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**Facility Interface Capability
Assessment (FICA) Project Report**

**MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY**

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Facility Interface Capability Assessment (FICA) Project Report

September 1995

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LIST OF ACRONYMS AND ABBREVIATIONS

BWR	boiling water reactor
CRWMS	Civilian Radioactive Waste Management System
DSDP	Cask System Development Program
DOE	U.S. Department of Energy
EEL	Edison Electric Institute
EIA	Energy Information Administration
EPRI	Electric Power Research Institute
FICA	Facility Interface Capability Assessment
FSAR	Final Safety Analysis Report
HLW	high-level waste
INIS	Integrated Nuclear Information System
ISFSI	Independent Spent Fuel Storage Installation
IVAP	Information Verification and Acquisition Plan
LWT	legal weight truck
LMES	Lockheed Martin Energy Systems
NAC	Nuclear Assurance Corporation
NRC	U.S. Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
NWPA	Nuclear Waste Policy Act of 1982
OCRWM	Office of Civilian Radioactive Waste Management
ORNL	Oak Ridge National Laboratory
OWT	over weight truck
psf	pounds per square foot
PWR	pressurized water reactor
R/B	rail/barge
SNF	spent nuclear fuel
STP	South Texas Project
TSA	Transportation System Acquisition
UWASTE	Utility Nuclear Waste and Transportation Program (coordinated through EEL)
UNWMG	Utilities Nuclear Waste Management Group

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EXECUTIVE SUMMARY

The U.S. Department of Energy's (DOE) Office of Civilian Radioactive Waste Management (OCRWM) is responsible for developing the Civilian Radioactive Waste Management System (CRWMS) to accept spent nuclear fuel from commercial facilities. In support of the development of the CRWMS, OCRWM sponsored the Facility Interface Capability Assessment (FICA) project. The objective of this project was to assess the capability of each commercial spent nuclear fuel (SNF) storage facility, at which SNF is stored, to handle various SNF shipping casks.

The purpose of this report is to present and analyze the results of the facility assessments completed within the FICA project. The project was conducted in two phases. During Phase I, the data items required to complete the facility assessments were identified and the database for the project was created. During Phase II, visits were made to 122 facilities on 76 sites to collect data and information, the database was updated, and assessments of the cask-handling capabilities at each facility were performed.

Each assessment of cask-handling capability contains three parts:

1. the current capability of the facility (planning base)
2. the potential enhanced capability if revisions were made to the facility licensing and/or administrative controls
3. the potential enhanced capability if limited physical modifications were made to the facility

Each assessment was completed using four conceptual cask size envelopes (dimensions and weights) that are referred to in this report as the "FICA Casks." The FICA Casks represent maximum bounds of casks that could be used as part of the CRWMS.

The main conclusion derived from the planning base assessments is that the current facility capabilities will not allow handling of any of the FICA Casks at 49 of the 122 facilities evaluated. However, consideration of potential revisions and/or modifications showed that all but one of the 49 facilities could be adapted to handle at least one of the FICA Casks. For this to be possible, facility licensing, administrative controls, and/or physical aspects of the facility would need to be modified.

The table on the following page illustrates, in summary form, the results of the assessments, with and without potential actions to enhance capability.

Assessment summary — number of facilities able to handle the FICA Casks

FICA Cask	Number of facilities capable of handling casks based on current capability	Number of facilities capable of handling casks following administrative and/or licensing changes	Number of facilities capable of handling casks following administrative changes, licensing changes, and/or plant modifications
LWT	73	105	121
OWT	68	98	119
100-ton R/B	50	76	99
125-ton R/B	26	52	79

Note: LWT = legal-weight truck; OWT = overweight truck; R/B = rail/barge.

These summary numbers refer only to facility capabilities for cask handling. They do not address the capability of the cask to accommodate the SNF in the form in which it will need to be transported from each facility.

It is important to recognize that the project did not include any of the detailed technical analyses that would be required for implementing the potential changes identified. Therefore, there is no certainty that the assessed changes can be achieved. Demonstration that the potential changes could be achieved would have required technical analyses and the evaluation of licensing requirements that were beyond the scope of this project.

Nothing in this report is intended (1) to recommend judgment on whether any of the administrative changes, licensing changes, or physical modifications considered should be completed or (2) to imply that the utility or operator for any facility has expressed the intention of completing any facility changes.

PREFACE

This report presents the results of the technical work completed in the FICA project. This project involved visits to, and the collection and analysis of data from all 121 of the civilian nuclear reactors and one fuel storage facility (located at Morris, Illinois) from which spent fuel will be shipped to the Civilian Radioactive Waste Management System. Data collections and selected information updates were made between 1986 and 1991. During the visits, each facility's current cask-handling capability was determined, and the data collected were analyzed to assess the potential capability of that facility. The Nuclear Assurance Corporation (NAC) was responsible for data collection, completion of facility assessments, and report development.

The technical data relating to each facility's cask-handling capability are presented. In addition, the database is available in electronic format (diskette and user manual) and can be obtained upon request to:

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1. INTRODUCTION

The Nuclear Waste Policy Act of 1982 (NWPA), as amended, authorized the U.S. Department of Energy (DOE) to enter into contracts with owners and generators of spent nuclear fuel (SNF) and/or high-level radioactive waste (HLW) of domestic origin for acceptance of title to and subsequent transportation, storage, and disposal of such SNF and HLW. Under the provisions of the "Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste" (10 CFR 961) agreed between DOE and owners of the SNF (referred to as "Purchasers" in the contract), DOE is responsible for providing the shipping casks and all ancillary equipment needed for transporting these materials from the Purchasers' sites. The Purchasers will be responsible for loading the SNF into the transport casks.

The cask-handling capabilities that exist at Purchasers' reactors and other SNF storage facilities have an impact on the design of the Civilian Radioactive Waste Management System (CRWMS). To support the CRWMS design, especially that of the CRWMS transportation system, the DOE's Office of Civilian Radioactive Waste Management (OCRWM) determined that a facility interface capability assessment needed to be completed to determine facility capabilities for loading and shipping SNF. Data collections and selected updates were made between 1986 and 1991. The assessment determined current capabilities, assessed limitations, defined potential revisions to facility licensing and administrative controls, and defined potential limited physical facility modifications that might allow larger casks to be handled at the facility.

The primary source of information for this report has been the utilities and storage facility operators. Overall, full support was generously provided by all of the Purchasers. Their cooperation was invaluable to data collection, verification, and analysis, as well as review of the assessments. Much of the information consisted of engineering drawings and technical documents provided in response to a written request. Visits to the 122 facilities on 76 sites that have contracts for delivering SNF to the DOE were also made to allow interpretation of the numerical data, discussion of any remaining data items, and verification of the data already obtained. The site visits provided an opportunity to walk through and visually assess the cask travel path, to examine the configuration and equipment associated with the SNF handling areas at each facility, and to hold discussions with facility operations and engineering staff. This process allowed examination of plant features that were not readily identifiable on drawings or in the documents provided by the utility. For example, in many cases, plant hardware or equipment extend into the cask travel path between the cask receiving area and the fuel loading area. However, because these items are above the floor level, they may not appear on the standard elevation drawings provided by utilities.

Following the initial data collection activity and completion of the site visit, an assessment was made of the existing capability of each site to handle Facility Interface Capability Assessment (FICA) Casks and the potential capability if the facility were to be modified. The purpose of this report is to summarize the results of these assessments.

The scope of the project did not include any of the detailed technical analyses that would be required for implementing the potential changes identified. Accordingly, the assessments are based on the judgment and engineering experience of the project staff, and there is no certainty that the assessed changes can be realized. Demonstration that the potential changes are achievable would have required technical analyses and the evaluation of licensing requirements that were beyond the scope of this project.

Nothing in this report is intended to recommend whether any of the administrative changes, licensing changes, or physical modifications considered should be completed. Finally, nothing in this report is intended to imply that the utility or operator for any facility has expressed the intention of completing any facility changes.

2. BACKGROUND

2.1 OVERVIEW

The FICA project was performed to provide the data and analysis necessary to characterize the cask-handling interface capabilities between the CRWMS and the commercial facilities from which SNF will be shipped.

The specific objectives of the FICA project were to:

1. Determine and document existing and planned facility capabilities to handle casks.
2. Identify facilities where possible interface changes could result in benefits to the shipping operations of the CRWMS by defining changes that might allow the facility to ship SNF in larger casks.

The FICA project was conducted in two phases. In Phase I, the informational requirements for performing assessments of facility capabilities were defined, a database was produced for recording and presenting the information and data that would be obtained, and the Information Verification and Acquisition Plan (IVAP) was developed. The IVAP defined the procedure for performing site visits (data collecting) and assessments. In addition, site visit procedures were developed, ten nuclear reactors at five sites operated by five utilities were identified, and plans were made for visiting these sites at the beginning of Phase II so the IVAP and site visit procedures could be tested.

During Phase I, a FICA Utility Working Group was formed which consisted of representatives from the utilities operating the test visit facilities, the Electric Power Research Institute (EPRI) and the Edison Electric Institute (EEI/UWASTE*). The FICA Utility Working Group was established to facilitate communications with the Purchasers, coordinate visits, and facilitate Purchaser review of data and project results. The FICA Utility Working Group was essential in providing a utility perspective to the project and, also, valuable guidance on how the visits could be completed without affecting the utilities' operational requirements.

In Phase II, site visits and assessments of facility interface capability were completed for the 122 commercial nuclear facilities on 76 sites from which SNF will be accepted by the CRWMS. The site visits included 121 reactors. In addition, a site visit was made to the storage facility at the General Electric Morris Operations (formerly the General Electric Reprocessing Facility), which is located at Morris, Illinois.

In the performance of site visits during Phase II, discussions were held with and information was obtained from utility staff representing operations, engineering, and other departments. This ensured

*Utility Nuclear Waste and Transportation Program.

that the FICA information and data obtained during the site visits were current and accurate; it also increased the likelihood that the information and data were appropriately interpreted.

2.2 PROJECT SCOPE

2.2.1 Phase I — Project Planning and Development

Phase I of the FICA project began in 1986. The first task was the review of several existing data bases established to maintain information related to the cask-handling interfaces at existing power reactors and independent SNF storage facilities. In a parallel effort, the Energy Information Administration and OCRWM contractors and subcontractors were contacted to identify existing data requiring validation, as well as additional information that needed to be incorporated into the database.

Following these actions, the FICA database was created to accommodate those data items identified to meet the requirements of the project; then all available information and data were added. The result was a data base that summarized the information obtained through the review of existing data sources and identified the additional information that was required. The primary data sources used for this task were:

1. Fuel-Trac[®] Data Base, Client Reports, and other internal sources—Nuclear Assurance Corporation, 1971-1986
2. *Control of Heavy Loads: Safety Evaluation Reports and Technical Evaluation Reports*, NUREG-0612 (11 Volumes) — Franklin Research Center, 1981-1985
3. Data Report on Sandia Document, *Spent Nuclear Fuel and High-Level Waste Shipping Cask Interface Data Collection*—Westinghouse Electric Corporation, September 17, 1986
4. *Spent Nuclear Fuel Shipping Cask-Handling Capabilities of Commercial Light Water Reactors*—Pacific Northwest Laboratory, April 1985
5. Information from the RW-859 Survey for INIS Data Base—Department of Energy—EIA, Electronic Transmittal (Magnetic Tape), March 1986*

The second task in Phase I was to develop a preliminary plan for the verification of information assembled in the first task, as well as a plan to acquire the data necessary to complete the database. The latter plan, the IVAP, became the operation manual for the activities in Phase II. The IVAP documented the procedures for collecting the required information, including the site visits, and performing the facility assessments. Phase I was completed in December 1986.

* See p. 71 for the titles of these reports

2.2.2 Phase II — Site Visits and Data Assessment

The first task of Phase II included the completion of test visits to ten facilities at five selected sites in order to test the database and the IVAP. The second task of Phase II included visiting the remainder of the facilities and performing assessments of all other facility cask-handling capabilities.

The ten facilities at the five sites included in the test visits are listed in Table 1. They were selected to reflect the range of reactor types [pressurized water reactor (PWR) and boiling water reactor (BWR)], vendors (General Electric, Westinghouse, Combustion Engineering, and Babcock & Wilcox), spent-fuel shipping experience (none, limited, extensive), storage alternatives under consideration (e.g., in-pool and out-of-pool), plant age (1 to 17 years), and experience with fuels of different status (intact and failed) that would be encountered during the remainder of the site visits. On completion of the test visits (October 1987), draft assessments and facility data printouts were prepared.

In November 1987, the plan for the second task of Phase II was issued in preparation for visits to the remaining 71 sites (112 facilities). Throughout the performance of Phase II, the site visit schedule was periodically adjusted to meet utility availability. Visits to all sites were completed by March 1990. The facilities visited, along with the corresponding dates and locations, are shown in Appendix 1. Throughout the site visits, a high level of utility cooperation and support was received.

During each site visit, an "open items list" was prepared and left with the utility to complete following the visit. This list identified the data that could not be obtained or verified during the site visit. Following each site visit, the data collected were entered into the project database and a facility assessment report was completed. As the additional data became available, revisions to the facility assessment reports were made.

Following completion of the first site visits, the draft assessments were prepared, based on the envelope dimensions of the casks specified in the OCRWM Transportation System Acquisition (TSA) Phase I-From-Reactor Casks program. However, as the TSA designs were developed, it became possible to identify nominal cask sizes representative of these designs. In November 1989, the decision was made to complete a second cask-handling assessment for each facility, based on the bounding dimensions that would be representative of all TSA cask designs. All TSA designs were for either a legal-weight truck cask or a 100-ton rail/barge (R/B) cask.

Bounding dimensions for an overweight truck cask and a 125-ton rail/barge cask were derived from early design concepts for these casks and existing commercial cask designs. These four model casks were called the "Second Level Assessment Casks". As a result, the project database and the individual facility assessment reports include assessments based on two sets of casks:

1. Reference Casks — Based on the TSA program envelope dimensions.
2. Second Level Assessment Casks — Based on dimensions generally representative of the TSA casks currently being designed (legal weight truck cask and 100-ton rail/barge cask) and casks available or being designed for commercial use (overweight truck cask and 125-ton rail/barge cask).

Table 1. Test visit sites

Facility	Vendor/ type ^a	Off-site shipping experience	Initial year of operation
Millstone 1	GE-BWR	None	1970
Millstone 2	CE-PWR	None	1975
Millstone 3	W-PWR	None	1986
Surry 1	W-PWR	Extensive	1972
Surry 2	W-PWR	Extensive	1973
Peach Bottom 2	GE-BWR	Limited	1974
Peach Bottom 3	GE-BWR	None	1974
St. Lucie 1	CE-PWR	None	1976
St. Lucie 2	CE-PWR	None	1983
Crystal River 3	B&W-PWR	Limited	1977

^aGE-BWR refers to a General Electric-supplied boiling water reactor; CE-PWR refers to a Combustion Engineering-supplied pressurized water reactor; W-PWR refers to a Westinghouse-supplied pressurized water reactor; and B&W-PWR refers to a Babcock & Wilcox-supplied pressurized water reactor.

For both sets, only the weight and the external dimensions of the casks were considered. Other aspects of suitability of the casks for fuel shipments from individual facilities (including the compatibility of the spent fuel with the cask design) were not included in the scope of the project.

