference: 1-83 PlantCode: NEE3

B-213

NUREG/CR-4639

HIEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
BU	CRO	OPERATES the Main Steam System Operator fails to check main steam isolation & bypass valves closed Operator Action, HRA Method = Slim Naud. Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 4.3E-3 EF: 10 UCB: 4.3E-2 LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-86 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
BU	CRO	MONITORS the Main Steam System Operator fails to check main steam isolation & bypass valves closed Operator ACTION, HRA Method = Slim Naud. Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 4.3E-3 EF: 10 UCB: 4.3E-2 LCB: 4.3E-4 E: 0.1 N: 23.2	1.1E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-86 group 4, task 14 Origin: Analytic Reference: 1-86 PlantCode: CPS
BU	EO	MAINTAINS the Condensate Systems Common cause miscalibration of water tank low level sensors Local; Seq=NA; Ev=Pre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
BU	EO	MAINTAINS the Containment Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Yard EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
BW	EO	MAINTAINS the Containment Isolation System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P86
BW	EO	MAINTAINS the Reactor Building Spray System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: P86
BW	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Seq: M/A; Pre-1.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 5.0E-3 Median: 5.0E-3 EF: 3 UCB: 1.5E-2 LCB: 1.7E-3 E: 2.0 N: 400.0	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
BW	EO	OPERATES the DC Power System Subject selects wrong circuit breaker from dense group remote Seq: M/A; Pre-1.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.7E-3 Median: 1.7E-3 EF: 3 UCB: 5.1E-3 LCB: 5.7E-4 E: 2.0 N: 1176.4	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP

B-215

NUREG/CR-4639

HEP RAW Data

HEP RAW Data

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Row	MUCLARR calc		
BW	EO	<p>OPERATES the DC Power System Subject selects wrong circuit breaker from dense group</p> <p>Action:remote; Sq.:N/A; Pre-I.E., Therp</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 1.9E-2 Median: 1.5E-2 EF: 3 UCB: 4.5E-2 LCB: 5.0E-3 E: 2.0 M: 133.3</p>	<p>1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3</p>	<p>ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U</p>	<p>Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP</p>
BW	EO	<p>MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group</p> <p>Action:remote; Sq.:N/A; Pre-I.E., Therp</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 1.9E-2 Median: 1.5E-2 EF: 3 UCB: --- LCB: 5.0E-3 E: 2.0 M: 133.3</p>	<p>1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3</p>	<p>ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U</p>	<p>Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP</p>
BW	EO	<p>MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group</p> <p>remote Seq=N/A, Pre-I.E., Therp</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 2.1E-3 Median: 1.7E-3 EF: 3 UCB: 3.1E-3 LCB: 5.7E-4 E: 2.0 M: 1176.4</p>	<p>2.1E-3 --- 3.1E-3 5.7E-4 2.0 1176.4</p>	<p>ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U</p>	<p>Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP</p>
BW	EO	<p>MAINTAINS the DC Power System Subject improperly mates electrical connector</p> <p>Action:remote; Sq.:N/A; Pre-I.E., Therp</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 3.0E-3 Median: 3.0E-3 EF: 3 UCB: 9.0E-3 LCB: 1.0E-3 E: 2.0 M: 666.6</p>	<p>3.0E-3 --- 9.0E-3 1.0E-3 2.0 666.6</p>	<p>ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U</p>	<p>Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP</p>

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	EO	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
			Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.0E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: --- PlantCode: ALLP
BW	EO	OPERATES the Plant AC Power System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLV	Job Ttl	Task Description	Data Values		PEFs	Document Information
			Row	NUCLARR calc		
BW	EO	OPERATES the Plant AC Power System Subject selects wrong circuit breaker from dense group remote Seq=M/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	2.1E-3	ATime: --:--:--	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
			Median: 1.7E-3 EF: 3 UCB: 5.1E-3 LCB: 5.7E-4 E: 2.0 N: 1176.4	---	PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	
BW	EO	OPERATES the Plant AC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:M/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	1.9E-2	ATime: --:--:--	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
			Median: 1.5E-2 EF: 3 UCB: 4.5E-2 LCB: 5.0E-3 E: 2.0 N: 133.3	---	PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	
BW	EO	MAINTAINS the Plant AC Power System Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.3E-1	ATime: --:--:--	Document: 3-84 pg 6-34, item 17 Origin: Subjective Reference: 1-83 PlantCode: NEE3
			Median: 1.0E-1 EF: 3 UCB: 3.0E-1 LCB: 3.3E-2 E: 2.0 N: 20.0	---	PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	
BW	EO	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group remote Seq=M/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	2.1E-3	ATime: --:--:--	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
			Median: 1.7E-3 EF: 3 UCB: 5.1E-3 LCB: 5.7E-4 E: 2.0 N: 1176.4	---	PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLAB calc		
BW	EO	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
BW	EO	MAINTAINS the Plant AC Power System Subject improperly mates electrical connector Action:remote; Sq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
BW	EO	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
BW	EO	INSPECTS the Plant AC Power System Subject improperly mates electrical connector Action:remote; Sq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP

B-219

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
8W	EO	OPERATES the Emergency Core Cooling Systems Excessive task duration results in poor judgement motiv= 9, workload=11, commun= 7; remote; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 9.0E-2 LCB: 1.6E-2 E: N:	4.4E-2 3.8E-2 2 4.0 105.4	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
8W	EO	OPERATES the Emergency Core Cooling Systems Excessive task demands result in poor judgement motiv= 7, workload=13, commun= 9; remote; Post-IE; ROP; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.9E-1 LCB: 2.9E-2 E: N:	1.2E-1 9.2E-2 3 2.0 21.8	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 4 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
8W	EO	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
8W	EO	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of water tank low level sensors daily check, local, seqn/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: LCB: E: N:	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	EO	TESTS the High Pressure Safety Injection System EO fails to close vent path to the HWSI (HPSI) Seq = HPI test, NU running, no valve status board; HRA Method = THERP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.0E-3 Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N: 133.0	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.0	Atime: --- PTime: --- Experience: 3 Feedback: 4 Procedure: 3 Staffing: 2 Stress: 1 Supervision: 3 Tagging: U Training: 2	Document: 1-92 6, 0-8, NY1-NU Origin: Analytic Reference: 1-83 PlantCode: BW
BW	EO	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	Atime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
BW	EO	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of water tank low level sensors daily check, local, seqn/s, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 5.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	Atime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
BW	EO	MAINTAINS the Decay Heat Removal/Core Flooding System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	Atime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

B-221

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	EO	OPERATES the Decay Heat Removal/Low Press Safety Inject System EOS doesn't remember to close DN 21 & 23 Remote; seq=ISLOCA-DLI-SU-B; ev=pre; THERP (table 20-7) Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: 3.0E-3 Median: 3.0E-3 EF: 3 UCB: 9.0E-3 LCB: 1.0E-3 E: 2.0 N: 666.6	3.0E-3 ---	ATime: --- PTime: --- Experience: 1 Feedback: U Procedure: U Staffing: U Stress: -1 Supervision: U Tagging: U Training: U	Document: 1-92 pg E-36, table 9 Origin: Analytic Reference: ----- PlantCode: BSW
BW	EO	MAINTAINS the Decay Heat Removal/Low Press Safety Inject System Common cause miscalibration of water tank low level sensors daily check, local, seqn/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 ---	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
BW	EO	MAINTAINS the Feedwater Systems Common cause miscalibration of water tank low level sensors Local; Seq=N/A; Ev=Pre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 ---	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
BW	EO	MAINTAINS the Main Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, seqn/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 ---	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
BU	EO	MAINTAINS the Emergency Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, seq'n/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5	6.7E-5	ATime: ---:--:--	Document: 4-87 Origins Analytic Reference: ----- PlantCode: PBS
			Median: 2.5E-5	---	PTime: ---:--:--	
			EF: 10	---	Experience: U	
			UCB: 2.5E-4	2.5E-4	Feedback: U	
BU	EO	MAINTAINS the Safety Features Actuation System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	LCB: 2.5E-6	2.5E-6	Procedure: U	Document: 4-87 Origins Analytic Reference: ----- PlantCode: PBS
			E: 0.1	0.1	Staffing: U	
			N: 4000.0	4000.0	Stress: U	
					Supervision: U	
BU	EO	OPERATES the Reactor Coolant System Violate procedure and devise own foreu1 native 9, workload= 8, common 5; remote; ; Pre -EE; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.7E-4	2.7E-4	ATime: ---:--:--	Document: 2-90 table 2 Origins Analytic Reference: ----- PlantCode: ALLP
			Median: 1.0E-4	1.0E-4	PTime: ---:--:--	
			EF: 10	---	Experience: U	
			UCB: 1.0E-3	1.0E-3	Feedback: U	
BU	EO	MAINTAINS the Steam Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	LCB: 1.0E-5	1.0E-5	Procedure: U	Document: 4-87 Origins Analytic Reference: ----- PlantCode: PBS
			E: 0.1	0.1	Staffing: U	
			N: 1000.0	1000.0	Stress: U	
					Supervision: U	

B-223

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAM DATA

Vend EqLv	Job Ytl	Task Description	Data Values		PSSs	Document Information
			Ram	NUCLARR rate		
BW	E0	INSPECTS the Process Sampling Systems Checkers performing QA tolerate a discrepancy motiv=9,workload=10,commu=6;remote;Pre -IE;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	3.2E-2	ATime: ---:--:--	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
			Median:	1.2E-2	PTime: ---:--:--	
			EF:	10	Experience: 3	
			UCB:	1.2E-1	Feedback: U	
			LCB:	1.2E-3	Procedure: 5	
			E:	0.1	Staffing: U	
			N:	8.3	Stress: 3	
					Supervision: 3	
					Tagging: U	
					Training: 4	
BW	NT	MAINTAINS the Condensate Systems Common cause miscalibration of water tank low level sensors Local; SecPM/A; Ev=Pre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean:	6.7E-5	ATime: ---:--:--	Document: 4-87
			Median:	2.5E-5	PTime: ---:--:--	
			EF:	10	Experience: U	Origin:
			UCB:	2.5E-4	Feedback: U	Analytic
			LCB:	2.5E-6	Procedure: U	Reference: -----
			E:	0.1	Staffing: U	PlantCode: B&W
			N:	4000.0	Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
BW	NT	MAINTAINS the Containment Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean:	2.7E-4	ATime: ---:--:--	Document: 4-87
			Median:	1.0E-4	PTime: ---:--:--	
			EF:	10	Experience: U	Origin:
			UCB:	1.0E-3	Feedback: U	Analytic
			LCB:	1.0E-5	Procedure: U	Reference: -----
			E:	0.1	Staffing: U	PlantCode: PBS
			N:	1000.0	Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
BW	NT	MAINTAINS the Containment Isolation System Common cause miscalibration of high containment pressure sources Error Type: COMMISSION Recovery: CONSIDERED	Mean:	2.7E-4	ATime: ---:--:--	Document: 4-87
			Median:	1.0E-4	PTime: ---:--:--	
			EF:	10	Experience: U	Origin:
			UCB:	1.0E-3	Feedback: U	Analytic
			LCB:	1.0E-5	Procedure: U	Reference: -----
			E:	0.1	Staffing: U	PlantCode: PBS
			N:	1000.0	Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
BW	NT	MAINTAINS the Reactor Building Spray System Common cause miscalibration of high containment pressure sources Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PMS
BW	NT	TESTS the DC Power System Subject improperly mates electrical connector Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 3.8E-3 Median: 3.0E-3 EF: 3 UCB: 9.0E-3 LCB: 1.0E-3 E: 2.0 N: 666.6	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data Reference: ----- PlantCode: ALLP
BW	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group remote Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.1E-3 Median: 1.7E-3 EF: 3 UCB: 5.1E-3 LCB: 5.7E-4 E: 2.0 N: 1176.4	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
BW	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.9E-2 Median: 1.5E-2 EF: 3 UCB: 4.5E-2 LCB: 5.0E-3 E: 2.0 N: 133.3	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP

B-225

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	NT	TESTS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	6.2E-3	Atime: ---:--	Documents: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
			Median: 5.0E-3		PTime: ---:--	
			EF: 3	---	Experience: U	
			UCB: 1.5E-2		Feedback: U	
BW	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 1.7E-3		Procedure: U	Documents: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
			E: 2.0		Staffing: 1	
			N: 400.0		Stress: 1	
					Supervision: U	
BW	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED			Tagging: 2	Documents: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
					Training: U	
			Mean:	2.1E-3	Atime: ---:--	
			Median: 1.7E-3		PTime: ---:--	
BW	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group remote Seq: N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	EF: 3	---	Experience: U	Documents: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
			UCB: 5.1E-3		Feedback: U	
			LCB: 5.7E-4		Procedure: U	
			E: 2.0		Staffing: 1	
BW	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	N: 1176.4		Stress: 1	Documents: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
					Supervision: U	
					Tagging: 1	
					Training: U	
BW	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	1.9E-2	Atime: ---:--	Documents: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
			Median: 1.5E-2		PTime: ---:--	
			EF: 3	---	Experience: U	
			UCB: 4.5E-2		Feedback: U	
BW	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 5.0E-3		Procedure: U	Documents: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
			E: 2.0		Staffing: 1	
			N: 133.3		Stress: 1	
					Supervision: U	
BW	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED			Tagging: 3	Documents: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
					Training: U	
			Mean:	1.9E-2	Atime: ---:--	
			Median: 1.5E-2		PTime: ---:--	
BW	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	EF: 3	---	Experience: U	Documents: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
			UCB: 4.5E-2		Feedback: U	
			LCB: 5.0E-3		Procedure: U	
			E: 2.0		Staffing: 1	
BW	NT	MAINTAINS the DC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	N: 133.3		Stress: 1	Documents: 1-83 pg 20-28, item 11 Origin: Field Data Reference: ----- PlantCode: ALLP
					Supervision: U	
					Tagging: 3	
					Training: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	NT	MAINTAINS the DC Power System Subject improperly mates electrical connector -- Action:remote; Sq.:N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	3.8E-3	ATime: ---:---	Document: 1-83 pg 20-28, item 13 Origin: Field Data References: ----- PlantCode: ALLP
			Median: 3.0E-3		PTime: ---:---	
			EF: 3	---	Experience: U	
			UCB: 9.0E-3		Feedback: U	
BW	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 1.0E-3		Procedure: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data References: ----- PlantCode: ALLP
			E: 2.0		Staffing: 1	
			M: 666.6		Stress: 1	
					Supervision: U	
BW	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	2.1E-3	ATime: ---:---	Document: 1-83 pg 20-28, item 11 Origin: Field Data References: ----- PlantCode: ALLP
			Median: 1.7E-3		PTime: ---:---	
			EF: 3	---	Experience: U	
			UCB: 5.1E-3		Feedback: U	
BW	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 5.7E-4		Procedure: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data References: ----- PlantCode: ALLP
			E: 2.0		Staffing: 1	
			M: 1176.4		Stress: 1	
					Supervision: U	
BW	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	1.9E-2	ATime: ---:---	Document: 1-83 pg 20-28, item 11 Origin: Field Data References: ----- PlantCode: ALLP
			Median: 1.5E-2		PTime: ---:---	
			EF: 3	---	Experience: U	
			UCB: 4.5E-2		Feedback: U	
BW	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 5.0E-3		Procedure: U	Document: 1-83 pg 20-28, item 13 Origin: Field Data References: ----- PlantCode: ALLP
			E: 2.0		Staffing: 1	
			M: 133.3		Stress: 1	
					Supervision: U	
BW	NT	TESTS the Plant AC Power System Subject improperly mates electrical connector -- Action:remote; Sq.:N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	3.8E-3	ATime: ---:---	Document: 1-83 pg 20-28, item 13 Origin: Field Data References: ----- PlantCode: ALLP
			Median: 3.0E-3		PTime: ---:---	
			EF: 3	---	Experience: U	
			UCB: 9.0E-3		Feedback: U	
BW	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 1.0E-3		Procedure: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data References: ----- PlantCode: ALLP
			E: 2.0		Staffing: 1	
			M: 666.6		Stress: 1	
					Supervision: U	
BW	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean:	2.1E-3	ATime: ---:---	Document: 1-83 pg 20-28, item 11 Origin: Field Data References: ----- PlantCode: ALLP
			Median: 1.7E-3		PTime: ---:---	
			EF: 3	---	Experience: U	
			UCB: 5.1E-3		Feedback: U	
BW	NT	TESTS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 5.7E-4		Procedure: U	Document: 1-83 pg 20-28, item 11 Origin: Field Data References: ----- PlantCode: ALLP
			E: 2.0		Staffing: 1	
			M: 1176.4		Stress: 1	
					Supervision: U	

B-227

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vard EqLV	Job Ttl	Task Description	Data Values		PSEs	Document Information
			Raw	NUCLARR calc		
BW	MT	TESTS the Plant AC Power System	Mean:	6.2E-3	ATime: ---:--	Document: 1-83
		Subject selects wrong circuit breaker from dense group	Median: 5.0E-3		PTime: ---:--	pg 20-28, item 11
		Action: remote; Sq.: M/A; Pre-I.E.; Therp	EF: 3	---	Experience: U	Origin:
			UCB: 1.5E-2		Feedback: U	Subjective
			LCS: 1.7E-3		Procedure: U	Reference: -----
		Error Type: COMMISSION Recovery: NOT CONSIDERED	E: 2.0		Staffing: 1	PlantCode: ALLP
			N: 400.0		Stress: 1	
					Supervision: U	
					Tagging: 2	
					Training: U	
BW	MT	MAINTAINS the Plant AC Power System	Mean:	6.2E-3	ATime: ---:--	Document: 1-83
		Subject selects wrong circuit breaker from dense group	Median: 5.0E-3		PTime: ---:--	pg 20-28, item 11
		Action: remote; Sq.: M/A; Pre-I.E.; Therp	EF: 3	---	Experience: U	Origin:
			UCB: 1.5E-2		Feedback: U	Field Data
			LCS: 1.7E-3		Procedure: U	Reference: -----
		Error Type: COMMISSION Recovery: NOT CONSIDERED	E: 2.0		Staffing: 1	PlantCode: ALLP
			N: 400.0		Stress: 1	
					Supervision: U	
					Tagging: 2	
					Training: U	
BW	MT	MAINTAINS the Plant AC Power System	Mean:	2.1E-3	ATime: ---:--	Document: 1-83
		Subject selects wrong circuit breaker from dense group	Median: 1.7E-3		PTime: ---:--	pg 20-28, item 11
		remote Sq.: M/A, Pre-I.E., Therp	EF: 3	---	Experience: U	Origin:
			UCB: 5.1E-3		Feedback: U	Field Data
			LCS: 5.7E-4		Procedure: U	Reference: -----
		Error Type: COMMISSION Recovery: NOT CONSIDERED	E: 2.0		Staffing: 1	PlantCode: ALLP
			N: 1176.6		Stress: 1	
					Supervision: U	
					Tagging: 1	
					Training: U	
BW	MT	MAINTAINS the Plant AC Power System	Mean:	3.8E-3	ATime: ---:--	Document: 1-83
		Subject improperly mates electrical connector	Median: 3.0E-3		PTime: ---:--	pg 20-28, item 13
		Action: remote; Sq.: M/A; Pre-I.E., Therp	EF: 3	---	Experience: U	Origin:
			UCB: 9.0E-3		Feedback: U	Field Data
			LCS: 1.0E-3		Procedure: U	Reference: -----
		Error Type: COMMISSION Recovery: NOT CONSIDERED	E: 2.0		Staffing: 1	PlantCode: ALLP
			N: 666.6		Stress: 1	
					Supervision: U	
					Tagging: U	
					Training: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
04	MT	MAINTAINS the Plant AC Power System Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: --- Median: 1.5E-2 EF: 3 UCB: --- LCB: 4.5E-2 E: 5.0E-3 N: 2.0 133.3	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-26, item 11 Origin: Field Data Reference: --- PlantCode: MLP
04	MT	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of water tank low level sensors Local; Seqm/A; Ev=Pre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: --- LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS
04	MT	MAINTAINS the Emergency Core Cooling Systems Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: --- LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS
04	MT	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of water tank low level sensors daily check, local, seqm/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: --- LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: --- PlantCode: PBS

B-229

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vand EqLv	Job Tti	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLAIR calc		
BW	NT	MAINTAINS the High Pressure Safety Injection System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
BW	NT	MAINTAINS the Decay Heat Removal/Core Flooding System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
BW	NT	MAINTAINS the Decay Heat Removal/Core Flooding System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
BW	NT	MAINTAINS the Decay Heat Removal/Low Press Safety Inject System Common cause miscalibration of water tank low level sensors daily check, local, seqm/a, Pre-1.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BW	NT	MAINTAINS the Feedwater System Common cause miscalibration of water tank low level sensors Local; Seqm/A; EvPre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5	6.7E-5	ATime: ---:--	Document: 4-87
			Median: 2.5E-5		PTime: ---:--	
			EF: 10	---	Experience: U	Origin:
			UCB: 2.5E-4		Feedback: U	Analytic
			LCB: 2.5E-6		Procedure: U	Reference: -----
BW	NT	MAINTAINS the Main Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, seqm/a, Pre-1.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	E: 0.1		Staffing: U	PlantCode: PBS
			N: 4000.0		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
BW	NT	MAINTAINS the Emergency Feedwater System Common cause miscalibration of water tank low level sensors daily check, local, seqm/a, Pre-1.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5	6.7E-5	ATime: ---:--	Document: 4-87
			Median: 2.5E-5		PTime: ---:--	
			EF: 10	---	Experience: U	Origin:
			UCB: 2.5E-4		Feedback: U	Analytic
			LCB: 2.5E-6		Procedure: U	Reference: -----
BW	NT	MAINTAINS the Safety Features Actuation System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	E: 0.1		Staffing: U	PlantCode: PBS
			N: 4000.0		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
BW	NT	MAINTAINS the Safety Features Actuation System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4	2.7E-4	ATime: ---:--	Document: 4-87
			Median: 1.0E-4		PTime: ---:--	
			EF: 10	---	Experience: U	Origin:
			UCB: 1.0E-3		Feedback: U	Analytic
			LCB: 1.0E-5		Procedure: U	Reference: -----
BW	NT	MAINTAINS the Safety Features Actuation System Common cause miscalibration of high containment pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	E: 0.1		Staffing: U	PlantCode: PBS
			N: 1000.0		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
BU	MT	MAINTAINS the Steam System	Mean: 2.7E-4	2.7E-4	ATime: ---:--:--	Document: 4-87
		Common cause miscalibration of high containment pressure sensors	Median: 1.0E-4		PTime: ---:--:--	
			EF: 10	---	Experience: U	Origin:
			UCB: 1.0E-3		Feedback: U	Analytic
			LCB: 1.0E-5		Procedure: U	Reference: -----
			E: 0.1		Staffing: U	PlantCode: P88
			M: 1000.0		Stress: U	
		Error Type: COMMISSION Recovery: CONSIDERED			Supervision: U	
					Tagging: U	
					Training: U	
COMP	CRO	OPERATES the Circuit Breaker	Mean: 6.4E-3	6.4E-3	ATime: ---:--:--	Document: 2-89
		Operator fails to manually trip breakers	Median: 2.4E-3		PTime: ---:--:--	group 3, task 11
			EF: 10	---	Experience: U	Origin:
		SLTN-MAUD	UCB: 2.4E-2		Feedback: U	Simulation Modeling
			LCB: 2.4E-4		Procedure: U	Reference: 1-86
			E: 0.1		Staffing: U	PlantCode: CPS
			M: 41.6		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
					Tagging: U	
					Training: U	
COMP	CRO	OPENS/CLOSES the Circuit Breaker	Mean: 6.2E-3	6.2E-3	ATime: ---:--:--	Document: 1-83
		Subject selects wrong circuit breaker from dense group	Median: 5.0E-3		PTime: ---:--:--	pg 20-28, Item 11
			EF: 3	---	Experience: U	Origin:
			UCB: 1.5E-2		Feedback: U	Subjective
			LCB: 1.7E-3		Procedure: U	Reference: -----
			E: 2.0		Staffing: 1	PlantCode: ALLP
			M: 400.0		Stress: 1	
		Error Type: COMMISSION Recovery: NOT CONSIDERED			Supervision: U	
					Tagging: 2	
					Training: U	
COMP	CRO	OPENS/CLOSES the Circuit Breaker	Mean: 2.1E-3	2.1E-3	ATime: ---:--:--	Document: 1-83
		Subject selects wrong circuit breaker from dense group	Median: 1.7E-3		PTime: ---:--:--	pg 20-28, Item 11
			EF: 3	---	Experience: U	Origin:
			UCB: 5.1E-3		Feedback: U	Subjective
			LCB: 5.7E-4		Procedure: U	Reference: -----
			E: 2.0		Staffing: 1	PlantCode: ALLP
			M: 1176.4		Stress: 1	
		Error Type: COMMISSION Recovery: NOT CONSIDERED			Supervision: U	
					Tagging: 1	
					Training: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	MUCLARK calc		
COMP	CRO	OPENS/CLOSES the Circuit Breaker Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: 2.0 N: 133.3	1.9E-2 ... 4.5E-2 5.0E-3 2.0 133.3	ATime: ---1-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
COMP	CRO	OPENS/CLOSES the Circuit Breaker Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: 2.0 N: 20.0	1.3E-1 ... 3.0E-1 3.3E-2 2.0 20.0	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 17 Origin: Analytic Reference: 1-83 PlantCode: NEE3
COMP	CRO	OPENS/CLOSES the Circuit Breaker Operator fails to trip turbine and open all circuit breakers Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: 0.1 N: 10.0	2.7E-2 ... 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: 3 Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YOR1
COMP	CRO	OPENS/CLOSES the Circuit Breaker Operator fails to reconnect stub bus (LOSP only) Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 10 UCB: LCB: E: 0.1 N: 9.0	2.9E-2 ... 1.1E-1 1.1E-3 0.1 9.0	ATime: ---:-- PTime: ---:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #1 Origin: Analytic Reference: ----- PlantCode: SP61

B-233

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend Eqly	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	MACLARK calc		
COMP	CRO	OPERATES the Switch Operator fails to manually trip Rx (1st location) Slim-Maud Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.6E-3 EF: 10 UCB: LCB: E: N:	1.2E-2 --- 4.6E-2 4.6E-4 0.1 21.7	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: 2	Document: 2-88 group 5, task 1 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
COMP	CRO	OPERATES the Switch Operator fails to manually trip Rx (2nd location) Slim-Maud Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: 2	Document: 2-88 group 5, task 3 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
COMP	CRO	OPENS/CLOSES the Switchgear Operator fails to reconnect stub-bus after LOSP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 01:00:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 207 Origin: Analytic Reference: 4-87 PlantCode: SP51
COMP	CRO	DIAGNOSES the Flow Control Instrument CRO fails to remind other operator to close safety Injection valve HRA Method = THERP; Error Factor = 2.4 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.0E-1 Median: 2.6E-1 EF: 3 UCB: LCB: E: N:	3.2E-1 --- 7.7E-1 8.5E-2 2.0 7.8	ATime: ---:---: PTime: ---:---: Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C17-D (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
COMP	CRO	<p>DIAGNOSES the Flow Control Instrument CRO selects wrong valve (safety injection)</p> <p>NRA Method = THERP</p> <p>Error Type: COMMISSION Recovery: CONSIDERED</p>	<p>Mean: 3.7E-3 Median: 3.0E-3 EF: 3 UCB: 8.9E-3 LCB: 9.9E-4 E: 2.0 N: 672.2</p>	<p>3.7E-3 --- 8.9E-3 9.9E-4 2.0 672.2</p>	<p>ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: W Training: 2</p>	<p>Document: 2-92 C17-C (THERP #3) Origins: Analytic Reference: 1-83 PlantCode: CE</p>
COMP	CRO	<p>MONITORS the Flow Control Instrument Insufficient resources/instrumentation provided by management</p> <p>motive=7,workload=10,comm=9;local ; ;Pre -IE;NRA=INTENT</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: Median: EF: --- UCB: 2.4E-1 LCB: 7.4E-2 E: N:</p>	<p>1.4E-1 1.3E-1 2 8.0 60.0</p>	<p>ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3</p>	<p>Document: 2-90 table 2 Origins: Analytic Reference: --- PlantCode: ALLP</p>
COMP	CRO	<p>OPERATES the Flow Control Instrument CRO incorrectly activates control</p> <p>Post-i.e.; NRA Method = THERP</p> <p>Error Type: COMMISSION Recovery: CONSIDERED</p>	<p>Mean: 1.9E-2 Median: 1.5E-2 EF: 3 UCB: 4.5E-2 LCB: 5.0E-3 E: 2.0 N: 134.4</p>	<p>1.9E-2 --- 4.5E-2 5.0E-3 2.0 134.4</p>	<p>ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: W Training: 2</p>	<p>Document: 2-92 C11-F (THERP #10) Origins: Analytic Reference: 1-83 PlantCode: CE</p>
COMP	CRO	<p>OPERATES the Flow Control Instrument CRO incorrectly activates control on flow control valve</p> <p>Post-i.e.; NRA Method = THERP</p> <p>Error Type: COMMISSION Recovery: CONSIDERED</p>	<p>Mean: 1.9E-2 Median: 1.5E-2 EF: 3 UCB: 4.5E-2 LCB: 5.0E-3 E: 2.0 N: 134.4</p>	<p>1.9E-2 --- 4.5E-2 5.0E-3 2.0 134.4</p>	<p>ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: W Training: 2</p>	<p>Document: 2-92 C11-D (THERP #10) Origins: Analytic Reference: 1-83 PlantCode: CE</p>