For completeness, both assessments are retained in the individual facility documents. However, this report considers the facility cask-handling capabilities based only on the "Second Level Assessment Casks." For simplicity, in this report they are referred to as the "FICA Casks." The FICA Casks, which are described in more detail in Sect. 3.0, consisted of the following four generic models:

1. a legal-weight truck (LWT) cask
2. an overweight truck (OWT) cask
3. a 100-ton rail/barge (R/B) cask
4. a 125-ton R/B cask

Each facility assessment first addressed the current capability of the facility and identified those FICA Casks which can be handled without any type of administrative (i.e., licensing or operating document) revisions or physical modifications.

The facility assessment then considered the potential cask-handling capability if the facility were to be modified. The first type of change assessed in this task considered possible changes that the utility might make to either the facility licensing documents or the administrative controls in order to remove one or more limiting conditions. Examples include the completion of a new cask-drop analysis and the relaxation of the requirement for a specified water depth over a fuel assembly during cask loading. Judgment was used in assessing potential changes, taking into account factors such as the crane design capacity, the age of the plant, the physical size of various areas of the plant, and any information on the cask that the facility was designed to handle.

Each facility assessment then addressed the possibility of removing plant restrictions by physically modifying the plant. The modifications considered in this case were those which were judged by the project staff to be achievable without a major impact on the plant but which, when completed, would increase the cask-handling capability of the facility. Examples of the physical modifications include the installation of an engineered plate to spread the weight of a cask over a larger specific floor area and modification to an anti-tipover device in the cask loading area. Major plant modifications, such as replacement of the cask-handling crane or moving of the building structural supports, were not considered because they were beyond the scope of the project.

Physical plant modifications are generally more difficult and costly to implement than changes to operating procedures or licensing documents. Specifically, many physical plant modifications require prior licensing document revisions; for this reason, these two types of changes are discussed separately. However, in some cases, the physical modifications assessed in this project may be more readily achievable than changes to licensing documents or administrative controls.

The project did not include any of the detailed technical analyses that would be required prior to implementation of the potential changes identified. Thus, the assessments are based on judgment and engineering experience, and there is no certainty that the assessed changes can be achieved. To demonstrate achievability would have required technical analyses and the evaluation of licensing requirements that were beyond the scope of this project.

Upon completion of the assessment and database printout for a facility, the completed package was subjected to a formal internal review process. Following completion of an internal review, the assessment and database printout were reviewed by the relevant utility or operating company to ensure that its position was correctly represented and to resolve any outstanding questions that might affect the final assessment. Any clarifications provided by the utility or operating company were then taken into account in preparing the final assessment and database printout.

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3. TECHNICAL BASIS FOR THE PROJECT

In order to assess the cask-handling capabilities at the facilities from which spent fuel will be accepted by the CRWMS, information was required, primarily related to the physical dimensions of plant areas, crane weight limits, and floor load limits. Additional information, such as basic fuel characteristics data, has also been collected in order to put the assessments into context.

This section of the report discusses:

1. data collected on fuel assembly dimensions
2. specifications of the casks used as the basis of the cask-handling assessment
3. method of assessment used to determine facility capabilities

3.1 FUEL ASSEMBLY DIMENSIONS

There are many different types of fuel assemblies with different physical dimensions and weights. Each reactor vendor has its own fuel handling system design, and there are often significant differences between successive generations of fuel and fuel handling systems designed by the same vendor.

Although many parameters relating to fuel geometry, weight, and radiological characteristics are also pertinent to loading SNF shipping casks, the scope of the project only included cask handling at the relevant facilities. Two parameters relating to the SNF assembly were critical in the FICA project in assessing cask handling at the facility: overall fuel assembly length and active fuel length.

The operating procedures or technical specifications for a facility will often specify the minimum depth of water required to be maintained over the top of an irradiated fuel assembly at all times in the spent-fuel pool. In some facilities, however, the minimum water depth is specified above the active fuel length (i.e., the length in which the irradiated fuel is located). In other facilities, the water cover requirement is specified indirectly by limiting the height to which a fuel assembly may be raised above the pool floor. Each of these limits necessarily restricts the length of cask into which fuel can be loaded at a facility, although this is not necessarily the most restrictive limit at the facility.

3.2 CASK PARAMETERS

The main focus of the FICA is related to determining the ability of the facilities considered to handle casks. In order to assess the cask-handling capabilities for a given facility, the relevant parameters of casks that might be handled there were defined to be:

1. weight

2. width across trunnions
3. body diameter
4. footprint diameter
5. body length
6. length, including lifting yoke

Figure 1 shows, generically, major cask features relating to in-facility handling and graphically depicts the geometric parameters used for determining the ability of a facility to handle the cask. From this set of parameters, the following key parameters were derived for assessing facility capability:

1. cask footprint area
2. specific floor load
3. width clearance for a square setdown area
4. width clearance for a circular setdown area

During cask-handling operations, the weight carried by the crane varies according to the status of the cask, including among other factors whether the cask

1. is full of water or drained
2. contains or does not contain SNF
3. is used with a redundant or a nonredundant yoke

For each of the FICA Casks, the weight refers to the maximum weight required to be carried by the crane during cask-handling operations.

The preliminary designs of two LWT and two 100-ton R/B casks developed under OCRWM's Cask System Development Program (CSDP) were used to establish maximum cask bounding dimensions and weights for the FICA LWT cask and the FICA 100-ton R/B cask. The parameters selected for this case were representative of the CSDP casks, although they were not identical to any of the individual preliminary designs.

Since designs for OWT and 125-ton R/B casks have not been initiated by OCRWM, preliminary design dimensions were not available for these casks. Thus, representative dimensions for generic casks of these two sizes were derived, based on concepts developed in the early stages of the OCRWM cask development program and on existing commercial cask designs.

REF. FILE: SG378005

Fig. 1. Cask-handling dimension parameters.

A set of dimension and weight parameters for the FICA LWT, OWT, 100-ton R/B and 125-ton R/B program cask types was produced in May 1989 to be used as the basis for the facility cask-handling assessments. These parameters are shown in Table 2.

For the purpose of deriving floor loadings, a footprint diameter and area were modeled for each cask. The footprint, for the OWT cask only, was assumed to be a square; therefore, the dimension shown as the diameter for the OWT cask in Table 2 is not a true diameter and, for assessing cask-handling clearances, only the body and trunnion dimensions were used.

In determining cask-handling capabilities, it is necessary to consider dimensional and weight limitations within the facility. For each facility, the cask parameters were compared with the facility layout and dimensions; and the capability of the facility to handle each of the casks was considered. As noted in Section 5.6.1, numerical floor load limits were able to be specified by utilities for only a few facilities. Where no numerical floor load limits were available, other available information was used to indicate potential cask weight limits as discussed in Sections 3.4 and 4.3.6.

3.3 FACILITY PARAMETERS

In order to assess facility cask-handling capabilities, the cask parameters established for the FICA Casks were compared with the dimensions and weight limitations of all relevant plant features at each facility.

In each facility, the cask travel path was considered as four separate elements:

1. receiving area (also called the vehicle bay)
2. upending area (in most plants, the same as the receiving area)
3. decontamination area
4. fuel loading area

Figures 2—5 show simplified section and plan views of typical or generic plant layouts for PWR and BWR cask-handling facilities. Plant clearance limitations were considered throughout all stages of the cask handling and loading operations until the cask was mounted back on a vehicle in the receiving area. In addition, the crane weight capacity, operational clearances, and floor load limitations along the cask travel path were taken into account.

As discussed in Section 3.1, there is a requirement in each facility to maintain a specified minimum water cover over a fuel assembly during cask loading. This ensures that sufficient shielding is maintained to meet radiation control requirements. Although specified in a number of ways, this water cover requirement was also considered in determining cask-handling capability.

Table 2. FICA Cask parameters

Parameter	Type of cask			
	LWT	OWT	100-ton R/B	125-ton R/B
Dimensions*				
Weight, tons (W)	28	40	100	125
Width across trunnions, ft, in. (T)	4, 5	5, 6	7, 10	8, 5
Body diameter, ft, in. (B)	3, 6	4, 8	7, 4	8, 3
Footprint diameter ft, in. (F)	2, 5	5, 6	6, 5	6, 11
Body Length, ft, in.	17, 0	17, 2	17, 2	17, 2
Length including lifting yoke, ft, in.	22, 6	23, 1	22, 0	22, 0
Derived parameters*				
Footprint area, ft ² (A)	4.6	21.8	32.3	37.6
Specific floor load, lbs/ft ² [(2000 · W)/A]	12,200	3,700	6,200	6,600
Width clearance - square setdown area (B + 2 in.) ft, in.	3, 8	4, 10	7, 6	8, 5
Width clearance - circular setdown area (T + 10 in.) ft, in.	5, 3	6, 4	8, 8	9, 3

* Letters in parentheses are abbreviations for the parameters and derived parameters. Formulas give values for derived parameters.

3.4 OPERATING CONTROLS

In assessing plant limitations relative to cask handling, there are a number of operating controls that are specified in the plant Technical Specifications, Operating Procedures and Final Safety Analysis Report (FSAR). In many cases, these are controlled by mechanical interlocks or limit switches on equipment; in some cases, however, they are controlled administratively.

The controls that are in some cases the most restrictive and that occur in many plant areas related to cask handling, are imposed because of calculated floor load limits. Prior to handling any cask at a facility, it is necessary to demonstrate that each area where the cask may be set down can accept the weight of the cask. Floor load limits are typically available as either the static limit or the dynamic set-down limit although, in some cases, both may be specified. Static floor load limits relate to the maximum stationary load a floor may accept, assuming no set-down velocity. Dynamic floor load limits include a factor (typically 1.2 applied to the static load limit) which allows for the set-down velocity. Throughout the project, difficulty was experienced in obtaining floor load limit data. This is discussed in Section 5.6.1, and the assumptions made to allow facility assessments to be completed in the absence of this data are discussed in Section 4.3.6.

Chapter 9 and/or Chapter 15 of the FSAR for most plants include a description of the cask assumed in the design of the plant. For the purposes of this project, where no other information was available, it was assumed that the facility could handle a cask of this weight in the cask receiving, upending, decontamination, and cask-loading areas. Where this was assumed, it is recorded as such in the individual FICA Project Facility Cask-handling Assessment reports.*

For each facility the design capacity of the crane was identified and recorded. At many facilities, the crane had been downrated by imposition of an operating limit lower than the design capacity, and the current value of this operating limit was also recorded. In some cases, the downrating was introduced to provide an additional load margin for all heavy load operations, while in others it followed completion of a cask drop analysis and applied only to cask-handling operations. In many cases where the operating capacity was lower than the design capacity, this followed the introduction of NUREG-0554 and NUREG-0612.

NUREG-0554, *Single-Failure-Proof Cranes for Nuclear Power Plants*, was issued by the NRC in 1979. It identified the design, fabrication, installation, inspection, testing and operating requirements for single-failure-proof overhead cask-handling systems.

NUREG-0612, *Control of Heavy Loads at Nuclear Power Plants — Resolution of Generic Technical Activity*, was issued by the NRC in 1980. It established the guidelines for control of heavy loads, including:

1. definition of safe load paths
2. use of cask-handling procedures

*There are 122 individual FICA Project Facility Cask-handling Assessment reports — one for each site.

SG376001

Fig. 2. Plan view of generic BWR cask-handling facility.

SG376002

Fig. 3. Section view of generic BWR cask-handling facility.

SG376003

Fig. 4. Plan view of generic PWR cask-handling facility.

Fig. 5. Section view of generic PWR cask-handling facility.

3. training of crane operators
4. guidelines on the use of slings and special lifting devices
5. periodic inspection and maintenance requirements for cranes

The objective of NUREG-0612 related to the handling of casks is to ensure that either the potential for a cask-drop accident is extremely small, or the consequences of a cask-drop accident are within acceptable limits. To demonstrate that the potential for a cask-drop accident is small, the cask-handling system must be single-failure proof as defined by NUREG-0554. The single failure proof requirement may be met by redundancy (provision of dual components) or overcapacity. In each case, the design safety factor required is specified. To demonstrate that the consequences of a potential cask-drop accident are within acceptable limits, mechanical stops or electrical interlocks may be used to prevent the travel of heavy loads over fuel or safety-related equipment, or the consequences of a postulated cask-drop accident may be analyzed to show that these are within acceptable limits. Where it is necessary to complete a cask-drop analysis, Appendix 1 to NUREG-0612 specifies the appropriate assumptions, boundary conditions, techniques, and acceptance criteria.

Cask-drop analyses may be performed to demonstrate that a specific cask can be handled or that a generic cask-drop analysis may be performed. If a cask-specific analysis has been completed, the utility may be required to perform a new analysis before a different cask may be used at the plant, unless it can be demonstrated that the existing analysis is bounding for the new cask. A generic cask-drop analysis may assume a worst-case combination of cask weight and diameter which allows the utility flexibility in selecting a cask for use at the plant.

For utilities that have NRC-approved cask-drop analyses, the results of those analyses were used in assessing the facility's cask-handling capability. However, cask-drop analyses were completed for some plants before the guidelines in NUREG-0612 were issued by the NRC. In these cases, the analyses may not meet the NRC's acceptance criteria established by NUREG-0612, and a new cask-drop analysis may be required before the utility can handle a cask. A determination of whether a cask-drop analysis meets the NUREG-0612 acceptance criteria is beyond the scope of the FICA project. For facilities with cask-drop analyses completed prior to NUREG-0612, judgment was made by the project team on a case-by-case basis, taking into account the period since the analysis was completed, the most recent use of the crane and discussions with utility staff. The date of the most recent cask-drop analysis is recorded in the project database where identified by the utility concerned. Thus, it may be readily determined whether the cask-drop analysis preceded introduction of the specific requirements of NUREG-0612.

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4. PROJECT DEVELOPMENT

4.1 DATA ITEMS

An initial data item list was identified at the start of Phase I of the project, and this list formed the basis of the initial goals of the site visit program. The purpose of the data item list was to provide, as concisely and completely as possible, a defined set of parameters that would accurately describe the capability of any given site to handle spent-fuel shipping casks. The list was intended to be as short as possible and still allow a thorough description of each site's capabilities.

During the test visits, a number of additional data items were identified which were necessary to allow a full assessment of capabilities at some facilities. Also, it was determined that more contextual data were required to allow a new user to obtain a full understanding of the requirements and capabilities of individual facilities. After completion of the test visits, the data item list was modified so that the additional parameters could be included in the data collection activities during the remaining site visits.

Also, in many cases, utilities made available data which were not required for the database or to complete the facility assessment. However, where, in the judgment of the project staff, this provided added depth and would be helpful to other users, it has been included.

Throughout the performance of site visits and the completion of the assessment reports, the definitions applied to the data items in the database have been continually under review. Periodic project meetings have been held to discuss technical issues, including the general applicability of the data item definitions. In some instances, the data item definitions have been revised and the wording of the data item definition changed. The final list of data item descriptions is included as Appendix 3 of the FICA Users Manual.

4.2 FACILITY DATABASE PRINTOUT

The data item list was initially assembled to group related data items together and the printout for each facility was sent to the utility prior to the site visit. During the test site visits, the original printout was found to be cumbersome because the order in which the site visit was conducted was different from the order of the data items in the printout. After the initial test visits, the data was reordered and subsequent visits employed this revised database printout. Some final revisions to the format have also been made following completion of the site visit program.

4.3 BASIS OF ASSESSMENT

At the completion of each site visit and after the preparation of the facility database printout, a draft of the cask-handling assessment was prepared for each facility on the site. The assessment addressed

the current cask-handling capability at each facility as well as the potential to allow any increased capability by upgrading to allow handling of larger casks. The assessment followed a consistent and an orderly outline for all facilities.

During the internal review procedure, it was noted that some assessments of current capability were based on assumed completion of minor modifications in anticipation of future cask handling operations. In order to standardize the approach to assessment of current capabilities, it was determined that no assessments would take into account any potential change in licensing or administrative controls or physical modifications. All of the earlier assessments were revised as required for consistency.

Toward the end of the site visit program, but prior to general review of the assessments by the utilities, a number of issues that could affect potential improved cask/facility interfaces were presented to the FICA Utility Working Group. This presentation consisted of a review and discussion by representatives from DOE, ORNL, utility representatives, EEI, and NAC. This review resulted in the development of a standard set of definitions for areas deemed to be open to broad interpretation. It was agreed that application of the definitions would need to take into account the individual characteristics of the facilities. These items are discussed below and presented with their resolution.

4.3.1 Capacity of the Cask-Handling Crane

The design and operating capacity of the cask-handling crane are important to the assessment of the utility's cask-handling capability at the plant. In many cases the crane operating capacity is less than its design capacity because of load handling limitations imposed as a result of cask-drop analyses, crane support structural limits, or building support structural limits.

A cask-drop analysis which concludes that a plant is limited to handling casks which weigh less than the crane design capacity does not necessarily result in the crane operating capacity being set below its design capacity. The utility determines the operating capacity of the cask-handling crane in light of all analyses performed, other heavy loads required to be lifted by the crane, and licensing implications of setting the operating capacity below the design capacity. For example, if the cask-handling crane has a design capacity of 125 tons and the cask-drop analysis determines that the utility is limited to handling casks with a maximum weight of 100 tons, the utility may introduce a Technical Specification change which specifies this maximum weight for cask handling rather than limiting the crane to 100-ton operating capacity for all purposes.

The FICA assessments of cask-handling capability are based on the operating capacity of the crane or the cask-drop analysis for the plant, whichever is lower.

4.3.2 Availability of an On-Site Barge Facility

At many sites, a barge facility was available during the plant construction phase but has not been subsequently used or maintained. It is not easily determined whether the barge facility is still usable or has decayed to the extent that, if the facility were to be returned to its original specification, it would need to be essentially rebuilt. The FICA assumed that if a barge facility was available in the

past, the water and land access routes to the facility will be potentially usable, and barges will be available that require a minimum of installed facilities. Thus, the database may indicate that a barge facility is available, even if none of it remains. Where the site lies on a navigable waterway, but no barge facility has ever been developed, the FICA database may indicate there is barge capability if there is adequate water depth, land access, and no identified reason to conclude that a barge could not be used.

4.3.3 On-Site Road Vehicle Limits

On some sites, the existing road layouts presented some difficulty for a cask transporter to gain access to the truck bay. This applies particularly to heavy-haul vehicles which would be carrying rail/barge casks. It was determined that although difficulty of vehicle access would be noted in the *FICA Project Cask-handling Assessment Report*, the assessed capability would not be reduced because of difficult access.

4.3.4 Limitation on Cask-Handling Headroom

When a cask is being moved from the truck bay to the loading area, it is suspended from the facility crane hook by a yoke. The FICA Cask parameters specify the combined length of cask and yoke. This length is one of the parameters used as the basis of assessment in the FICA project. For some facilities, this limitation results in the facility being assessed as currently incapable of handling any casks. However, a modified yoke could be provided to reduce this headroom requirement although the specific reduction may depend on the detailed design of the facility and which cask was being handled. In order to represent this situation properly, facilities with insufficient headroom were assessed as having no current capability. Provision of a modified yoke is considered a "physical modification" allowing handling of the FICA Casks if the facility were to implement this modification. Based on the assumption that this modification was made, a headroom requirement of 2 ft longer than the specific cask lengths was used as the basis of assessment of capability.

4.3.5 Floor Load Limitation in the Decontamination Area

The introduction of the heavy load handling analysis under NUREG-0554 and NUREG-0612* has resulted in some facilities being restricted to the use of lower weight casks than would previously have been licensed. This is because of the potential consequences of a cask-drop accident. Where a tighter limitation is imposed because of the floor load limitation in the decontamination area, it is possible that temporary decontamination facilities could be established in another area to avoid the load limitation presented by the decontamination area floor. It was agreed that the facility cask-handling-capability assessment would not necessarily be limited by any floor load limitation of the formally designated decontamination area. Consideration could thus be given, where appropriate, to the possibility of providing temporary decontamination facilities in other operational areas where floor load limits would allow it. For facilities where this occurred, the personnel performing the FICA were to identify an alternative area where a temporary decontamination facility could be established.

*See p. 71 for the titles of these reports.

4.3.6 Assessment of Capabilities Where Floor Load Limitations Are Not Known

Many utilities were unable to provide information on floor load limitations without either a significant internal effort or contracting with their architect/engineers. However, in many cases, the utility knows which cask was used as the basis for the facility design. The possibility of calculating the floor loadings for some facilities from the parameters of the design basis casks was examined. However, to properly assess the possibility of handling other casks, it is necessary to make assumptions on the safety margins provided in the analysis of the design basis casks, which was beyond the scope of the FICA project. Thus, unless there is information indicating a lower limit, it was assumed that the floor load limitations are sufficient to handle any casks up to the weight of the design basis cask, irrespective of any difference in cask dimensions.

4.3.7 Variation in Pool Water Depth

In order to derive the maximum (i.e., least restrictive) cask length which can be accommodated by the facility, the normal water depth in the cask loading area was considered as the basis for assessment. It may be possible for some facilities to increase the water depth to accommodate the FICA Cask lengths where the normal operating water level would be insufficient. However, this was considered only when the facility operator had examined this possibility and determined it practicable.

4.3.8 Specified Minimum Water Cover for a Single Fuel Assembly

A minimum water cover requirement for shielding of an individual assembly may be specified in the facility Technical Specifications, Operating Procedures or FSAR. In some cases, the specified minimum water cover is based on the length of cask for which the facility was designed or has previously handled. The result is that a wide range of minimum water cover specifications apply to otherwise similar facilities and in some cases result in an assessment that none of the FICA Casks can currently be handled. Where no minimum water cover was specified, a standard water cover requirement was assumed. The standard water depths were considered to be:

1. PWRs — 8 ft
2. BWRs — 6 ft

Also, where a facility, based on utility operating experience, could not accommodate the FICA Casks because of the required water cover, a reduction in the water cover requirement was considered a licensing change.

4.3.9 Assessment of Fuel Compatibility with FICA Cask Parameters

The fuel assembly length for the two South Texas Project (STP) units is 16 ft 8 in., which is too long to be accommodated in any of the TSA Program casks currently being designed. Although the conceptual "FICA Casks" have no internal dimensions defined, it is assumed that these could not accept STP fuel assemblies since they are based on the TSA Program cask designs. Thus, although the FICA Casks can be handled in the STP cask-handling facilities, they could not be used for loading

and shipping fuel from the site. It is possible that fuel stored at other facilities may also not be able to be accommodated in the final designs of the TSA Program casks. It was considered appropriate to leave assessment of the suitability of casks for shipment of particular fuel designs until the internal dimensions of the casks were better defined.

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5. RESULTS AND ANALYSIS

This section summarizes and analyzes the results of the data collection activities and cask-handling assessments of the FICA project. The detailed data on which these summary presentations and analyses are based is recorded in alphabetical order by facility in the following appendices:

1. Appendix 2: Facility Data — Current Cask-Handling Parameter Limits
2. Appendix 3: Assessed Facility Cask-Handling Capabilities
3. Appendix 4: Facility Data — Crane Parameters
4. Appendix 5: Facility Data — On-site Transportation Capabilities
5. Appendix 6: Facility Data — Cask Shipment Experience

The assessment of cask-handling capability for each facility is based on information provided by the utility or operator in engineering documents and additional information obtained during the site visits. The main focus of the data collection activity and the site visits was the identification of current cask-handling limits and consideration of how these limitations could be removed. The results of this part of the assessment are presented in Section 5.1.

The limitations found during the assessment were then compared with the parameters of the FICA Casks used as the basis of assessment (see Table 2). This resulted in identification of the largest of the FICA Casks which could currently be handled. The possibility of increasing cask-handling capabilities by administrative changes and/or plant modifications was then considered for each facility. The current cask-handling capabilities and potential capabilities if such changes were implemented are presented in Section 5.2 with a tabulation of the changes assessed and the number of facilities for which each was considered. Section 5.3 summarizes and discusses the crane data collected and floor loading limits and the impact of this data on the cask-handling assessments. Section 5.4 presents statistical information on current site transportation capabilities and cask-handling experience at the facilities assessed. Section 5.5 contains further discussion of five facilities where particular features of the facility dimensions or layout warrant special attention. Section 5.6 discusses the data items which posed particular problems in data collection and completion of facility cask-handling assessments.

5.1 CURRENT CASK-HANDLING LIMITS

Appendix 2 tabulates the three main facility parameters relevant to assessment of cask-handling capabilities:

1. the maximum length cask which can be handled in the plant

2. the maximum diameter cask which can be handled in the plant
3. the maximum weight cask which can be handled in the plant

These parameters, when compared with the FICA Cask parameters, determine the current facility cask-handling capabilities. They are considered separately in the sections below.

The general classes of licensing changes and/or plant modifications which might be necessary to overcome the assessed limitations are also noted. In general, length limitations are the easiest to overcome, relative to width or weight limitations, frequently requiring only limited licensing or administrative changes. Conversely, width limitations are generally the most difficult to overcome as modifications to the physical structure of the facility are often required. The effort required to overcome weight limitations varies between these two extremes, ranging from licensing/administrative changes (performing a new cask drop analysis) to significant physical modifications (installing a new crane). However, it is important to recognize that the project did not include any of the detailed technical analyses that would be required for implementing the potential changes identified. Therefore, there is no certainty that the assessed changes can be achieved. Demonstration that the potential changes could be achieved would have required technical analyses and the evaluation of licensing requirements that were beyond the scope of this project.

Nothing in this report is intended (1) to recommend judgment on whether any of the administrative changes, licensing changes or physical modifications considered should be completed; or (2) to imply that the utility or plant operator for any facility has expressed the intention of completing any facility changes.

5.1.1 Cask Length Limits

Length limitations are considered in the project in two ways - limitations to the body length of the cask itself and limitations to the length when suspended from the cask-handling crane hook using a yoke. Figure 6 shows the distribution of current cask length limits at the 122 facilities assessed. As the figure illustrates, there is a nearly continuous spectrum of cask length limitations which reflect the variation in pool depth, specified water shielding cover, and other limitations at the facilities assessed. Table 3 presents the current assessed cask length limit for each facility, while Table 4 shows the number of facilities which can, and cannot, currently handle the FICA Casks based on the assessed length limitations.

At almost all of the facilities where the cask body length is the limiting parameter, the constraining factor is the specified requirement for a minimum depth of water to be maintained over a fuel assembly during cask loading operations. This can, in most cases, be changed to allow handling of longer casks through licensing or administrative changes, but without a physical modification to the plant. In some cases, however, modification to fuel handling equipment may also be required. Only one facility (La Crosse) was assessed as not being able to handle any of the FICA Casks because of cask body length limitations. This is discussed further in Section 5.5.5.

Fig. 6. Facility limits — cask length.

Table 3. Current cask length limits

<u>12' 6"</u> Waterford 3	<u>16' 3"</u> Pilgrim	<u>17' 4"</u> Crystal River
<u>12' 11"</u> Indian Point 1	<u>16' 4"</u> Zion 1 Zion 2	<u>17' 6"</u> Millstone 1
<u>14' 6"</u> Cooper	<u>16' 5"</u> Monticello	<u>17' 7"</u> Braidwood 1 Braidwood 2 Byron 1 Byron 2
<u>15' 3"</u> Nine Mile Point 1	<u>16' 6"</u> Browns Ferry 1 Browns Ferry 2 Browns Ferry 3 Harris Kewaunee San Onofre 1	<u>17' 11"</u> Calvert Cliffs 1 Calvert Cliffs 2 Maine Yankee Susquehanna 1 Susquehanna 2
<u>15' 5"</u> Hatch 1 Hatch 2	<u>16' 7"</u> Washington Nuclear Plant 2	<u>18' 0"</u> Brunswick 1 Brunswick 2 Oconee 1 Oconee 2 Oconee 3
<u>15' 7"</u> Haddam Neck Nine Mile Point 2	<u>16' 9"</u> Ginna	<u>18' 1"</u> Farley 1 Farley 2
<u>15' 10"</u> Indian Point 2	<u>16' 10"</u> La Crosse	<u>18' 2"</u> Catawba 1 Catawba 2 McGuire 1 McGuire 2
<u>15' 11"</u> Big Rock Point	<u>16' 11"</u> Palisades	<u>18' 3"</u> Robinson 2
<u>16' 0"</u> Vermont Yankee	<u>17' 0"</u> Fitzpatrick Oyster Creek	<u>18' 4"</u> River Bend
<u>16' 1"</u> Dresden 2 Dresden 3 Fermi 2 Quad Cities 1 Quad Cities 2 Shoreham	<u>17' 1"</u> Duane Arnold Turkey Point 3 Turkey Point 4	
<u>16' 2"</u> Indian Point 3 Peach Bottom 2 Peach Bottom 3	<u>17' 3"</u> Millstone 2	

Table 3. Current cask length limits (Continued)

<u>18' 6"</u> Surry 1 Surry 2	<u>20' 4"</u> Clinton	<u>21' 11"</u> South Texas Project 1 South Texas Project 2
<u>18' 8"</u> Point Beach 1 Point Beach 2	<u>20' 5"</u> North Anna 1 North Anna 2	<u>22' 1"</u> Davis-Besse
<u>18' 11"</u> Cook 1 Cook 2	<u>20' 7"</u> Humboldt Bay 3 LaSalle 1 LaSalle 2	<u>22' 2"</u> Diablo Canyon 1 Diablo Canyon 2 San Onofre 2 San Onofre 3
<u>19' 2"</u> Arkansas Nuclear One Unit 1	<u>20' 8"</u> Rancho Seco	<u>23' 1"</u> Fort Calhoun
<u>19' 3"</u> Arkansas Nuclear One Unit 2	<u>20' 10"</u> Limerick 1 Limerick 2	<u>23' 3"</u> Comanche Peak 1 Comanche Peak 2
<u>19' 6"</u> Trojan Watts Bar 1 Watts Bar 2	<u>20' 11"</u> Perry 1 St. Lucie 1 Wolf Creek	<u>23' 8"</u> Callaway
<u>19' 7"</u> Beaver Valley 1 Beaver Valley 2 Summer	<u>21' 0"</u> Vogtle 1 Vogtle 2	<u>24' 0"</u> Seabrook
<u>19' 9"</u> Hope Creek Sequoyah 1 Sequoyah 2	<u>21' 3"</u> Millstone 3 Yankee Rowe	<u>24' 4"</u> Morris Operation
<u>20' 0"</u> Fort Saint Vrain	<u>21' 4"</u> Salem 1 Salem 2 St. Lucie 2	<u>27' 3"</u> Grand Gulf
<u>20' 2"</u> Three Mile Island 1	<u>21' 8"</u> Dresden 1 Prairie Island 1 Prairie Island 2	
<u>20' 3"</u> Palo Verde 1 Palo Verde 2 Palo Verde 3		

Table 4. Effect of cask length limitations on assessed cask-handling capability

Cask length	Cask type of this length	Can currently handle cask length	Cannot currently handle cask length
17 ft, 0 in.	LWT	88	34
17 ft, 2 in.	OWT, 100-ton, 125-ton	83	39

Where the suspended length is the limiting parameter, it indicates either a general headroom limitation within the facility or an obstruction over which the cask must be lifted at some point on the cask travel path. In all cases involving a general headroom restriction, use of a shorter yoke (defined as a physical modification – see Section 4.3.4) allowed the FICA Casks to be handled. In only one case (Indian Point 1) did the use of a shorter yoke still not allow handling of the FICA Casks. This is discussed further in Section 5.5.4.