B-235

NUREG/CR-4639

THERP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	OPERATES the Flow Control Instrument CRO fails to verify other operator closed correct valve HRA Method: THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.0E-1 Median: 2.6E-1 EF: 3 UCB: --- LCB: 7.7E-1 E: 8.5E-2 N: 2.0 7.8	3.2E-1 --- 7.7E-1 8.5E-2 2.0 7.8	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C17-P (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE
COMP	CRO	OPERATES the Flow Control Instrument CRO closes incorrect safety injection valve HRA Method: THERP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 3.7E-3 Median: 3.0E-3 EF: 3 UCB: --- LCB: 8.0E-3 E: 9.0E-4 N: 2.0 672.2	3.7E-3 --- 8.0E-3 9.0E-4 2.0 672.2	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C17-D (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
COMP	CRO	MONITORS the Flow Control Instrument Insufficient resources/instrumentation provided by management Motive= 7, workload=10, commun= 9; local; Pre -IE; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: --- Median: --- EF: --- UCB: 2.4E-1 LCB: 7.4E-2 E: --- N: ---	1.4E-1 1.3E-1 2 --- 8.0 60.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
COMP	CRO	DIAGNOSES the Level Control Instrument CRO fails to tell other operator to check RCS level not stabilizing HRA Method = THERP; Error Factor = 2.4 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.0E-1 Median: 2.6E-1 EF: 3 UCB: --- LCB: 7.7E-1 E: 8.5E-2 N: 2.0 7.8	3.2E-1 --- 7.7E-1 8.5E-2 2.0 7.8	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C17-H (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
COMP	CRO	DIAGNOSES the Level Control Instrument CRO error in determining pressurizer level stable HRA Method = THERP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 8.9E-3 EF: 3 UCB: 2.7E-2 LCB: 3.0E-3 E: 2.0 N: 224.0	1.1E-2 --- 2.7E-2 3.0E-3 2.0 224.0	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C17-G (THERP) Origin: Analytic Reference: 1-83 PlantCode: CE
COMP	CRO	DIAGNOSES the Level Control Instrument CRO fails to remind other oper to check if RCS lvl not stabilizing Error Factor = 2.2 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.5E-1 Median: 3.2E-1 EF: 2 UCB: 6.5E-1 LCB: 1.6E-1 E: 6.0 N: 18.4	3.5E-1 --- 6.5E-1 1.6E-1 6.0 18.4	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C17-F (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE
COMP	CRO	DIAGNOSES the Level Control Instrument CRO fails to determine reactor cooling system level not stabilizing HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-2 Median: 8.9E-3 EF: 3 UCB: 2.7E-2 LCB: 3.0E-3 E: 2.0 N: 224.0	1.1E-2 --- 2.7E-2 3.0E-3 2.0 224.0	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C17-E (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
COMP	CRO	MONITORS the Level Control Instrument Insufficient resources/instrumentation provided by management motive= 7,workload=10,comm= 9;local;Pre -1E;HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.4E-1 LCB: 7.4E-2 E: N:	1.4E-1 1.3E-1 2 2.4E-1 7.4E-2 8.0 60.0	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: ---:--- PlantCode: ALLP

B-237

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	MONITORS the Pressure Control Instrument Insufficient resources/instrumentation provided by management motive= 7,workload=10,comm= 9;local;Pre -IE;MRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.4E-1 LCB: 7.4E-2 E: N:	1.4E-1 1.3E-1 2 8.0 60.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: U Stress : 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: ---:---:--- PlantCode: ALLP
COMP	CRO	OPERATES the Control Rod Drive Mechanisms Operator fails to insert rods AFWS; local; Post I.E., pos; Slim Naud Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 2-88 group 2, task 4 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
COMP	CRO	OPERATES the Control Rod Drive Mechanisms Operator fails to manually insert rods to shut down reactor Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-4 EF: --- UCB: 2.0E-3 LCB: 2.0E-5 E: N:	5.8E-4 7 4.5E-5 0.5 1666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress : 4 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-5, Item 11 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: GE
COMP	CRO	OPERATES the Pumps Operator fails to lock out the AFW pump Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-2 EF: 10 UCB: LCB: E: N:	1.1E-1 --- 4.0E-1 4.0E-3 0.1 2.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCN

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	OPERATES the Pumps Operator restarts the bleed and feed pumps improperly Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 5.2E-3 EF: 10 UCB: LCB: E: N:	1.4E-2 --- 5.2E-2 5.2E-4 0.1 19.2	Atime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YK21
COMP	CRO	OPERATES the Pumps Operator fails to manually actuate CPC MDP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-2 EF: 10 UCB: LCB: E: N:	1.0E-1 --- 3.0E-1 3.0E-3 0.1 2.6	Atime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #10,12 Origin: Analytic Reference: ----- PlantCode: SP81
COMP	CRO	OPERATES the Pumps Operator fails to manually actuate CPC SWS MDP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-2 EF: 10 UCB: LCB: E: N:	1.0E-1 --- 3.0E-1 3.0E-3 0.1 2.6	Atime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #13 Origin: Analytic Reference: ----- PlantCode: SP81
COMP	CRO	OPERATES the Pumps Operator fails to allow standby MPI pump to remain idle Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-2 EF: 10 UCB: LCB: E: N:	1.3E-1 --- 5.0E-1 5.0E-3 0.1 2.0	Atime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 19 Origin: Subjective Reference: 1-85 PlantCode: WEE3

B-239

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	STARTS/STOPS the Pumps Operator fails to manually start pump C Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.8E-4 Median: 3.8E-4 EF: 10 UCB: 3.8E-3 LCB: 3.8E-5 E: 0.1 N: 263.1	1.0E-3 --- 3.8E-3 3.8E-5 0.1 263.1	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 2-86 ch IV, pg 200 Origin: Analytic Reference: 4-87 PlantCode: SPS1
COMP	CRO	STARTS/STOPS the Pumps Operator fails to stop reactor coolant pump POA, SLIM-MAUD, low monitoring Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.0E-3 Median: 1.0E-3 EF: 10 UCB: 1.0E-2 LCB: 1.0E-4 E: 0.1 N: 97.0	2.7E-3 --- 1.0E-2 1.0E-4 0.1 97.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 2-88 group 2, task 21 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
COMP	CRO	STARTS/STOPS the Centrifugal Pump Operator fails to start (manually) AFM pumps post-IE, POA, SLIM-MAUD Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.1E-3 Median: 1.1E-3 EF: 10 UCB: 1.1E-2 LCB: 1.1E-4 E: 0.1 N: 90.9	2.9E-3 --- 1.1E-2 1.1E-4 0.1 90.9	ATime: ---:--- PTime: ---:--- Experience: U Feedback: 3 Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 2-88 group 1, task 7 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
COMP	CRO	MONITORS the Pressure Sensor CRO (Supervisor) fails to determine containment pressure not rising NRA Method = THERP; Error factor = 2.3 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.3E-1 Median: 3.0E-1 EF: 2 UCB: 6.1E-1 LCB: 1.5E-1 E: 6.0 N: 19.7	3.3E-1 --- 6.1E-1 1.5E-1 6.0 19.7	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Documents: 2-92 CS-D (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	MONITORS the Pressure Sensor CRO fails to determine if SG pressure not abnormally low or dropping HRA Method = THERP; Error Factor = 2.3 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.3E-1 Median: 3.0E-1 EF: 2 UCB: 6.1E-1 LCB: 1.5E-1 E: 6.0 N: 19.7	3.3E-1 --- 6.1E-1 1.5E-1 6.0 19.7	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 CS-B (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE
COMP	CRO	MONITORS the Radiation Sensor CRO fails to detect radioactivity in steam plant HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.5E-2 Median: 1.2E-2 EF: 3 UCB: 3.6E-2 LCB: 4.0E-3 E: 2.0 N: 168.0	1.5E-2 --- 3.6E-2 4.0E-3 2.0 168.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 CS-E (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
COMP	CRO	OPERATES the Steam Generators Operator fails to terminate flow from SG blowdown line during SBTR Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: 3.4E-4 E: 0.1 N: 29.4	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #30 Origin: Analytic Reference: ----- PlantCode: SPS1
COMP	CRO	OPERATES the Turbines Operator fails to trip turbine and open oil circuit breakers Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: 1.0E-3 E: 0.1 N: 10.0	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 3 Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YXR1

B-241

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EQLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	MUCLAIR calc		
COMP	CRO	OPERATES the Turbines Operator fails to trip turbine during LOSP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
COMP	CRO	OPERATES the Turbines Operator fails to trip main turbine Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: LCB: E: N:	7.1E-3 --- 2.7E-2 2.7E-4 0.1 37.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #32 Origin: Analytic Reference: ----- PlantCode: SP51
COMP	CRO	MONITORS the Valves Operator fails to check main steam isolation & bypass valves closed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.3E-3 EF: 10 UCB: LCB: E: N:	1.9E-2 --- 4.3E-2 4.3E-4 0.1 23.2	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 2 Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-88 group 4, task 14 Origin: Simulation Modeling Reference: 1-86 PlantCode: CPS
COMP	CRO	OPERATES the Valves Operator fails to reopen valve in EORS or CSRS system Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-81 PlantCode: SHP1

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	OPERATES the Valves Operator fails to operate LPCS valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 20:00:00 PTime: 00:06:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 Ch IV, pg 205, #3 Origin: Unknown Reference: 4-87 PlantCode: GSS1
COMP	CRO	OPERATES the Valves Operator fails to align CSRS valves Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.3E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.3E-2 3.3E-4 0.1 30.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Unknown Reference: 1-81 PlantCode: SMP1
COMP	CRO	OPERATES the Valves Operator fails to realign ESF valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-84 Origin: Unknown Reference: 1-75 PlantCode: CCN1
COMP	CRO	OPENS/CLOSES the Valves Operator inadvertently closes HPIS valve Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-4 EF: 10 UCB: LCB: E: N:	8.0E-4 --- 3.0E-3 3.0E-5 0.1 333.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-81 Origin: Unknown Reference: 1-75 PlantCode: SMP1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	OPENS/CLOSES the Valves Operator fails to locally open suction valves Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 16 Origin: Unknown Reference: 1-83 PlantCode: NEE3
COMP	CRO	OPENS/CLOSES the Valves Operator fails to close 3 CSIS valves Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-5 EF: 10 UCB: LCB: E: N:	8.0E-5 --- 3.0E-4 3.0E-6 0.1 3333.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Unknown Reference: 1-81 PlantCode: SMP1
COMP	CRO	OPENS/CLOSES the Valves Operator fails to close RVST valve in CSIS Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.0E-4 EF: 10 UCB: LCB: E: N:	1.1E-3 --- 4.0E-3 4.0E-5 0.1 250.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: SMP1
COMP	CRO	OPENS/CLOSES the Valves Operator fails to open the service water system valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 10 UCB: LCB: E: N:	2.7E-1 --- 1.0E+0 1.0E-2 0.1 1.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-84 Origin: Unknown Reference: 1-75 PlantCode: CON1

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PGFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	OPENS/CLOSES the Valves Operator fails to open PORV block valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.4E-2 EF: 10 UCB: 9.4E-1 LCB: 9.4E-3 E: 0.1 N: 1.0	2.5E-1 --- 9.4E-1 9.4E-3 0.1 1.0	ATime: 00:02:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 203 Origin: Unknown Reference: 4-87 PlantCode: SPS1
COMP	CRO	OPENS/CLOSES the Relief Valve Operator fails to manually shut PORV of PORV related steps;SSTR,local,post-IE,POA,NAPPS sim. 50/50 success Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-5 EF: 10 UCB: 1.0E-4 LCB: 1.0E-6 E: 0.1 N: 10000.0	2.7E-5 --- 1.0E-4 1.0E-6 0.1 10000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-88 subtask 22 Origin: Simulation Modeling Reference: 3-85 PlantCode: SSK1
COMP	CRO	OPERATES the Valve Operators Operator fails to close main condensor isolation valves Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.9E-2 EF: 10 UCB: 5.9E-1 LCB: 5.9E-3 E: 0.1 N: 1.7	1.6E-1 --- 5.9E-1 5.9E-3 0.1 1.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #27 Origin: Analytic Reference: ----- PlantCode: SPS1
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to open alternate injection path for NP1 Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-4 EF: 10 UCB: 4.0E-3 LCB: 4.0E-5 E: 0.1 N: 250.0	1.1E-3 --- 4.0E-3 4.0E-5 0.1 250.0	ATime: 02:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 242 Origin: Analytic Reference: 4-87 PlantCode: SPS1

B-245

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EQLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to operate LPCS valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N: 133.3	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3	ATime: 20:00:00 PTime: 00:05:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 205, #3 Origin: Analytic Reference: 4-87 PlantCode: 0031
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to position valve to open Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: 1.0E-1 LCB: 1.0E-3 E: 0.1 N: 10.0	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCM
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to start MOV Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.5E-1 EF: 10 UCB: 1.0E+0 LCB: 6.3E-2 E: 1.5 N: 6.0	3.6E-1 4 1.0E+0 6.3E-2 1.5 6.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCM
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to operate motor operated valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-4 EF: --- UCB: 3.0E-4 LCB: 3.0E-5 E: 2.0 N: 20000.0	1.2E-4 3 3.3E-5 2.0 20000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCM

APPENDIX B. RAW DATA

Yend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLEAR calc		
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to shut FU MOVs and Baileys during LOSP Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-3 EF: 10 UCB: LCB: E: N:	1.0E-2 --- 3.8E-2 3.8E-4 0.1 26.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
COMP	CRO	OPERATES the Electric Motor-AC Operator isolates SG MOV and Bailey improperly Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to close RCS PORV block valve Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: LCB: E: N:	7.1E-3 --- 2.7E-2 2.7E-4 0.1 37.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #53 Origin: Analytic Reference: ----- PlantCode: SP51
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to open one PORV for S2 feed & bleed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.7E-2 EF: 10 UCB: LCB: E: N:	1.9E-1 --- 7.7E-1 7.7E-3 0.1 1.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #53 Origin: Analytic Reference: ----- PlantCode: SP51

B-247

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to open both PORVs for feed & bleed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-2 EF: 10 UCB: LCB: E: N:	2.9E-2 --- 1.1E-1 1.1E-3 0.1 9.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #36a Origin: Analytic Reference: ----- PlantCode: SPS1
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to open both PORVs for feed & bleed Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.4E-2 EF: 10 UCB: LCB: E: N:	1.2E-1 --- 4.4E-1 4.4E-3 0.1 2.2	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #36b Origin: Analytic Reference: ----- PlantCode: SPS1
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to terminate flow from stuck open SQ PORV Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.2E-2 EF: 10 UCB: LCB: E: N:	8.5E-2 --- 3.2E-1 3.2E-3 0.1 3.1	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #28 Origin: Analytic Reference: ----- PlantCode: SPS1
COMP	CRO	OPERATES the Electric Motor-AC Operator fails to position valve to open Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.5E-1 EF: 10 UCB: LCB: E: N:	3.6E-1 4 1.0E+0 6.3E-2 1.5 6.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-84 PlantCode: CCM

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
COMP	EO	OPERATES the Circuit Breaker Subject selects wrong circuit breaker from dense group remote, seqns, pre-i.e., therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
COMP	EO	OPERATES the Circuit Breaker Subject selects wrong circuit breaker from dense group remote, seqns, pre-i.e., therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
COMP	EO	OPERATES the Circuit Breaker Subject selects wrong circuit breaker from dense group remote, seqns, pre-i.e., therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
COMP	EO	OPERATES the Circuit Breaker Operator fails to restore AC power by manually closing a breaker Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 17 Origin: Analytic Reference: 1-83 PlantCode: NEE3

B-249

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	EO	OPERATES the Circuit Breaker Equipment operator selects wrong circuit breaker Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 3.0E-3 Median: EF: --- UCB: 2.0E-2 LCB: 2.0E-4 E: N:	5.3E-3 2.0E-3 10 0.1 50.0	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-8, item 10 Origin: Psychological Scaling Reference: --- PlantCode: ALLP
COMP	EO	OPENS/CLOSES the Disconnect Subject improperly mates electrical connector Action: remote; Sq: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.0E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Subjective Reference: --- PlantCode: ALLP
COMP	EO	OPERATES the Flow Control Instrument Violate procedure and reconfigure equipment Motive B, workload= B, common= 7; remote; Pre -IE; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 8.3E-2 LCB: 5.5E-4 E: N:	2.2E-2 6.8E-3 12 0.1 14.8	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP
COMP	EO	OPERATES the Level Control Instrument Violate procedure and reconfigure equipment Motive B, workload= B, common= 7; local; Pre -IE; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 8.3E-2 LCB: 5.5E-4 E: N:	2.2E-2 6.8E-3 12 0.1 14.8	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttt	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLAMP calc.		
COMP	EO	OPERATES the Pressure Control Instrument Violate procedure and reconfigure equipment motive= 8, workload= 8, commun= 7; local; Pre -IE; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: UCB: LCB: E: N:	2.2E-2 6.6E-3 12 8.3E-2 5.5E-4 0.1 14.8	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
COMP	EO	OPERATES the Temperature Control Instrument Violate procedure and reconfigure equipment motive= 8, workload= 8, commun= 7; local; Pre -IE; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: UCB: LCB: E: N:	2.2E-2 6.6E-3 12 8.3E-2 5.5E-4 0.1 14.8	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 3	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
COMP	EO	OPERATES the Electrical Equipment Operator fails to restore DC battery from hardware failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: EF: UCB: LCB: E: N:	2.0E-1 7.5E-2 10 7.5E-1 7.5E-3 0.1 1.3	ATime: 04:00:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #2 Origin: Unknown Reference: 4-87 PlantCode: GGS1
COMP	EO	OPERATES the Electrical Equipment Operator fails to restore DC battery from hardware failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: EF: UCB: LCB: E: N:	3.9E-1 3.0E-1 10 1.0E+0 9.0E-2 2.0 6.6	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #2 Origin: Unknown Reference: 4-87 PlantCode: GGS1

B-251

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	EO	OPERATES the Electrical Equipment Operator fails to recover DC battery from common mode failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-1 EF: 10 UCB: LCB: E: N:	4.5E-1 3 1.0E+0 1.4E-1 3.0 7.6	ATime: 00:40:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #1 Origin: Unknown Reference: 4-87 PlantCode: GGS1
COMP	EO	OPERATES the Electrical Equipment Operator fails to recover DC battery from common mode failure Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-1 EF: 10 UCB: LCB: E: N:	3.9E-1 3 1.0E+0 9.0E-2 2.0 6.6	ATime: 04:00:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #1 Origin: Unknown Reference: 4-87 PlantCode: GGS1
COMP	EO	OPERATES the Generator Equipment operator fails to align diesel generator Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-84 Origin: Unknown Reference: 1-75 PlantCode: CCN1
COMP	EO	INSPECTS the Centrifugal Pump Operator switches boric acid transfer pump speed too quickly Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 00:10:00 PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 203 Origin: Analytic Reference: 4-87 PlantCode: SP61

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	EO	INSPECTS the Level Sensor Common cause miscalibration of CST low level sensors Local: Seqn/A; Ev=Pre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PMS
COMP	EO	INSPECTS the Pressure Sensor Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PMS
COMP	EO	INSPECTS the Valves Operator fails to verify locally operated valve position Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-3 EF: --- UCB: 4.0E-2 LCB: 2.0E-4 E: N:	1.0E-2 13 2.3E-4 0.1 33.3	ATime: --:--:-- PTime: --:--:-- Experience: 3 Feedback: U Procedure: 3 Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-8, Item 11 Origin: Psychological Scaling Reference: ----- PlantCode: BUR
COMP	EO	OPERATES the Valves AUX operator fails to locally open air operated valves Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-2 EF: --- UCB: 3.0E-1 LCB: 5.0E-3 E: N:	1.0E-1 13 2.3E-3 0.1 3.3	ATime: 01:00:00 PTime: --:--:-- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-6, Item 15 Origin: Psychological Scaling Reference: ----- PlantCode: BUR

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFa	Document Information
			ROM	NUCLARR calc		
COMP	EO	OPENS/CLOSES the Valves Operator locally opens wrong manual valve Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-2 EF: --- UCB: 2.6E-1 LCB: 2.0E-3 E: N:	6.7E-2 13 1.9E-3 0.1 5.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: 0 Supervision: U Tagging: 2 Training: U	Document: 2-84 pg C-7, item 5 Origin: Psychological Scaling Reference: ----- PlantCode: SMR
COMP	EO	OPENS/CLOSES the Valves Operator chooses wrong valve Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-4 EF: --- UCB: 3.0E-3 LCB: 4.0E-5 E: N:	8.5E-4 7 3.3E-5 0.5 1250.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: 0 Supervision: U Tagging: 0 Training: U	Document: 2-84 pg C-7, item 6 Origin: Psychological Scaling Reference: ----- PlantCode: SMR
COMP	EO	OPENS/CLOSES the Valves Operator fails to locally open suction valves Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-34, item 16 Origin: Analytic Reference: 1-83 PlantCode: NEE3
COMP	EO	OPERATES the Electric Motor-AC Operator fails to open valve to allow emergency boration Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-86 ch IV, pg 203 Origin: Analytic Reference: 4-87 PlantCode: SP51

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
COMP	EO	OPERATES the Pneumatic AUX operator fails to locally open air operated valves post I.E., POA; expert judgement Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-2 EF: 9 UCB: LCB: E: 0.5 N: 16.6	7.3E-2 --- 2.7E-1 3.3E-3 0.5 16.6	ATime: 01:00:00 PTime: ---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-6, item 15 Origin: Psychological Scaling Reference: ----- PlantCode: GE
COMP	EO	INSPECTS the Vessels/Tanks Common cause miscalibration of CST low level sensors Local; Seqm/A; Ev=Pre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: LCB: E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PPS
COMP	EO	INSPECTS the Tank Common cause miscalibration of CST low level sensors daily check, local, seqm/a, Pre-I.E., NRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: LCB: E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PPS
COMP	WT	MAINTAINS the Circuit Breaker Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 5 UCB: LCB: E: 2.0 N: 400.0	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 28-28, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP

B-255

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PEFs	Document Information
			Row	NUCLARR calc		
COMP	NT	MAINTAINS the Circuit Breaker Subject selects wrong circuit breaker from dense group remote SeqM/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: 2.0 N:	2.1E-3 --- 5.1E-3 5.7E-4 1176.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
COMP	NT	MAINTAINS the Circuit Breaker Subject selects wrong circuit breaker from dense group Action:remote; Sq.:M/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: 2.0 N:	1.9E-2 --- 4.5E-2 5.0E-3 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
COMP	NT	MAINTAINS the Circuit Breaker NT damages circuit breaker during removal/insertion BRA method = EKPJ; Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-2 Median: 4.1E-2 EF: 5 UCB: LCB: E: 1.0 N:	6.7E-2 --- 2.1E-1 8.3E-3 24.1	ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: U Staffing: 2 Stress: 3 Supervision: 3 Tagging: 1 Training: U	Document: 1-91 NPROS Origin: Subjective Reference: --- PlantCode: B&U
COMP	NT	REPAIRS the Circuit Breaker Subject selects wrong circuit breaker from dense group Action:remote; Sq.:M/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: 2.0 N:	6.2E-3 --- 1.5E-2 1.7E-3 400.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend Eqty	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
COMP	MT	REPAIRS the Circuit Breaker Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
COMP	MT	REPAIRS the Circuit Breaker Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: N:	1.9E-2 --- 4.5E-2 5.0E-3 2.0 133.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
COMP	MT	TESTS the Circuit Breaker Subject selects wrong circuit breaker from dense group Action:remote; Sq.:N/A; Pre-I.E.; Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 3 UCB: LCB: E: N:	6.2E-3 --- 1.5E-2 1.7E-3 2.0 400.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 2 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP
COMP	MT	TESTS the Circuit Breaker Subject selects wrong circuit breaker from dense group remote Seq=N/A, Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.7E-3 EF: 3 UCB: LCB: E: N:	2.1E-3 --- 5.1E-3 5.7E-4 2.0 1176.4	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 1 Training: U	Document: 1-83 pg 20-28, item 11 Origin: Subjective Reference: --- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	MT	TESTS the Circuit Breaker Subject selects wrong circuit breaker from dense group Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-2 EF: 3 UCB: LCB: E: 2.0 N: 133.3	1.0E-2 --- 4.5E-2 5.0E-3 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: 3 Training: U	Document: 1-83 pg 20-20, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
COMP	MT	TESTS the Circuit Breaker Maint tech fails to restore SIAS circuit breaker to closed position Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: 0.1 N: 133.3	2.0E-3 --- 7.5E-3 7.5E-5 133.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brooklyn db file Origin: Analytic Reference: 1-82 PlantCode: YCR1
COMP	MT	MAINTAINS the Disconnect Subject improperly mates electrical connector Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: 2.0 N: 666.6	3.8E-3 --- 9.0E-3 1.0E-3 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-20, item 13 Origin: Subjective Reference: ----- PlantCode: ALLP
COMP	MT	REPAIRS the Disconnect Subject improperly mates electrical connector Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: 2.0 N: 666.6	3.8E-3 --- 9.0E-3 1.0E-3 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-20, item 13 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLV	Job Titl	Task Description	Data Values		PSFs	Document Information
			Ran	NUCLARR calc		
COMP	NT	TESTS the Disconnect Subject improperly mates electrical connector Action: remote; Sq.: N/A; Pre-I.E., Therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 13 Origin: Subjective Reference: ----- PlantCode: ALLP
COMP	NT	TESTS the Switch Maint. tech fails to restore SIAS switch after test Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 19 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 135.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
COMP	NT	TESTS the Switch NT fails to activate steam switches Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.0E-2 EF: 5 UCB: LCB: E: N:	9.7E-2 --- 3.0E-1 1.2E-2 1.0 16.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 5 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	NT	TESTS the Switch NT fails to restore switches Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.2E-2 EF: 3 UCB: LCB: E: N:	9.0E-2 --- 2.2E-1 2.4E-2 2.0 27.7	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 32 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	NT	CALIBRATES the Flow Control Instrument Common mode: failures due to poor safety culture motive: 6, workload: 7, comm: 8; remote; Pre-IE; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: UCB: 2.0E-1 LCB: 4.6E-3 E: N:	5.9E-2 3.0E-2 7 0.5 16.4	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origins: Analytic Reference: --- PlantCode: ALLP
COMP	NT	DIAGNOSES the Flow Control Instrument NT fails to read steam flow indication In scenario a 2nd NT performs this action Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.6E-2 EF: 2 UCB: LCB: E: N:	8.3E-2 --- 1.5E-1 3.8E-2 6.0 78.9	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 3-85 subtask 18 Origins: Simulation Modeling Reference: 3-85 PlantCode: GMR
COMP	NT	CALIBRATES the Level Control Instrument Common mode: failures due to poor safety culture motive: 6, workload: 7, comm: 8; remote; Pre-IE; HRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: UCB: 2.0E-1 LCB: 4.6E-3 E: N:	5.9E-2 3.0E-2 7 0.5 16.4	ATime: --- PTime: --- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origins: Analytic Reference: --- PlantCode: ALLP
COMP	NT	CALIBRATES the Pressure Control Instrument Maintenance tech miscalculates RX pressure instruments Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 187 Origins: Analytic Reference: 4-87 PlantCode: PBS2

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
COMP	MT	CALIBRATES the Pressure Control Instrument Common mode; failures due to poor safety culture motiv= 6, workload= 7, commun= 8; remote; Pre -1E; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.0E-1 LCB: 4.6E-3 E: N:	5.9E-2 3.0E-2 7 0.5 16.4	Atime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
COMP	MT	CALIBRATES the Temperature Control Instrument Common mode; failures due to poor safety culture motiv= 6, workload= 7, commun= 8; remote; Pre -1E; NRA=INTENT Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: EF: --- UCB: 2.0E-1 LCB: 4.6E-3 E: N:	5.9E-2 3.0E-2 7 0.5 16.4	Atime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: 5 Staffing: U Stress: 3 Supervision: 3 Tagging: U Training: 4	Document: 2-90 table 2 Origin: Analytic Reference: ----- PlantCode: ALLP
COMP	MT	DIAGNOSES the Voltage Control Instrument MT fails to request voltage readings full protective clothing; mechanic makes request of 2nd mechanic Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.7E-1 EF: 2 UCB: LCB: E: N:	1.9E-1 --- 3.4E-1 8.5E-2 6.0 35.2	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 17 Origin: Simulation Modeling Reference: 3-85 PlantCode: SMR
COMP	MT	CALIBRATES the Electrical Equipment MT fails to calibrate transmitter full protect. cloth. for 1 MT; assisted by 2nd MT Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-1 EF: 2 UCB: LCB: E: N:	1.7E-1 --- 3.1E-1 7.7E-2 6.0 39.2	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 23 Origin: Simulation Modeling Reference: 3-85 PlantCode: SMR

B-261

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
COMP	MT	DIAGNOSES the Electrical Equipment MT fails to inspect transmitter full protect. clothing; 1st inspection of transmitt. this scenario Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.0E-1	ATime: ---:--	Document: 3-88 subtask 10 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			Median: 1.7E-1		PTime: ---:--	
			EF: 2	---	Experience: 0	
			UCB: 3.3E-1		Feedback: 0	
COMP	MT	DIAGNOSES the Electrical Equipment MT fails to inspect transmitter Test Steam Isolation, Local, , Pre-IE, POA, MAPPS-50 iterations Error Type: OMISSION Recovery: CONSIDERED	LCB: 8.3E-2		Procedure: 3	Document: 3-88 subtask 15 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			E: 6.0		Staffing: 1	
			N: 36.3		Stress: 1	
					Supervision: 0	
COMP	MT	TESTS the Electrical Equipment Maintenance technician fails to test voltage IE, POA, MAPPS - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean:	2.1E-1	ATime: ---:--	Document: 3-88 subtask 2 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			Median: 1.9E-1		PTime: ---:--	
			EF: 2	---	Experience: 0	
			UCB: 3.0E-1		Feedback: 0	
COMP	MT	TESTS the Electrical Equipment MT fails to test calibrated transmitter line Isolation, local, pre-IE, POA, MAPPS - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	LCB: 9.5E-2		Procedure: 3	Document: 3-88 subtask 25 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			E: 6.0		Staffing: 1	
			N: 31.5		Stress: 1	
					Supervision: 0	
COMP	MT	TESTS the Electrical Equipment MT fails to test calibrated transmitter line Isolation, local, pre-IE, POA, MAPPS - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean:	2.3E-1	ATime: ---:--	Document: 3-88 subtask 2 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			Median: 1.6E-1		PTime: ---:--	
			EF: 4	---	Experience: 0	
			UCB: 6.4E-1		Feedback: 0	
COMP	MT	TESTS the Electrical Equipment MT fails to test calibrated transmitter line Isolation, local, pre-IE, POA, MAPPS - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	LCB: 4.0E-2		Procedure: 3	Document: 3-88 subtask 25 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			E: 1.5		Staffing: 1	
			N: 9.3		Stress: 1	
					Supervision: 0	
COMP	MT	TESTS the Electrical Equipment MT fails to test calibrated transmitter line Isolation, local, pre-IE, POA, MAPPS - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.3E-1	ATime: ---:--	Document: 3-88 subtask 25 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			Median: 1.2E-1		PTime: ---:--	
			EF: 2	---	Experience: 0	
			UCB: 2.3E-1		Feedback: 0	
COMP	MT	TESTS the Electrical Equipment MT fails to test calibrated transmitter line Isolation, local, pre-IE, POA, MAPPS - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	LCB: 5.8E-2		Procedure: 3	Document: 3-88 subtask 25 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			E: 6.0		Staffing: 1	
			N: 51.7		Stress: 1	
					Supervision: 0	
COMP	MT	TESTS the Electrical Equipment MT fails to test calibrated transmitter line Isolation, local, pre-IE, POA, MAPPS - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.3E-1	ATime: ---:--	Document: 3-88 subtask 25 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			Median: 1.2E-1		PTime: ---:--	
			EF: 2	---	Experience: 0	
			UCB: 2.3E-1		Feedback: 0	
COMP	MT	TESTS the Electrical Equipment MT fails to test calibrated transmitter line Isolation, local, pre-IE, POA, MAPPS - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	LCB: 5.8E-2		Procedure: 3	Document: 3-88 subtask 25 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
			E: 6.0		Staffing: 1	
			N: 51.7		Stress: 1	
					Supervision: 0	

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	NT	TESTS the Electrical Equipment NT fails to test voltage line isolation, local, pre-IE, PDA, MAPPS - 50 iterations Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.7E-1 EF: 2 UCB: LCB: E: N:	1.0E-1 --- 3.5E-1 0.7E-2 6.0 34.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 29 Origin: Simulation Modeling Reference: 3-85 PlantCode: BUR
COMP	NT	TESTS the Generator M. tech fails to restore diesel generator after test Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-4 EF: 10 UCB: LCB: E: N:	1.3E-3 --- 5.0E-3 5.0E-5 0.1 200.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-84 Origin: Unknown Reference: 1-75 PlantCode: CCN1
COMP	NT	TESTS the Equipment - Nonspecific NT fails to obtain procedures Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.7E-2 EF: 4 UCB: LCB: E: N:	1.1E-1 --- 3.1E-1 1.9E-2 1.5 19.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 3 Origin: Simulation Modeling Reference: 3-85 PlantCode: BUR
COMP	NT	TESTS the Equipment - Nonspecific NT fails to don protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-3 EF: 7 UCB: LCB: E: N:	6.0E-3 --- 2.1E-2 4.3E-4 0.5 166.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 8 Origin: Simulation Modeling Reference: 3-85 PlantCode: BUR

B-263

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Itl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
COMP	NT	TESTS the Equipment - Nonspecific NT fails to loosen panel bolts full protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.0E-2 EF: 3 UCB: LCB: E: N:	1.2E-1 --- 2.9E-1 3.3E-2 2.0 20.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 9 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	NT	TESTS the Equipment - Nonspecific NT fails to obtain tools full protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-1 EF: 3 UCB: LCB: E: N:	1.5E-1 --- 3.5E-1 3.9E-2 2.0 16.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 12 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	NT	TESTS the Equipment - Nonspecific NT fails to tighten fittings full protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-1 EF: 3 UCB: LCB: E: N:	1.5E-1 --- 3.5E-1 3.9E-2 2.0 16.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 13 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	NT	TESTS the Equipment - Nonspecific NT fails to obtain test equipment full protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.1E-1 3.4E-2 2.0 19.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 19 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	MT	TESTS the Equipment - Nonspecific MT fails to connect test equipment full protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.4E-1 EF: 3 UCB: LCB: E: N:	1.8E-1 --- 4.3E-1 4.7E-2 2.0 14.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 21 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	MT	TESTS the Equipment - Nonspecific MT fails to activate stops on test equipment full protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.6E-2 EF: 3 UCB: LCB: E: N:	9.5E-2 --- 2.3E-1 2.5E-2 2.0 26.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 26 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	MT	TESTS the Equipment - Nonspecific MT fails to return tools and test equipment full protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.4E-1 EF: 2 UCB: LCB: E: N:	1.5E-1 --- 2.8E-1 6.9E-2 6.0 43.4	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 30 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	MT	TESTS the Equipment - Nonspecific MT fails to deff protective clothing full protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.0E-3 EF: 4 UCB: LCB: E: N:	1.1E-2 --- 3.2E-2 2.0E-3 1.5 187.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 31 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR

B-265

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	MT	MAINTAINS the Pumps Fail to restore HPCS pump to service when out for maintenance seqstquv,tqux; remote; evmpost-l.e.,rop; Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-1 EF: 10 UCB: LCB: E: N:	2.7E-1 9 1.0E+0 1.2E-2 0.5 4.5	ATime: 20:00:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #3 Origin: Analytic Reference: 1-75 PlantCode: GGS1
COMP	MT	MAINTAINS the Pumps Fail to restore HPCS pump to service when out for maintenance seqstquv,tqux; remote; evmpost-l.e.,rop; Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-1 EF: 10 UCB: LCB: E: N:	4.2E-1 3 1.0E+0 1.2E-1 2.5 7.3	ATime: 00:40:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 204, #3 Origin: Analytic Reference: 1-75 PlantCode: GGS1
COMP	MT	MAINTAINS the Pumps Maintenance tech fails to test/restore APW pump after testing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: LCB: E: N:	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 4-86 PlantCode: CCN1
COMP	MT	CALIBRATES the Sensors M. tech fails to calibrate containment spray activation sensors Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-6 0.1 100.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Subjective Reference: 1-81 PlantCode: BWP1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	NT	CALIBRATES the Sensors Common cause miscalibration of CST low level sensors daily check, local, sequ/s, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N: 4000.0	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PMS
COMP	NT	CALIBRATES the Sensors Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: 1.0E-3 LCB: 1.0E-5 E: 0.1 N: 1000.0	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PMS
COMP	NT	TESTS the Sensors NT fails to test sensor output Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.8E-1 EF: 2 UCB: LCB: E: 6.0 N: 33.5	2.0E-1 --- 3.6E-1 0.0E-2 6.0 33.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 6 Origin: Simulation Modeling Reference: 3-88 PlantCode: SRR
COMP	NT	CALIBRATES the Level Sensor Maintenance tech fails to calibrate RWST sensors properly Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-4 EF: 10 UCB: LCB: E: 0.1 N: 909.0	2.9E-4 --- 1.1E-3 1.1E-5 0.1 909.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: 1 Training: U	Document: 2-86 ch IV, pg 193 Origin: Analytic Reference: 4-87 PlantCode: SPS1

B-267

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttt	Task Description	Data Values		PSfs	Document Information
			Est	NUCLARR calc		
COMP	NT	CALIBRATES the Level Sensor Common mode miscalibration of level sensors seqnre; remote; ev-pre le, pos; therp Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-4 EF: 10 UCB: 3.0E-3 LCB: 3.0E-5 E: N:	8.0E-4 --- 0.1 333.3	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #5 Origin: Analytic Reference: 4-87 PlantCode: GGS1
COMP	NT	CALIBRATES the Level Sensor Common cause miscalibration of CST low level sensors Local; Seqn/A; EvsPre; ASEP Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N:	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
COMP	NT	CALIBRATES the Level Sensor Common cause miscalibration of CST low level sensors daily check, local, seqn/a, Pre-I.E., HRA Method = ASEP. Error Type: COMMISSION Recovery: CONSIDERED	Mean: 6.7E-5 Median: 2.5E-5 EF: 10 UCB: 2.5E-4 LCB: 2.5E-6 E: 0.1 N:	6.7E-5 --- 2.5E-4 2.5E-6 0.1 4000.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
COMP	NT	CALIBRATES the Pressure Sensor Common mode miscalibration of pressure sensors seqnre; remote; ev-pre le, pos; therp Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-4 EF: 10 UCB: 3.0E-3 LCB: 3.0E-5 E: N:	8.0E-4 --- 0.1 333.3	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #9 Origin: Analytic Reference: 4-87 PlantCode: GGS1

APPENDIX B. RAW DATA

Vend EqLv	Job Ftl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
COMP	NT	CALIBRATES the Pressure Sensor Maint. tech fails to calibrate SIAS-A pressure detector properly Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-3 EF: 10 UCB: LCB: E: N:	3.2E-3 --- 1.2E-2 1.2E-4 0.1 63.3	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
COMP	NT	CALIBRATES the Pressure Sensor Maint. tech fails to calibrate 2 SIAS pressure detectors Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.9E-5 EF: 10 UCB: LCB: E: N:	1.3E-4 --- 4.9E-4 4.9E-6 0.1 2040.8	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-85 Brookhaven db file Origin: Analytic Reference: 1-82 PlantCode: YKR1
COMP	NT	CALIBRATES the Pressure Sensor Common cause miscalibration of high drywell pressure sensors Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.7E-4 Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 4-87 Origin: Analytic Reference: ----- PlantCode: PBS
COMP	NT	DIAGNOSES the Valves NT fails to inspect valves full protective clothing Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-1 EF: 2 UCB: LCB: E: N:	2.1E-1 --- 3.9E-1 9.0E-2 6.0 30.7	Atime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 27 Origin: Simulation Modeling Reference: 3-85 PlantCode: BUR

B-269

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend Eq.v	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	MT	MAINTAINS the Valves Valve not restored after maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-84 pg 6-33, item 6 Origin: Analytic Reference: 1-83 PlantCode: NEE3
COMP	MT	MAINTAINS the Valves Failure to restore valve after test/maintenance (CRD) Pre I.E., pos; THERP --- Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #1 Origin: Unknown Reference: 4-87 PlantCode: GGS1
COMP	MT	MAINTAINS the Valves Failure to restore LPCS pump A suction valve after test/maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: LCB: E: N:	8.0E-3 --- 3.0E-2 3.0E-4 0.1 33.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #2 Origin: Unknown Reference: 4-87 PlantCode: GGS1
COMP	MT	MAINTAINS the Valves MF fails to restore LPI manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-5 EF: 10 UCB: LCB: E: N:	2.9E-5 --- 1.1E-4 1.1E-6 0.1 9090.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 196, #2 Origin: Subjective Reference: 4-87 PlantCode: SMT

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	NT	TESTS the Valves Maintenance tech fails to restore valve after pump test Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: 1.0E-2 LCB: 1.0E-4 E: 0.1 N: 100.0	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: 1 Training: U	Document: 2-86 ch IV, pg 193 Origin: Analytic Reference: 4-87 PlantCode: SP51
COMP	NT	TESTS the Valves Maintenance tech fails to restore SLC valve after test Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.0E-3 EF: 4 UCB: 2.0E-2 LCB: 1.0E-3 E: 2.5 N: 357.1	8.6E-3 3 2.5E-3 2.5 357.1	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 3-86 ch IV, pg 187 Origin: Analytic Reference: 4-87 PlantCode: P852
COMP	NT	TESTS the Valves Failure to restore both valves in SLC test return line after test seqpne; remote; evapre ie,pos; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.8E-3 EF: 10 UCB: 1.8E-2 LCB: 1.8E-4 E: 0.1 N: 55.5	4.8E-3 --- 0.1 55.5	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #11 Origin: Analytic Reference: 4-87 PlantCode: 0051
COMP	NT	TESTS the Valves Failure to restore valve after test/maintenance (CRD) seqpne; remote; evapre ie,pos; therp Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-3 EF: 10 UCB: 3.3E-2 LCB: 3.0E-4 E: 0.1 N: 33.3	8.7E-3 11 2.7E-4 0.1 33.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #1 Origin: Analytic Reference: 4-87 PlantCode: 0051

B-271

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLV	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	NT	TESTS the Valves Failure to restore LPCS pump A suction valve after test/maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean:	8.0E-3	ATime: -----	Documents: 1-87 ch IV, pg 200, #2 Origin: Analytic Reference: 4-87 PlantCode: G651
			Median: 3.0E-3		PTime: -----	
			EF: 10	---	Experience: U	
			UCB: 3.0E-2		Feedback: U	
COMP	NT	TESTS the Valves Fail to restore service water manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	LCB: 3.0E-4		Procedure: U	Document: 2-87 ch IV, pg 196, #6 Origin: Analytic Reference: 4-87 PlantCode: SMP1
			E: 0.1	0.1	Staffing: U	
			N: 33.3	33.3	Stress: U	
					Supervision: U	
COMP	NT	TESTS the Valves Fail to restore OCM manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean: 8.0E-4	8.0E-4	ATime: -----	Document: 2-87 ch IV, pg 196, #3 Origin: Analytic Reference: 4-87 PlantCode: SMP1
			Median: 3.0E-4		PTime: -----	
			EF: 10	---	Experience: U	
			UCB: 3.0E-3	3.0E-3	Feedback: U	
COMP	NT	TESTS the Valves Fail to restore OCM manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	LCB: 3.0E-5	3.0E-5	Procedure: U	Document: 2-87 ch IV, pg 196, #3 Origin: Analytic Reference: 4-87 PlantCode: SMP1
			E: 0.1	0.1	Staffing: U	
			N: 2631.5	2631.5	Stress: U	
					Supervision: U	
COMP	NT	TESTS the Valves NT fails to restore LPI manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean:	2.0E-5	ATime: -----	Document: 2-87 ch IV, pg 196, #2 Origin: Analytic Reference: 4-87 PlantCode: SMP1
			Median: 1.1E-5		PTime: -----	
			EF: 10	---	Experience: U	
			UCB: 1.1E-4	1.1E-4	Feedback: U	
COMP	NT	TESTS the Valves NT fails to restore LPI manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	LCB: 1.1E-6	1.1E-6	Procedure: U	Document: 2-87 ch IV, pg 196, #2 Origin: Analytic Reference: 4-87 PlantCode: SMP1
			E: 0.1	0.1	Staffing: U	
			N: 9090.9	9090.9	Stress: U	
					Supervision: U	
COMP	NT	TESTS the Valves NT fails to restore LPI manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	Mean:	2.0E-5	ATime: -----	Document: 2-87 ch IV, pg 196, #2 Origin: Analytic Reference: 4-87 PlantCode: SMP1
			Median: 1.1E-5		PTime: -----	
			EF: 10	---	Experience: U	
			UCB: 1.1E-4	1.1E-4	Feedback: U	
COMP	NT	TESTS the Valves NT fails to restore LPI manual valve from test & maintenance Error Type: OMISSION Recovery: CONSIDERED	LCB: 1.1E-6	1.1E-6	Procedure: U	Document: 2-87 ch IV, pg 196, #2 Origin: Analytic Reference: 4-87 PlantCode: SMP1
			E: 0.1	0.1	Staffing: U	
			N: 9090.9	9090.9	Stress: U	
					Supervision: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	MT	TESTS the Valves MT fails to check valve operation light Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.8E-2 EF: 2 UCB: LCB: E: N:	9.6E-2 --- 1.8E-1 4.4E-2 6.0 68.1	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-85 subtask 7 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	MT	TESTS the Valves MT fails to activate isolation valve lever full protective clothing; 1st activ. of isolation valve this scenario Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.3E-2 EF: 3 UCB: LCB: E: N:	1.0E-1 --- 2.5E-1 2.8E-2 2.0 26.1	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-85 subtask 11 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	MT	TESTS the Valves MT fails to activate isolation valve lever full protective clothing; 2nd activ. of isolation valve this scenario Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.0E-2 EF: 3 UCB: LCB: E: N:	1.0E-1 --- 2.4E-1 2.7E-2 2.0 25.0	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-85 subtask 14 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR
COMP	MT	TESTS the Valves MT fails to activate isolation valve lever full protective clothing; 3rd activ. of isolation valve this scenario Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.7E-2 EF: 4 UCB: LCB: E: N:	1.2E-1 --- 3.5E-1 2.2E-2 1.5 17.2	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-85 subtask 16 Origin: Simulation Modeling Reference: 3-85 PlantCode: BWR

APPENDIX B. RASH DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	MT	TESTS the Valves MT fails to activate isolation valve lever full protective clothing; 4th activ. of isolation valve this scenario Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.1E-2 EF: 3 UCB: LCB: E: N:	7.6E-2 --- 1.8E-1 2.0E-2 2.0 32.7	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 20 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
COMP	MT	TESTS the Valves MT fails to activate equalizing lever full protective clothing; 1st activ. of equal valve lever this scenar. Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.3E-2 EF: 5 UCB: LCB: E: N:	1.2E-1 --- 3.7E-1 1.5E-2 1.0 13.7	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 22 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
COMP	MT	TESTS the Valves MT fails to activate equalizing valve lever full protective clothing; 2nd activ. of equal valve lever this scenar. Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.8E-2 EF: 4 UCB: LCB: E: N:	1.1E-1 --- 3.1E-1 2.0E-2 1.5 19.2	ATime: --- PTime: --- Experience: U Feedback: U Procedure: 3 Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 3-88 subtask 28 Origin: Simulation Modeling Reference: 3-85 PlantCode: BMR
COMP	MT	TESTS the Valves Failure to restore test suction valve after test Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 9.0E-4 EF: 10 UCB: LCB: E: N:	2.4E-3 --- 9.0E-3 9.0E-5 0.1 191.1	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-87 ch IV, pg 200, #12 Origin: Unknown Reference: 4-87 PlantCode: GGS1

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
COMP	MT	TESTS the Pneumatic Fail to restore service water air operated valve from test & maint Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-5 EF: 10 UCB: 1.1E-4 LCB: 1.1E-6 E: 0.1 N: 9090.9	2.9E-5 --- 1.1E-4 1.1E-6 0.1 9090.9	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 196, #5 Origin: Analytic Reference: 4-87 PlantCode: SNP1
COMP	MT	TESTS the Pneumatic MT fails to restore service water air operated valve after test Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.0E-4 EF: 10 UCB: 3.0E-3 LCB: 3.0E-5 E: 0.1 N: 333.3	8.0E-4 --- 3.0E-3 3.0E-5 0.1 333.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 2-87 ch IV, pg 196, #6 Origin: Subjective Reference: 4-87 PlantCode: SNP1
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.5E-3 EF: 10 UCB: 2.5E-2 LCB: 2.5E-4 E: 0.1 N: 39.6	6.7E-3 --- 2.5E-2 2.5E-4 0.1 39.6	ATime: ---:--- PTime: 00:00:04 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.9E-3 EF: 10 UCB: 1.9E-2 LCB: 1.9E-4 E: 0.1 N: 52.0	5.1E-3 --- 1.9E-2 1.9E-4 0.1 52.0	ATime: ---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

B-275

NUREG/CR-4639

HEP RAW Data

APPENDIX 8. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.7E-3 EF: 10 UCB: LCB: E: N:	7.9E-3 --- 2.7E-2 2.7E-4 0.1 37.4	ATime: ---:---:--- PTime: 00:00:04 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.2	ATime: ---:---:--- PTime: 00:00:05 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.3E-3 EF: 10 UCB: LCB: E: N:	8.7E-3 --- 3.3E-2 3.3E-4 0.1 30.5	ATime: ---:---:--- PTime: 00:00:05 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.9E-3 EF: 10 UCB: LCB: E: N:	7.7E-3 --- 2.9E-2 2.9E-4 0.1 34.6	ATime: ---:---:--- PTime: 00:00:05 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PEFs	Document Information
			Raw	NUCLARK calc		
0/1/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.1E-3 EF: 10 UCB: LCB: E: N:	8.1E-3 --- 3.1E-2 3.1E-4 0.1 32.7	ATime: ---:---:--- PTime: 00:00:05 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.4E-3 EF: 10 UCB: LCB: E: N:	3.7E-3 --- 1.4E-2 1.4E-4 0.1 71.9	ATime: ---:---:--- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.1E-3 --- 1.5E-2 1.5E-4 0.1 64.9	ATime: ---:---:--- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.3E-3 EF: 10 UCB: LCB: E: N:	6.1E-3 --- 2.3E-2 2.3E-4 0.1 43.6	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

B-277

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSfa	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.1E-3 Median: 2.1E-3 EF: 10 UCB: 2.1E-2 LCB: 2.1E-4 E: 0.1 N: 46.7	5.7E-3 --- 2.1E-2 2.1E-4 0.1 46.7	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly (circular scale) no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.9E-3 Median: 1.9E-3 EF: 10 UCB: 1.9E-2 LCB: 1.9E-4 E: 0.1 N: 53.1	5.0E-3 --- 1.9E-2 1.9E-4 0.1 53.1	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3, A-2 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly No specifics on event, loc, or seq. Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 6.1E-3 Median: 2.3E-3 EF: 10 UCB: 2.3E-2 LCB: 2.3E-4 E: 0.1 N: 43.6	6.1E-3 --- 2.3E-2 2.3E-4 0.1 43.6	ATime: --:--:-- PTime: 00:02:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 appendix A Origin: Field Data Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Qualitative Displays Personnel fail to read qualitative display properly No specifics on event, loc, or seq. HRA Method = 02. Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 6.1E-3 Median: 2.3E-3 EF: 10 UCB: 2.3E-2 LCB: 2.3E-4 E: 0.1 N: 43.6	6.1E-3 --- 2.3E-2 2.3E-4 0.1 43.6	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-1 Origin: Field Data Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: 7.5E-4 LCB: 7.5E-6 E: 0.1 N: 1329.7	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.1E-2 EF: 10 UCB: 3.1E-1 LCB: 3.1E-3 E: 0.1 N: 3.1	8.4E-2 --- 3.1E-1 3.1E-3 0.1 3.1	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-2 EF: 10 UCB: 1.6E-1 LCB: 1.6E-3 E: 0.1 N: 6.4	4.2E-2 --- 1.6E-1 1.6E-3 0.1 6.4	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N: 133.0	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP

B-279

NUREG/CR-4639

HEP Raw Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		P9Fs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in Indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean:	7.1E-2	ATime: -----	Document: 1-82
			Median: 2.7E-2		PTime: -----	pg B-10
			EF: 10	---	Experience: U	Origin:
			UCB: 2.7E-1		Feedback: U	Laboratory
			LCB: 2.7E-3		Procedure: U	Reference: -----
			E: 0.1		Staffing: U	PlantCode: ALLP
			N: 3.7		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in Indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean:	3.5E-2	ATime: -----	Document: 1-82
			Median: 1.3E-2		PTime: -----	pg B-10
			EF: 10	---	Experience: U	Origin:
			UCB: 1.3E-1		Feedback: U	Laboratory
			LCB: 1.3E-3		Procedure: U	Reference: -----
			E: 0.1		Staffing: U	PlantCode: ALLP
			N: 7.5		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in Indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean:	1.8E-3	ATime: -----	Document: 1-82
			Median: 6.8E-4		PTime: -----	pg B-10
			EF: 10	---	Experience: U	Origin:
			UCB: 6.8E-3		Feedback: U	Laboratory
			LCB: 6.8E-5		Procedure: U	Reference: -----
			E: 0.1		Staffing: U	PlantCode: ALLP
			N: 147.7		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in Indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean:	4.4E-2	ATime: -----	Document: 1-82
			Median: 1.7E-2		PTime: -----	pg B-10
			EF: 10	---	Experience: U	Origin:
			UCB: 1.7E-1		Feedback: U	Laboratory
			LCB: 1.7E-3		Procedure: U	Reference: -----
			E: 0.1		Staffing: U	PlantCode: ALLP
			N: 6.0		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Zon	NUCLARR calc		
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.9E-3 EF: 10 UCB: LCB: E: N:	2.4E-2 --- 8.9E-2 8.9E-4 0.1 11.2	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-2 EF: 10 UCB: LCB: E: N:	4.0E-2 --- 1.5E-1 1.5E-3 0.1 6.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 266.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-3 EF: 10 UCB: LCB: E: N:	2.0E-2 --- 7.5E-2 7.5E-4 0.1 15.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP

B-281

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Yend EqLv	Job Tel	Task Description	Data Values		PGFa	Document Information
			Raw	MUCLASH calc		
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 266.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.7E-2 EF: 10 UCB: LCB: E: N:	4.4E-2 --- 1.7E-1 1.7E-3 0.1 6.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.9E-3 EF: 10 UCB: LCB: E: N:	2.4E-2 --- 8.9E-2 8.9E-4 0.1 11.2	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 266.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-2 EF: 10 UCB: LCB: E: N:	4.0E-2 --- 1.5E-1 1.5E-3 0.1 6.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-3 EF: 10 UCB: LCB: E: N:	2.0E-2 --- 7.5E-2 7.5E-4 0.1 13.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 266.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.0E-2 4.8E-4 0.1 24.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP

B-283

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			RAW	NUCLARR calC		
0/1/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.6E-2 EF: 10 UCB: LCB: E: N:	4.2E-2 --- 1.6E-1 1.6E-3 0.1 6.4	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.7E-2 EF: 10 UCB: LCB: E: N:	7.1E-2 --- 2.7E-1 2.7E-3 0.1 3.7	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.3E-2 EF: 10 UCB: LCB: E: N:	3.5E-2 --- 1.3E-1 1.3E-3 0.1 7.5	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedures: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

APPENDIX B. RAW DATA

Yand EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.1E-3 EF: 10 UCB: LCB: E: N:	5.7E-3 --- 2.1E-2 2.1E-4 0.1 44.6	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP -
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.2	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Indicator Light Personnel fail to notice change in indicator status no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.8E-3 EF: 10 UCB: LCB: E: N:	4.8E-3 --- 1.8E-2 1.8E-4 0.1 55.4	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: ----- PlantCode: ALLP