5.1.2 Cask Diameter Limits

Figure 7 shows the distribution of current cask diameter limits at the 122 facilities assessed. There are distinct groups of facilities identifiable from Figure 7 with diameter limits at discrete one foot intervals between 9 feet and 13 feet. The majority of the limitations in these groups, as well as the majority overall, result from the dimensions of the cask loading areas. The limiting dimension for each facility is presented in Table 5. Table 6 shows the number of facilities which can and cannot currently handle each of the FICA Casks based on the assessed diameter limitations.

Table 6 shows that approximately 20% of the assessed facilities have dimensional limitations smaller than the 100-ton FICA Cask, primarily because most were not designed to accommodate such a cask size. Significant structural modifications would be required at 17 of the 26 facilities currently unable to accommodate the 100-ton FICA Cask, while modifications may be easier at the remaining 9 facilities. Analysis of such potential modifications was beyond the scope of this project.

5.1.3 Cask Weight Limits

Two primary factors determine the cask weight limitations at the facilities - crane capacity and floor load limitations. Although these are independent parameters, in some facilities the design capacity of the crane is downrated to a lower operating capacity to reflect any floor load limitation. In others, a floor load limitation is imposed directly as a Technical Specification without downrating the crane. Crane capacity and floor loading limitations are discussed further in Section 5.3. Figure 8 shows the distribution of current cask weight limits at the 122 facilities assessed.

Fig. 7. Facility limits — cask diameter.

Table 5. Current cask diameter limits^a

<u>2'5"</u> Fort Saint Vrain	San Onofre 1 Vermont Yankee	<u>8'7"</u> Crystal River 3 Ginna
<u>3'1"</u> Indian Point 1	<u>7'1"</u> Oconee 3	<u>8'10"</u> Calvert Cliffs 1 Calvert Cliffs 2 Prairie Island 1 Prairie Island 2
<u>4'6"</u> LaCrosse	<u>7'3"</u> Browns Ferry 1 Browns Ferry 2 Browns Ferry 3 Haddam Neck	<u>9'0"</u> Catawba 1 Catawba 2 Duane Arnold Fermi 2 Limerick 1 Limerick 2 Millstone 2 Nine Mile Point 1 Quad Cities 1 Quad Cities 2 Trojan
<u>5'0"</u> McGuire 1 Yankee Rowe	<u>7'4"</u> Shoreham	<u>9'2"</u> Oyster Creek
<u>5'1"</u> Big Rock Point	<u>7'6"</u> Indian Point 2 Pilgrim	<u>9'3"</u> Turkey Point 3 Turkey Point 4
<u>5'6"</u> Millstone 1	<u>7'10"</u> Point Beach 1 Point Beach 2	<u>9'4"</u> North Anna 1 North Anna 2
<u>6'0"</u> Dresden 1	<u>8'0"</u> Three Mile Island 1 Fort Calhoun Indian Point 3 Robinson 2	<u>9'6"</u> Arkansas Nuclear One Unit 1 Arkansas Nuclear One Unit 2 Zion 1 Zion 2
<u>6'4"</u> Kewaunee Monticello	<u>8'2"</u> Peach Bottom 2 Peach Bottom 3	<u>9'11"</u> Rancho Seco
<u>6'5"</u> Palisades	<u>8'4"</u> Surry 1 Surry 2	
<u>6'6"</u> Cooper Dresden 2 Dresden 3	<u>8'6"</u> Vogtle 1 Vogtle 2	
<u>6'8"</u> Harris		
<u>7'0"</u> McGuire 2 Oconee 1 Oconee 2		

Table 5. Current cask diameter limits* (Continued)

<u>10' 0"</u>	<u>10' 9"</u>	<u>12' 1"</u>
Beaver Valley 1	Braidwood 1	Callaway
Beaver Valley 2	Braidwood 2	
Clinton		<u>12'10"</u>
Diablo Canyon 1	<u>11' 0"</u>	Millstone 3
Diablo Canyon 2	Byron 1	
Hatch 1	Byron 2	<u>13'0"</u>
Hatch 2	Fitzpatrick	Comanche Peak 1
Humboldt Bay 3	Hope Creek	Comanche Peak 2
Maine Yankee	San Onofre 2	Susquehanna 1
Morris Operation	San Onofre 3	Susquehanna 2
Nine Mile Point 2		
Perry 1	<u>11' 1"</u>	<u>13'8"</u>
Salem 1	Waterford 3	Wolf Creek
Salem 2		
Seabrook	<u>11' 8"</u>	<u>14'0"</u>
St. Lucie 1	Summer	Davis-Besse
Washington Nuclear Plant 2		
<u>10' 3"</u>	<u>12' 0"</u>	
Brunswick 1	Grand Gulf	
Brunswick 2	LaSalle 1	
	LaSalle 2	
	Palo Verde 1	
	Palo Verde 2	
<u>10' 4"</u>	Palo Verde 3	
Cook 1	River Bend	
Cook 2	Sequoyah 1	
	Sequoyah 2	
<u>10' 8"</u>	South Texas Project 1	
Farley 1	South Texas Project 2	
Farley 2	St. Lucie 2	
	Watts Bar 1	
	Watts Bar 2	

*To determine the facility cask handling capability, allowances must be made for the clearances specified in Table 2.

Table 6. Effect of cask diameter limitations on assessed cask-handling capability

Cask body diameter	Cask type of this diameter	Can currently handle cask diameter	Cannot currently handle cask diameter
3 ft, 6 in.	LWT	120	2
4 ft, 8 in.	OWT	118	4
7 ft, 4 in.	100-ton	96	26
8 ft, 3 in.	125-ton	84	38

As the figure shows, cask weight limits below 100 tons form nearly a continuous range with the only groups identifiable being at 25 tons and 75 tons. These groups correspond to facilities which have previous truck and rail cask-handling experience, respectively. As a consequence, their cask weight limitation is generally based on a cask drop analysis performed specifically for the casks which they have previously shipped. For cask weights at and above 100 tons, the cask weight limitations form clear groups with only a few facilities having limitations between these groups. Table 7 presents the current assessed cask weight limit for each facility while Table 8 shows the number of facilities which can and cannot currently handle each of the FICA Cask weights.

Table 7 lists 13 facilities which indicate 0 (zero) as their current cask weight limit. These facilities currently have Technical Specification limitations which prohibit cask-handling activities. Additional analysis and/or special exemptions are the minimum requirements to permit cask-handling at these facilities. Upgrading cask weight limits at other facilities requires activities ranging from re-analysis to replacing the existing crane. Judging the feasibility of such modifications was beyond the scope of this project.

5.2 CASK-HANDLING CAPABILITIES

Appendix 3 tabulates the assessed facility cask-handling capabilities based on the FICA Cask parameters. These data are from the individual facility assessments and are also presented in the project database. The assessments are based only on the capability of facilities to handle the FICA Casks with the parameters shown in Table 2 and no internal dimensions or other design parameters have been specified for these model casks. Consequently, this project does not include any assessment of the suitability of the casks for shipping particular fuel types. Also, although the database includes some information on transportation experience, this project did not include an assessment of how casks could be shipped away from the facility sites.

Fig. 8. Facility limits --- cask weight.

Table 7. Current cask weight limits

<u>0 ton</u>	<u>60 ton</u>	<u>100 ton</u>
Arkansas Nuclear One Unit 1	Beaver Valley 1	Arkansas Nuclear One Unit 2
Cook 1		Beaver Valley 2
Cook 2	<u>62.5 ton</u>	Clinton
Crystal River 3	Fitzpatrick	Cooper
Fort Saint Vrain		Fermi 2
Hatch 1	<u>67.5 ton</u>	Haddam Neck
Hatch 2	Diablo Canyon 1	LaSalle 1
Humboldt Bay 3	Diablo Canyon 2	LaSalle 2
Indian Point 1		McGuire 1
Indian Point 2	<u>68 ton</u>	McGuire 2
Maine Yankee	Morris Operation	Millstone 2
Millstone 3		Nine Mile Point 1
Trojan	<u>70 ton</u>	Nine Mile Point 2
	San Onofre 1	Oconee 1
<u>24 ton</u>		Oconee 2
Big Rock Point	<u>75 ton</u>	Oconee 3
Dresden 1	Brunswick 1	Oyster Creek
	Brunswick 2	Peach Bottom 2
<u>25 ton</u>	Dresden 2	Peach Bottom 3
Calvert Cliffs 1	Dresden 3	St. Lucie 2
Calvert Cliffs 2	Quad Cities 1	Watts Bar 1
Palisades	Quad Cities 2	Watts Bar 2
St. Lucie 1		
Turkey Point 3	<u>77.5 ton</u>	<u>105 ton</u>
Turkey Point 4	Robinson 2	North Anna 1
		North Anna 2
<u>26 ton</u>	<u>80 ton</u>	
Pilgrim	Sequoyah 1	<u>106 ton</u>
	Sequoyah 2	Browns Ferry 1
<u>30 ton</u>		Browns Ferry 2
Ginna	<u>85 ton</u>	Browns Ferry 3
	Duane Arnold	
<u>36 ton</u>	Monticello	<u>110 ton</u>
LaCrosse		Braidwood 1
	<u>91 ton</u>	Braidwood 2
<u>37 ton</u>	Vogtle 1	Byron 1
Yankee Rowe	Vogtle 2	Byron 2
		Limerick 1
<u>40 ton</u>	<u>97.5 ton</u>	Limerick 2
Fort Calhoun	Harris	Millstone 1
Indian Point 3	Rancho Seco	Salem 1
		Salem 2
		Three Mile Island 1

Table 7. Current cask weight limits (Continued)

110 ton (cont.)
Vermont Yankee
Zion 1
Zion 2

120 ton
Kewaunee

123 ton
Shoreham

125 ton
Callaway
Catawba 1
Catawba 2
Farley 1
Farley 2
Davis-Besse
Grand Gulf
Perry 1
Point Beach 1
Point Beach 2

Prairie Island 1
Prairie Island 2
River Bend
San Onofre 2
San Onofre 3
Seabrook
Surry 1
Surry 2
Susquehanna 1
Susquehanna 2
Summer
Washington Nuclear Plant 2
Waterford 3
Wolf Creek

130 ton
Comanche Peak 1
Comanche Peak 2
Hope Creek

150 ton
Palo Verde 1
Palo Verde 2
Palo Verde 3
South Texas Project 1
South Texas Project 2

Table 8. Effect of cask weight limitations on assessed cask-handling capability

Cask weight (ton)	Cask type of this weight	Can currently handle cask weight	Cannot currently handle cask weight
28	LWT cask	100	22
40	OWT cask	97	25
100	100-ton	74	48
125	125-ton	32	90

Figure 9 presents the assessed facility cask-handling capabilities in summary as a 3-dimensional bar chart. The number of facilities which could currently handle each of the FICA Casks is shown in the front row. The center row shows the number of facilities which could handle each of the FICA Casks if administrative changes were made, while the back row shows the number of facilities which could handle each of the casks if administrative changes, licensing changes, and/or physical modifications to the facility were implemented. The facility capabilities summarized in the front, center and back rows of Figure 9 are shown individually in Tables 9, 10, and 11, respectively. The only plant which is not assessed as able to handle the LWT cask, if modifications within the scope of the project were implemented, is LaCrosse. However, there are four other plants which were assessed as requiring significant modifications to allow handling of the LWT and OWT casks. These plants and the modifications assessed are discussed in Section 5.5.

The modification flowchart of Figure 10 shows the increased cask-handling capability assessed for each of the groups in Figure 9. For example, the individual facilities in the group of 98 facilities which could handle a FICA OWT cask if administrative changes were made, do not all have the current capability to handle a FICA OWT Cask. Only 68 facilities currently have that capability as shown by the arrow leading to the box on the lower right. The box in the lower center and the arrow leading to it indicate that 3 of the 98 facilities were previously assessed as having the current capability to handle only the FICA LWT Cask. Finally, the box on the lower left and its corresponding arrow indicate that 27 of the 98 facilities were originally assessed as being unable to handle any of the FICA Casks.

Of the 98 facilities being considered, 8 could then have their cask-handling capabilities increased by physical modification to allow the use of a 125-ton cask. One additional facility could have its cask-handling capability increased by physical modification to allow a 100-ton cask to be handled, increasing to 9 the facilities which could then handle a 100-ton cask. All 98 facilities in the group could also handle an OWT cask if physical modifications were implemented as indicated by the vertical arrow above the box. The changes in facility capabilities which could potentially be achieved

Fig. 9. Cask-handling capabilities.

Table 9. Current facility cask-handling capabilities

Cannot Currently Handle LWT Cask

Arkansas Nuclear One Unit 1

Big Rock Point

Browns Ferry 1

Browns Ferry 2

Browns Ferry 3

Calvert Cliffs 1

Calvert Cliffs 2

Cook 1

Cook 2

Cooper

Crystal River 3

Dresden 1

Dresden 2

Dresden 3

Fermi 2

Fort Saint Vrain

Ginna

Haddam Neck

Harris

Hatch 1

Hatch 2

Humboldt Bay 3

Indian Point 1

Indian Point 2

Indian Point 3

Kewaunee

La Crosse

Maine Yankee

Millstone 3

Monticello

Nine Mile Point 1

Nine Mile Point 2

Palisades

Peach Bottom 2

Peach Bottom 3

Pilgrim

Quad Cities 1

Quad Cities 2

San Onofre 1

Shoreham

St. Lucie 1

Trojan

Turkey Point 3

Turkey Point 4

Vermont Yankee

Washington Nuclear Plant 2

Waterford 3

Zion 1

Zion 2

Current Capability: LWT Cask

Duane Arnold

Fitzpatrick

McGuire 1

Oyster Creek

Yankee Rowe

Current Capability: OWT Cask^a

Beaver Valley 1

Brunswick 1

Brunswick 2

Diablo Canyon 1

Diablo Canyon 2

Fort Calhoun

McGuire 2

Millstone 1

Morris Operation

Oconee 1

Oconee 2

Oconee 3

Table 9. Current facility cask-handling capabilities (Continued)

Rancho Seco	Current Capability: 125 Ton Cask*
Robinson 2	Callaway
Sequoyah 1	Catawba 1
Sequoyah 2	Catawba 2
Vogtle 1	Comanche Peak 1
Vogtle 2	Comanche Peak 2
	Davis-Besse
Current Capability: 100 Ton Cask*	Farley 1
Arkansas Nuclear One Unit 2	Farley 2
Beaver Valley 2	Grand Gulf
Braidwood 1	Hope Creek
Braidwood 2	Palo Verde 1
Byron 1	Palo Verde 2
Byron 2	Palo Verde 3
Clinton	Perry 1
LaSalle 1	Prairie Island 1
LaSalle 2	Prairie Island 2
Limerick 1	River Bend
Limerick 2	San Onofre 2
Millstone 2	San Onofre 3
North Anna 1	Seabrook
North Anna 2	South Texas Project 1
Point Beach 1	South Texas Project 2
Point Beach 2	Summer
Salem 1	Susquehanna 1
Salem 2	Susquehanna 2
St. Lucie 2	Wolf Creek
Surry 1	
Surry 2	
Three Mile Island 1	
Watts Bar 1	
Watts Bar 2	

*The capability indicated is the largest of the FICA casks which can be handled at each facility. All FICA casks smaller than that indicated can also be handled.