B-285

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.8E-4 EF: 10 UCB: LCB: E: N:	1.8E-3 --- 6.8E-3 6.8E-3 0.1 147.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.7E-2 EF: 10 UCB: LCB: E: N:	4.4E-2 --- 1.7E-1 1.7E-3 0.1 6.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.9E-3 EF: 10 UCB: LCB: E: N:	2.4E-2 --- 8.9E-2 8.9E-4 0.1 11.2	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-3 0.1 266.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLV	Job Ttl	Task Description	Data Values		PSfs	Document Information
			Raw	NUCLARK calc		
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-2 EF: 10 UCB: LCB: E: N:	4.0E-2 --- 1.5E-1 1.5E-3 0.1 6.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-3 EF: 10 UCB: LCB: E: N:	2.0E-2 --- 7.5E-2 7.5E-4 0.1 13.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 266.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.7E-2 EF: 10 UCB: LCB: E: N:	4.4E-2 --- 1.7E-1 1.7E-3 0.1 6.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-287

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	IDENTIFIES the Legend Light	Mean:	2.4E-2	ATime: --:--:--	Document: 1-82
		Personnel fail to notice change in indicator status	Median: 8.9E-3		PTime: --:--:--	pg 8-10
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 8.9E-2		Feedback: U	Laboratory
D/I/C	Subj	IDENTIFIES the Legend Light	LCB: 8.9E-4		Procedure: U	Reference: 1-67
		Personnel fail to notice change in indicator status	E: 0.1		Staffing: U	PlantCode: ALLP
		No specifics on event, location, or sequence	N: 11.2		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
D/I/C	Subj	IDENTIFIES the Legend Light	Mean:	1.0E-3	ATime: --:--:--	Document: 1-82
		Personnel fail to notice change in indicator status	Median: 3.8E-4		PTime: --:--:--	pg 8-10
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 3.8E-3		Feedback: U	Laboratory
D/I/C	Subj	IDENTIFIES the Legend Light	LCB: 3.8E-5		Procedure: U	Reference: 1-67
		Personnel fail to notice change in indicator status	E: 0.1		Staffing: U	PlantCode: ALLP
		No specifics on event, location, or sequence	N: 266.0		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
D/I/C	Subj	IDENTIFIES the Legend Light	Mean:	4.0E-2	ATime: --:--:--	Document: 1-82
		Personnel fail to notice change in indicator status	Median: 1.5E-2		PTime: --:--:--	pg 8-10
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 1.5E-1		Feedback: U	Laboratory
D/I/C	Subj	IDENTIFIES the Legend Light	LCB: 1.5E-3		Procedure: U	Reference: 1-67
		Personnel fail to notice change in indicator status	E: 0.1		Staffing: U	PlantCode: ALLP
		No specifics on event, location, or sequence	N: 6.6		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
D/I/C	Subj	IDENTIFIES the Legend Light	Mean:	2.0E-2	ATime: --:--:--	Document: 1-82
		Personnel fail to notice change in indicator status	Median: 7.5E-3		PTime: --:--:--	pg 8-10
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 7.5E-2		Feedback: U	Laboratory
D/I/C	Subj	IDENTIFIES the Legend Light	LCB: 7.5E-4		Procedure: U	Reference: 1-67
		Personnel fail to notice change in indicator status	E: 0.1		Staffing: U	PlantCode: ALLP
		No specifics on event, location, or sequence	N: 13.3		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
D/I/C	Subj	IDENTIFIES the Legend Light	Mean:	2.0E-2	ATime: --:--:--	Document: 1-82
		Personnel fail to notice change in indicator status	Median: 7.5E-3		PTime: --:--:--	pg 8-10
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 7.5E-2		Feedback: U	Laboratory
D/I/C	Subj	IDENTIFIES the Legend Light	LCB: 7.5E-4		Procedure: U	Reference: 1-67
		Personnel fail to notice change in indicator status	E: 0.1		Staffing: U	PlantCode: ALLP
		No specifics on event, location, or sequence	N: 13.3		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
D/I/C	Subj	IDENTIFIES the Legend Light	Mean:	2.0E-2	ATime: --:--:--	Document: 1-82
		Personnel fail to notice change in indicator status	Median: 7.5E-3		PTime: --:--:--	pg 8-10
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 7.5E-2		Feedback: U	Laboratory
D/I/C	Subj	IDENTIFIES the Legend Light	LCB: 7.5E-4		Procedure: U	Reference: 1-67
		Personnel fail to notice change in indicator status	E: 0.1		Staffing: U	PlantCode: ALLP
		No specifics on event, location, or sequence	N: 13.3		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
D/I/C	Subj	IDENTIFIES the Legend Light	Mean:	2.0E-2	ATime: --:--:--	Document: 1-82
		Personnel fail to notice change in indicator status	Median: 7.5E-3		PTime: --:--:--	pg 8-10
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin:
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 7.5E-2		Feedback: U	Laboratory
D/I/C	Subj	IDENTIFIES the Legend Light	LCB: 7.5E-4		Procedure: U	Reference: 1-67
		Personnel fail to notice change in indicator status	E: 0.1		Staffing: U	PlantCode: ALLP
		No specifics on event, location, or sequence	N: 13.3		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	

APPENDIX B. RAW DATA

Yend EQLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 266.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-3 EF: 10 UCB: LCB: E: N:	1.1E-2 --- 4.0E-2 4.0E-4 0.1 24.8	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.1E-3 EF: 10 UCB: LCB: E: N:	5.7E-3 --- 2.1E-2 2.1E-4 0.1 46.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-289

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.1E-3 --- 3.4E-2 3.4E-4 0.1 29.2	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-16 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
O/I/C	Subj	IDENTIFIES the Legend light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.8E-3 EF: 10 UCB: LCB: E: N:	4.8E-3 --- 1.8E-2 1.8E-4 0.1 55.4	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
O/I/C	Subj	IDENTIFIES the Legend Light Personnel fail to notice change in indicator status No specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-10 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciator event during time allot Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E+0 EF: 1 UCB: LCB: E: N:	1.0E+0 --- 1.0E+0 1.0E+0 20.0 20.0	ATime: 00:01:00 PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 1 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARE calc		
D/I/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciator event during time allot Minimal amount of time Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E+0 EF: 1 UCB: 1.0E+0 LCB: 1.0E+0 E: 20.0 N: 20.0	1.0E+0 --- 1.0E+0 1.0E+0 20.0 20.0	ATime: 00:01:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 7 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciator event during time allot Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-1 EF: 2 UCB: 1.0E+0 LCB: 2.5E-1 E: 6.0 N: 12.0	5.5E-1 --- 1.0E+0 2.5E-1 6.0 12.0	ATime: 00:10:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 2 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciator event during time allot Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 10 UCB: 1.0E+0 LCB: 1.0E-2 E: 0.1 N: 1.0	2.7E-1 --- 1.0E+0 1.0E-2 0.1 1.0	ATime: 00:20:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 3 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciator event during time allot Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: 1.0E-1 LCB: 1.0E-3 E: 0.1 N: 10.0	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: 00:30:00 PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 4 Origin: Subjective Reference: ----- PlantCode: ALLP

B-291

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciated event during time allot Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: 0.1 N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: 01:00:30 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 5 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciated event during time allot Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-4 EF: 30 UCB: LCB: E: 0.1 N:	8.5E-4 --- 1.0E-3 3.3E-6 0.1 1000.0	ATime: 23:59:59 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 6 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciated event during time allot Limited amount of time Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E+0 EF: 1 UCB: LCB: E: 20.0 N:	1.0E+0 --- 1.0E+0 1.0E+0 20.0 20.0	ATime: 00:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 8 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciated event during time allot Moderate amount of time Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-1 EF: 2 UCB: LCB: E: 6.0 N:	5.5E-1 --- 1.0E+0 2.5E+1 6.0 12.0	ATime: 00:20:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 9 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend Eqty	Job Tit	Task Description	Data Values		PSFs	Document Information
			Rea	NUCLARR calc		
0/1/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciated event during time allot Ample amount of time Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 10 UCB: 1.0E+0 LCB: 1.0E-2 E: 0.1 N: 1.0	2.7E-1 --- 1.0E+0 1.0E-2 0.1 1.0	ATime: 00:30:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 10 Origin: Subjective Reference: ----- PlantCode: ALLP
0/1/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciated event during time allot Ample amount of time Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-2 EF: 10 UCB: 1.0E-1 LCB: 1.0E-3 E: 0.1 N: 10.0	2.7E-2 --- 1.0E-1 1.0E-3 0.1 10.0	ATime: 00:40:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 11 Origin: Subjective Reference: ----- PlantCode: ALLP
0/1/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciated event during time allot Ample amount of time Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: 1.0E-2 LCB: 1.0E-4 E: 0.1 N: 100.0	2.7E-3 --- 1.0E-2 1.0E-4 0.1 100.0	ATime: 01:10:00 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 12 Origin: Subjective Reference: ----- PlantCode: ALLP
0/1/C	Subj	DIAGNOSES the Annunciator Subject fails to diagnose annunciated event during time allot Ample amount of time Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-4 EF: 30 UCB: 3.0E-3 LCB: 3.3E-6 E: 0.1 N: 1000.0	8.5E-4 --- 3.0E-3 3.3E-6 0.1 1000.0	ATime: 25:59:59 PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 3 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-17, item 13 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-1 EF: 10 UCB: LCB: E: N:	3.1E-1 5 1.0E+0 3.4E-2 1.0 5.4	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.3E-2 EF: 10 UCB: LCB: E: N:	1.9E-1 --- 7.3E-1 7.3E-3 0.1 1.3	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.4E-2 EF: 10 UCB: LCB: E: N:	2.0E-1 --- 7.4E-1 7.4E-3 0.1 1.3	ATime: --:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-2 EF: 10 UCB: LCB: E: N:	5.4E-2 --- 2.0E-1 2.0E-3 0.1 4.9	ATime: --:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSfs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-1 EF: 10 UCB: LCB: E: N:	2.8E-1 8 1.0E+0 1.6E-2 0.5 4.0	ATime: ---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.5E-2 EF: 10 UCB: LCB: E: N:	1.7E-1 --- 6.5E-1 6.5E-3 0.1 1.5	ATime: ---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
O/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-2 EF: 10 UCB: LCB: E: N:	4.1E-2 --- 1.5E-1 1.5E-3 0.1 6.5	ATime: ---:--- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
O/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-2 EF: 10 UCB: LCB: E: N:	3.2E-2 --- 1.2E-1 1.2E-3 0.1 8.2	ATime: ---:--- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	MONITORS the CRT text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.7E-1 EF: 10 UCB: LCB: E: N:	3.0E-1 6 1.0E+0 2.9E-2 1.0 5.8	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.1E-2 EF: 10 UCB: LCB: E: N:	1.4E-1 --- 6.1E-1 6.1E-3 0.1 1.6	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.2E-2 EF: 10 UCB: LCB: E: N:	1.7E-1 --- 6.2E-1 6.2E-3 0.1 1.6	ATime: --:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.3E-3 EF: 10 UCB: LCB: E: N:	2.2E-2 --- 8.3E-2 8.3E-4 0.1 12.0	ATime: --:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ftl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E-1 EF: 10 UCB: LCB: E: N:	2.7E-1 9 1.0E+0 1.3E-2 0.5 4.4	ATime: ---:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.3E-2 EF: 10 UCB: LCB: E: N:	1.4E-1 --- 5.3E-1 5.3E-3 0.1 1.9	ATime: ---:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.0E-3 --- 3.4E-2 3.4E-4 0.1 29.5	ATime: ---:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Text Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.9E-4 EF: 10 UCB: LCB: E: N:	5.0E-4 --- 1.9E-3 1.9E-5 0.1 531.9	ATime: ---:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP

B-297

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLV	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the Quantitative Displays Personnel read without knowing instrument is faulty Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-1 EF: 5 UCB: 5.0E-1 LCB: 2.0E-2 E: 1.0 N: 10.0	1.6E-1 --- 5.0E-1 2.0E-2 1.0 10.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-26, Item 7 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	READS the Quantitative Displays Personnel read without knowing instrument is faulty Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E+0 EF: 5 UCB: 1.0E+0 LCB: 1.0E+0 E: 20.0 N: 20.0	1.0E+0 1 1.0E+0 1.0E+0 20.0 20.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-26, Item 7 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Operator reads digital indicator incorrectly Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-5 EF: --- UCB: 3.0E-3 LCB: 9.0E-6 E: 0.1 N: 2000.0	1.7E-3 69 3.0E-3 8.0E-7 0.1 2000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-8, Item 16 Origin: Psychological Scaling Reference: ----- PlantCode: BMR
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.8E-4 EF: 10 UCB: 6.8E-3 LCB: 6.8E-5 E: 0.1 N: 147.0	1.8E-3 --- 6.8E-3 6.8E-5 0.1 147.0	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 8.6E-4 EF: 10 UCB: LCB: E: N:	2.3E-3 --- 8.6E-3 8.6E-3 0.1 116.2	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.6E-4 EF: 10 UCB: LCB: E: N:	1.5E-3 --- 5.6E-3 5.6E-3 0.1 178.5	ATime: ---:---:--- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.2E-3 EF: 10 UCB: LCB: E: N:	3.1E-3 --- 1.2E-2 1.2E-4 0.1 85.4	ATime: ---:---:--- PTime: 00:00:03 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 8.6E-4 EF: 10 UCB: LCB: E: N:	2.3E-3 --- 8.6E-3 8.6E-3 0.1 116.2	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

B-299

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.3E-4 EF: 10 LCB: LCB: E: N:	1.4E-3 --- 5.3E-3 5.3E-5 0.1 188.6	ATime: --:--:-- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.1E-4 EF: 10 LCB: LCB: E: N:	1.1E-3 --- 4.1E-3 4.1E-5 0.1 243.9	ATime: --:--:-- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.1E-4 EF: 10 LCB: LCB: E: N:	1.9E-3 --- 7.1E-3 7.1E-5 0.1 140.8	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.9E-4 EF: 10 LCB: LCB: E: N:	2.1E-3 --- 7.9E-3 7.9E-5 0.1 126.5	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.9E-4 EF: 10 UCB: LCB: E: N:	1.3E-3 --- 4.9E-3 4.9E-5 0.1 204.0	ATime: --:--:-- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.8E-4 EF: 10 UCB: LCB: E: N:	1.8E-3 --- 6.8E-3 6.8E-5 0.1 147.0	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 263.1	ATime: --:--:-- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 9.8E-4 EF: 10 UCB: LCB: E: N:	2.6E-3 --- 9.8E-3 9.8E-5 0.1 102.0	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence; performance time=1.5 sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.8E-4 EF: 10 UCB: LCB: E: 0.1 N:	1.8E-3 --- 6.8E-3 6.8E-5 0.1 147.0	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-B2 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.4E-4 EF: 10 UCB: LCB: E: 0.1 N:	9.1E-4 --- 3.4E-3 3.4E-5 0.1 296.1	ATime: ---:---:--- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-B2 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.3E-4 EF: 10 UCB: LCB: E: 0.1 N:	6.1E-4 --- 2.3E-3 2.3E-5 0.1 434.7	ATime: ---:---:--- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-B2 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.3E-4 EF: 10 UCB: LCB: E: 0.1 N:	1.4E-3 --- 5.3E-3 5.3E-5 0.1 188.6	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-B2 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the Counter-Digital Readout Personnel fails to read counter (digits) readout properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 9.0E-4 Median: 9.0E-4 EF: 10 UCB: 9.0E-3 LCB: 9.0E-5 E: 0.1 N: 102.0	2.6E-3 ---	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-3 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Counter-Digital Readout Personnel fail to read counter (deg) readout properly Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.4E-3 Median: 5.3E-4 EF: 10 UCB: 5.3E-3 LCB: 5.3E-5 E: 0.1 N: 190.0	1.4E-3 ---	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 appendix A Origin: Field Data Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Meter Operator reads wrong meter Error Type: COMMISSION Recovery: CONSIDERED	Mean: 1.0E-3 Median: 1.0E-3 EF: --- UCB: 1.0E-2 LCB: 9.0E-5 E: 0.1 N: 100.0	2.7E-3 10 1.0E-4 0.1 100.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-7, item 7 Origin: Psychological Scaling Reference: ----- PlantCode: BWR
D/I/C	Subj	READS the Meter Operator reads wrong meter Error Type: COMMISSION Recovery: CONSIDERED	Mean: 4.0E-3 Median: 4.0E-3 EF: --- UCB: 3.0E-2 LCB: 6.0E-4 E: 1.0 N: 166.6	9.7E-3 5 1.2E-3 1.0 166.6	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-7, item 8 Origin: Psychological Scaling Reference: ----- PlantCode: BWR

HEP RAW Data

B-303

NUREG/CR-4639

APPENDIX B. RAW DATA

Vend EqLv	Job Ftl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the Meter Operator reads wrong meter	Mean: Median: 1.0E-2 EF: --- UCB: 5.0E-2 LCB: 1.0E-3 E: N:	1.6E-2 5 2.0E-3 1.0 100.0	ATime: ---:--:-- PTime: ---:--:-- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-7, item 9 Origin: Psychological Scaling Reference: ----- PlantCode: BMR
		Error Type: COMMISSION Recovery: CONSIDERED				
D/I/C	Subj	READS the Meter Operator fails to realize meter is faulty	Mean: Median: 2.0E-2 EF: --- UCB: 1.0E-1 LCB: 2.0E-3 E: N:	3.2E-2 5 4.6E-3 1.0 50.0	ATime: ---:--:-- PTime: ---:--:-- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-8, item 12 Origin: Psychological Scaling Reference: ----- PlantCode: BMR
		Error Type: COMMISSION Recovery: CONSIDERED				
D/I/C	Subj	READS the Meter Operator fails to notice meter out of range	Mean: Median: 3.0E-3 EF: --- UCB: 8.0E-2 LCB: 1.0E-3 E: N:	2.2E-2 27 1.1E-4 0.1 33.3	ATime: ---:--:-- PTime: ---:--:-- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 2-84 pg C-8, item 19 Origin: Psychological Scaling Reference: ----- PlantCode: BMR
		Error Type: OMISSION Recovery: CONSIDERED				
D/I/C	Subj	READS the Meter Personnel fail to read meter properly no specifics on event, location, or sequence	Mean: Median: 4.8E-3 EF: 10 UCB: LCB: 4.8E-4 E: N:	1.3E-2 --- 4.8E-2 4.8E-4 0.1 20.9	ATime: ---:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-12 Origin: Laboratory Reference: ----- PlantCode: ALLP
		Error Type: OMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the Meter Personnel fail to read meter properly no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.8E-3 EF: 10 UCB: LCB: E: N:	4.8E-3 --- 1.8E-2 1.8E-4 0.1 55.1	ATime: ---:---:--- PTime: 00:00:10 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-12 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	READS the Meter Personnel fail to read meter properly no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.0E-3 EF: 10 UCB: LCB: E: N:	2.7E-3 --- 1.0E-2 1.0E-4 0.1 90.5	ATime: ---:---:--- PTime: 00:00:10 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-12 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	READS the Meter Personnel fail to read meter properly no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.3E-3 EF: 10 UCB: LCB: E: N:	3.5E-3 --- 1.3E-2 1.3E-4 0.1 76.0	ATime: ---:---:--- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-12 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	READS the Meter Personnel fail to read meter properly no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-3 0.1 266.0	ATime: ---:---:--- PTime: 00:00:10 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-12 Origin: Laboratory Reference: ----- PlantCode: ALLP

B-305

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
0/1/C	Subj	READS the Meter	Mean:	6.0E-4	ATime: ---:---	Document: 1-82
		Personnel fail to read meter properly	Median: 2.3E-4		PTime: 00:00:10	pg 8-12
		no specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin: Laboratory
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 2.3E-3		Feedback: U	Reference: -----
0/1/C	Subj	READS the Meter	LCB: 2.3E-5		Procedure: U	PlantCode: ALLP
		Personnel fail to read meter properly	E: 0.1		Staffing: U	
		on event, location or sequence.	N: 443.2		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
0/1/C	Subj	READS the Meter	Mean: 3.2E-2	3.2E-2	ATime: ---:---	Document: 1-82
		Personnel fail to read meter properly	Median: 1.2E-2		PTime: ---:---	pg 8-12
		on event, location or sequence.	EF: 10	---	Experience: U	Origin: Field Data
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 1.2E-1		Feedback: U	Reference: 1-67
0/1/C	Subj	READS the Meter	LCB: 1.2E-3		Procedure: U	PlantCode: ALLP
		Personnel fail to read meter properly	E: 0.1		Staffing: U	
		on event, location or sequence.	N: 8.4		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
0/1/C	Subj	READS the Meter	Mean: 1.8E-2	1.8E-2	ATime: ---:---	Document: 1-82
		Personnel fail to read meter properly	Median: 6.6E-3		PTime: ---:---	pg 8-12
		on event, location or sequence.	EF: 10	---	Experience: U	Origin: Field Data
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 6.6E-2		Feedback: U	Reference: 1-67
0/1/C	Subj	READS the Meter	LCB: 6.6E-4		Procedure: U	PlantCode: ALLP
		Personnel fail to read meter properly	E: 0.1		Staffing: U	
		on event, location or sequence.	N: 15.2		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
0/1/C	Subj	READS the Meter	Mean: 1.4E-2	1.4E-2	ATime: ---:---	Document: 1-82
		Personnel fail to read meter properly	Median: 5.1E-3		PTime: ---:---	pg 8-12
		on event, location or sequence. NRA Method = 02.	EF: 10	---	Experience: U	Origin: Field Data
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 5.1E-2		Feedback: U	Reference: 1-67
0/1/C	Subj	READS the Meter	LCB: 5.1E-4		Procedure: U	PlantCode: ALLP
		Personnel fail to read meter properly	E: 0.1		Staffing: U	
		on event, location or sequence.	N: 19.7		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	
0/1/C	Subj	READS the Meter	Mean: 1.4E-2	1.4E-2	ATime: ---:---	Document: 1-82
		Personnel fail to read meter properly	Median: 5.1E-3		PTime: ---:---	pg 8-12
		on event, location or sequence.	EF: 10	---	Experience: U	Origin: Field Data
		Error Type: OMISSION Recovery: CONSIDERED	UCB: 5.1E-2		Feedback: U	Reference: 1-67
0/1/C	Subj	READS the Meter	LCB: 5.1E-4		Procedure: U	PlantCode: ALLP
		Personnel fail to read meter properly	E: 0.1		Staffing: U	
		on event, location or sequence.	N: 19.7		Stress: U	
		Error Type: OMISSION Recovery: CONSIDERED			Supervision: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the Meter Personnel fail to read meter properly on event, location or sequence. Error Type: OMISSION Recovery: CONSIDERED	Mean: 4.5E-3 Median: 1.7E-3 EF: 10 UCB: 1.7E-2 LCB: 1.7E-4 E: 0.1 N: 59.1	4.5E-3 --- 1.7E-2 1.7E-4 0.1 59.1	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-12 Origin: Field Data Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	READS the Meter Personnel fail to read meter properly on event, location or sequence. Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.3E-3 Median: 8.6E-4 EF: 10 UCB: 8.6E-3 LCB: 8.6E-5 E: 0.1 N: 115.6	2.3E-3 --- 8.6E-3 8.6E-5 0.1 115.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-12 Origin: Field Data Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	READS the Meter Personnel fail to read electrical/flow meter correctly Error Type: COMMISSION Recovery: CONSIDERED	Mean: 1.4E-2 Median: 5.3E-3 EF: 10 UCB: 5.3E-2 LCB: 5.3E-4 E: 0.1 N: 19.0	1.4E-2 --- 5.3E-2 5.3E-4 0.1 19.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg C-22 Origin: Field Data Reference: 1-64 PlantCode: ALLP
D/I/C	Subj	MONITORS the Meter Perform check reading of analogue meter Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-3 EF: 3 UCB: 3.0E-3 LCB: 3.3E-4 E: 2.0 N: 2000.0	1.3E-3 --- 3.0E-3 3.3E-4 2.0 2000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-27, item 2 Origin: Subjective Reference: ----- PlantCode: ALLP

B-307

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	MONITORS the Meter Perform check reading of analogue meter	Mean: Median: 2.0E-3 EF: 3 UCB: LCB: 6.7E-4 E: 2.0 N:	2.5E-3 --- 6.0E-3 6.7E-4 2.0 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-27, item 3 Origin: Subjective Reference: ---:---:--- PlantCode: ALLP
		Error Type: COMMISSION Recovery: NOT CONSIDERED				
D/I/C	Subj	MONITORS the Meter Perform check reading of analogue meter	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: 1.0E-3 E: 2.0 N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-27, item 4 Origin: Subjective Reference: ---:---:--- PlantCode: ALLP
		Error Type: COMMISSION Recovery: NOT CONSIDERED				
D/I/C	Subj	READS the Chart Recorder Operator incorrectly interprets chart recorder	Mean: Median: 1.0E-3 EF: --- UCB: 8.0E-3 LCB: 1.0E-4 E: N:	2.2E-3 --- 8 1.3E-4 0.5 500.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-8, item 17 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: BMR
		Error Type: COMMISSION Recovery: CONSIDERED				
D/I/C	Subj	READS the Chart Recorder Operator incorrectly interprets chart recorder	Mean: Median: 1.0E-2 EF: --- UCB: 4.0E-2 LCB: 1.0E-2 E: N:	1.4E-2 --- 4 2.5E-3 1.5 150.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-8, item 18 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: BMR
		Error Type: COMMISSION Recovery: CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLV	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	MONITORS the Chart Recorder Subject fails to read qualitative chart recorder accurately Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.0E-3 EF: 3 UCB: LCB: E: N:	2.5E-3 --- 6.0E-3 6.7E-4 2.0 1000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-27, item 5 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the Chart Recorder Subject fails to read qualitative chart recorder accurately Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.0E-3 EF: 3 UCB: LCB: E: N:	7.5E-3 --- 1.8E-2 2.0E-3 2.0 333.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-27, item 6 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Graphic Display Personnel fail to notice updates in CRT graphics no specifics on event, location, or sequence Error type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.3E-1 EF: 10 UCB: LCB: E: N:	2.8E-1 8 1.0E+0 1.6E-2 0.5 3.9	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Graphic Display Personnel fail to notice updates in CRT graphics no specifics on event, location, or sequence Error type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.5E-2 EF: 10 UCB: LCB: E: N:	2.0E-1 --- 7.5E-1 7.5E-3 0.1 1.3	ATime: ---:---:--- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP

B-309

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
0/1/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.8E-1 EF: 10 UCB: LCB: E: N:	3.1E-1 5 1.0E+0 3.4E-2 1.0 5.4	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
0/1/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.3E-2 EF: 10 UCB: LCB: E: N:	1.9E-1 --- 7.3E-1 7.3E-3 0.1 1.3	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
0/1/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 7.4E-2 EF: 10 UCB: LCB: E: N:	2.0E-1 --- 7.4E-1 7.4E-3 0.1 1.3	ATime: --:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
0/1/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-2 EF: 10 UCB: LCB: E: N:	5.4E-2 --- 2.0E-1 2.0E-3 0.1 4.9	ATime: --:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSfs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-1 EF: 10 UCB: LCB: E: N:	2.0E-1 8 1.0E+0 1.6E-2 0.5 4.0	ATime: ---:---: PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.5E-2 EF: 10 UCB: LCB: E: N:	1.7E-1 --- 6.5E-1 6.5E-3 0.1 1.5	ATime: ---:---: PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.5E-2 EF: 10 UCB: LCB: E: N:	4.1E-2 --- 1.5E-1 1.5E-3 0.1 6.5	ATime: ---:---: PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.2E-2 EF: 10 UCB: LCB: E: N:	3.2E-2 --- 1.2E-1 1.2E-3 0.1 8.2	ATime: ---:---: PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP

B-311

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.7E-1 EF: 10 UCB: LCB: E: N:	3.0E-1 6 1.0E+0 2.9E-2 1.0 5.8	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.1E-2 EF: 10 UCB: LCB: E: N:	1.6E-1 --- 6.1E-1 6.1E-3 0.1 1.6	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 6.2E-2 EF: 10 UCB: LCB: E: N:	1.7E-1 --- 6.2E-1 6.2E-3 0.1 1.6	ATime: --:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 8.3E-3 EF: 10 UCB: LCB: E: N:	2.2E-2 --- 8.3E-2 8.3E-4 0.1 12.0	ATime: --:--:-- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-14 Origin: Laboratory Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.1E+1 EF: 10 UCB: LCB: E: N:	2.7E-1 9 1.0E+0 1.3E-2 0.5 4.4	ATime: ---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-B2 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 5.3E-2 EF: 10 UCB: LCB: E: N:	1.4E-1 --- 5.3E-1 5.3E-3 0.1 1.9	ATime: ---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-B2 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	9.0E-3 --- 3.4E-2 3.4E-4 0.1 29.5	ATime: ---:--- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-B2 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP
D/I/C	Subj	MONITORS the CRT Alphanumeric Display Personnel fail to notice updates in CRT-alphanumeric no specifics on event, location, or sequence Error Type: OMISSION Recovery: CONSIDERED	Mean: Median: 1.9E-4 EF: 10 UCB: LCB: E: N:	5.0E-4 --- 1.9E-3 1.9E-5 0.1 531.9	ATime: ---:--- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-B2 pg B-14 Origin: Laboratory Reference: ----- PlantCode: ALLP