**Table 10. Facility cask-handling capabilities if
administrative changes are implemented**

**Could not handle LWT cask after
administrative changes**

Big Rock Point
Crystal River 3
Dresden 1
Fort Saint Vrain
Harris
Indian Point 1
Indian Point 2
Kewaunee
La Crosse
Millstone 3
Palisades
Pilgrim
Shoreham
Vermont Yankee
Waterford 3
Zion 1
Zion 2

Browns Ferry 3
Brunswick 1
Brunswick 2
Dresden 2
Dresden 3
Fitzpatrick
Fort Calhoun
Haddam Neck
Humboldt Bay 3
Indian Point 3
McGuire 2
Millstone 1
Monticello
Oconee 1
Oconee 2
Oconee 3
Robinson 2
San Onofre 1
St. Lucie 1

**Capability after administrative changes:
LWT cask**

Calvert Cliffs 1
Calvert Cliffs 2
Ginna
McGuire 1
Turkey Point 3
Turkey Point 4
Yankee Rowe

**Capability after administrative changes:
OWT cask^a**

Beaver Valley 1
Browns Ferry 1
Browns Ferry 2

**Capability after administrative changes:
100 ton cask^a**

Arkansas Nuclear One Unit 1
Arkansas Nuclear One Unit 2
Cooper
Duane Arnold
Fermi 2
Limerick 1
Limerick 2
Millstone 2
Nine Mile Point 1
Oyster Creek
Peach Bottom 2
Peach Bottom 3

**Table 10. Facility cask-handling capabilities if
administrative changes are implemented (Continued)**

Point Beach 1	Hope Creek
Point Beach 2	LaSalle 1
Rancho Seco	LaSalle 2
Salem 1	Maine Yankee
Salem 2	Morris Operation
Sequoyah 1	Nine Mile Point 2
Sequoyah 2	North Anna 1
Surry 1	North Anna 2
Surry 2	Palo Verde 1
Three Mile Island 1	Palo Verde 2
Watts Bar 1	Palo Verde 3
Watts Bar 2	Perry 1
	Prairie Island 1
	Prairie Island 2
Capability after administrative changes:	Quad Cities 1
125 ton cask ^a	Quad Cities 2
Beaver Valley 2	River Bend
Braidwood 1	San Onofre 2
Braidwood 2	San Onofre 3
Byron 1	Seabrook
Byron 2	South Texas Project 1
Callaway	South Texas Project 2
Catawba 1	St. Lucie 2
Catawba 2	Summer
Clinton	Susquehanna 1
Comanche Peak 1	Susquehanna 2
Comanche Peak 2	Trojan
Cook 1	Vogtle 1
Cook 2	Vogtle 2
Davis-Besse	Washington Nuclear Plant 2
Diablo Canyon 1	Wolf Creek
Diablo Canyon 2	
Farley 1	
Farley 2	
Grand Gulf	
Hatch 1	
Hatch 2	

^aThe capability indicated is the largest of the FICA casks which can be handled at each facility. All FICA casks smaller than that indicated can also be handled.

Table 11. Facility cask-handling capabilities if administrative changes and physical modifications are implemented

Could not handle LWT after administrative changes and physical modifications:

LaCrosse

Capability after administrative changes and/or facility modifications: LWT cask

Ginna

Yankee Rowe

Capability after administrative changes and facility modifications: OWT cask^a

Big Rock Point

Brunswick 1

Brunswick 2

Crystal River 3

Dresden 1

Fort Calhoun

Fort Saint Vrain

Haddam Neck

Humboldt Bay 3

Indian Point 1

Indian Point 2

Indian Point 3

Millstone 1

Monticello

Oconee 1

Oconee 2

Oconee 3

Robinson 2

San Onofre 1

Vermont Yankee

Capability after administrative changes and facility modifications: 100 ton cask^a

Arkansas Nuclear One Unit 1

Arkansas Nuclear One Unit 2

Cooper

Duane Arnold

Fermi 2

Millstone 2

Nine Mile Point 1

Oyster Creek

Palisades

Pilgrim

Salem 1

Salem 2

Sequoyah 1

Sequoyah 2

St. Lucie 1

Three Mile Island 1

Turkey Point 3

Turkey Point 4

Watts Bar 1

Watts Bar 2

Capability after administrative changes and facility modifications: 125 ton cask^a

Beaver Valley 1

Beaver Valley 2

Braidwood 1

Braidwood 2

Browns Ferry 1

Browns Ferry 2

Browns Ferry 3

Byron 1

Byron 2

Table 11. Facility cask-handling capabilities if Administrative changes and physical modifications are implemented (Continued)

Callaway	Palo Verde 3
Calvert Cliffs 1	Peach Bottom 2
Calvert Cliffs 2	Peach Bottom 3
Catawba 1	Perry 1
Catawba 2	Point Beach 1
Clinton	Point Beach 2
Comanche Peak 1	Prairie Island 1
Comanche Peak 2	Prairie Island 2
Cook 1	Quad Cities 1
Cook 2	Quad Cities 2
Davis-Besse	Rancho Seco
Diablo Canyon 1	River Bend
Diablo Canyon 2	San Onofre 2
Dresden 2	San Onofre 3
Dresden 3	Seabrook
Farley 1	Shoreham
Farley 2	South Texas Project 1
Fitzpatrick	South Texas Project 2
Grand Gulf	St. Lucie 2
Harris	Summer
Hatch 1	Surry 1
Hatch 2	Surry 2
Hope Creek	Susquehanna 1
Kewaunee	Susquehanna 2
LaSalle 1	Trojan
LaSalle 2	Vogtle 1
Limerick 1	Vogtle 2
Limerick 2	Washington Nuclear Plant 2
Maine Yankee	Waterford 3
McGuire 1	Wolf Creek
McGuire 2	Zion 1
Millstone 3	Zion 2
Morris Operation	
Nine Mile Point 2	
North Anna 1	
North Anna 2	
Palo Verde 1	
Palo Verde 2	

*The capability indicated is the largest of the FICA casks which can be handled at each facility. All FICA casks smaller than that indicated can also be handled.

Fig. 10. Modification flow chart (number of facilities).

if modifications were implemented are shown for individual facilities in Tables 12 and 13: Table 12 presents facilities grouped according to current capability and, within each group, further divided by potential capability if modifications were implemented. Table 13 presents facilities grouped according to potential capability if modifications were implemented and, within each group, further divided by current capability.

Tables 14 through 17 characterize the modifications assessed to increase the facility cask-handling capabilities. Each table considers the facilities which have the same current capability as indicated in Figure 9. However, in order to present the modifications in a concise manner, the administrative changes and physical modifications assessed are presented together. In determining current cask-handling capability and potential facility modifications, each facility was assessed independently. At some sites, however, some of the cask-handling equipment or part of the cask travel path is common to two facilities.

In these cases, one administrative change or physical modification may increase the cask-handling capability of two facilities. For consistency, Tables 9 through 12 and Tables 14 through 17 refer to the number of facilities, and not the total number of modifications assessed.

In Tables 14 through 17, the facilities for which the same type of modification(s) have been assessed are presented as groups. Where more than one modification is assessed for a group, the modifications are listed in descending order of apparent difficulty. Where a relatively minor modification is assessed at some, but not all, of the facilities in a group, this is shown in the fourth column. The four columns on the right of the table indicate the number of facilities which can handle each of the FICA Casks if the modifications were implemented.

Before proceeding, it should be noted that the scope of the project did not include any of the detailed technical analyses that would be required for implementing the potential changes identified. Accordingly, the assessments are based only on the reviewer's judgment and engineering experience, and there is no certainty that the assessed changes can be, or should be, realized. Demonstration that the potential changes are achievable would have required technical analyses and the evaluation of licensing requirements that were beyond the scope of this project.

Nothing in this report is intended to recommend whether any of the administrative changes, licensing changes, or physical modifications considered should be completed. Finally, nothing in this report is intended to imply that the utility or plant operator for any facility has expressed the intention of completing any facility changes.

As shown by Tables 14 through 17, the single most common modification assessed is a NUREG-0612 reanalysis. Specifically, 54 of the 79 facilities which are expected to benefit if plant modifications are performed were assessed to meet the requirements of NUREG-0612. At 38 of these facilities, this was the only significant modification assessed. The next most frequent type of modification assessed is a reduction in specified water cover. The assessments indicated that 21 facilities could benefit from this type of modification; for 11 of these facilities it was the only type of modification assessed. Accordingly, significant improvements in facility capabilities, relative to the handling of FICA Casks,

**Table 12. Current facility cask-handling capabilities
(ordered by capability if modified)**

Cannot currently handle LWT cask:
Could not handle LWT cask following
potential modifications assessed:
 La Crosse

Capability if modified: LWT cask
 Ginna

Capability if modified: OWT cask^a
 Big Rock Point
 Crystal River 3
 Dresden 1
 Fort Saint Vrain
 Haddam Neck
 Humboldt Bay 3
 Indian Point 1
 Indian Point 2
 Indian Point 3
 Monticello
 San Onofre 1
 Vermont Yankee

Capability if modified: 100 ton cask^a
 Arkansas Nuclear One Unit 1
 Cooper
 Fermi 2
 Nine Mile Point 1
 Palisades
 Pilgrim
 St. Lucie 1
 Turkey Point 3
 Turkey Point 4

Capability if modified: 125 ton cask^a
 Browns Ferry 1
 Browns Ferry 2
 Browns Ferry 3
 Calvert Cliffs 1
 Calvert Cliffs 2
 Cook 1
 Cook 2
 Dresden 2
 Dresden 3
 Harris

Hatch 1
 Hatch 2
 Kewaunee
 Maine Yankee
 Millstone 3
 Nine Mile Point 2
 Peach Bottom 2
 Peach Bottom 3
 Quad Cities 1
 Quad Cities 2
 Shoreham
 Trojan
 Washington Nuclear Plant 2
 Waterford 3
 Zion 1
 Zion 2

Current capability: LWT cask
Capability if modified: LWT cask
 Yankee Rowe

Capability if modified: 100 ton cask^a
 Duane Arnold
 Oyster Creek

Capability if modified: 125 ton cask^a
 Fitzpatrick
 McGuire 1

**Table 12. Current facility cask-handling capabilities
(ordered by capability if modified) (Continued)**

Current capability: OWT cask*

Capability if modified: OWT cask

Brunswick 1
Brunswick 2
Fort Calhoun
Millstone 1
Oconee 1
Oconee 2
Oconee 3
Robinson 2

Capability if modified: 100 ton cask

Sequoyah 1
Sequoyah 2

Capability if modified: 125 ton cask

Beaver Valley 1
Diablo Canyon 1
Diablo Canyon 2
McGuire 2
Morris Operation
Rancho Seco
Vogtle 1
Vogtle 2

Current capability: 100 ton cask*

Capability if modified: 100 ton cask

Arkansas Nuclear One Unit 2
Millstone 2
Salem 1
Salem 2
Three Mile Island 1
Watts Bar 1
Watts Bar 2

Capability if modified: 125 ton cask

Beaver Valley 2
Braidwood 1
Braidwood 2
Byron 1

Byron 2

Clinton

LaSalle 1

LaSalle 2

Limerick 1

Limerick 2

North Anna 1

North Anna 2

Point Beach 1

Point Beach 2

Surry 1

Surry 2

St. Lucie 2

Current capability: 125 ton cask*

Callaway

Catawba 1

Catawba 2

Commanche Peak 1

Commanche Peak 2

Davis-Besse

Farley 1

Farley 2

Grand Gulf

Hope Creek

Palo Verde 1

Palo Verde 2

Palo Verde 3

Perry 1

Prairie Island 1

Prairie Island 2

River Bend

San Onofre 2

San Onofre 3

Seabrook

South Texas Project 1

South Texas Project 2

Summer

Susquehanna 1

Susquehanna 2

Wolf Creek

*The capability indicated is the largest of the FICA casks which can be handled at each facility. All FICA casks smaller than that indicated can also be handled.

**Table 13. Facility cask-handling capabilities if modified
(ordered by current capability)**

Could not handle LWT cask following

Potential modifications assessed:

Cannot currently handle LWT cask
La Crosse

Capability if modified: LWT cask

Cannot currently handle LWT cask
Ginna

Current Capability: LWT cask

Yankee Rowe

Capability if modified: OWT cask^a

Cannot currently handle LWT cask

Big Rock Point
Crystal River 3
Dresden 1
Fort Saint Vrain
Haddam Neck
Humboldt Bay 3
Indian Point 1
Indian Point 2
Indian Point 3
Monticello
San Onofre 1
Vermont Yankee

Current capability: OWT cask

Brunswick 1
Brunswick 2
Fort Calhoun
Millstone 1
Oconee 1
Oconee 2
Oconee 3
Robinson 2

Capability if modified: 100 ton cask^a

Cannot currently handle LWT cask

Arkansas Nuclear One Unit 1
Cooper
Fermi 2
Nine Mile Point 1
Palisades

Pilgrim

St. Lucie 1

Turkey Point 3

Turkey Point 4

Current capability: LWT cask

Duane Arnold
Oyster Creek

Current capability: OWT cask

Sequoyah 1
Sequoyah 2

Current capability: 100 ton cask

Arkansas Nuclear One Unit 2
Millstone 2
Salem 1
Salem 2
Three Mile Island 1
Watts Bar 1
Watts Bar 2

Capability if modified: 125 ton cask^a

Cannot currently handle LWT cask

Browns Ferry 1
Browns Ferry 2
Browns Ferry 3
Calvert Cliffs 1
Calvert Cliffs 2
Cook 1
Cook 2
Dresden 2
Dresden 3
Harris
Hatch 1
Hatch 2
Kewaunee
Main Yankee
Millstone 3
Nine Mile Point 2
Peach Bottom 2
Peach Bottom 3
Quad Cities 1

**Table 13. Facility cask-handling capabilities if modified
(ordered by current capability) (Continued)**

Quad Cities 2	Current capability: 125 ton cask
Shoreham	Callaway
Trojan	Catawba 1
Washington Nuclear Plant 2	Catawba 2
Waterford 3	Comanche Peak 1
Zion 1	Comanche Peak 2
Zion 2	Davis-Besse
	Farley 1
Current capability: LWT cask	Farley 2
Fitzpatrick	Grand Gulf
McGuire 1	Hope Creek
	Palo Verde 1
Current capability: OWT cask	Palo Verde 2
Beaver Valley 1	Palo Verde 3
Diablo Canyon 1	Perry 1
Diablo Canyon 2	Prairie Island 1
McGuire 2	Prairie Island 2
Morris Operation	River Bend
Rancho Seco	San Onofre 2
Vogtle 1	San Onofre 3
Vogtle 2	Seabrook
	South Texas Project 1
Current capability: 100 ton cask	South Texas Project 2
Beaver Valley 2	Summer
Braidwood 1	Susquehanna 1
Braidwood 2	Susquehanna 2
Byron 1	Wolf Creek
Byron 2	
Clinton	
LaSalle 1	
LaSalle 2	
Limerick 1	
Limerick 2	
North Anna 1	
North Anna 2	
Point Beach 1	
Point Beach 2	
St. Lucie 2	
Surry 1	
Surry 2	

*The capability is the largest of the FICA casks which can be handled at each facility. All FICA casks smaller than that indicated can also be handled.