B-313

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	POSITIONS the Two-Position Switches Subject tries to position (turn) a 2-position switch population stereotypes Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-4 EF: 10 UCB: LCB: E: N:	2.7E-4 --- 1.0E-3 1.0E-5 0.1 1000.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 8 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	POSITIONS the Two-Position Switches Subject tries to position (turn) a 2-position switch Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-2 EF: 5 UCB: LCB: E: N:	1.6E-2 --- 5.0E-2 2.0E-3 1.0 100.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 8 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	POSITIONS the Two-Position Switches Subject tries to position (turn) a 2-position switch task performed under high stress Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-1 EF: 5 UCB: LCB: E: N:	1.6E-1 --- 5.0E-1 2.0E-2 1.0 10.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 8 Origin: Subjective Reference: ----- PlantCode: ALLP
O/I/C	Subj	POSITIONS the Two-Position Switches Personnel position 2 position switch Error Type: COMMISSION Recovery: CONSIDERED	Mean: 2.1E-3 Median: 7.9E-4 EF: 10 UCB: LCB: E: N:	2.1E-3 --- 7.9E-3 7.9E-5 0.1 126.6	ATime: ---:--- PTime: 00:02:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg C-22 Origin: Field Data Reference: 1-64 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	SELECTS the Two-Position Switches Operator chooses wrong switch Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 4.0E-3 EF: --- UCB: 3.0E-2 LCB: 6.0E-4 E: --- N: ---	8.5E-3 7 5.3E-4 0.5 125.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-7, item 1 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: BMR
D/I/C	Subj	SELECTS the Two-Position Switches Operator chooses wrong switch Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 2.0E-3 EF: --- UCB: 1.0E-2 LCB: 3.0E-4 E: --- N: ---	3.2E-3 5 4.0E-4 1.0 500.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-7, item 2 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: BMR
D/I/C	Subj	SELECTS the Two-Position Switches Operator chooses wrong switch Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-4 EF: --- UCB: 3.0E-3 LCB: 1.0E-4 E: --- N: ---	9.0E-4 6 8.3E-5 1.0 2000.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-7, item 3 Origin: Psychological Scaling Reference: ---:---:--- PlantCode: BMR
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-5 EF: 10 UCB: --- LCB: --- E: --- N: ---	1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-315

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	8.9E-3 --- 3.4E-2 3.4E-4 0.1 29.8	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.3E-4 EF: 10 UCB: LCB: E: N:	1.4E-3 --- 5.3E-3 5.3E-5 0.1 188.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1333.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1333.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.4E-4 EF: 10 UCB: LCB: E: N:	9.0E-4 --- 3.4E-3 3.4E-5 0.1 295.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-4 EF: 10 UCB: LCB: E: N:	4.0E-4 --- 1.5E-3 1.5E-5 0.1 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-3 EF: 10 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.6E-4 EF: 10 UCB: LCB: E: N:	7.0E-4 --- 2.6E-3 2.6E-5 0.1 380.2	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-317

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend SQLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
0/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.1E-3 EF: 10 UCB: LCB: E: N:	5.6E-3 --- 2.1E-2 2.1E-4 0.1 47.5	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-4 EF: 10 UCB: LCB: E: N:	4.0E-4 --- 1.5E-3 1.5E-5 0.1 666.6	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 9.0E-4 EF: 10 UCB: LCB: E: N:	2.4E-3 --- 9.0E-3 9.0E-5 0.1 110.7	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
D/I/C	Subj	<p>SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton</p> <p>No specifics on event, location, or sequence</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: Median: 3.8E-5 EF: 10 UCB: LCB: E: N:</p>	<p>1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5</p>	<p>ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg B-3 Origin: - Laboratory Reference: 1-67 PlantCode: ALLP</p>
D/I/C	Subj	<p>SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton</p> <p>No specifics on event, location, or sequence</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: Median: 1.1E-4 EF: 10 UCB: LCB: E: N:</p>	<p>3.0E-4 --- 1.1E-3 1.1E-5 0.1 886.5</p>	<p>ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg B-3 Origin: - Laboratory Reference: 1-67 PlantCode: ALLP</p>
D/I/C	Subj	<p>SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton</p> <p>No specifics on event, location, or sequence</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:</p>	<p>2.8E-3 --- 7.5E-3 7.9E-5 0.1 132.9</p>	<p>ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg B-3 Origin: - Laboratory Reference: 1-67 PlantCode: ALLP</p>
D/I/C	Subj	<p>SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton</p> <p>No specifics on event, location, or sequence</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: Median: 3.0E-5 EF: 10 UCB: LCB: E: N:</p>	<p>1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5</p>	<p>ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg B-3 Origin: - Laboratory Reference: 1-67 PlantCode: ALLP</p>

B-319

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend)	Mean:	2.0E-4	ATime: ---:--	Document: 1-82
		Personnel fail to select appropriate pushbutton	Median: 7.5E-5		PTime: ---:--	pg B-3
		EF: 10	---		Experience: U	Origin:
		No specifics on event, location, or sequence	UCB: 7.5E-4		Feedback: U	Laboratory
		Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 7.5E-6		Procedure: U	Reference: 1-67
			E: 0.1		Staffing: U	PlantCode: ALLP
			N: 1329.7		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend)	Mean:	1.4E-3	ATime: ---:--	Document: 1-82
		Personnel fail to select appropriate pushbutton	Median: 5.3E-4		PTime: ---:--	pg B-3
		EF: 10	---		Experience: U	Origin:
		No specifics on event, location, or sequence	UCB: 5.3E-3		Feedback: U	Laboratory
		Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 5.3E-5		Procedure: U	Reference: 1-67
			E: 0.1		Staffing: U	PlantCode: ALLP
			N: 190.1		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
O/I/C	Subj	SELECTS the Push-Button (Illuminated Legend)	Mean:	1.0E-4	ATime: ---:--	Document: 1-82
		Personnel fail to select appropriate pushbutton	Median: 3.8E-5		PTime: ---:--	pg B-3
		EF: 10	---		Experience: U	Origin:
		No specifics on event, location, or sequence	UCB: 3.8E-4		Feedback: U	Laboratory
		Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 3.7E-6		Procedure: U	Reference: 1-67
			E: 0.1		Staffing: U	PlantCode: ALLP
			N: 2659.5		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	
O/I/C	Subj	SELECTS the Push-Button (Illuminated Legend)	Mean:	2.0E-4	ATime: ---:--	Document: 1-82
		Personnel fail to select appropriate pushbutton	Median: 7.5E-5		PTime: ---:--	pg B-3
		EF: 10	---		Experience: U	Origin:
		No specifics on event, location, or sequence	UCB: 7.5E-4		Feedback: U	Laboratory
		Error Type: COMMISSION Recovery: NOT CONSIDERED	LCB: 7.5E-6		Procedure: U	Reference: 1-67
			E: 0.1		Staffing: U	PlantCode: ALLP
			N: 1329.7		Stress: U	
					Supervision: U	
					Tagging: U	
					Training: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.5E-6 EF: 10 UCB: LCB: E: N:	1.2E-3 --- 4.5E-3 4.5E-5 0.1 221.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend) Personnel fail to select appropriate pushbutton No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 265.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-321

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	SELECTS the Push-Button (Illuminated Legend)	Mean:	1.0E-4	ATime: ---:---	Document: 1-82
		Personnel fail to select appropriate pushbutton	Median: 3.0E-5		PTime: ---:---	pg 8-3
		EF: 10	---		Experience: U	Origin:
		No specifics on event, location, or sequence	UCB: 3.8E-4		Feedback: U	Laboratory
D/I/C	Subj	SELECTS the Push-Button (Other)	Mean:	1.4E-3	ATime: ---:---	Document: 1-82
		Operator improperly uses (selects) pushbuttons	Median: 5.2E-4		PTime: 00:00:02	pg A-17
		EF: 10	---		Experience: U	Origin:
		concise positioning; no info on event, location, or sequence; pt=1.44sec	UCB: 5.2E-3		Feedback: U	Laboratory
D/I/C	Subj	SELECTS the Push-Button (Other)	Mean:	1.6E-3	ATime: ---:---	Document: 1-82
		Operator improperly uses (selects) pushbuttons	Median: 6.0E-4		PTime: 00:00:03	pg A-17
		EF: 10	---		Experience: U	Origin:
		concise positioning; no info on event, location, or sequence; pt=2.11sec	UCB: 6.0E-3		Feedback: U	Laboratory
D/I/C	Subj	SELECTS the Push-Button (Other)	Mean:	2.1E-3	ATime: ---:---	Document: 1-82
		Operator improperly uses (selects) pushbuttons	Median: 7.9E-4		PTime: 00:00:04	pg A-17
		EF: 10	---		Experience: U	Origin:
		concise positioning; no info on event, location, or sequence; pt=3.31sec	UCB: 7.9E-3		Feedback: U	Laboratory

APPENDIX B. RAW DATA

Vend EqLv	Job Tct	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
0/1/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons concise positioning; no info on event, location, or sequence; pt=0.69sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.1E-3 EF: 10 UCB: LCB: E: N:	1.9E-2 --- 7.1E-2 7.1E-4 0.1 14.0	ATime: --- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons concise positioning; no info on event, location, or sequence; pt=1.36sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.9E-4 EF: 10 UCB: LCB: E: N:	2.1E-3 --- 7.9E-3 7.9E-5 0.1 126.9	ATime: --- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons concise positioning; no info on event, location, or sequence; pt=2.56sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.9E-4 EF: 10 UCB: LCB: E: N:	2.1E-3 --- 7.9E-3 7.9E-5 0.1 126.9	ATime: --- PTime: 00:00:03 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons gross positioning; no info on event, location, or sequence; pt=1.94sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.1E-4 EF: 10 UCB: LCB: E: N:	1.9E-3 --- 7.1E-3 7.1E-5 0.1 140.0	ATime: --- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

B-323

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFa	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons guous positioning; no info on event, location, or sequence; pt=2.61sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.9E-4 EF: 10 UCB: LCB: E: N:	2.4E-3 --- 7.9E-3 7.9E-5 0.1 126.9	ATime: ---:---:--- PTime: 00:00:03 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons guous positioning; no info on event, location, or sequence; pt=3.81sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 9.8E-4 EF: 10 UCB: LCB: E: N:	2.6E-3 --- 9.0E-3 9.0E-5 0.1 102.4	ATime: ---:---:--- PTime: 00:00:04 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons guous positioning; no info on event, location, or sequence; pt=1.19sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 9.0E-4 EF: 10 UCB: LCB: E: N:	2.4E-3 --- 9.0E-3 9.0E-5 0.1 111.2	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons guous positioning; no info on event, location, or sequence; pt=1.86sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 9.8E-4 EF: 10 UCB: LCB: E: N:	2.6E-3 --- 9.8E-3 9.8E-5 0.1 102.5	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend Eq.v	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons cise positioning; no info on event, location, or sequence; pt=3.06sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.2E-3 EF: 10 UCB: LCB: E: N:	3.1E-3 --- 1.2E-2 1.2E-4 0.1 86.2	ATime: --:--:-- PTime: 00:00:04 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons cise positioning; no info on event, location, or sequence; pt=1.32sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 266.6	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons cise positioning; no info on event, location, or sequence; pt=1.99sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.5E-4 EF: 10 UCB: LCB: E: N:	1.2E-3 --- 4.5E-3 4.5E-5 0.1 221.7	ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons cise positioning; no info on event, location, or sequence; pt=3.19sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.4E-4 EF: 10 UCB: LCB: E: N:	1.7E-3 --- 6.4E-3 6.4E-5 0.1 156.7	ATime: --:--:-- PTime: 00:00:04 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

B-325

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLV	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
0/1/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons concise positioning; no info on event, location, or sequence; pt=0.57sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.6E-4 EF: 10 UCB: LCB: E: 0.1 N:	1.5E-3 --- 5.6E-3 5.6E-5 0.1 177.6	ATime: ---:---:--- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons concise positioning; no info on event, location, or sequence; pt=1.24sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.4E-4 EF: 10 UCB: LCB: E: 0.1 N:	1.7E-3 --- 6.4E-3 6.4E-5 0.1 156.7	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons concise positioning; no info on event, location, or sequence; pt=2.44sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 8.3E-4 EF: 10 UCB: LCB: E: 0.1 N:	2.2E-3 --- 8.3E-3 8.3E-5 0.1 121.2	ATime: ---:---:--- PTime: 00:00:03 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons guage positioning; no info on event, location, or sequence; pt=1.82sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.6E-4 EF: 10 UCB: LCB: E: 0.1 N:	1.5E-3 --- 5.6E-3 5.6E-5 0.1 177.6	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	<p>SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons</p> <p>guous positioning; no info on event, location, or sequence; pt=2.49sec</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 2.2E-3 Median: 8.3E-4 EF: 10 UCB: 8.3E-3 LCB: 8.3E-5 E: 0.1 N: 121.2</p>	<p>2.2E-3 --- 8.3E-3 8.3E-5 0.1 121.2</p>	<p>ATime: ---:---:--- PTime: 00:00:03 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP</p>
D/I/C	Subj	<p>SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons</p> <p>guous positioning; no info on event, location, or sequence; pt=3.19sec</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 1.7E-3 Median: 6.4E-4 EF: 10 UCB: 6.4E-3 LCB: 6.4E-5 E: 0.1 N: 156.7</p>	<p>1.7E-3 --- 6.4E-3 6.4E-5 0.1 156.7</p>	<p>ATime: ---:---:--- PTime: 00:00:04 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP</p>
D/I/C	Subj	<p>SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons</p> <p>guous positioning; no info on event, location, or sequence; pt=1.08sec</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 2.0E-3 Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N: 133.3</p>	<p>2.0E-3 --- 7.5E-3 7.5E-5 0.1 133.3</p>	<p>ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP</p>
D/I/C	Subj	<p>SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons</p> <p>guous positioning; no info on event, location, or sequence; pt=1.74sec</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 2.2E-3 Median: 8.3E-4 EF: 10 UCB: 8.3E-3 LCB: 8.3E-5 E: 0.1 N: 121.0</p>	<p>2.2E-3 --- 8.3E-3 8.3E-5 0.1 121.0</p>	<p>ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP</p>

B-327

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend Eq/V	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLARR calc		
D/I/C	Subj	SELECTS the Push-Button (Other) Operator improperly uses (selects) pushbuttons guinea positioning; no info on event, location, or sequence; pt=2.94sec Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.4E-4 EF: 10 UCB: LCB: E: N:	3.6E-4 --- 1.4E-3 1.4E-5 0.1 740.7	ATime: ---:--:-- PTime: 00:00:03 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-17 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.5E-4 EF: 10 UCB: LCB: E: N:	1.2E-3 --- 4.5E-3 4.5E-5 0.1 221.7	ATime: ---:--:-- PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-5 EF: 10 UCB: LCB: E: N:	1.0E-4 --- 3.0E-4 3.7E-6 0.1 2659.5	ATime: ---:--:-- PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 265.9	ATime: ---:--:-- PTime: ---:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

APPENDIX B. RAM DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFa	Document Information
			RAM	NUCLAMR calc		
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.8E-5 EF: 10 UCB: LCB: E: N:	1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.8E-5 EF: 10 UCB: LCB: E: N:	1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-329

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.3E-4 EF: 10 UCB: LCB: E: N:	1.4E-3 --- 5.3E-3 5.3E-5 0.1 190.1	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.4E-3 EF: 10 UCB: LCB: E: N:	8.9E-3 --- 3.4E-2 3.4E-4 0.1 29.8	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.3E-4 EF: 10 UCB: LCB: E: N:	1.4E-3 --- 5.3E-3 5.3E-5 0.1 188.6	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1333.3	ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
0/1/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-5 EF: 10 UCB: LCB: E: N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1333.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: --- Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.4E-4 EF: 10 UCB: LCB: E: N:	9.0E-4 --- 3.4E-3 3.4E-5 0.1 295.8	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: --- Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.1E-3 EF: 10 UCB: LCB: E: N:	5.6E-3 --- 2.1E-2 2.1E-4 0.1 47.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: --- Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-4 EF: 10 UCB: LCB: E: N:	4.0E-4 --- 1.5E-3 1.5E-5 0.1 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: --- Laboratory Reference: 1-67 PlantCode: ALLP

B-331

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSfs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	Mean:	7.0E-4	ATime: --:--:--	Document: 1-82
		Personnel fail to select appropriate switch position	Median: 2.6E-4		PTime: --:--:--	pg 8-3
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin: Laboratory
		Error Type: COMMISSION Recovery: NOT CONSIDERED	UCB: 2.6E-3		Feedback: U	Reference: 1-67
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	LCB: 2.6E-5		Procedure: U	PlantCode: ALLP
		Personnel fail to select appropriate switch position	E: 0.1		Staffing: U	
		No specifics on event, location, or sequence	N: 380.2		Stress: U	
		Error Type: COMMISSION Recovery: NOT CONSIDERED			Supervision: U	
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	Mean:	4.0E-3	ATime: --:--:--	Document: 1-82
		Personnel fail to select appropriate switch position	Median: 1.5E-3		PTime: --:--:--	pg 8-3
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin: Laboratory
		Error Type: COMMISSION Recovery: NOT CONSIDERED	UCB: 1.5E-2		Feedback: U	Reference: 1-67
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	LCB: 1.5E-4		Procedure: U	PlantCode: ALLP
		Personnel fail to select appropriate switch position	E: 0.1		Staffing: U	
		No specifics on event, location, or sequence	N: 66.6		Stress: U	
		Error Type: COMMISSION Recovery: NOT CONSIDERED			Supervision: U	
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	Mean:	2.0E-4	ATime: --:--:--	Document: 1-82
		Personnel fail to select appropriate switch position	Median: 7.5E-5		PTime: --:--:--	pg 8-3
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin: Laboratory
		Error Type: COMMISSION Recovery: NOT CONSIDERED	UCB: 7.5E-4		Feedback: U	Reference: 1-67
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	LCB: 7.5E-6		Procedure: U	PlantCode: ALLP
		Personnel fail to select appropriate switch position	E: 0.1		Staffing: U	
		No specifics on event, location, or sequence	N: 1329.7		Stress: U	
		Error Type: COMMISSION Recovery: NOT CONSIDERED			Supervision: U	
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	Mean:	4.0E-4	ATime: --:--:--	Document: 1-82
		Personnel fail to select appropriate switch position	Median: 1.5E-4		PTime: --:--:--	pg 8-3
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin: Laboratory
		Error Type: COMMISSION Recovery: NOT CONSIDERED	UCB: 1.5E-3		Feedback: U	Reference: 1-67
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	LCB: 1.5E-5		Procedure: U	PlantCode: ALLP
		Personnel fail to select appropriate switch position	E: 0.1		Staffing: U	
		No specifics on event, location, or sequence	N: 666.6		Stress: U	
		Error Type: COMMISSION Recovery: NOT CONSIDERED			Supervision: U	
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	Mean:	4.0E-4	ATime: --:--:--	Document: 1-82
		Personnel fail to select appropriate switch position	Median: 1.5E-4		PTime: --:--:--	pg 8-3
		No specifics on event, location, or sequence	EF: 10	---	Experience: U	Origin: Laboratory
		Error Type: COMMISSION Recovery: NOT CONSIDERED	UCB: 1.5E-3		Feedback: U	Reference: 1-67
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position	LCB: 1.5E-5		Procedure: U	PlantCode: ALLP
		Personnel fail to select appropriate switch position	E: 0.1		Staffing: U	
		No specifics on event, location, or sequence	N: 666.6		Stress: U	
		Error Type: COMMISSION Recovery: NOT CONSIDERED			Supervision: U	

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 9.0E-4 EF: 10 UCB: LCB: E: N:	2.4E-3 --- 9.0E-3 9.0E-5 0.1 110.8	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.8E-5 EF: 10 UCB: LCB: E: N:	1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.1E-4 EF: 10 UCB: LCB: E: N:	3.0E-4 --- 1.1E-3 1.1E-5 0.1 886.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.5E-4 EF: 10 UCB: LCB: E: N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 132.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-333

NUREG/CR-4639

HIEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Row	NUCLEAR catc		
D/I/C	Subj	SELECTS the Toggle Switch/Two-Position Personnel fail to select appropriate switch position	Mean: 3.8E-5 Median: 3.8E-5 EF: 10 UCB: 3.8E-4 LCB: 3.7E-6 E: 0.1 N: 2659.5	1.0E-4 ---	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 1-B2 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
		No specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED				
D/I/C	Subj	POSITIONS the Knob Personnel positions "zero-in" knob	Mean: 3.8E-3 Median: 1.4E-3 EF: 10 UCB: 1.4E-2 LCB: 1.4E-4 E: 0.1 N: 70.0	3.8E-3 ---	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 1-B2 pg C-22 Origin: Field Data Reference: 1-64 PlantCode: ALLP
		Error Type: COMMISSION Recovery: CONSIDERED				
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key	Mean: 8.9E-3 Median: 3.5E-3 EF: 10 UCB: 3.5E-2 LCB: 3.5E-4 E: 0.1 N: 28.5	9.3E-3 ---	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 1-B2 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
		on event, location or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED				
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key	Mean: 1.4E-3 Median: 5.3E-4 EF: 10 UCB: 5.3E-3 LCB: 5.3E-5 E: 0.1 N: 188.6	1.4E-3 ---	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 1-B2 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
		on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED				

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NAELARR calc		
0/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.0E-4 Median: 7.5E-5 EF: 10 UCB: 7.5E-4 LCB: 7.5E-6 E: 0.1 N: 1333.3	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1333.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.0E-4 Median: 7.5E-5 EF: 10 UCB: 7.5E-4 LCB: 7.5E-6 E: 0.1 N: 1333.3	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1333.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 9.0E-4 Median: 3.4E-4 EF: 10 UCB: 3.4E-3 LCB: 3.4E-5 E: 0.1 N: 295.8	9.0E-4 --- 3.4E-3 3.4E-5 0.1 295.8	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 5.6E-3 Median: 2.1E-3 EF: 10 UCB: 2.1E-2 LCB: 2.1E-4 E: 0.1 N: 47.5	5.6E-3 --- 2.1E-2 2.1E-4 0.1 47.5	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-335

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
0/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 4.0E-4 Median: 1.5E-4 EF: 10 UCB: 1.5E-3 LCB: 1.5E-5 E: 0.1 N:	4.0E-4 --- 1.5E-3 1.5E-5 0.1 666.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 4.0E-3 Median: 1.5E-3 EF: 10 UCB: 1.5E-2 LCB: 1.5E-4 E: 0.1 N:	4.0E-3 --- 1.5E-2 1.5E-4 0.1 66.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 7.0E-4 Median: 2.6E-4 EF: 10 UCB: 2.6E-3 LCB: 2.6E-5 E: 0.1 N:	6.9E-4 --- 2.6E-3 2.6E-5 0.1 386.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.0E-3 Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 132.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLV	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
9/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 4.0E-4 Median: 1.5E-4 EF: 10 UCB: 1.5E-3 LCB: 1.5E-5 E: 0.1 N: 666.6	4.0E-4 --- 1.5E-3 1.5E-5 0.1 666.6	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.4E-3 Median: 9.0E-4 EF: 10 UCB: 9.0E-3 LCB: 9.0E-5 E: 0.1 N: 110.8	2.4E-3 --- 9.0E-3 9.0E-5 0.1 110.8	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.0E-4 Median: 3.0E-5 EF: 10 UCB: 3.8E-4 LCB: 3.7E-6 E: 0.1 N: 2659.5	1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3, item 7 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
0/1/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 3.0E-4 Median: 1.1E-4 EF: 10 UCB: 1.1E-3 LCB: 1.1E-5 E: 0.1 N: 886.5	3.0E-4 --- 1.1E-3 1.1E-5 0.1 886.5	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-337

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.0E-3 Median: 7.5E-4 EF: 10 UCB: 7.5E-3 LCB: 7.5E-5 E: 0.1 N:	2.0E-3 --- 7.5E-3 7.5E-5 0.1 132.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.0E-4 Median: 3.8E-5 EF: 10 UCB: 3.8E-4 LCB: 3.7E-6 E: 0.1 N:	1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3, item ?? Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.0E-4 Median: 7.5E-5 EF: 10 UCB: 7.5E-4 LCB: 7.5E-6 E: 0.1 N:	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.4E-3 Median: 5.3E-4 EF: 10 UCB: 5.3E-3 LCB: 5.3E-5 E: 0.1 N:	1.4E-3 --- 5.3E-3 5.3E-5 0.1 190.1	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg B-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

APPENDIX B. RAW DATA

Yend EqLv	Job Titl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.0E-4 Median: 7.5E-5 EF: 10 UCB: 7.5E-4 LCB: 7.5E-6 E: 0.1 N: 1329.7	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.0E-4 Median: 3.8E-5 EF: 10 UCB: 3.8E-4 LCB: 3.7E-6 E: 0.1 N: 2699.5	1.0E-4 --- 3.8E-4 3.7E-6 0.1 2699.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3, item 777 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 1.0E-5 Median: 3.8E-4 EF: 10 UCB: 3.8E-3 LCB: 3.8E-5 E: 0.1 N: 265.9	1.0E-5 --- 3.8E-3 3.8E-5 0.1 265.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP
D/I/C	Subj	SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 2.0E-4 Median: 7.5E-5 EF: 10 UCB: 7.5E-4 LCB: 7.5E-6 E: 0.1 N: 1329.7	2.0E-4 --- 7.5E-4 7.5E-6 0.1 1329.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg 8-3 Origin: Laboratory Reference: 1-67 PlantCode: ALLP

B-339

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
0/1/C	Subj	<p>SELECTS the Keylock Personnel fail to select appropriate key on event, location, or sequence</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 1.0E-4 Median: 3.8E-5 EF: 10 UCB: 3.8E-4 LCB: 3.7E-6 E: 0.1 M: 2659.5</p>	<p>1.0E-4 --- 3.8E-4 3.7E-6 0.1 2659.5</p>	<p>ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg B-3, item 7777 Origin: Laboratory Reference: 1-67 PlantCode: ALLP</p>
0/1/C	Subj	<p>POSITIONS the Multiposition Selectors Operator sets switch to wrong position</p> <p>Error Type: COMMISSION Recovery: CONSIDERED</p>	<p>Mean: --- Median: 3.0E-3 EF: --- UCB: 2.0E-2 LCB: 5.0E-4 E: --- M: 166.6</p>	<p>5.8E-3 7 4.5E-4 0.5 166.6</p>	<p>ATime: ---:--- PTime: ---:--- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 2-84 pg C-6, item 20 Origin: Psychological Scaling Reference: --- PlantCode: BLR</p>
0/1/C	Subj	<p>POSITIONS the Multiposition Selectors SPN mode selector switch A not left in auto position sequence; local; evapre 1e,poa; therp</p> <p>Error Type: OMISSION Recovery: CONSIDERED</p>	<p>Mean: --- Median: 3.0E-3 EF: 10 UCB: 3.0E-2 LCB: 3.0E-4 E: --- M: 33.3</p>	<p>8.0E-3 --- 0.1 33.3</p>	<p>ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-87 ch IV, pg 200, #13 Origin: Analytic Reference: 4-87 PlantCode: 6681</p>
0/1/C	Subj	<p>POSITIONS the Multiposition Selectors Personnel positions multiple position switch</p> <p>Error Type: COMMISSION Recovery: CONSIDERED</p>	<p>Mean: 2.8E-3 Median: 1.1E-3 EF: 10 UCB: 1.1E-2 LCB: 1.1E-4 E: 0.1 M: 95.0</p>	<p>2.8E-3 --- 1.1E-2 1.1E-4 0.1 95.0</p>	<p>ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg C-22 Origin: Field Data Reference: 1-64 PlantCode: ALLP</p>