Table 14. Characterization of modifications to facilities
which cannot currently handle the LWT cask

Group number	No. of facilities in group	Type of modification ^a		Capability after modification			
		All facilities in group	Some facilities in group	LWT	OWT	100- ton	125- ton
1	17	0612 analysis ^b	Reduce specified water cover ^c , Modify decontamination area, Modify decontamination area platforms, Modify handrail	17	17	16	12
2	10	Reduce specified water cover		10	9	5	3
3	5	0612 analysis, Remove racks, Reduce specified water cover	Modify cask support frame in cask loading area	5	5	5	4
4	3	0612 analysis, Short yoke ^d	Reduce specified water cover	3	3	0	0
5	3	0612 analysis, Reduce specified water cover, Modify cask support frame in cask loading area		3	3	3	3
6	2	0612 analysis, Install impact limiter		2	2	2	0
7	2	Replace crane ^e (Utility program for ISFSI)		2	2	2	2
8	1	Short yoke ^d , Reduce specified water cover		1	1	0	0
9	1	Modify crane ^e , 0612 analysis		1	1	0	0
10	1	Modify floor ^f , Install impact limiter		1	1	0	0
11	1	Install impact limiter		1	1	1	1
12	1	Modify cask loading area gate		1	1	1	1
13	1	Modify crane or reinforce floor ^f ; Install mechanical barrier		1	1	0	0
	48	Total facilities		48	47	35	26

Footnotes - see p. 55.

Notes on Tables 14 - 17

- a. **Type of modification:** Facilities are grouped according to the main modification assessed. This is shown in the left column with any other modifications assessed for all facilities in the group. Modifications not required at all facilities in group, and relatively minor compared with main modification, are shown in the right column.
- b. **0612 analysis:** Analysis is required to demonstrate compliance with NUREG-0612. (For example: floor loading analysis, cask-drop analysis, crane analysis.) The type of modification also includes crane load test.
- c. **Reduce specified water cover:** Change is required to Technical Specification or operating procedures. The type of modification also includes minor modifications to fuel handling equipment if required (for example: resetting limit switches).
- d. **Short yoke:** Nonstandard lifting yoke is required to remove headroom restriction in plant.
- e. **Replace crane:
Modify crane:
Modify floor:** The modification is considered only when utility indicated requirement from previous analysis or already planned by utility for another purpose. Other modifications are considered beyond the scope of the project.

**Table 15. Characterization of modifications to facilities
which cannot currently handle the OWT cask**

Group number	No. of facilities in group	Type of modification ^a		Capability after modification		
		All facilities in group	Some facilities in group	OWT	100-ton	125-ton
1	2	0612 analysis ^b	Reduce specified water cover ^c ; modify decontamination area platforms	2	1	0
2	1	Modify crane ^c ; Reduce specified water cover		1	1	0
3	1	Reduce specified water cover		1	1	0
	4	Total facilities		4	4	2

Footnotes - see page 55.

**Table 16. Characterization of modifications to facilities
which cannot currently handle the 100-ton rail/barge cask**

Group number	No. of facilities in group	Type of modification ^a		Capability after modification	
		All facilities in group	Some facilities in group	100-ton	125-ton
1	8	0612 analysis ^b	Modify decontamination area platforms	8	6
2	2	Modify crane ^c ; 0612 analysis		2	2
	10	Total facilities		10	8

Footnotes - see page 55.

**Table 17. Characterization of modifications to facilities
which cannot currently handle the 125-ton rail/barge cask**

Group number	No. of facilities in group	Type of modification at all facilities in group	Capability after modification
			125-ton
1	11	0612 analysis ^b	11
2	4	Modify cask support frame in cask loading area	4
3	2	Modify platform in decontamination area	2
	17	Total facilities	17

Footnotes - see page 55.

could be could be achieved if these two types of modifications were performed at the facilities indicated by Tables 14 through 17.

5.3 CRANE CHARACTERISTICS AND FLOOR LOADING LIMITATIONS

Appendix 4 summarizes the facility crane data from the project database. Crane capacities are closely related to cask-handling weight limitations and in many cases the crane rating is the determining factor. This is either because the crane design capacity is the actual facility limit or because the current operating capacity has been set to reflect another limitation elsewhere in the facility.

Figure 11 shows the distribution of crane design capacities and current crane operating capacities. Tables 18 and 19 present the design and current operating capacities for each crane. To allow cross reference between these two capacities and to allow this to be related to Figure 11, table 18 groups the facilities by design capacity and subdivides each group by operating capacity, while Table 19 groups the facilities by operating capacity and subdivides each group by design capacity.

Table 20 compares the crane capacities from Figure 11 with the weights of the FICA Casks. It is apparent by comparison of Figure 8 and Figure 11 (or comparison of Table 7 with Table 19) that the current crane operating capacity is the limiting parameter for many facilities with cask weight limits up to 100 tons. However, at many facilities the crane operating limitation is imposed administratively because of floor load limitations. Many facilities with floor load limitations in this range have completed cask-drop analyses related to a specific cask. The facilities are thus limited by their current license conditions to the weight of cask used as the basis of the cask-drop analysis. Where no limiting

Fig. 11. Summary of crane design and current operating capacities.

**Table 18. Crane design and current operating capacities
(ordered by design capacity)**

<u>Design</u>		
40 tons	Cooper	125 tons
Operating: 0 tons	Duane Arnold	Operating: 0 tons
Indian Point 2	Haddam Neck	Trojan
Operating: 30 tons	Millstone 2	Operating: 60 tons
Ginna	Oconee 1	Beaver Valley 1
Operating: 40 tons	Oconee 2	Operating: 62.5 tons
Indian Point 3	Oconee 3	Fitzpatrick
	Oyster Creek	Operating: 75 tons
50 tons	Palisades	Dresden 2
Operating: 50 tons	Rancho Seco	Dresden 3
Fort Saint Vrain		Quad Cities 1
La Crosse		Quad Cities 2
	105 tons	Operating: 80 tons
75 tons	Operating: 25 tons	Sequoyah 1
Operating: 0 tons	St. Lucie 1	Sequoyah 2
Humboldt Bay 3	Turkey Point 3	Operating: 100 tons
Indian Point 1	Turkey Point 4	Beaver Valley 2
Operating: 24 tons	Operating: 105 tons	LaSalle 1
Big Rock Point	San Onofre 1	LaSalle 2
Dresden 1		McGuire 1
Operating: 37 tons	110 tons	McGuire 2
Yankee Rowe	Operating: 110 tons	Nine Mile Point 1
Operating: 75 tons	Millstone 1	Nine Mile Point 2
Fort Calhoun	Salem 1	Operating: 106 tons
	Salem 2	Browns Ferry 1
85 tons	Three Mile Island 1	Browns Ferry 2
Operating: 85 tons	Vermont Yankee	Browns Ferry 3
Monticello		Operating: 109 tons
	120 tons	Vogtle 1
100 tons	Operating: 72 tons	Vogtle 2
Operating: 26 tons	Crystal River 3	
Pilgrim		
Operating: 100 tons		
Arkansas Nuclear—1 Unit 1		
Arkansas Nuclear—1 Unit 2		

**Table 18. Crane design and current operating capacities
(ordered by design capacity) (Continued)**

Operating: 110 tons	Perry 1	Operating: 130 tons
Braidwood 1	Point Beach 1	Hope Creek
Braidwood 2	Point Beach 2	Operating: 150 tons
Byron 1	Prairie Island 1	Calvert Cliffs 1
Byron 2	Prairie Island 2	Calvert Cliffs 2
Limerick 1	River Bend	Grand Gulf
Limerick 2	Robinson 2	Harris
Peach Bottom 2	San Onofre 2	Palo Verde 1
Peach Bottom 3	San Onofre 3	Palo Verde 2
Zion 1	Seabrook	Palo Verde 3
Zion 2	Summer	South Texas Project 1
	Surry 1	South Texas Project 2
Operating: 117 tons	Surry 2	Wolf Creek
Fermi 2	Susquehanna 1	
	Susquehanna 2	
Operating: 123 tons	Washington Nuclear Plant 2	
Shoreham	Waterford 3	
	Watts Bar 1	
Operating: 125 tons	Watts Bar 2	
Brunswick 1		
Brunswick 2	130 tons	
Catawba 1	Operating: 130 tons	
Catawba 2	Commanche Peak 1	
Clinton	Commanche Peak 2	
Diablo Canyon 1		
Diablo Canyon 2	140 tons	
Farley 1	Operating: 140 tons	
Farley 2	Davis-Besse	
Hatch 1		
Hatch 2	150 tons	
Kewaunee	Operating: 60 tons	
Maine Yankee	Cook 1	
Millstone 3	Cook 2	
Morris Operation	Operating: 100 tons	
North Anna 1	St. Lucie 2	
North Anna 2	Operating: 125 tons	
	Calaway	

**Table 19. Crane design and current operating capacities
(ordered by current operating capacity)**

<u>Operating</u>		
0 tons	50 tons	100 tons
Design: 40 tons	Design: 50 tons	Design: 100 tons
Indian Point 2	Fort Saint Vrain	Arkansas Nuclear One Unit 1
Design: 75 tons	La Crosse	Arkansas Nuclear One Unit 2
Humboldt Bay 3		Cooper
Indian Point 3	60 tons	Duane Arnold
Design: 125 tons	Design: 125 tons	Haddam Neck
Trojan	Beaver Valley 1	Millstone 2
	Design: 150 tons	Oconee 1
24 tons	Cook 1	Oconee 2
Design: 75 tons	Cook 2	Oconee 3
Big Rock Point		Oyster Creek
Dresden 1	62.5 tons	Palisades
	Design: 125 tons	Rancho Seco
25 tons	Fitzpatrick	Design: 125 tons
Design: 105 tons		Beaver Valley 2
St. Lucie 1	72 tons	LaSalle 1
Turkey Point 3	Design: 120 tons	LaSalle 2
Turkey Point 4	Crystal River 3	McGuire 1
		McGuire 2
26 tons	75 tons	Nine Mile Point 1
Design: 100 tons	Design: 75 tons	Nine Mile Point 2
Pilgrim	Fort Calhoun	Design: 150 tons
	Design: 125 tons	St. Lucie 2
30 tons	Dresden 2	
Design: 40 tons	Dresden 3	105 tons
Ginna	Quad Cities 1	Design: 105 tons
	Quad Cities 2	San Onofre 1
37 tons	80 tons	
Design: 75 tons	Design: 125 tons	106 tons
Yankee Rowe	Sequoyah 1	Design: 125 tons
	Sequoyah 2	Browns Ferry 1
40 tons		Browns Ferry 2
Design: 40 tons	85 tons	Browns Ferry 3
Indian Point 3	Design: 85 tons	
	Monticello	109 tons
		Design: 125 tons
		Vogtle 1
		Vogtle 2

**Table 19. Crane design and current operating capacities
(ordered by current operating capacity) (Continued)**

110 tons	125 tons	Design: 150 tons
Design: 110 tons	Design: 125 tons	Callaway
Millstone 1	Brunswick 1	
Salem 1	Brunswick 2	130 tons
Salem 2	Catawba 1	Design: 130 tons
Three Mile Island 1	Catawba 2	Comanche Peak 1
Vermont Yankee	Clinton	Comanche Peak 2
Design: 125 tons	Diablo Canyon 1	Design: 150 tons
Braidwood 1	Diablo Canyon 2	Hope Creek
Braidwood 2	Farley 1	
Byron 1	Farley 2	140 tons
Byron 2	Hatch 1	Design: 140 tons
Limerick 1	Hatch 2	Davis-Besse
Limerick 2	Kewaunee	
Peach Bottom 2	Maine Yankee	150 tons
Peach Bottom 3	Millstone 3	Design: 150 tons
Zion 1	Morris Operation	Calvert Cliffs 1
Zion 2	North Anna 1	Calvert Cliffs 2
	North Anna 2	Grand Gulf
117 tons	Perry 1	Harris
Design: 125 tons	Point Beach 1	Palo Verde 1
Fermi 2	Point Beach 2	Palo Verde 2
	Prairie Island 1	Palo Verde 3
123 tons	Prairie Island 2	South Texas Project 1
Design: 125 tons	River Bend	South Texas Project 2
Shoreham	Robinson 2	Wolf Creek
	San Onofre 2	
	San Onofre 3	
	Seabrook	
	Summer	
	Surry 1	
	Surry 2	
	Susquehanna 1	
	Susquehanna 2	
	Washington Nuclear Plant 2	
	Waterford 3	
	Watts Bar 1	
	Watts Bar 2	

features were identified or reported by the utility concerned, these plants were assessed as being capable of handling heavier casks if reanalysis and revision of the license conditions were made. In some cases a physical modification may also be required for installation of an impact limiter or engineered plate to spread the cask weight over an area larger than the base of the cask.

Table 21 indicates the number of facilities which have demonstrated that their cranes are classed as single failure proof under the terms of NUREG-0612 and how many of those achieve single failure proof status by redundancy.

Table 22 shows the number of facilities for which cask-drop analyses have been completed. Those analyses performed since January 1981 were subject to the requirements of NUREG-0612. Detailed technical evaluation of whether or not the cask-drop analyses completed earlier than January 1981 meet the requirements of NUREG-0612 was beyond the scope of the project. However, an engineering judgment of the cask drop analysis at these facilities was made by the project team on a case-by-case basis, taking into account the period since the analysis was completed, the most recent use of the crane, and discussions with utility staff. This is recorded in the FICA Project Cask-handling Assessment Report for the relevant facilities.

Table 20. Crane design and operating capacities

Cask weight	Cask type	Design capacity		Operating capacity	
		Could currently handle cask weight	Could not currently handle cask weight	Could currently handle cask weight	Could not currently handle cask weight
28	LWT cask	122	0	112	10
40	OWT cask	122	0	110	12
100	100-ton	110	12	94	28
125	125-ton	87	35	51	71

Table 21. Redundant and single failure proof status of facility cranes

	Redundant	Nonredundant	Blank ^a	Total facilities
Single failure proof	40	26	2	68
Nonsingle failure proof	1	49	0	50
N/A	1	3	0	4
Total facilities	42	78	2	122

^aThis represents a blank field in the database for LaSalle 1 and 2.

Table 22. Cask-drop analyses — number of facilities and dates

	Number of Facilities	
	Before 12/31/1980	Since 1/1/1981
Analyses completed	31	37
Total analyses completed	68	
Total analyses not completed		54
Total facilities		122

5.4 TRANSPORTATION CAPABILITIES AND CASK HANDLING EXPERIENCE

Appendix 5 provides general information on the transportation capabilities of each facility. The on-site rail and barge capabilities are summarized in Table 23, and the operational status is indicated. All facilities have access to the interstate highway system. Each facility's capability is counted separately, although some facilities share common cask transportation routes.

Table 23. On-site rail and barge transportation capabilities

Number of facilities		Active	Inactive	Total
With rail access	To the site only	13	8	21
	Into the receiving area	42	20	62
With barge access		20	42	62

Appendix 6 provides general information on details the cask-handling experience of each facility using road, rail and barge transportation and is summarized in Table 24.

Table 24. Cask shipping experience

Shipment mode(s)	No. of facilities			
	Truck	Rail	Barge	Any experience
Truck only	32			32
Rail only		5		5
Truck and rail	11	11		11
Truck and barge	2		2	2
Total	45	16	2	47

5.5 FURTHER DISCUSSION OF FACILITY ASSESSMENTS

Table 25 identifies five facilities which warrant further discussion, following assessment of their cask-handling capabilities based on the FICA Casks. If modifications were implemented, all except one could use the OWT cask. These facilities are discussed individually in the following sections.

Table 25. Facilities identified for further assessment

Facility	Limiting parameter	Current capability	Potential capability after modification
Big Rock Point	Cask-drop analysis/cask diameter	0	LWT, OWT
Crystal River	Cask-drop analysis	0	LWT, OWT
Fort St. Vrain	Cask-drop analysis/cask diameter	0	LWT, OWT
Indian Point 1	Headroom/cask diameter	0	LWT, OWT
La Crosse	Cask length/cask diameter	0	0

5.5.1 Big Rock Point

Big Rock Point has a cask-handling crane with a design capacity of 75 tons, but it has been derated and is currently limited to the use of casks weighing no more than 24 tons. This limit results from a cask-drop analysis based on the transfer cask used within the plant for refueling operations and currently precludes the use of any of the FICA Casks. No analysis has been completed for a heavier cask although nothing was identified by the utility or the project team which would potentially prevent modifying the cask-drop analysis to allow the use of casks weighing 40 tons. Thus, the project assessment is that this facility could handle the OWT cask if the crane were requalified. If, however, the revised cask-drop analysis concludes that a 25-ton cask cannot be used, use of the refueling transfer cask already available could be considered for dry loading of shipping casks.

5.5.2 Crystal River

Crystal River is currently precluded from handling any casks by the results of a cask-drop analysis completed in 1982. The cask-drop analysis concluded that the building structure could accept the loads associated with cask-handling operations and potential cask-drop accident conditions for casks weighing up to 40 tons. However, the cask decontamination and loading area floors would require reinforcement or installation of impact limiters. Also, a mechanical barrier was required to prevent the possibility of a cask entering the fuel storage area of the pool in the event of a drop accident. Assessment of these modifications was beyond the scope of this project, but is reported here because it was being considered by the utility, following completion of the 1982 cask-drop analysis.

Alternatively, modifying the crane to make it single failure proof would avoid the need for reinforcement of the decontamination and loading area floors or revision of the cask-drop analysis.

5.5.3 Fort St. Vrain

Fort St. Vrain is a high temperature gas-cooled reactor which was permanently shut down in 1989. Spent fuel was stored in dry "wells" and consequently, the cask-handling arrangements are quite different from those of light water reactors. The possibility of shipping fuel from Fort St. Vrain using the FICA Casks was considered and the project assessment was that the OWT cask could be used, if plant modifications were made.

However, construction of a dry vault storage facility at the site was scheduled in late 1991 and transfer of the spent fuel from the reactor building dry wells to the vault was completed in June 1992. Consequently, the assessment of cask-handling at the Fort St. Vrain site no longer applies.

5.5.4 Indian Point 1

Indian Point 1 is permanently shut down. This plant has limited headroom along the cask-handling route and will need a special short yoke to handle any of the FICA Casks. Depending on the detailed design of the short yoke, there may also be a problem in upending any cask to allow it to be moved through the plant. This may require arrangements to upend the cask outside the fuel-handling building and provision of a special-purpose transfer system to allow the cask to be brought into the building with its axis vertical.

Removal of part of the wall around the decontamination area or identification of an alternative decontamination area would also be required and procedural changes would need to be introduced. None of these modifications individually should be difficult to achieve although, collectively, they represent a package of plant modifications and changes to administrative controls which exceeds the modifications considered at other facilities.

5.5.5 La Crosse

La Crosse has dimensional restrictions at many points along the cask travel path and could not handle any of the FICA Casks even if the modifications assessed in the project were made. The most restrictive part of the cask travel path is in the cask upending area. As the cask enters the upending area from the airlock, with its axis horizontal, the layout of the plant requires that the upending operation start before the cask is fully out of the airlock. The maximum cask length that can currently be handled depends on the cask diameter (due to the clearance between the cask support cradle and the top of the airlock), but is approximately 16 feet 8 inches. Handling experience with existing casks confirms that none of the FICA Casks could be handled without considerable facility modification, possibly including modification of the airlock. As the plant is permanently shut down, this may be possible but was not considered to be within the definition of facility modification for the purposes of this project.

5.6 OPEN ITEMS

For many facilities, a number of data items remain open. Most of the open items concern background information about the facility, and do not represent limitations which affect the assessment of cask-handling capabilities. However, in some cases, data items relevant to assessment of cask-handling capabilities remain open or unverified, so that assessed capabilities are based in part on assumed values. In such cases, the lack of data and the assumptions made are recorded in the FICA Project Cask-handling Assessment reports.

The main areas where problems were encountered in data collection are discussed in the sections which follow.

5.6.1 Floor Load Limitations

The FICA database contains data item fields for the maximum static floor load in the spent-fuel pool and the uniform static floor load and maximum dynamic load for the cask receiving, upending, decontamination, intermediate set-down and cask loading areas. These were the plant parameters identified in Phase I of the project as necessary to allow plant structural limitations to be taken into account in assessing cask-handling capabilities. However, it became apparent during the data collection activities of the site visit program that utilities rarely have cause to use such engineering data, and utility staff would have to expend considerable time and effort to obtain this information.

Since the maximum static floor load in the spent-fuel pool was rarely available from the utility, the data item field in the Spent Fuel Pool Data Module was usually left with no value entered. In some cases the utility supplied information for this data item field, but the value given was not considered to be the appropriate load limit for the pool floor as required for this project. For example, plant engineering drawings provided by several utilities indicated spent-fuel pool floor load limits of 1,000 pounds per square foot (psf). As the static floor load due to the weight of the water alone is about 2,500 psf, the 1,000 psf figure is clearly not the appropriate limit for the FICA database. The 1,000 psf figure may relate to loads in addition to the weight of water, but there is insufficient confidence in this to consider it in assessing potential plant modifications.

The uniform static floor load and the maximum dynamic load for the cask receiving, upending, decontamination, intermediate set-down and cask loading areas were intended to be used in assessing the facility's capability to handle spent-fuel shipping casks based on building structural limits, where this capability had not yet been determined for a specific cask. These limits, along with cask-handling crane capacity limits and dimensional limits imposed by plant features, would then allow assessment of the cask-handling capability of the facility. As with the maximum spent-fuel pool floor load limit, uniform static and dynamic load limits for these areas were rarely available from the utility. In some cases the utility provided engineering drawings for its facilities indicating uniform static floor load limits on the order of 250 psf. These may apply to general building floors when the load is applied over the entire area, but would limit the utility to handling 25,000-pound (12.5-ton) loads if applied to an area the size of typical cask setdown areas. Floor load figures of this type are clearly inapplicable to the project requirements for plants designed to handle heavy casks and were not taken into account in completing cask-handling assessments.

When utilities have load limit information available, it is most often a derived limit specified in the plant Technical Specifications documents (e.g., crane downrating). Alternatively, where a floor load analysis has been used in support of a particular operation, capability to perform that operation is confirmed (e.g., handling of an LWT cask). However, there is usually no indication of the margin available which may allow a different operation (e.g., handling of an OWT cask). Thus, specific floor load limitations are not often readily available. Furthermore, because of changes in licensing regulations and analytical methods, floor load limitations based on calculations completed more than a few years ago may no longer be valid. Thus, specific reassessment may be required before cask-handling operations, or other action resulting in increased floor loadings, may be permitted.

5.6.2 Plant Dimensions

For some plants, the data available from engineering drawings or other reference sources provided by the utility was not comprehensive. Also, in the majority of cases, no "as-built" drawings were available. Consequently, plant data were verified during the site visit to the extent practicable, although some data items (e.g., pool water depth) could not be verified without impacting utility operations beyond the level specified for the project. In some cases, assumed values had to be used (for example, overhead clearances). Where such dimensional data item values were assumed, they were identified as assumptions. However, no assumed values were required which represent limitations to assessed capability.

5.6.3 Transportation Vehicle Data

The FICA project database contains data fields for the principal limiting dimensions on transportation vehicles both on- and off-site. However, as for the floor load limitations discussed above, there was found to be no generally applicable means of identifying vehicle dimension limits. Some dimensions (e.g., vehicle length) had identifiable limits where access to enclosed areas was required. However, for plants with all vehicle operations in the open, there is not necessarily an identifiable limit, and judgment was required in determining whether there was an appropriate entry for the data item. In selected cases the data item has no value entered, and the associated comment fields have been used to provide information about the transportation limitations. In very few cases were identifiable limitations reported by the utilities as significant restrictions to transportation capabilities. Apart from being shown as data entries in the database, these are discussed fully in the FICA Project Cask-handling Assessment Report. In all other cases, utilities indicated that arrangements could be made to transport casks to the receiving area, up to and including the maximum weight of a cask which could be handled in the facility.

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6. BIBLIOGRAPHY

Single-Failure-Proof Cranes for Nuclear Power Plants, NUREG-0554, U.S. Nuclear Regulatory Commission, Washington, D.C., May 1979.

Control of Heavy Loads at Nuclear Power Plants — Resolution of Generic Technical Activity, NUREG-0612, U.S. Nuclear Regulatory Commission, Washington, D.C., July 1980.

Nuclear Fuel Data Form, (Survey form completed by U.S. owners and generators of irradiated nuclear fuel and submitted to the U.S. Department of Energy Information Administration), RW-859.

Appendix 1.

SUMMARY OF THE SITE VISIT PROGRAM

APPENDIX 1
Summary of the Site Visit Program

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Site Visit Date</u>	<u>Type of Facility / NSSS Vendor Name</u>	<u>MWth/ MWe</u>	<u>Plant Location: City, State</u>	<u>Utility Contact: Name Location</u>
1	ARKANSAS NUCLEAR ONE UNIT 1 ARKANSAS POWER AND LIGHT COMPANY	04/06/89	PWR BABCOCK & WILCOX	2568 883	RUSSELLVILLE, AR	FRANK PHILPOTT Site Office
2	ARKANSAS NUCLEAR ONE UNIT 2 ARKANSAS POWER AND LIGHT COMPANY	04/06/89	PWR COMBUSTION ENGINEERING	2815 897	RUSSELLVILLE, AR	FRANK PHILPOTT Site Office
3	BEAVER VALLEY 1 DUQUESNE LIGHT COMPANY	09/08/88	PWR WESTINGHOUSE	2660 860	SHIPPINGPORT, PA	ROBERT D. SHERER Utility Office
4	BEAVER VALLEY 2 DUQUESNE LIGHT COMPANY	09/08/88	PWR WESTINGHOUSE	2660 888	SHIPPINGPORT, PA	ROBERT D. SHERER Utility Office
5	BIG ROCK POINT 1 CONSUMERS POWER COMPANY	08/03/88	BWR GENERAL ELECTRIC	240 75	CHARLEVOIX, MI	MIKE BOURASSA Site Office
6	BRAIDWOOD 1 COMMONWEALTH EDISON COMPANY	05/24/88	PWR WESTINGHOUSE	3425 1175	BRACEVILLE, IL	PATRICIA J. GARNIER Utility Office
7	BRAIDWOOD 2 COMMONWEALTH EDISON COMPANY	05/24/88	PWR WESTINGHOUSE	3425 1175	BRACEVILLE, IL	PATRICIA J. GARNIER Utility Office
8	BROWNS FERRY 1 TENNESSEE VALLEY AUTHORITY	05/10/89	BWR GENERAL ELECTRIC	3293 1098	DECATUR, AL	BOB MULLIN Utility Office
9	BROWNS FERRY 2 TENNESSEE VALLEY AUTHORITY	05/10/89	BWR GENERAL ELECTRIC	3293 1098	DECATUR, AL	BOB MULLIN Utility Office
10	BROWNS FERRY 3 TENNESSEE VALLEY AUTHORITY	05/10/89	BWR GENERAL ELECTRIC	3293 1098	DECATUR, AL	BOB MULLIN Utility Office
11	BRUNSWICK 1 CAROLINA POWER & LIGHT COMPANY	03/15/89	BWR GENERAL ELECTRIC	2436 790	SOUTHPORT, NC	ROBERT K. KUNITA Utility Office
12	BRUNSWICK 2 CAROLINA POWER & LIGHT COMPANY	03/15/89	BWR GENERAL ELECTRIC	2436 790	SOUTHPORT, NC	ROBERT K. KUNITA Utility Office
13	BYRON 1 COMMONWEALTH EDISON COMPANY	05/25/88	PWR WESTINGHOUSE	3411 1175	BYRON, IL	PATRICIA J. GARNIER Utility Office
14	BYRON 2 COMMONWEALTH EDISON COMPANY	05/25/88	PWR WESTINGHOUSE	3411 1175	BYRON, IL	PATRICIA J. GARNIER Utility Office
15	CALLAWAY 1 UNION ELECTRIC COMPANY	07/26/88	PWR WESTINGHOUSE	3565 1200	FULTON, MO	ALAN C. PASSWATER Utility Office