APPENDIX B. RAW DATA

Vend EqLv	Job Tit	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	POSITIONS the J-Handle Switch Operator fails to remove pull lock condition	Mean: Median: 2.7E-3 EF: 10 UCB: 2.7E-2 LCB: 2.7E-4 E: 0.1 N: 37.5	7.1E-3 --- 2.7E-2 2.7E-4 0.1 37.5	ATime: --1--1-- PTime: --1--2-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 5-88 table 4.9-4, #19 Origin: Analytic Reference: ----- PlantCode: SP51
		Error Type: OMISSION Recovery: CONSIDERED				
D/I/C	Subj	POSITIONS the Rotary Switch Subject attempts to position (turn) rotary control types	Mean: Median: 5.0E-4 EF: 10 UCB: 5.0E-3 LCB: 5.0E-5 E: 0.1 N: 200.0	1.3E-3 --- 5.0E-3 5.0E-5 0.1 200.0	ATime: --1--1-- PTime: --1--2-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 5 Origin: Subjective Reference: ----- PlantCode: ALIP
		Error Type: COMMISSION Recovery: NOT CONSIDERED				
D/I/C	Subj	POSITIONS the Rotary Switch Operator turns rotary switch in wrong direction	Mean: Median: 5.0E-4 EF: --- UCB: 4.0E-3 LCB: 0.0E-5 E: 0.5 N: 1000.0	1.1E-3 8 6.3E-5 0.5 1000.0	ATime: --1--1-- PTime: --1--2-- Experience: 3 Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-7, item 4 Origin: Psychological Scaling Reference: ----- PlantCode: NLR
		Error Type: COMMISSION Recovery: CONSIDERED				
D/I/C	Subj	POSITIONS the Rotary Switch Subject attempts to position (turn) rotary control high stress	Mean: Median: 5.0E-1 EF: 5 UCB: 1.0E+0 LCB: 2.5E-1 E: 0.0 N: 12.0	5.5E-1 2 1.0E+0 2.5E-1 0.0 12.0	ATime: --1--1-- PTime: --1--2-- Experience: U Feedback: U Procedure: U Staffing: U Stress: 4 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 7 Origin: Subjective Reference: ----- PlantCode: ALIP
		Error Type: COMMISSION Recovery: NOT CONSIDERED				

B-341

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
0/I/C	Subj	POSITIONS the Rotary Switch Subject attempts to position (turn) rotary control conditions Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-2 EF: 5 UCB: LCB: E: N:	8.1E-2 --- 2.5E-1 1.0E-2 1.0 20.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 6 Origin: Subjective Reference: ----- PlantCode: ALLP
0/I/C	Subj	POSITIONS the Rotary Switch Subject improperly positions rotary switch sequence; remote; evs-pre-ic, pos; therp Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.0E-4 EF: 10 UCB: LCB: E: N:	1.1E-3 --- 4.0E-3 4.0E-5 0.1 250.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 9 Origin: Subjective Reference: ----- PlantCode: ALLP
0/I/C	Subj	ADJUSTS the Continuously Variable Controls Subject fails to hold switch until change of state complete Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 3 UCB: LCB: E: N:	3.8E-3 --- 9.0E-3 1.0E-3 2.0 666.6	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 10 Origin: Subjective Reference: ----- PlantCode: ALLP
0/I/C	Subj	ADJUSTS the Continuously Variable Controls Subject fail to hold switch until change of state complete Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: 3.0E-3 Median: 2.4E-3 EF: 3 UCB: LCB: E: N:	3.0E-3 --- 7.1E-3 7.9E-4 2.0 840.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-28, item 10 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLAAR calc		
D/I/C	Subj	CALCULATES the Calculator Personnel attempt simple arithmetic calculations Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-2 EF: 3 UCB: LCB: E: N:	1.3E-2 --- 3.0E-2 3.3E-3 2.0 200.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-26, item 10 Origin: --- Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	CALCULATES the Calculator Use calculator very inaccurately Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-2 EF: 5 UCB: LCB: E: N:	8.1E-2 --- 2.5E-1 1.0E-2 1.0 20.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-26, item 11 Origin: --- Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	CALCULATES the Calculator Personnel attempt simple arithmetic calculations Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-1 EF: 3 UCB: LCB: E: N:	1.3E-1 --- 3.0E-1 3.3E-2 2.0 20.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-26, item 10 Origin: --- Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	CALCULATES the Calculator Use calculator very inaccurately Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 5.0E-1 EF: 5 UCB: LCB: E: N:	5.5E-1 2 1.0E+0 2.5E-1 6.0 12.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 4 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-26, item 11 Origin: --- Subjective Reference: ----- PlantCode: ALLP

B-343

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	USES the Printed Communications Subject fails to use valve change or restoration list Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-2 EF: 3 UCB: LCB: E: N:	1.3E-2 --- 3.0E-2 3.3E-3 2.0 200.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-22, item 5 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	USES the Printed Communications Subject fails to use checklist properly checklist for written entries (e.g. display readings, etc.) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-1 EF: 5 UCB: LCB: E: N:	5.5E-1 2 1.0E+0 2.5E-1 6.0 12.0	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-22, item 8 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	WRITES the Printed Communications Subject omits step in written communication Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.8E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 1 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	WRITES the Printed Communications Subject incorrectly writes step in written communication reading & writing errors assumed; technical errors not addressed Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.8E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 3 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			RAM	NUCLARR calc		
D/I/C	Subj	WRITES the Tag Subject omits step in written communication Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.8E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 1 Origin: Subjective Reference: --- PlantCode: ALLP
D/I/C	Subj	WRITES the Tag Subject incorrectly writes step in written communication reading & writing errors assumed; technical info errors not addressed Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.8E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 3 Origin: Subjective Reference: --- PlantCode: ALLP
D/I/C	Subj	WRITES the Log Book Subject omits step in written communication Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.8E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 1 Origin: Subjective Reference: --- PlantCode: ALLP
D/I/C	Subj	WRITES the Log Book Subject incorrectly writes step in written communication reading & writing errors assumed; technical info errors not addressed Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.8E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: --- PTime: --- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 3 Origin: Subjective Reference: --- PlantCode: ALLP

B-345

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	WRITES the Administrative Procedure Subject omits step in written communication Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: M:	4.0E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 1 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	WRITES the Administrative Procedure Subject incorrectly writes step in written communication reading & writing errors assumed; technical info errors not addressed Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: --- LCB: E: M:	4.0E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 3 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	USES the Operating Procedure Subject fails to use written operations procedure Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.0E-2 EF: 3 UCB: LCB: E: M:	1.3E-2 --- 3.0E-2 3.3E-3 2.0 200.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 1 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-22, item 3 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	USES the Operating Procedure Subject fails to use written operations procedure Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-3 EF: 10 UCB: LCB: E: M:	1.3E-2 --- 5.0E-2 5.0E-4 0.1 20.0	ATime: ---:---: PTime: ---:---: Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 3 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-22, item 4 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
0/1/C	Subj	SELECTS the Operating Procedure ORD fails to enter procedure per attachment HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 1.5E-2 Median: 1.2E-2 EF: 3 UCB: 3.6E-2 LCB: 4.0E-3 E: 2.0 N: 168.0	1.5E-2 --- 3.6E-2 4.0E-3 2.0 168.0	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C5-6 (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
0/1/C	Subj	SELECTS the Operating Procedure ORD fails to enter appropriate procedure Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.7E-2 Median: 1.0E-2 EF: 10 UCB: 1.0E-1 LCB: 1.0E-3 E: 0.1 N: 9.9	2.7E-2 --- 1.0E-1 1.0E-3 0.1 9.9	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C1-E (THERP #4) Origin: Analytic Reference: 1-83 PlantCode: CE
0/1/C	Subj	SELECTS the Operating Procedure ORD fails to enter proper sect of proc (SDC Malfunction) Seq = FTDQM (ISLOCA; seq. 5); Post-i.e.; HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.7E-2 Median: 1.0E-2 EF: 10 UCB: 1.0E-1 LCB: 1.0E-3 E: 0.1 N: 9.9	2.7E-2 --- 1.0E-1 1.0E-3 0.1 9.9	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C15-D (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
0/1/C	Subj	SELECTS the Operating Procedure ORD fails to enter proper proc (for shutdown cooling malfunction) Post-i.e.; HRA Method = THERP Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.7E-2 Median: 1.0E-2 EF: 10 UCB: 1.0E-1 LCB: 1.0E-3 E: 0.1 N: 9.9	2.7E-2 --- 1.0E-1 1.0E-3 0.1 9.9	ATime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: N Training: 2	Document: 2-92 C13-b (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE

B-347

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend Eqlv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	VERIFIES the Operating Procedure Supervisor fails to direct CRO to enter procedure Error Factor = 2.3 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.3E-1 Median: 3.0E-1 EF: 2 UCB: --- LCB: 6.1E-1 E: 1.5E-1 N: 6.0 19.7	3.3E-1 --- 6.1E-1 1.5E-1 6.0 19.7	Atime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C1-F (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE
D/I/C	Subj	VERIFIES the Operating Procedure Supervisor (CRO) fails to verify entry into procedure per attachment NRA Method = THERP; Error factor = 2.3 Error Type: OMISSION Recovery: CONSIDERED	Mean: 3.3E-1 Median: 3.0E-1 EF: 2 UCB: --- LCB: 6.1E-1 E: 1.5E-1 N: 6.0 19.7	3.3E-1 --- 6.1E-1 1.5E-1 6.0 19.7	Atime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C5-H (THERP #1) Origin: Analytic Reference: 1-83 PlantCode: CE
D/I/C	Subj	VERIFIES the Operating Procedure Supervisor (CRO) fails to direct CRO to enter proper procedure Seq = FTDGM (ISLOCA); Post-i.e.; NRA Method = THERP; Error factor = 2.5 Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.8E-1 Median: 2.4E-1 EF: 3 UCB: --- LCB: 7.3E-1 E: 8.1E-2 N: 2.0 8.2	3.0E-1 --- 7.3E-1 8.1E-2 2.0 8.2	Atime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C15-E (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE
D/I/C	Subj	VERIFIES the Operating Procedure CRO (Supervisor) fails to direct CRO to enter procedure Seq = FTD (ISLOCA); Post-i.e.; NRA Method = THERP; Error factor = 2.5 Error Type: OMISSION Recovery: CONSIDERED	Mean: 2.8E-1 Median: 2.4E-1 EF: 3 UCB: --- LCB: 7.3E-1 E: 8.1E-2 N: 2.0 8.2	3.0E-1 --- 7.3E-1 8.1E-2 2.0 8.2	Atime: ---:---:--- PTime: ---:---:--- Experience: 3 Feedback: U Procedure: 3 Staffing: 3 Stress: 3 Supervision: 3 Tagging: M Training: 2	Document: 2-92 C13-E (THERP #3) Origin: Analytic Reference: 1-83 PlantCode: CE

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	WRITES the Operating Procedure Subject omits step in written communication Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.8E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 1 Origin: Subjective Reference: ---:---:--- PlantCode: ALLP
D/I/C	Subj	WRITES the Operating Procedure Subject incorrectly writes step in written communication reading & writing errors assumed; technical info errors not addressed Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.8E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 3 Origin: Subjective Reference: ---:---:--- PlantCode: ALLP
D/I/C	Subj	USES the Maintenance Procedure Subject fails to use written maintenance procedure Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-1 EF: 5 UCB: LCB: E: N:	3.9E-1 3 1.0E+0 9.0E-2 2.0 6.6	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 0 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-22, item 7 Origin: Subjective Reference: ---:---:--- PlantCode: ALLP
D/I/C	Subj	WRITES the Maintenance Procedure Subject omits step in written communication Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.8E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 1 Origin: Subjective Reference: ---:---:--- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	WRITES the Maintenance Procedure Subject incorrectly writes step in written communication reading & writing errors assumed; technical info errors not addressed Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 3 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	USES the Test Or Calibration Procedure Subject fails to use written test/calibration procedure Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.0E-2 EF: 5 UCB: LCB: E: N:	8.1E-2 --- 2.5E-1 1.0E-2 1.0 20.0	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-22, item 6 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	WRITES the Test Or Calibration Procedure Subject omits step in written communication Error Type: OMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 1 Origin: Subjective Reference: ----- PlantCode: ALLP
D/I/C	Subj	WRITES the Test Or Calibration Procedure Subject incorrectly writes step in written communication reading & writing errors assumed; technical info errors not addressed Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-3 EF: 5 UCB: LCB: E: N:	4.0E-3 --- 1.5E-2 6.0E-4 1.0 333.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: 1 Stress: 2 Supervision: U Tagging: U Training: U	Document: 1-83 pg 20-21, item 3 Origin: Subjective Reference: ----- PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
0/1/C	Subj	READS the Graph Operator incorrectly reads graph Error Type: COMMISSION Recovery: CONSIDERED	Mean: Median: 7.0E-3 EF: --- UCB: 3.0E-2 LCB: 5.0E-4 E: N:	1.0E-2 4 1.6E-3 1.0 142.8	ATime: :--:--:-- PTime: :--:--:-- Experience: 3 Feedback: U Procedure: 3 Staffing: 1 Stress: U Supervision: U Tagging: U Training: U	Document: 2-84 pg C-8, item 13 Origin: Psychological Scaling Reference: :--:--:-- PlantCode: SRR
0/1/C	Subj	READS the Label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.65) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 2.6E-4 EF: 10 UCB: LCB: E: N:	7.0E-4 --- 2.6E-3 2.6E-5 0.1 380.2	ATime: :--:--:-- PTime: :--:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	READS the Label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.4) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.1E-4 EF: 10 UCB: LCB: E: N:	1.9E-3 --- 7.1E-3 7.1E-5 0.1 140.0	ATime: :--:--:-- PTime: :--:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	READS the Label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.20) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.9E-4 EF: 10 UCB: LCB: E: N:	5.0E-4 --- 1.9E-3 1.9E-5 0.1 531.9	ATime: :--:--:-- PTime: :--:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

B-351

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Titl	Task Description	Data Values		PSTs	Document Information
			RAM	NUCLARK calc		
D/I/C	Subj	READS the Label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (1.16) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.6E-4 EF: 10 UCB: LCB: E: N:	1.5E-3 --- 5.6E-3 5.6E-5 0.1 177.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.56) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.5E-4 EF: 10 UCB: LCB: E: N:	1.2E-3 --- 4.5E-3 4.5E-5 0.1 221.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.91) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.9E-4 EF: 10 UCB: LCB: E: N:	1.3E-3 --- 4.9E-3 4.9E-5 0.1 204.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the Label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.31) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 265.9	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress : U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Verd EqLV	Job Tel	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARK calc		
0/1/C	Subj	READS the label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 3 sec (2.1) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.9E-4 EF: 10 UCB: LCB: E: N:	2.1E-3 --- 7.9E-3 7.9E-5 0.1 126.7	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	READS the Label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.51) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.9E-4 EF: 10 UCB: LCB: E: N:	1.3E-3 --- 4.9E-3 4.9E-5 0.1 204.5	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	READS the label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.76) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.6E-4 EF: 10 UCB: LCB: E: N:	1.5E-3 --- 5.6E-3 5.6E-5 0.1 177.3	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	READS the Label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 2 sec(1.11) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.0E-4 EF: 10 UCB: LCB: E: N:	1.6E-3 --- 6.0E-3 6.0E-5 0.1 166.1	ATime: ---:---:--- PTime: ---:---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

B-353

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	READS the label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 3 sec(2.05) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 8.3E-4 EF: 10 UCB: LCB: E: N:	2.2E-3 --- 8.3E-3 8.3E-5 0.1 120.9	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.4) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.0E-4 EF: 10 UCB: LCB: E: N:	8.0E-4 --- 3.0E-3 3.0E-5 0.1 333.3	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 2 sec(1.36) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.8E-4 EF: 10 UCB: LCB: E: N:	1.8E-3 --- 6.8E-3 6.8E-5 0.1 147.7	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	READS the label Personnel fails to read label properly No specifics on event, location, or sequence; perf. time = 1 sec (.65) Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 3.8E-4 EF: 10 UCB: LCB: E: N:	1.0E-3 --- 3.8E-3 3.8E-5 0.1 265.9	ATime: ---:--- PTime: ---:--- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFa	Document Information
			Raw	MUCLARR calc		
D/I/C	Subj	<p>READS the Label Personnel fails to read label properly</p> <p>No specifics on event, location, or sequence; perf.time = 3 sec (2.3)</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 2.4E-3 Median: 9.0E-4 EF: 10 UCB: 9.0E-3 LCB: 9.0E-5 E: 0.1 N: 119.1</p>	<p>2.4E-3 --- 9.0E-3 9.0E-5 0.1 119.1</p>	<p>ATime: --:--:-- PTime: --:--:-- Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg A-4 Origin: Laboratory Reference: 1-62 PlantCode: ALLP</p>
D/I/C	Subj	<p>POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly</p> <p>specifics on event, location, or sequence; performance time = 1.65 sec</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 2.6E-3 Median: 9.7E-4 EF: 10 UCB: 9.7E-3 LCB: 9.7E-5 E: 0.1 N: 102.6</p>	<p>2.6E-3 --- 9.7E-3 9.7E-5 0.1 102.6</p>	<p>ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP</p>
D/I/C	Subj	<p>POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly</p> <p>no info on event, location, or sequence; performance time = 1.75 sec</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 2.3E-3 Median: 8.6E-4 EF: 10 UCB: 8.6E-3 LCB: 8.6E-5 E: 0.1 N: 116.2</p>	<p>2.3E-3 --- 8.6E-3 8.6E-5 0.1 116.2</p>	<p>ATime: --:--:-- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP</p>
D/I/C	Subj	<p>POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly</p> <p>no info on event, location, or sequence; performance time = 2.40 sec</p> <p>Error Type: COMMISSION Recovery: NOT CONSIDERED</p>	<p>Mean: 3.1E-3 Median: 1.2E-3 EF: 10 UCB: 1.2E-2 LCB: 1.2E-4 E: 0.1 N: 86.2</p>	<p>3.1E-3 --- 1.2E-2 1.2E-4 0.1 86.2</p>	<p>ATime: --:--:-- PTime: 00:00:03 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U</p>	<p>Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP</p>

B-355

NUREG/CR-4639

HEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Tcl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.9E-4 EF: 10 UCB: LCB: E: N:	2.1E-3 --- 7.9E-3 7.9E-5 0.1 126.5	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 9.8E-4 EF: 10 UCB: LCB: E: N:	2.6E-3 --- 9.8E-3 9.8E-5 0.1 102.4	ATime: ---:---:--- PTime: 00:00:03 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 5.2E-4 EF: 10 UCB: LCB: E: N:	1.4E-3 --- 5.2E-3 5.2E-5 0.1 192.3	ATime: ---:---:--- PTime: 00:00:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.1E-4 EF: 10 UCB: LCB: E: N:	1.9E-3 --- 7.1E-3 7.1E-5 0.1 140.8	ATime: ---:---:--- PTime: 00:00:09 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
0/1/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 8.6E-4 EF: 10 UCB: 8.6E-3 LCB: 8.6E-5 E: 0.1 N: 116.2	2.3E-3 --- 8.6E-3 8.6E-5 0.1 116.2	ATime: ---:---:--- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 9.7E-4 EF: 10 UCB: 9.7E-3 LCB: 9.7E-5 E: 0.1 N: 103.0	2.6E-3 --- 9.7E-3 9.7E-5 0.1 103.0	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.1E-4 EF: 10 UCB: 4.1E-3 LCB: 4.1E-5 E: 0.1 N: 263.9	1.1E-3 --- 4.1E-3 4.1E-5 0.1 263.9	ATime: ---:---:--- PTime: 00:00:08 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
0/1/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.8E-4 EF: 10 UCB: 6.8E-3 LCB: 6.8E-5 E: 0.1 N: 147.0	1.8E-3 --- 6.8E-3 6.8E-5 0.1 147.0	ATime: ---:---:--- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

B-357

NUREG/CR-4639

HIEP RAW Data

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLEAR calc		
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.0E-4 EF: 10 UCB: LCB: E: N:	1.6E-3 --- 6.0E-3 6.0E-5 0.1 166.6	ATime: ---:--:-- PTime: 00:00:00 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.0E-4 EF: 10 UCB: LCB: E: N:	1.6E-3 --- 6.0E-3 6.0E-5 0.1 166.6	ATime: ---:--:-- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 4.1E-4 EF: 10 UCB: LCB: E: N:	1.1E-3 --- 4.1E-3 4.1E-5 0.1 242.1	ATime: ---:--:-- PTime: 00:00:01 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 1.5E-4 EF: 10 UCB: LCB: E: N:	4.0E-4 --- 1.5E-3 1.5E-5 0.1 666.6	ATime: ---:--:-- PTime: 00:00:07 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Documents: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

APPENDIX B. RAW DATA

Vend EqLv	Job Ttl	Task Description	Data Values		PSFs	Document Information
			Raw	NUCLARR calc		
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 7.9E-4 EF: 10 UCB: LCB: E: N:	2.1E-5 --- 7.9E-5 7.9E-5 0.1 126.7	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP
D/I/C	Subj	POSITIONS the Equipment - Nonspecific Personnel fail to connect cable properly no specifics on event, location, or sequence Error Type: COMMISSION Recovery: NOT CONSIDERED	Mean: Median: 6.0E-4 EF: 10 UCB: LCB: E: N:	1.6E-5 --- 6.0E-5 6.0E-5 0.1 166.3	ATime: ---:---:--- PTime: 00:00:02 Experience: U Feedback: U Procedure: U Staffing: U Stress: U Supervision: U Tagging: U Training: U	Document: 1-82 pg A-11 Origin: Laboratory Reference: 1-62 PlantCode: ALLP

Appendix C

HEP Codes

 

Appendix C

HEP Codes

C-1. EQUIPMENT/HUMAN ACTION COMBINATIONS

The equipment and human action combinations available in NUCLARR are shown in a series of 16 matrices. Actions are listed for each system or piece of equipment involved. These combinations are divided into three major categories, with associated parameters (in *italics*), as listed below:

1. System level, identification of *vendor and job title*
2. Component level, identification of *job title*
3. Instrumentation level, which is independent of vendor or job title.

At the beginning of each matrix, a box in the upper left corner of the page identifies the key parameters contained in that matrix. The following information is presented in each box:

- Equipment level (system, component, or instrumentation)
- NSSS vendor (GE, Westinghouse, CE, B&W) if the matrix includes data at the system level
- Job title (CRO, EO, MT) if the matrix is for system or component level data

The equipment available is identified in rows at the left side of each matrix. Available actions are listed in columns at the top of each page. At the intersection of each column and row (i.e., the action on a piece of equipment), one of the following is shown:

- Number indicating the number of data points currently in NUCLARR for the stated combination
- Symbol (*) indicating that there are more than 99 data points available for the stated combination
- Double dash (--) indicating that there is no data for the stated combination
- Symbol (■) indicating that the stated combination is not valid.

Rows with a designator "ALL" show the total number of unique data points for the related set of equipment and human actions (i.e., the column total within a related group of rows).

 

Systems					
General Electric					
CRO					
KEY					
■ = Invalid Combination					
* = Valid Cell > 99 Data Points					
- = Valid Cell, Currently Empty					
Equipment Description		T S S	O P E R A T O R S	M O N I T O R S	D I A G N O S T I C S
ALL AIR SYSTEMS		--	1	1	1
Instrument Air System		--	1	1	1
ALL COMMUNICATION SYSTEMS		--	1	--	--
Communication Systems		--	1	--	--
ALL CONDENSATE SYSTEMS		--	1	--	--
Condensate Systems		--	1	--	--
ALL CONTAINMENT SYSTEMS		--	31	1	1
Containment Systems		--	19	--	1
Containment Penetration/Isolation System		--	2	--	--
Containment Spray (RHR) System		--	1	--	--
Standby Gas Treatment System		--	--	1	--
Suppression Pool Support System		--	10	--	--
ALL CONTROL ROD DRIVE SYSTEMS		--	10	--	1
Control Rod Drive Systems		--	10	--	1
ALL ELECTRICAL DISTRIBUTION SYSTEMS		--	21	--	--
Electrical Distribution Systems		--	19	--	--
Plant AC Distribution System		--	2	--	--
ALL EMERGENCY CORE COOLING SYSTEMS		--	23	2	2

• Systems	T E S T S	O P E R A T I O N S	M O N I T O R S	D I A G N O S T I C S
Equipment Description	S	S	S	S
Emergency Core Cooling Systems	--	15	--	2
High Pressure Coolant Injection System	--	1	1	--
High Pressure Core Spray System	--	1	--	--
Low Pressure Core Spray System	--	4	1	--
Residual Heat Removal/Low Press Coolant Inject Syst	--	2	--	--
ALL GENERATOR SYSTEMS	--	3	--	--
Generator H2 Cooling/CO2 Purge System	--	3	--	--
ALL HEATING, VENTILATION & AIR COND SYST	--	2	--	--
Heating, Ventilation & Air Conditioning Systems	--	2	--	--
ALL INSTRUMENTATION AND CONTROL SYSTEMS	--	9	--	--
Reactor Protection System	--	1	--	--
Neutron Monitoring System	--	1	--	--
Automatic Depressurization System	--	3	--	--
Feedwater Control System	--	4	--	--
ALL WATER SYSTEMS	--	6	--	2
Water Systems	--	5	--	--
Circulating Water System	--	--	--	2
Station Service Water System	--	1	--	--
ALL REACTOR COOLANT SYSTEM/CONNECTED SYSTEM	--	22	--	--

		O	N	D
		P	O	I
		E	N	G
		T	R	M
		E	A	T
		S	T	O
		T	E	S
		S	S	S
Equipment Description				
Reactor Coolant Systems and Connected Systems	-- 1 -- --			
Reactor Core Isolation Cooling System	-- 19 -- --			
Standby Liquid Control System	-- 2 -- --			
ALL STANDBY DIESEL GENERATOR SYSTEMS	-- 8 -- --			
Standby Diesel Generator Systems	-- 8 -- --			
ALL STEAM SYSTEMS	-- 4 -- --			
Main Steam System	-- 4 -- --			

Systems						
General Electric						
ED						
KEY						
- = Invalid Combination						
+ = Valid Cell > 99 Data Points						
- = Valid Cell, Currently Empty						
Equipment Description						
ALL AIR SYSTEMS		--	1	--	--	--
Instrument Air System		--	1	--	--	--
ALL CONDENSATE SYSTEMS		--	--	--	1	--
Condensate Systems		--	--	--	1	--
ALL CONTAINMENT SYSTEMS		--	32	--	2	--
Containment Systems		--	24	--	1	--
Containment Penetration/Isolation System		--	--	--	1	--
Containment Spray (RHR) System		--	--	--	1	--
Suppression Pool Support System		--	8	--	--	--
ALL CONTROL ROD DRIVE SYSTEMS		--	8	--	--	--
Control Rod Drive Systems		--	8	--	--	--
ALL ELECTRICAL DISTRIBUTION SYSTEMS		--	30	--	12	1
Electrical Distribution Systems		--	21	--	5	--
DC Power System		--	7	--	4	1
Plant AC Distribution System		--	4	--	5	1
ALL EMERGENCY CORE COOLING SYSTEMS		--	25	--	2	--
Emergency Core Cooling Systems		--	13	--	2	--
High Pressure Coolant Injection System		--	1	--	2	--

<ul style="list-style-type: none"> • Systems • General Electric • ED 	D M			
	O P E T E S	I A O T S E S	A I N A I N S	I N S P E C T S
Equipment Description				
High Pressure Core Spray System	--	1	--	2 --
Low Pressure Core Spray System	--	5	--	2 --
Residual Heat Removal/Low Press Coolant Inject Syst	--	5	--	2 --
ALL INSTRUMENTATION AND CONTROL SYSTEMS	--	1	--	1 --
Automatic Depressurization System	--	--	--	1 --
Containment Atmosphere Monitoring System	--	--	--	1 --
Feedwater Control System	--	1	--	-- --
ALL REACTOR COOLANT SYSTEM/CONNECTED SYSTEM	--	13	--	1 --
Feedwater System	--	--	--	1 --
Reactor Core Isolation Cooling System	--	13	--	1 --
ALL STANDBY DIESEL GENERATOR SYSTEMS	--	7	--	-- --
Standby Diesel Generator Systems	--	7	--	-- --
ALL STEAM SYSTEMS	--	4	--	5 --
Main Steam System	--	4	--	5 --
ALL PROCESS SAMPLING SYSTEMS	--	--	--	-- 1
Process Sampling Systems	--	--	--	-- 1

Systems		D M I A C G T H N E E O S C S T K E S S S			
General Electric					
MT					
KEY					
<ul style="list-style-type: none"> - Invalid Combination - Valid Cell > 99 Data Points - Valid Cell, Currently Empty 					
Equipment Description					
ALL CONDENSATE SYSTEMS		--	--	--	1
Condensate Systems		--	--	--	1
ALL CONTAINMENT SYSTEMS		1	--	--	2
Containment Systems		--	--	--	1
Containment		--	--	--	1
Penetration/Isolation System		--	--	--	1
Containment Spray (RHR) System		--	--	--	1
Suppression Pool Support System		1	--	--	--
ALL CONTROL ROD DRIVE SYSTEMS		1	--	--	--
Control Rod Drive Systems		1	--	--	--
ALL ELECTRICAL DISTRIBUTION SYSTEMS		4	--	--	4
DC Power System		4	--	--	4
Plant AC Distribution System		4	--	--	4
ALL EMERGENCY CORE COOLING SYSTEMS		--	--	--	6
Emergency Core Cooling Systems		--	--	--	2
High Pressure Coolant Injection System		--	--	--	2
High Pressure Core Spray System		--	--	--	4
Low Pressure Core Spray System		--	--	--	3
Residual Heat Removal/Low Press Coolant Inject Syst		--	--	--	2

		D	M
		I	A
		A	I
		C	G
		H	N
		E	O
		S	S
		T	K
		S	S
Equipment Description		S	S
ALL INSTRUMENTATION AND CONTROL SYSTEMS	1	--	-- 2
Instrumentation and Control Systems	1	--	-- 1
Automatic Depressurization System	--	--	-- 1
Containment Atmosphere Monitoring System	--	--	-- 1
ALL WATER SYSTEMS	--	--	-- 1
Station Service Water System	--	--	-- 1
ALL REACTOR COOLANT SYSTEM/CONNECTED SYSTEM	3	--	-- 1
Feedwater System	--	--	-- 1
Reactor Core Isolation Cooling System	--	--	-- 1
Standby Liquid Control System	3	--	-- --

Systems					
Westinghouse					
CRO					
KEY					
■ = Invalid Combination					
* = Valid Cell > 99 Data Points					
- = Valid Cell, Currently Empty					
Equipment Description		D	M	I	A
		T	R	I	N
		E	A	T	O
		S	T	O	S
		T	E	R	E
		S	S	S	S
ALL AIR SYSTEMS	--	3	1	1	
Air Systems	--	1	--	--	
Instrument Air System	--	2	1	1	
ALL COMMUNICATION SYSTEMS	--	1	--	--	
Communication Systems	--	1	--	--	
ALL CONDENSATE SYSTEMS	--	5	1	--	
Condensate Systems	--	5	1	--	
ALL CONTAINMENT SYSTEMS		1	9	1	1
Containment Systems	--	2	--	1	
Containment Isolation System	--	2	--	--	
Containment Spray System		1	6	1	--
ALL CONTROL ROD DRIVE SYSTEMS	--	1	--	1	
Control Rod Drive Systems	--	1	--	1	
ALL ELECTRICAL DISTRIBUTION SYSTEMS	--	2	2	--	
Electrical Distribution Systems	--	1	2	--	
Plant AC Distribution System	--	1	--	--	
ALL EMERGENCY CORE COOLING SYSTEMS		2	39	2	5
Emergency Core Cooling Systems		2	13	2	3

Equipment Description	D I A G N O S I C S			
	T E S T S	R E S S S	I N T E R S	O S S
▪ Systems				
▪ Westinghouse				
▪ CRO				
High Pressure Safety Injection System	-- 22	--	--	--
Residual Heat Removal/Low Press Safety Inject Syst	-- 4	--	--	2
ALL FEEDWATER SYSTEMS	-- 18	2	2	
Feedwater Systems	-- 6	1	1	
Auxiliary Feedwater System	-- 10	1	1	
Main Feedwater System	-- 3	1	--	
ALL HEATING, VENTILATION & AIR COND SYST	-- --	--	--	1
Heating, Ventilation & Air Conditioning Systems	-- --	--	--	1
ALL INSTRUMENTATION AND CONTROL SYSTEMS	-- 29	9	8	
Instrumentation and Control Systems	-- 7	6	6	
Electrohydraulic Control (Turbine Control) System	-- 1	--	--	
Engineered Safeguards Actuation and Logic System	-- 10	--	--	
Pressurizer Level Control System	-- 2	--	--	
Pressurizer Pressure Control System	-- 5	1	--	
Reactor Protection System	-- 3	--	--	
Steam Generator Water Level Control System	-- 1	2	2	
ALL REACTOR COOLANT SYSTEMS	-- 16	5	3	
Reactor Coolant Systems	-- 12	5	2	
Chemical And Volume Control System	-- 4	--	1	

HEP Codes

Equipment Description	D I A G N O S T I C S			
	T E S T S	R E T E S	M O T O R S	O I L S
• Systems				
• Westinghouse				
• CRO				
ALL REFUELING SYSTEMS	--	1	--	--
Spent Fuel Pit Cooling System	--	1	--	--
ALL TURBINE SYSTEMS	--	1	1	1
Turbine Systems	--	1	--	1
Extraction Steam System	--	--	1	--
ALL WATER SYSTEMS	--	4	--	--
Component Cooling Water System	--	3	--	--
Nuclear Service Water System	--	1	--	--
ALL MAIN STEAM SYSTEMS	--	8	1	--
Main Steam System	--	8	1	--

Systems		D M I				
Westinghouse		O T A I				
EO		P E G N S				
KEY		T R N T P				
■ = Invalid Combination * = Valid Cell > 99 Data Points - = Valid Cell, Currently Empty		E A O A E				
Equipment Description		S T S I C				
ALL CONDENSATE SYSTEMS		--	--	--	1	--
Condensate Systems		--	--	--	1	--
ALL CONTAINMENT SYSTEMS		--	--	--	1	--
Containment Systems		--	--	--	1	--
Containment/Reactor Building Penetration System		--	--	--	1	--
Containment Fan Cooling System		--	--	--	1	--
Containment Isolation System		--	--	--	1	--
Containment Spray System		--	--	--	1	--
ALL ELECTRICAL DISTRIBUTION SYSTEMS		--	4	--	5	1
DC Power System		--	3	--	4	1
Plant AC Distribution System		--	4	--	5	1
ALL EMERGENCY CORE COOLING SYSTEMS		--	2	--	2	--
Emergency Core Cooling Systems		--	2	--	2	--
High Pressure Safety Injection System		--	--	--	2	--
Residual Heat Removal/Low Press Safety Inject Syst		--	--	--	2	--
ALL FEEDWATER SYSTEMS		--	--	--	1	--
Feedwater Systems		--	--	--	1	--
Auxiliary Feedwater System		--	--	--	1	--
Main Feedwater System		--	--	--	1	--

HEP Codes

		O	D	M	I
		P	I	A	N
		E	G	N	S
		T	R	T	P
		E	A	O	A
		S	T	S	I
		T	E	E	N
		S	S	S	S
Equipment Description					
ALL REACTOR COOLANT SYSTEMS	--	1	--	--	--
Reactor Coolant Systems	--	1	--	--	--
1					
ALL PROCESS SAMPLING SYSTEMS	--	--	--	--	1
Process Sampling Systems	--	--	--	--	1

Systems				
Westinghouse				
NT				
KEY - Invalid Combination * - Valid Cell > 99 Data Points - Valid Cell, Currently Empty				
Equipment Description				
ALL CONDENSATE SYSTEMS	--	--	--	1
Condensate Systems	--	--	--	1
ALL CONTAINMENT SYSTEMS	1	--	--	2
Containment Systems	--	--	--	1
Containment/Reactor Building Penetration System	--	--	--	1
Containment Fan Cooling System	--	--	--	1
Containment Isolation System	--	--	--	1
Containment Spray System	1	--	--	2
ALL ELECTRICAL DISTRIBUTION SYSTEMS	4	--	--	4
DC Power System	4	--	--	4
Plant AC Distribution System	4	--	--	4
ALL EMERGENCY CORE COOLING SYSTEMS	1	--	--	4
Emergency Core Cooling Systems	--	--	--	4
High Pressure Safety Injection System	--	--	--	2
Residual Heat Removal/Low Press Safety Inject Syst	1	--	--	2
ALL FEEDWATER SYSTEMS	--	--	--	2
Feedwater Systems	--	--	--	2
Auxiliary Feedwater System	--	--	--	1
Main Feedwater System	--	--	--	1

HEP Codes

	D	M		
	I	A		
	C	G	N	
	T	H	N	T
	E	E	O	A
	S	C	S	I
	T	K	E	N
Equipment Description	S	S	S	S
ALL INSTRUMENTATION AND CONTROL SYSTEMS	--	--	--	2
Engineered Safeguards Actuation and Logic System	--	--	--	2
ALL WATER SYSTEMS	3	--	--	--
Component Cooling Water System	1	--	--	--
Nuclear Service Water System	2	--	--	--

Systems					
Combustion Engineering					
CRO					
KEY					
■ = Invalid Combination					
* = Valid Cell > 99 Data Points					
- = Valid Cell, Currently Empty					
Equipment Description					
ALL AIR SYSTEMS		--	1	1	1
Instrument Air System		--	1	1	1
ALL ANNUNCIATOR SYSTEMS		--	--	5	--
Annunciator Systems		--	--	5	--
ALL COMMUNICATION SYSTEMS		--	1	--	--
Communication Systems		--	1	--	--
ALL CONDENSATE SYSTEMS		--	1	1	--
Condensate Systems		--	1	1	--
ALL CONTAINMENT SYSTEMS		--	2	1	1
Containment Systems		--	1	1	1
Containment Spray System		--	2	--	--
ALL ELECTRICAL DISTRIBUTION SYSTEMS		--	1	--	--
Plant AC Power System		--	1	--	--
ALL EMERGENCY CORE COOLING SYSTEMS		1	14	1	3
Emergency Core Cooling Systems		1	4	1	3
High Pressure Safety Injection System		--	2	--	--
Low Press Safety Injection/Shutdown Cooling Sys		--	8	--	--

HEP Codes

		O	M	I
• Systems		P	O	A
• Combustion Engineering		E	N	G
• CRO		T	R	I
		E	A	T
		S	T	O
		T	E	S
Equipment Description		S	S	S
ALL FEEDWATER SYSTEMS	--	4	1	--
Feedwater Systems	--	2	1	--
Main Feedwater System	--	1	1	--
Auxiliary/Emergency Feedwater System	--	3	--	--
ALL INSTRUMENTATION AND CONTROL SYSTEMS	--	--	5	--
Pressurizer Level Control System	--	--	2	--
Pressurizer Pressure Control System	--	--	2	--
Steam Generator Water Level Control System	--	--	1	--
ALL RADWASTE SYSTEMS	--	--	1	--
Liquid Radwaste System	--	--	1	--
ALL REACTOR COOLANT SYSTEMS	--	1	--	--
Chemical And Volume Control System	--	1	--	--
ALL TURBINE SYSTEMS	--	--	1	--
Extraction Steam System	--	--	1	--
ALL WATER SYSTEMS	--	1	--	--
Water Systems	--	1	--	--
ALL MAIN STEAM SYSTEMS	--	1	1	--
Main Steam System	--	1	1	--

Systems						
Combustion Engineering						
EO						
KEY						
■ = Invalid Combination						
* = Valid Cell > 99 Data Points						
- = Valid Cell, Currently Empty						
Equipment Description		T	E	S	D	M
		S	S	S	S	S
ALL CONDENSATE SYSTEMS		--	--	--	1	--
Condensate Systems		--	--	--	1	--
Condensate Storage System		--	--	--	1	--
ALL CONTAINMENT SYSTEMS		--	--	--	1	--
Containment Systems		--	--	--	1	--
Containment Isolation System		--	--	--	1	--
Containment Spray System		--	--	--	1	--
Containment Cooling System		--	--	--	1	--
ALL ELECTRICAL DISTRIBUTION SYSTEMS		--	5	--	5	1
DC Power System		--	3	--	4	1
Plant AC Power System		--	5	--	5	1
ALL EMERGENCY CORE COOLING SYSTEMS		--	2	--	2	--
Emergency Core Cooling Systems		--	2	--	1	--
High Pressure Safety Injection System		--	--	--	2	--
Low Press Safety Injection/Shutdown Cooling Sys		--	--	--	1	--
ALL FEEDWATER SYSTEMS		--	--	--	2	--
Feedwater Systems		--	--	--	2	--
Main Feedwater System		--	--	--	1	--
Auxiliary/Emergency Feedwater System		--	--	--	1	--

HEP Codes

		D	M		
		O	I	A	I
		P	A	I	N
		E	G	N	S
		T	R	T	P
		E	A	O	A
		S	T	S	I
		T	E	E	N
		S	S	S	S
Equipment Description					
ALL REACTOR COOLANT SYSTEMS	--	1	--	--	--
Reactor Coolant Systems	--	1	--	--	--
ALL MAIN STEAM SYSTEMS	--	--	--	1	--
Main Steam System	--	--	--	1	--
ALL PROCESS SAMPLING SYSTEMS	--	--	--	--	1
Process Sampling Systems	--	--	--	--	1

Systems					
Combustion Engineering					
MT					
KEY					
■ = Invalid Combination					
* = Valid Cell > 99 Data Points					
- = Valid Cell, Currently Empty					
Equipment Description		T	C	D	W
		E	H	I	A
		S	S	A	I
		T	K	G	N
		S	S	O	T
		S	S	S	A
		S	S	S	I
		S	S	S	N
		S	S	S	S
ALL CONDENSATE SYSTEMS		--	--	--	1
Condensate Systems		--	--	--	1
Condensate Storage System		--	--	--	1
ALL CONTAINMENT SYSTEMS		--	--	--	1
Containment Systems		--	--	--	1
Containment Isolation System		--	--	--	1
Containment Spray System		--	--	--	1
Containment Cooling System		--	--	--	1
ALL ELECTRICAL DISTRIBUTION SYSTEMS		5	--	--	5
DC Power System		4	--	--	4
Plant AC Power System		5	--	--	5
ALL EMERGENCY CORE COOLING SYSTEMS		--	--	--	2
Emergency Core Cooling Systems		--	--	--	1
High Pressure Safety Injection System		--	--	--	2
Low Press Safety Injection/Shutdown Cooling Sys		--	--	--	1
ALL FEEDWATER SYSTEMS		1	--	--	3
Feedwater Systems		--	--	--	1
Main Feedwater System		--	--	--	1
Auxiliary/Emergency Feedwater System		1	--	--	3

HEP Codes

	D I A G N O S T I C S			
• Systems				
• Combustion Engineering	T	C	H	N
• NT	E	E	O	A
Equipment Description	S	C	S	I
	T	K	E	N
	S	S	S	S
ALL MAIN STEAM SYSTEMS	--	--	--	1
Main Steam System	--	--	--	1

Systems					
Babcock & Wilcox					
CRO					
KEY					
■ = Invalid Combination					
* = Valid Cell > 99 Data Points					
- = Valid Cell, Currently Empty					
Equipment Description		T S S	O P E R A T O R S	M O N I T O R S	D I A G N O S T I C S
ALL AIR SYSTEMS		--	8	1	1
Air Systems		--	4	--	--
Instrument Air System		--	4	1	1
ALL COMMUNICATION SYSTEMS		--	1	--	--
Communication Systems		--	1	--	--
ALL CONDENSATE SYSTEMS		--	1	1	--
Condensate Systems		--	1	1	--
ALL CONTAINMENT SYSTEMS		--	2	--	1
Containment Systems		--	1	--	1
Reactor Building Spray System		--	1	--	--
ALL CONTROL ROD DRIVE SYSTEMS		--	--	--	1
Control Rod Drive Systems		--	--	--	1
ALL ELECTRICAL DISTRIBUTION SYSTEMS		--	1	--	--
Plant AC Power System		--	1	--	--
ALL EMERGENCY CORE COOLING SYSTEMS		1	20	5	4
Emergency Core Cooling Systems		1	4	1	2
High Pressure Safety Injection System		--	9	2	1
Decay Heat Removal/Core Flooding System		--	1	--	--

HEP Codes

<ul style="list-style-type: none"> • Systems ▪ Babcock & Wilcox • CRO 	O P E N I N G			
	T E S T S	R A T E S	T O R S	D I A G N O S E S
Equipment Description				
Decay Heat Removal/Low Press Safety Inject System	--	6	2	1
ALL FEEDWATER SYSTEMS	--	7	1	--
Feedwater Systems	--	5	1	--
Main Feedwater System	--	1	1	--
Emergency Feedwater System	--	2	--	--
ALL WATER SYSTEMS	--	2	--	--
Water Systems	--	1	--	--
Low Pressure Service Water System	--	1	--	--
ALL STEAM SYSTEMS	--	1	1	--
Main Steam System	--	1	1	--

Systems		D M O I A I P A I N E G N S T R N T P E A O A E S T S I C T E E N T S S S S S				
Babcock & Wilcox						
EO						
KEY						
■ = Invalid Combination						
* = Valid Cell > 99 Data Points						
- = Valid Cell, Currently Empty						
Equipment Description						
ALL CONDENSATE SYSTEMS		--	--	--	1	--
Condensate Systems		--	--	--	1	--
ALL CONTAINMENT SYSTEMS		--	--	--	1	--
Containment Systems		--	--	--	1	--
Containment Isolation System		--	--	--	1	--
Reactor Building Spray System		--	--	--	1	--
ALL ELECTRICAL DISTRIBUTION SYSTEMS		--	4	--	5	1
DC Power System		--	3	--	4	1
Plant AC Power System		--	4	--	5	1
ALL EMERGENCY CORE COOLING SYSTEMS		1	3	--	2	--
Emergency Core Cooling Systems		--	2	--	2	--
High Pressure Safety Injection System		1	--	--	2	--
Decay Heat Removal/Core Flooding System		--	--	--	1	--
Decay Heat Removal/Low Press Safety Inject System		--	1	--	1	--
ALL FEEDWATER SYSTEMS		--	--	--	1	--
Feedwater Systems		--	--	--	1	--
Main Feedwater System		--	--	--	1	--
Emergency Feedwater System		--	--	--	1	--
Safety Features Actuation System		--	--	--	1	--

HEP Codes

		D	M		
		O	I	A	I
		P	A	I	N
		E	G	N	S
		T	R	T	P
		E	A	O	A
		S	T	S	I
		T	E	E	N
		S	S	S	S
Equipment Description					
ALL REACTOR COOLANT SYSTEMS	--	1	--	--	--
Reactor Coolant Systems	--	1	--	--	--
ALL STEAM SYSTEMS	--	--	--	1	--
Steam Systems	--	--	--	1	--
ALL PROCESS SAMPLING SYSTEMS	--	--	--	--	1
Process Sampling Systems	--	--	--	--	1

Systems				
Babcock & Wilcox				
MT				
KEY				
■ = Invalid Combination				
* = Valid Cell > 99 Data Points				
- = Valid Cell, Currently Empty				
Equipment Description	T	C	G	M
	E	H	N	A
	S	C	S	I
	T	X	E	N
	S	S	S	S
ALL CONDENSATE SYSTEMS	--	--	--	1
Condensate Systems	--	--	--	1
ALL CONTAINMENT SYSTEMS	--	--	--	2
Containment Systems	--	--	--	1
Containment Isolation System	--	--	--	1
Reactor Building Spray System	--	--	--	1
ALL ELECTRICAL DISTRIBUTION SYSTEMS	4	--	--	4
DC Power System	4	--	--	4
Plant AC Power System	4	--	--	4
ALL EMERGENCY CORE COOLING SYSTEMS	--	--	--	2
Emergency Core Cooling Systems	--	--	--	2
High Pressure Safety Injection System	--	--	--	2
Decay Heat Removal/Core Flooding System	--	--	--	1
Decay Heat Removal/Low Press Safety Inject System	--	--	--	1
ALL FEEDWATER SYSTEMS	--	--	--	1
Feedwater Systems	--	--	--	1
Main Feedwater System	--	--	--	1
Emergency Feedwater System	--	--	--	1

HEP Codes

Equipment Description	D I A G N O S T I C S				M A I N T E N A N C E
	T E S T S	C H E S S	H E S S	N E S S	
• Systems					
• Babcock & Wilcox					
• MT					
ALL INSTRUMENTATION AND CONTROL SYSTEMS	--	--	--	--	1
Safety Features Actuation System	--	--	--	--	1
ALL STEAM SYSTEMS	--	--	--	--	1
Steam Systems	--	--	--	--	1

<div>Components</div> <div>Components</div> <div>CRO</div> <div>KEY</div> <div> <div>■</div> = Invalid Combination * = Valid Cell > 99 Data Points - = Valid Cell, Currently Empty </div> <div>Equipment Description</div>	<div> <div>D</div><div>I</div><div>A</div><div>G</div><div>N</div><div>O</div><div>S</div><div>E</div><div>S</div> </div> <div> <div>M</div><div>O</div><div>N</div><div>I</div><div>T</div><div>O</div><div>R</div><div>E</div><div>S</div> </div> <div> <div>O</div><div>P</div><div>E</div><div>R</div><div>A</div><div>T</div><div>I</div><div>E</div><div>S</div> </div> <div> <div>F</div><div>I</div><div>L</div><div>S</div><div>/</div><div>D</div><div>R</div><div>A</div><div>I</div><div>N</div><div>S</div> </div> <div> <div>O</div><div>P</div><div>E</div><div>R</div><div>A</div><div>T</div><div>I</div><div>E</div><div>S</div> </div> <div> <div>S</div><div>T</div><div>S</div><div>/</div><div>S</div><div>T</div><div>O</div><div>P</div><div>S</div> </div>
ALL CIRCUIT CLOSURES/INTERRUPTERS Circuit Breaker Switch Switchgear	-- -- 3 ■ 7 ■ -- -- 1 ■ 6 ■ -- -- 2 ■ -- ■ -- -- -- ■ 1 ■
ALL CONTROL INSTRUMENTS Flow Control Instrument Flux Control Instrument Level Control Instrument Pressure Control Instrument	6 1 4 ■ ■ ■ 2 1 4 ■ ■ ■ -- 1 -- ■ ■ ■ 4 1 -- ■ ■ ■ -- 1 -- ■ ■ ■
ALL CONTROL ROD DRIVE MECHANISMS Control Rod Drive Mechanisms	-- -- 2 ■ ■ ■ -- -- 2 ■ ■ ■
ALL PUMPS Pumps Centrifugal Pump	-- -- 5 ■ ■ 3 -- -- 5 ■ ■ 2 -- -- -- ■ ■ 1
ALL SENSORS Pressure Sensor Radiation Sensor	-- 3 -- ■ ■ ■ -- 2 -- ■ ■ ■ -- 1 -- ■ ■ ■
ALL STEAM GENERATORS	-- -- 1 -- ■ ■

HEP Codes

	D I A G N O S E S	M O N I T O R S	O P E R A T O R S	F I L L S / D R A W I N G S	O P E R S / C O N T R O L S	S T A R T S / S T O P S
• Components						
• Components						
• CRO						
Equipment Description						
Steam Generators	-- --	1	--	■	■	
ALL TURBINES	-- --	3		■	■	■
Turbines	-- --	3		■	■	■
ALL VALVES	--	1	4	■	7	■
Valves	--	1	4	■	6	■
Relief Valve	-- --	--		■	1	■
ALL VALVE OPERATORS	-- --	14		■	■	■
Valve Operators	-- --	1		■	■	■
Electric Motor-AC	-- --	13		■	■	■

Components		F D S				
Components		I L P T				
ED		G N O S S R				
KEY		A N P / / S				
■ = Invalid Combination		G S E R D C /				
* = Valid Cell > 99 Data Points		N P R R L S				
- = Valid Cell, Currently Empty		O E A A O T				
Equipment Description		S C T I S O				
		E T E N E P				
		S S S S S S				
ALL CIRCUIT CLOSURES/INTERRUPTERS		-- --	5	■	1	■
Circuit Breaker		-- --	5	■	--	■
Disconnect		-- --	--	■	1	■
ALL CONTROL INSTRUMENTS		-- --	1	■	■	■
Flow Control Instrument		-- --	1	■	■	■
Level Control Instrument		-- --	1	■	■	■
Pressure Control Instrument		-- --	1	■	■	■
Temperature Control Instrument		-- --	1	■	■	■
ALL ELECTRICAL EQUIPMENT		-- --	4	■	■	■
Electrical Equipment		-- --	4	■	■	■
ALL ELECTRIC GENERATORS		-- --	1	■	■	--
Generator		-- --	1	■	■	--
ALL PUMPS		--	1	--	--	■
Centrifugal Pump		--	1	--	--	■
ALL SENSORS		--	2	--	■	■
Level Sensor		--	1	--	--	■
Pressure Sensor		--	1	--	--	■
ALL VALVES		--	1	1	■	3

HEP Codes

	D I A G N O S T I C S	I N S P E C T S	O P E R A T E S	F I L L S / D R A I N S	O P E N S / C L O S E S	S T A R T S / S T O P S
▪ Components						
▪ Components						
▪ EO						
Equipment Description						
Valves	--	1	1	■	3	■
ALL VALVE OPERATORS	--	--	2	■	■	■
Electric Motor-AC	--	--	1	■	■	■
Pneumatic	--	--	1	■	■	■
ALL VESSELS/TANKS	--	1	■	--	■	■
Vessels/Tanks	--	1	■	--	■	■
Tank	--	1	■	--	■	■

Components						
Components		C	D	M		
MT		L	I	A		
		B	G	N	R	
KEY		R	N	T	P	T
= Invalid Combination		A	O	A	A	E
* = Valid Cell > 99 Data Points		T	S	I	I	S
- = Valid Cell, Currently Empty		E	E	N	R	T
Equipment Description		S	S	S	S	S
ALL CIRCUIT CLOSURES/INTERRUPTERS		--	--	5	4	8
Circuit Breaker		■	--	4	3	4
Disconnect		■	--	1	1	1
Switch		--	--	--	--	3
ALL CONTROL INSTRUMENTS		2	2	--	--	--
Flow Control Instrument		1	1	--	--	--
Level Control Instrument		1	--	--	--	--
Pressure Control Instrument		2	--	--	--	--
Temperature Control Instrument		1	--	--	--	--
Voltage Control Instrument		--	1	--	--	--
ALL ELECTRICAL EQUIPMENT		1	2	--	--	3
Electrical Equipment		1	2	--	--	3
ALL ELECTRIC GENERATORS		--	--	--	--	1
Generator		--	--	--	--	1
ALL EQUIPMENT - NONSPECIFIC		--	--	--	--	10
Equipment - Nonspecific		--	--	--	--	10
ALL PUMPS		--	--	3	--	--
Pumps		--	--	3	--	--

HEP Codes

	C	D	M		
	A	I	A	R	
	L	I	I		
• Components	I	A	N	E	
• Components	B	G	T	P	T
• MT	R	N	A	A	E
	A	O	I	I	S
Equipment Description	T	S	N	R	S
	E	E	S	S	
	S	S	S	S	S
ALL SENSORS	8	--	--	--	1
Sensors	3	--	--	--	1
Level Sensor	3	--	--	--	--
Pressure Sensor	4	--	--	--	--
ALL VALVES	■	1	4	--	16
Valves	■	1	4	--	16
ALL VALVE OPERATORS	■	--	--	--	2
Pneumatic	■	--	--	--	2

Display/Instruments/Controls																	
Displays/Instr/Controls																	
Subject																	
KEY																	
■ = Invalid Combination																	
* = Valid Cell > 99 Data Points																	
- = Valid Cell, Currently Empty																	
Equipment Description		P	A	S	I	D	V	M	R	D	C	R	M	A	C		
		O	D	E	N	E	R	O	E	I	A	E	W	I	A		
		S	J	L	I	F	I	N	M	N	O	I	T	N	B		
		I	U	U	E	E	E	R	E	B	E	V	E	A	A		
		O	S	S	C	I	I	A	O	R	S	E	E	E	E		
		N	S	S	S	S	S	S	S	S	S	S	S	S	S		
ALL QUALITATIVE DISPLAYS		■	■	■	--	16	--	14	16	--	13	■	■	■	--	--	
Qualitative Displays		■	■	■	--	--	--	14	--	--	--	■	■	■	--	--	
Indicator Light		■	■	■	--	16	--	■	--	--	--	■	■	■	--	--	
Legend Light		■	■	■	--	15	--	--	--	--	--	■	■	■	--	--	
Annunciator		■	■	■	--	--	--	--	--	--	13	■	■	■	--	--	
CRT Text		■	■	■	--	--	--	--	16	--	--	■	■	■	■	■	
ALL QUANTITATIVE DISPLAYS		■	■	■	--	--	--	37	23	--	--	--	■	■	--	--	
Quantitative Displays		■	■	■	--	--	--	2	--	--	--	--	■	■	--	--	
Counter-Digital Readout		■	■	■	--	--	--	16	--	--	--	--	■	■	--	--	
Meter		■	■	■	--	--	--	17	3	--	--	--	■	■	--	--	
Chart Recorder		■	■	■	--	--	--	2	2	--	--	--	■	■	--	--	
CRT Graphic Display		■	■	■	--	--	--	--	2	--	--	--	■	■	■	■	
CRT Alphanumeric Display		■	■	■	--	--	--	--	16	--	--	--	■	■	■	■	
ALL TWO-POSITION SWITCHES		5	■	■	74	--	--	--	■	--	--	■	■	■	--	■	
Two-Position Switches		4	■	■	3	--	--	--	■	--	--	■	■	■	--	■	
Push-Button (Illuminated Legend)		--	■	■	19	--	--	--	■	--	--	■	■	■	--	■	
Push-Button (Other)		--	■	■	21	--	--	--	■	--	--	■	■	■	--	■	
Toggle Switch/Two-Position		--	■	■	16	--	--	--	■	--	--	■	■	■	--	■	
Knob		1	■	■	--	--	--	--	■	--	--	■	■	■	--	■	
Keylock		--	■	■	18	--	--	--	■	--	--	■	■	■	--	■	

<div>• Display/Instruments/Controls</div> <div>• Displays/Instr/Controls</div> <div>• Subject</div> <div>Equipment Description</div>	P O S I T I O N S	A D J U S T S	S E L E C T S	I D E N T I F I E S	V E R I F I E S	R E T A D S	N O N R E T S	R E M O D S	D I A G N O S T S	C A L C U L A T O R S	R E C E I V E S	M A I N T E N A N C E	C A L I B R A T I O N S	
ALL MULTIPOSITION SELECTORS	9			--	--	--			--	--			--	
Multiposition Selectors	3			--	--	--			--	--			--	
J-Handle Switch	1			--	--	--			--	--			--	
Rotary Switch	5			--	--	--			--	--			--	
ALL CONTINUOUSLY VARIABLE CONTROLS			2	--	--	--			--	--			--	--
Continuously Variable Controls			2	--	--	--			--	--			--	--
ALL KEYBOARDS		--							--	--	4		--	--
Calculator		--							--	--	4			
ALL PRINTED COMMUNICATIONS		6		4	--	4	14		--	--	--	2		
Printed Communications		2		--	--	--	--		--	--	--	2		
Tag		--		--	--	--	--		--	--		2		
Log Book		--		--	--	--	--		--	--		2		
Administrative Procedure		--		--	--	--	--		--	--		2		
Operating Procedure		2		4	--	4	--		--	--	--	2		
Maintenance Procedure		1		--	--	--	--		--	--	--	2		
Test Or Calibration Procedure		1		--	--	--	--		--	--	--	2		
Graph		--		--	--	--	1		--	--	--	--		
Label		--		--	--	--	13		--	--	--	--		
ALL EQUIPMENT - NONSPECIFIC	18	--	--	--	--	--	--	--	--	--	--	--	--	--

HEP Codes

[illegible]

C-2. PERFORMANCE SHAPING FACTORS

Performance shaping factors (PSFs) affect human performance. They may be related to personal characteristics or elements of a situation, such as level of experience, training, and general resistance to fatigue or stress. They may also be related to the immediate work environment, such as conditions of staffing or tagging, or the type and quality of procedures available to help the person execute a task properly. Although many PSFs are available for analysis, only a limited number have been included in the NUCLARR system. Any other PSFs identified in the original source of data (including those relating to the quality of human factors engineering design) are included in the task description.

When available in the source document, the PSFs are ranked on ordinal scales. This ranking scheme allows analysts to evaluate individual NUCLARR data records relative to the characteristics of their own analysis problems. Additional information about the handling of PSFs in NUCLARR can be found in *Guide to Data Processing and Revision*, Volume 3.³

The following is a description of the PSFs coded in NUCLARR:

*A*Time (Available Time)—Refers to the total time available for successful completion of the task. This time is often dependent on plant conditions and system response to phenomenological factors.

*P*Time (Performance Time)—This term refers to the average time spent by the operator or crew in performing the task.

Experience—The total time an individual has performed at the current job classification in a commercial nuclear power plant. Related experience in other types of facilities (e.g., Navy, petrochemical) or in other job classifications is generally not included. The valid experience levels include:

- U - Insufficient information available to evaluate this PSF
- N - No commercial nuclear power plant experience
- 1 - Ten or more years job experience
- 2 - Five or more years but less than ten years job experience
- 3 - Six months or more but less than five years job experience
- 4 - Less than six months job experience.

Feedback—The knowledge of results that a person receives about the status or adequacy of his actions. In general, feedback refers to how the operator knows the appropriate control action has been taken, or how he is informed of general facility conditions. The level of feedback a person may encounter in the performance of a task can range from superior to inadequate, as described below.

- U - Insufficient information available to evaluate this PSF
- 1 - Feedback superior: Extremely satisfactory, well above average—significantly helped performance

HEP Codes

- 2 - Feedback more than satisfactory but less than superior: Better than average—helped performance
- 3 - Feedback satisfactory: About average—did not help or hinder performance
- 4 - Feedback somewhat satisfactory: Below average—hindered performance
- 5 - Feedback NOT adequate: Well below average—significantly hindered performance
- 6 - Feedback not provided.

Procedure—In the performance of a task, the type and availability of procedures used often influence its final outcome. In assessing operator error, it is often desirable to know if a procedure was used at all and, if so, what type. If a procedure was used, it is of interest to understand how it was applied toward accomplishing the task. For example, was a procedure followed in its entirety or were parts of the procedure given to crew members? Categories for procedure use are a primary factor when measuring task performance. The valid categories include:

- U - Insufficient information available to evaluate this PSF
- 1 - A written procedure with step checkoffs was used; checkoff was performed by a second person observing the work
- 2 - A written procedure with step checkoffs was used; checkoff was performed by the person performing the work
- 3 - A written procedure was used
- 4 - Oral instructions directed actions
- 5 - A written procedure was available but not used. Contents were recalled from memory
- 6 - No procedures or instructions were available.

Staffing—The number of personnel who were directly involved in the performance of the task. Involvement implies actual assistance the primary crew member receives from other individuals in the operating area. If the staffing needs are inadequate, the potential for error is increased due to higher stress and workload demands placed on the primary operator. Staffing levels are measured as the total number of crew members participating in the task. Valid categories the following:

- U - Insufficient information available to evaluate this PSF
- 1 - Single person performs the task
- 2 - Two persons
- 3 - Three persons
- 4 - Four persons

- 5 - Five persons
- 6 - Six persons
- 7 - Count other than 1 ... 6 persons.

Stress—The extent to which stress either hindered or helped performance. Personnel may be stressed as a function of fatigue as well as workload demand, or just by virtue of responding to an emergency. The valid stress levels the following:

- U - Insufficient information available to evaluate this PSF.
- 1 - Optimum stress: A normal level of stress. An optimum level of stress is associated with an optimum task load and is characterized by an active interaction between the person and the environment at a pace that can be managed comfortably.
- 2 - Very low stress: Insufficient arousal to maintain alertness. A very low stress level is associated with a very low task load and is characterized by routine, passive activities in which a lack of sufficient stimulation can cause boredom or inattention.
- 3 - Moderately high stress: A moderately high stress level is associated with a heavy task load and is characterized by a requirement to perform at a faster pace than a person is capable of, or by a large number of stimuli competing for attention.
- 4 - Extremely high stress: An extremely high level of stress is characterized by the perception of an immediate threat to one's physical well-being, self-esteem, or professional status.

Supervision—The degree of direction and managerial responsibility taken by senior personnel during performance of a task. The amount of supervision to oversee and monitor task activities can influence task performance. The range of supervision can range from formal approval and verification to ensure the successful completion of a task within a given standard to no supervision at all. The scaled values for this PSF are as follows:

- U - Insufficient information available to evaluate this PSF.
- 1 - Senior supervisor provides approval to initiate the task and verifies whether or not it has been successfully accomplished within a given standard of performance.
- 2 - Other operator (not a supervisory position) formally monitors and verifies satisfactory completion of task (e.g., worker sign off, checklist). Verification is explicitly stated in a procedure and/or standards and practices documents.
- 3 - Other operator (not a supervisory position) informally monitors and verifies satisfactory completion of task (e.g., verbal notification, ad hoc protocol). Verification not specified in a procedure or standards and practices document.
- 4 - No supervision provided; operator performs task independent of any direct verification from other personnel.

HEP Codes

Tagging—This term encompasses the total tagging system and includes all administrative controls that ensure (a) awareness of any valves or other items of equipment that are in a normal state or a protected normal state, and (b) prompt restoration of this equipment to the normal or unprotected state after completion of review or maintenance operations. Thus, a tagging system includes the use of (a) tags, (b) chains, locks, and keys, and (c) logs, suspense forms, and other techniques that provide a record of the above. The adequacy of the tagging system can vary significantly in its overall sophistication and completeness from a formal system, consisting of a high degree of administrative controls to no tagging system at all, as follows:

- N - Tagging system is not applicable to this task.
- U - Tagging system is available, but information is insufficient to determine the level of tagging.
- 1 - A specific number of tags are used for each job. Each tag is uniquely numbered or otherwise identified. A record is kept of each tag.
- 2 - Tags are not accounted for individually. The operator may take an unspecified number and use accordingly. The record-keeping does not provide a thorough checking for errors of omission or selection.
- 3 - Tags are used, but record-keeping is inadequate to provide the shift supervisor with adequate knowledge of every item or equipment that should be restored. Also in this category, keys are available to users without logging requirements.
- 4 - No tags. A tagging system is applicable to the task but no tags are used.

Training—The amount of relevant training provided can significantly affect the outcome of task performance. Training adequacy can be satisfied through one or more of the following modes: on-the-job training (OJT), simulation/mockup, drill, or classroom. The measure of training is typically selected from the lowest level of training adequacy represented for which the HEP occurred. The valid training adequacy levels include the following:

- U - Insufficient information available to evaluate this PSF
- 1 - Very adequate
- 2 - Adequate, but could be improved
- 3 - Somewhat adequate, but sorely lacking in specific areas
- 4 - NOT adequate.

C-3. PLANT CODES

Each individual data record in NUCLARR includes a code for the plant from which the data were collected. In the case of proprietary data, special codes have been assigned to provide plant anonymity. The following list identifies the codes used by NUCLARR and the associated facilities:

Code	Facility	Code	Facility
ALLP	All plants	DCC1	Cook 1
ANO1	Arkansas 1	DCC2	Cook 2
ANO2	Arkansas 2	DCP1	Diablo Canyon 1
APRA	Proprietary PRA "A"	DCP2	Diablo Canyon 2
AREL	Proprietary REL "A"	DPRA	Unpublished PRA "D"
ATR	Adv. Test React.-INEL	DRS	All Dresden
AWV1	Vogtle 1	DRS1	Dresden 1
B&W	Babcock & Wilcox	DRS2	Dresden 2
BEP	All Brunswick	DRS3	Dresden 3
BEP1	Brunswick 1	EFP2	Fermi 2
BEP2	Brunswick 2	EIH1	Hatch 1
BIBB	Biblis B (Germany)	EIH2	Hatch 2
BPRA	Proprietary PRA "B"	EPRA	Unfinished PRA "E"
BREL	Proprietary REL "B"	EUR	European Comm (SAIC)
BRF1	Browns Ferry 1	FCS1	Fort Calhoun
BRF2	Browns Ferry 2	FFTF	Fast Flux Test Facil
BRF3	Browns Ferry 3	FPRA	Proprietary PRA "F"
BRP1	Big Rock Point	FSV1	Fort St. Vrain
BRS1	Braidwood 1	GE	General Electric
BVS1	Beaver Valley 1	GG51	Grand Gulf
BWR	All BWR Plants	GPRA	Unfinished PRA "G"
BYS1	Byron 1	HBR2	Robinson 2
BYS2	Byron 2	HCS1	Hope Creek
CAY1	Callaway	HMB1	Humboldt Bay
CCN	All Calvert Cliffs	HNP1	Haddam Neck
CCN1	Calvert cliffs 1	HPRA	Proprietary PRA "H"
CCN2	Calvert Cliffs 2	IP1	IPRDS Plant 1
CE	Combustion Engineer	IP2	IPRDS Plant 2
CNS1	Catawba 1	IP3	IPRDS 3, Units 1-3
CNS2	Catawba 2	IP4	IPRDS Plant 4
CPP1	Clinton 1	IP5	IPRDS 5, Units 1-3
CPR1	Cooper Station	IPS2	Indian Point 2
CPRA	Unpublished PRA "C"	IPS3	Indian Point 3
CPS	All Commanche Peak	JAF1	Fitzpatrick
CRP3	Crystal River 3	JMF	All Farley
DAC1	Duane Arnold	JMF1	Farley 1
DBS1	Davis-Besse	JMF2	Farley 2

HEP Codes

Code	Facility	Code	Facility
KNP1	Kewaunee	PNP1	Perry
LBR1	La Crosse	PPS1	Pilgrim
LGS1	Limerick	PWR	All PWR Plants
LSC	All Lasalle	QAD	All Quad Cities
LSC1	Lasalle 1	QAD1	Quad Cities 1
LSC2	Lasalle 2	QAD2	Quad Cities 2
LSC3	Lasalle 3	RBS1	River Bend
MGS1	Mcguire 1	REG1	Ginna
MGS2	Mcguire 2	RGLS	Ringhals 2 (Swedish)
MNP1	Monticello	RSS1	Rancho Seco
MNS1	Millstone 1	SBK1	Seabrook
MNS2	Millstone 2	SES	All Susquehanna
MNS3	Millstone 3	SES1	Susquehanna 1
MYP1	Maine Yankee	SES2	Susquehanna 2
NAS1	North Anna 1	SVR1	Savannah Riv. K React
NAS2	North Anna 2	TMI1	Three Mile Isl. 1
NEE1	Oconee 1	TMI2	Three Mile Isl. 2
NEE2	Oconee 2	TNP1	Trojan
NEE3	Oconee 3	TPS	All Turkey Point
NMP1	Nine Mile PT. 1	TPS3	Turkey Point 3
NMP2	Nine Mile PT. 2	TPS4	Turkey Point 4
NONP	Non-Plant Specific	VCS1	Summer
OCPI	Oyster Creek	VYS1	Vermont Yankee 1
PAL1	Palisades	WCS1	Wolf Creek
PAV1	Palo Verde 1	WEST	Westinghouse
PAV2	Palo Verde 2	WGS3	Waterford 3
PBH	All Point Beach	WNP2	Wash. Nuclear 2
PBH1	Point Beach 1	X	Plant X (SAIC DATA)
PBH2	Point Beach 2	Y1	Plant Y,(1ST U) SAIC
PBS	All Peach Bottom 1	Y2	Plant Y,(2ND U) SAIC
PBS2	Peach Bottom 2	YKR1	Yankee-Rowe
PBS3	Peach Bottom 3	ZIS	All Zion
PIN	All Prairie Island	ZIS1	Zion 1
PIN1	Prairie Island 1	ZIS2	Zion 2
PIN2	Prairie Island 2		

C-4. DOCUMENTS

Each individual data record in NUCLARR includes source document information. The document identification number is coded as XXX-YR, where X through XXX is a unique identification number, and YR is the last two digits of the calendar year in which the data were collected or published.

Document identification codes and document descriptions are listed below. In the document description, the authors or authoring agency are listed on the first line of each entry. The title of the document and other identifying information are presented in the subsequent lines for each entry, as available.

Document ID	Document
1-62.	Munger, S. J., Smith, R.W., and Payne, D. An Index of Electronic Equipment Operability: Data Store. January 1962, AIR-C43-1/62-RP(1).
1-64.	Irwin, I., Levitz, J., and Freed, A. Human Reliability in the Performance of Maintenance. May 1964, LRP 317/TDR-63-218.
1-67.	Meister, D., in Hornyak, S. J. Effectiveness of Display Subsystems Measurement and Predictive Techniques. September 1967, RADC Report TR-67-292.
1-75.	U.S. Nuclear Regulatory Commission Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants (WASH 1400). October 1975, NUREG-75/014.
1-81.	Carlson, D. D., et al. Reactor Safety Study Methodology Applications Program: Sequoyah #1 PWR Power Plant. April 1981, NUREG/CR-1659.
1-82.	Topmiller, D. A., Eckel, J. S., and Kozinsky, E. J. Human Reliability Data Bank for Nuclear Power Plant Operations Volume 1: A Review of Existing Human Reliability Data Banks. December 1982, NUREG/CR-2744/1.
1-83.	Swain, A. D., and Guttman, H. E. Handbook of Human Reliability Analysis with Emphasis on Nuclear Power Plant Applications. August 1983, NUREG/CR-1278.
1-84.	Beare, A. N., Dorris, R. E., et al. A Simulator Based Study of Human Errors in Nuclear Power Plant Control Room Tasks. January 1984, NUREG/CR-3309.

Document ID	Document
2-84.	Comer, M. K., Seaver, D. A., Stillwell, W. G., and Gaddy, C. D. Calculating Human Reliability Estimates Using Expert Judgement: Volume 2. October 1984, NUREG/CR-3688.
3-84.	Sugnet, W. R., Boyd, G. J., Lewis, S.R. Oconee PRA: Volume 1. June 1984, NSAC-60.
4-84.	Payne, A. C., et al. Interim Reliability Evaluation Program: Analysis of the Calvert Cliffs Unit 1 Nuclear Power Plant (Main Report & Appendices A, B, & C). August 1984, NUREG/CR-3511, 1 & 2.
5-84.	Siegel, A. I., et al. Maintenance Personnel Performance Simulation Model (MAPPS): Summary Description. May 1984, NUREG/CR-3626.
1-85.	Luckas, O'Brien, Perlman, Spettel Operator Actions in Anticipated Transient Without Scram (ATWS-TS) Sequence for Peach Bottom Plant. October 1985, unpublished report.
2-85.	O'Brien, J. N., & Spettell, C. M. Uses of Human Reliability Analysis Probabilistic Risk Assessment Results to Resolve Personnel Performance Issues That Could Affect Safety. October 1985, NUREG/CR-4103.
3-85.	Kopstein, F. F. & Wolf, J. J. Maintenance Personnel Performance Simulation (MAPPS) Model: User's Manual. September 1985, NUREG/CR-3634.
1-86.	Spettel, C. M., et al. Application of SLIM-MAUD: A Test of An Interactive Computer-Based Method for Organizing Expert Assessment of Human Performance & Reliability. October 1986, NUREG/CR-4016, Volume II.
2-86.	Bertuccio, R. C., Quilici, M. D., and Young, J. Analysis of Core Damage Frequency From Internal Events: Surry Unit 1. November 1986, NUREG/CR-4550, Volume III.
3-86.	Kolaczowski, A. M., et al. Analysis of Core Damage Frequency From Internal Events: Peach Bottom, Unit 2. October 1986, NUREG/CR-4550, Volume IV.
1-87.	Drouin, M. T., et al. Analysis of Core Damage Frequency From Internal Events: Grand Gulf, Unit 1. April 1987, NUREG/CR-4550, Volume VI.

Document ID	Document
2-87.	Bertucio, R. C., Moore, D. L., et al. Analysis of Core Damage Frequency From Internal Events: Sequoyah, Unit 1. February 1987, NUREG/CR-4550, Volume V.
3-87.	Diesel Generator Study, 1987, NUREG-1032.
4-87.	Swain, A. D. Accident Sequence Evaluation Program Human Reliability Analysis Procedure. February 1987, NUREG/CR-4772.
5-87.	Weston, L. M., Whitehead, D. W., and Graves, N. L. Recovery Actions in PRA for the Risk Methods Integration & Evaluation Program (RMIEP), Volume 1 June 1987 and Volume 2 December 1987, NUREG/CR-4834.
1-88.	Gertman, D., et al. Steam Generator Tube Rupture, Task 35 MAPPS Computer Run. July 1988. Unpublished.
2-88.	Haney, L., et al. SLIM-MAUD simulation, 6 groups of data. July 1988. Unpublished.
3-88.	Gertman, D., et al. Test Steam Line Isolation, Task 2 MAPPS Computer Run. July 1988. Unpublished.
5-88.	Bertucio, R. C., and Julius, J. A. Analysis of Core Damage Frequency From Internal Events: Surry Unit 1. September 1988, NUREG 4550, REV.1, Volume III.
2-90.	Gertman, D. I., et al. INTENT: A Method for Estimating Human Error Probabilities for Errors of Intention (Revision 1). November 1990, EGG-SRE-9178.
3-90.	NUS Corporation Operator Reliability Experiments Using Power Plant Simulators. Volumes 1 and 2. July 1990, EPRI-NP-6937.
1-91.	Reece, W., et al., March 1991 HHRAG Nuclear Plant Reliability Data System Search of B&W Plant Circuit Breaker System Data. November 1991, NPRDS Search. Unpublished.
2-91.	NUS Corporation Probabilistic Risk Assessment for the Individual Plant Examination Final Report: Surry Units 1 and 2. September 1991, Surry IPE.
1-92.	Galyean, W. J., et al. Assessment of ISLOCA Risks - Methodology & Application: Babcock and Wilcox Nuclear Power Station, Volumes 1 through 3. April 1992, NUREG/CR-5604.

HEP Codes

Document ID	Document
2-92.	Kelly, D. L., Auflick, L. J., and Haney, L. N. Assessment of ISLOCA Risks - Methodology & Application: Babcock and Combustion Engineering Plant. April 1992, NUREG/CR-5745.
3-92.	Kelly, D. L., Auflick, L. J., and Haney, L. N. Assessment of ISLOCA Risks - Methodology & Application: Westinghouse Four-Loop Ice Condenser Plant. April 1992, NUREG/CR-5744.

Appendix D

Statistics

Appendix D

Statistics

The purpose of this appendix is to provide a summary description of the statistics used in NUCLARR. For additional information, refer to the *User's Guide*, Volume 4^a of NUREG/CR-4639.

HEP Data Point Calculations

Typically, human error probability (HEP) data are submitted to NUCLARR in the form of counts of errors (E) and opportunities (N) for error, or as calculated probabilities. The NUCLARR system can store both types of data (counts and probabilities). NUCLARR can compute HEP point estimates and confidence bounds from count data. Conversely, given probabilities (i.e., a HEP and its upper confidence bound), NUCLARR can estimate the count data that would give rise to these results. All of these calculations and relationships are based on an assumed binomial distribution for the number of errors in N opportunities. In these calculations, the assumption is that a fixed but unknown probability of error for each trial is being estimated.

NUCLARR also considers uncertainty distributions for the HEPs. From the uncertainty distribution perspective, each HEP is a random quantity that takes on stated values with stated probabilities, instead of an unknown constant binomial distribution parameter. In accordance with common usage for small probability values that must be positive, each uncertainty distribution in NUCLARR is taken to be lognormal. From count data, a particular lognormal distribution is selected by using the data to estimate two lognormal distribution parameters. NUCLARR matches the lognormal distribution 95th percentile to the upper confidence bound, and the median to the HEP point estimate. This choice preserves the error factor as the ratio of the upper uncertainty bound to the point estimate. From the fitted lognormal distribution, a mean HEP value is also computed.^a

The equations used by the NUCLARR system for performing these calculations are listed below. All equations except those for the mean and error factor are based on an assumed constant error probability. In these equations, $F(df_1, df_2, p)$ and $\chi^2(df, p)$ are percentiles of, respectively, F and chi-square distributions. Furthermore, in the notation,

$$F_U = F(2E+2, 2N-2E, 0.95) \text{ and } F_L = F(2E, 2N-2E+2, 0.05).$$

The mean and error factor equations are based on fitting a lognormal distribution to the HEP and its upper confidence bound. The equations are as follows:

- Given a number of errors E and opportunities N,

$$\text{HEP} = E/N = \text{median} \tag{1}$$

a. For additional information on lognormal distributions, refer to D. Kececioglu, *Reliability Engineering Handbook, Volume 1*, New Jersey: Prentice-Hall, 1991.

Statistics

$$\text{UCB} = \text{upper confidence bound} = (E+1)*F_U/[N-E + (E+1)*F_U] \quad (2a)$$

$$\text{LCB} = \text{lower confidence bound} = E*F_L/(N-E + 1+E*F_L) \quad (3a)$$

for small N; or, for large N,

$$\text{UCB} = \chi^2(2E+2, 0.95)/(2N) \quad (2b)$$

$$\text{LCB} = \chi^2(2E, 0.05)/(2N) \quad (3b)$$

$$\text{EF} \approx \text{error factor} \approx \text{UCB/HEP} \quad (4)$$

$$\text{Mean} = \text{HEP} * \exp\{[\ln(\text{EF}/1.645)]^2/2\}. \quad (5)$$

- Given HEP and UCB, use (4) for EF.^b Using a table, solve for E in:

$$\text{EF} = \chi^2(2E+2, 0.95)/(2E).$$

Then estimate N from HEP and E, using Equation (1).

Aggregated HEPs

Aggregations are often used in risk analysis when (a) many data points apply to the situation being modeled, (b) only a top level or screening value is needed for the particular analysis, or (c) no original data points are available that fit a particular application. The NUCLARR system takes individual data records (see Appendix B) and combines them to produce a single aggregated data value for each combination of equipment and human action (see Appendix A). The aggregated output consists of a mean, median, error factor (EF), and upper and lower bounds (UCB, LCB).^c

HEPs are computed separately for omissions and commissions, and HEPs that reflect the consideration of recovery actions are never combined with HEPs for which recovery was not considered. Thus, as many as four aggregated HEPs are computed for a given data set, depending on the characteristics of the data present.

The calculation for combining a set of data for a given equipment class and action and, if appropriate, reactor vendor and job class, is as follows. After completing the processing of each point on entry into NUCLARR, each point being combined has a fitted lognormal distribution with a median (p , = HEP) from Equation (1) and an error factor (EF) from Equation (4). The aggregate is taken to be the geometric mean of the values being combined. Thus, its uncertainty distribution is also lognormal. The equations for combining N data points are as follows:

b. Note that the LCB is not needed for this calculation.

c. For additional information on confidence intervals, refer to N. L. Johnson, and S. Kotz, *Discrete Distributions*, New York: John Wiley & Sons, 1989.

$$\text{HEP} = \exp [\text{Sum of } (\ln p_i)/N]$$

$$\text{EF} = \exp [\text{Sum of } (\ln (EF_i))^2/N]^{1/2}$$

$$\text{UCB} = \text{upper bound} = \text{HEP} * \text{EF}$$

$$\text{LCB} = \text{lower bound} = \text{HEP} / \text{EF and}$$

$$\text{Mean} = \text{HEP} * \exp\{[\ln (EF/1.645)]^2/2\}.$$

Note that UCB and LCB are uncertainty bounds rather than confidence bounds for the aggregated data.

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

1. REPORT NUMBER
(Assigned by NRC. Add Vol., Suppl., Rev.,
and Addendum Numbers, if any.)

NUREG/CR-4639
EGG-2458
Vol. 5, Rev. 4

2. TITLE AND SUBTITLE

Nuclear Computerized Library for Assessing Reactor
Reliability (NUCLARR)
Volume 5: Data Manual
Part 2: Human Error Probability (HEP) Data

3. DATE REPORT PUBLISHED

MONTH YEAR

September 1994

4. FIN OR GRANT NUMBER

A6854

5. AUTHOR(S)

W.J. Reece, B.G. Gilbert, R.E. Richards

6. TYPE OF REPORT

Technical

7. PERIOD COVERED (Inclusive Dates)

8. PERFORMING ORGANIZATION - NAME AND ADDRESS (If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)

Idaho National Engineering Laboratory
EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, ID 83415

9. SPONSORING ORGANIZATION - NAME AND ADDRESS (If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)

Division of Systems Research
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

This data manual contains a hard copy of the information in the Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR) Version 3.5 database, which is sponsored by the U.S. Nuclear Regulatory Commission. NUCLARR was designed as a tool for risk analysis. Many of the nuclear reactors in the U.S. and several outside the U.S. are represented in the NUCLARR database. NUCLARR includes both human error probability estimates for workers at the plants and hardware failure data for nuclear reactor equipment. Aggregations of these data yield valuable reliability estimates for probabilistic risk assessments and human reliability analyses. The data manual is organized to permit manual searches of the information if the computerized version is not available.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

Human error probability
hardware component failure
probabilistic risk assessment
human reliability estimates

13. AVAILABILITY STATEMENT

Unlimited

14. SECURITY CLASSIFICATION

(This Page)

Unclassified

(This Report)

Unclassified

15. NUMBER OF PAGES

16. PRICE