APPENDIX 1 (Continued)
Summary of the Site Visit Program

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Site Visit Date</u>	<u>Type of Facility / NSSS Vendor Name</u>	<u>MWth/ MWe</u>	<u>Plant Location: City, State</u>	<u>Utility Contact: Name Location</u>
16	CALVERT CLIFFS 1 BALTIMORE GAS AND ELECTRIC COMPANY	10/31/89	PWR COMBUSTION ENGINEERING	2700 860	LUSBY, MD	KEN ALLOR Site Office
17	CALVERT CLIFFS 2 BALTIMORE GAS AND ELECTRIC COMPANY	10/31/89	PWR COMBUSTION ENGINEERING	2700 860	LUSBY, MD	KEN ALLOR Site Office
18	CATAWBA UNIT 1 DUKE POWER COMPANY	03/29/88	PWR WESTINGHOUSE	3411 1192	CLOVER, SC	ROBERT W. RASMUSSEN Utility Office
19	CATAWBA UNIT 2 DUKE POWER COMPANY	03/29/88	PWR WESTINGHOUSE	3411 1192	CLOVER, SC	ROBERT W. RASMUSSEN Utility Office
20	CLINTON 1 ILLINOIS POWER COMPANY	07/20/88	BWR GENERAL ELECTRIC	2894 933	CLINTON, IL	FRANK SPANGENBURG Site Office
21	COMANCHE PEAK 1 TU ELECTRIC	01/19/89	PWR WESTINGHOUSE	3411 1150	GLEN ROSE, TX	B.W. COSS Utility Office
22	COMANCHE PEAK 2 TU ELECTRIC	01/19/89	PWR WESTINGHOUSE	3411 1150	GLEN ROSE, TX	B.W. COSS Utility Office
23	COOPER NUCLEAR STATION NEBRASKA PUBLIC POWER DISTRICT	06/20/88	BWR GENERAL ELECTRIC	2381 787	BROWNVILLE, NE	PAUL BALLINGER Site Office
24	CRYSTAL RIVER 3 FLORIDA POWER CORPORATION	07/28/87	PWR BABCOCK & WILCOX	2544 860	CRYSTAL RIVER, FL	C. MICHAEL CALLIHAN Utility Office
25	DAVIS-BESSE NUCLEAR POWER STATION TOLEDO EDISON CO	04/27/89	PWR BABCOCK & WILCOX	2772 904	OAK HARBOR, OH	DR. JAMES KUTCHER Site Office
26	DC COOK 1 INDIANA MICHIGAN POWER COMPANY	10/05/89	PWR WESTINGHOUSE	3250 1020	BRIDGMAN, MI	ERIC LEWIS Utility Office
27	DC COOK 2 INDIANA MICHIGAN POWER COMPANY	10/05/89	PWR WESTINGHOUSE	3411 1060	BRIDGMAN, MI	ERIC LEWIS Utility Office
28	DIABLO CANYON 1 PACIFIC GAS AND ELECTRIC COMPANY	08/31/88	PWR WESTINGHOUSE	3338 1125	AVILA BEACH, CA	ROBERT W. LORENZ Utility Office
29	DIABLO CANYON 2 PACIFIC GAS AND ELECTRIC COMPANY	08/31/88	PWR WESTINGHOUSE	3411 1130	AVILA BEACH, CA	ROBERT W. LORENZ Utility Office
30	DRESDEN 1 COMMONWEALTH EDISON COMPANY	09/11/89	BWR GENERAL ELECTRIC	700 205	MORRIS, IL	PATRICIA J. GARNIER Utility Office

APPENDIX 1 (Continued)
Summary of the Site Visit Program

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Site Visit Date</u>	<u>Type of Facility / MSSS Vendor Name</u>	<u>MWh/ MWe</u>	<u>Plant Location: City, State</u>	<u>Utility Contact: Name Location</u>
31	DRESDEN 2 COMMONWEALTH EDISON COMPANY	09/11/89	BWR GENERAL ELECTRIC	2527 812	MORRIS, IL	PATRICIA J. GARNIER Utility Office
32	DRESDEN 3 COMMONWEALTH EDISON COMPANY	09/11/89	BWR GENERAL ELECTRIC	2527 812	MORRIS, IL	PATRICIA J. GARNIER Utility Office
33	DUANE ARNOLD ENERGY CENTER IOWA ELECTRIC LIGHT & POWER COMPANY	06/15/88	BWR GENERAL ELECTRIC	1658 545	PALO, IA	DR. WALTER C. NODEAN Utility Office
34	FARLEY 1 ALABAMA POWER COMPANY	07/29/88	PWR WESTINGHOUSE	2652 860	ASHFORD, AL	M. D. RICKLES Utility Office
35	FARLEY 2 ALABAMA POWER COMPANY	07/29/88	PWR WESTINGHOUSE	2652 860	ASHFORD, AL	M. D. RICKLES Utility Office
36	FERMI 2 DETROIT EDISON COMPANY	08/12/88	BWR GENERAL ELECTRIC	3292 1150	NEWPORT, MI	ADDISON D. SMART Site Office
37	FORT CALHOUN 1 OMAHA PUBLIC POWER DISTRICT	05/26/88	PWR COMBUSTION ENGINEERING	1500 490	FORT CALHOUN, NE	DAN D. KLOOCK Utility Office
38	FORT SAINT VRAIN PUBLIC SERVICE COMPANY OF COLORADO	03/03/89	HTG GENERAL ATOMIC COMPANY	842 342	PLATTEVILLE, CO	STEVE SHERROW Site Office
39	GRAND GULF 1 ENTERGY OPERATIONS, INC.	07/07/89	BWR GENERAL ELECTRIC	3833 1306	PORT GIBSON, MS	TOMMY ERRINGTON Site Office
40	HADDAM NECK CONNECTICUT YANKEE ATOMIC POWER COMPANY	02/28/89	PWR WESTINGHOUSE	1825 582	EAST HAMPTON, CT	GERRY P. VAN NOORDENNE Utility Office
41	HARRIS 1 CAROLINA POWER & LIGHT COMPANY	02/10/89	PWR WESTINGHOUSE	2775 920	NEW HILL, NC	ROBERT K. KUNITA Utility Office
42	HATCH 1 GEORGIA POWER COMPANY	08/03/88	BWR GENERAL ELECTRIC	2436 801	BAXLEY, GA	RAY BAKER Utility Office
43	HATCH 2 GEORGIA POWER COMPANY	08/03/88	BWR GENERAL ELECTRIC	2436 804	BAXLEY, GA	RAY BAKER Utility Office
44	HOPE CREEK 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	03/29/89	BWR GENERAL ELECTRIC	3293 1090	HANCOCKS BRIDGE, NJ	QURESH DAHODWALA Site Office
45	HUMBOLDT BAY POWER PLANT UNIT 3 PACIFIC GAS AND ELECTRIC COMPANY	09/01/88	BWR GENERAL ELECTRIC	220 65	EUREKA, CA	ROBERT W. LORENZ Utility Office

APPENDIX 1 (Continued)
Summary of the Site Visit Program

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Site Visit Date</u>	<u>Type of Facility / NSSS Vendor Name</u>	<u>MWth/ MWe</u>	<u>Plant Location: City, State</u>	<u>Utility Contact: Name Location</u>
46	INDIAN POINT 1 CONSOLIDATED EDISON COMPANY	05/11/89	PWR BABCOCK & WILCOX	615 285	BUCHANAN, NY	RICHARD REMSHAW Utility Office
47	INDIAN POINT 2 CONSOLIDATED EDISON COMPANY	05/11/89	PWR WESTINGHOUSE	2758 1007	BUCHANAN, NY	RICHARD REMSHAW Utility Office
48	INDIAN POINT 3 NEW YORK POWER AUTHORITY	05/11/89	PWR WESTINGHOUSE	3025 1025	BUCHANAN, NY	S.R. RAJAN Utility Office
49	J.A. FITZPATRICK NEW YORK POWER AUTHORITY	01/09/90	BWR GENERAL ELECTRIC	2436 849	LYCOMING, NY	WILLIAM R. YARIO Utility Office
50	KEWAUNEE 1 WISCONSIN PUBLIC SERVICE CORPORATION	08/24/88	PWR WESTINGHOUSE	1650 560	KEWAUNEE, WI	DANIEL J. ROPSON Utility Office
51	LA CROSSE DAIRYLAND POWER COOPERATIVE	01/12/89	BWR ALLIS-CHALMERS	165 50	GENOA, WI	DR. SEYMOUR J. RAFFETY Site Office
52	LASALLE 1 COMMONWEALTH EDISON COMPANY	08/23/89	BWR GENERAL ELECTRIC	3323 1132	MARSEILLES, IL	PATRICIA J. GARNIER Utility Office
53	LASALLE 2 COMMONWEALTH EDISON COMPANY	08/23/89	BWR GENERAL ELECTRIC	3323 1132	MARSEILLES, IL	PATRICIA J. GARNIER Utility Office
54	LIMERICK 1 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	12/03/87	BWR GENERAL ELECTRIC	3293 1092	POTTSTOWN, PA	AMY C. COLLINGE Utility Office
55	LIMERICK 2 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	12/03/87	BWR GENERAL ELECTRIC	3293 1092	POTTSTOWN, PA	AMY C. COLLINGE Utility Office
56	MAINE YANKEE MAINE YANKEE ATOMIC POWER COMPANY	06/02/88	PWR COMBUSTION ENGINEERING	2700 870	WISCASSET, ME	S.E. NICHOLS Site Office
57	MCGUIRE UNIT 1 DUKE POWER COMPANY	02/23/88	PWR WESTINGHOUSE	3411 1171	CORNELIUS, NC	ROBERT W. RASMUSSEN Utility Office
58	MCGUIRE UNIT 2 DUKE POWER COMPANY	02/23/88	PWR WESTINGHOUSE	3411 1171	CORNELIUS, NC	ROBERT W. RASMUSSEN Utility Office
59	MILLSTONE UNIT 1 NORTHEAST NUCLEAR ENERGY COMPANY	10/13/87	BWR GENERAL ELECTRIC	2011 684	WATERFORD, CT	GERRY P. VAN NOORDENNEM Utility Office
60	MILLSTONE UNIT 2 NORTHEAST NUCLEAR ENERGY COMPANY	10/13/87	PWR COMBUSTION ENGINEERING	2700 894	WATERFORD, CT	GERRY P. VAN NOORDENNEM Utility Office

APPENDIX 1 (Continued)
Summary of the Site Visit Program

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Site Visit Date</u>	<u>Type of Facility / NSSS Vendor Name</u>	<u>MWh/ MWe</u>	<u>Plant Location: City, State</u>	<u>Utility Contact: Name Location</u>
61	MILLSTONE UNIT 3 NORTHEAST NUCLEAR ENERGY COMPANY	10/13/87	PWR WESTINGHOUSE	3411 1197	WATERFORD, CT	GERRY P. VAN NOORDENEN Utility Office
62	MONTICELLO NORTHERN STATES POWER COMPANY	07/28/88	BWR GENERAL ELECTRIC	1670 553	MONTICELLO, MN	JOHN CLOSS Utility Office
63	MORRIS OPERATIONS MORRIS OPERATIONS	04/21/89	AFR NOT APPLICABLE	0 0	MORRIS, IL	GENE INGELS Site Office
64	NINE MILE POINT 1 NIAGARA MOHAWK POWER CORPORATION	07/12/89	BWR GENERAL ELECTRIC	1850 620	LYCOMING, NY	G.K. RHODE Utility Office
65	NINE MILE POINT 2 NIAGARA MOHAWK POWER CORPORATION	07/12/89	BWR GENERAL ELECTRIC	3323 1150	LYCOMING, NY	G.K. RHODE Utility Office
66	NORTH ANNA 1 VIRGINIA POWER	08/18/88	PWR WESTINGHOUSE	2893 982	MINERAL, VA	MARVIN L. SMITH Utility Office
67	NORTH ANNA 2 VIRGINIA POWER	08/18/88	PWR WESTINGHOUSE	2893 982	MINERAL, VA	MARVIN L. SMITH Utility Office
68	OCONEE UNIT 1 DUKE POWER COMPANY	06/02/88	PWR BABCOCK & WILCOX	2568 886	SENECA, SC	ROBERT W. RASMUSSEN Utility Office
69	OCONEE UNIT 2 DUKE POWER COMPANY	06/02/88	PWR BABCOCK & WILCOX	2568 886	SENECA, SC	ROBERT W. RASMUSSEN Utility Office
70	OCONEE UNIT 3 DUKE POWER COMPANY	06/02/88	PWR BABCOCK & WILCOX	2568 886	SENECA, SC	ROBERT W. RASMUSSEN Utility Office
71	OYSTER CREEK 1 JERSEY CENTRAL POWER AND LIGHT COMPANY	10/19/89	BWR GENERAL ELECTRIC	1930 650	FORKED RIVER, NJ	JOHN A. VINCENT Utility Office
72	PALISADES NUCLEAR PLANT CONSUMERS POWER COMPANY	08/10/88	PWR COMBUSTION ENGINEERING	2530 795	COVERT, MI	JOHN R. KNEELAND, JR. Site Office
73	PALO VERDE 1 ARIZONA PUBLIC SERVICE COMPANY	12/01/88	PWR COMBUSTION ENGINEERING	3800 1303	WINTERSBURG, AZ	SHARON L. LAWSON Site Office
74	PALO VERDE 2 ARIZONA PUBLIC SERVICE COMPANY	12/01/88	PWR COMBUSTION ENGINEERING	3800 1303	WINTERSBURG, AZ	SHARON L. LAWSON Site Office
75	PALO VERDE 3 ARIZONA PUBLIC SERVICE COMPANY	12/01/88	PWR COMBUSTION ENGINEERING	3800 1303	WINTERSBURG, AZ	SHARON L. LAWSON Site Office

APPENDIX 1 (Continued)
Summary of the Site Visit Program

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Site Visit Date</u>	<u>Type of Facility / NSSS Vendor Name</u>	<u>MWth/ MWe</u>	<u>Plant Location: City, State</u>	<u>Utility Contact: Name Location</u>
76	PEACH BOTTOM UNIT 2 PHILADELPHIA ELECTRIC COMPANY	08/19/87	BWR GENERAL ELECTRIC	3293 1098	DELTA, PA	AMY COLLINGE Utility Office
77	PEACH BOTTOM UNIT 3 PHILADELPHIA ELECTRIC COMPANY	08/19/87	BWR GENERAL ELECTRIC	3293 1098	DELTA, PA	AMY COLLINGE Utility Office
78	PERRY 1 CLEVELAND ELECTRIC ILLUMINATING COMPANY	10/24/89	BWR GENERAL ELECTRIC	3579 1250	PERRY, OH	DR. JAMES W. KUTCHER Utility Office
79	PILGRIM 1 BOSTON EDISON CO	03/22/90	BWR GENERAL ELECTRIC	1998 690	PLYMOUTH, MA	JOHN H. PIASCIK Utility Office
80	POINT BEACH 1 WISCONSIN ELECTRIC POWER COMPANY	07/28/88	PWR WESTINGHOUSE	1518 524	TWO RIVERS, WI	DAVID K. ZABRANSKY Utility Office
81	POINT BEACH 2 WISCONSIN ELECTRIC POWER COMPANY	07/28/88	PWR WESTINGHOUSE	1518 497	TWO RIVERS, WI	DAVID K. ZABRANSKY Utility Office
82	PRAIRIE ISLAND NUCLEAR GENERATING P12/20/88 NORTHERN STATES POWER COMPANY	07/28/88	PWR WESTINGHOUSE	1650 534	WELCH, MN	JOHN CLOSS Utility Office
83	PRAIRIE ISLAND NUCLEAR GENERATING P12/20/88 NORTHERN STATES POWER COMPANY	07/28/88	PWR WESTINGHOUSE	1650 534	WELCH, MN	JOHN CLOSS Utility Office
84	QUAD CITIES 1 COMMONWEALTH EDISON COMPANY	09/10/89	BWR GENERAL ELECTRIC	2511 813	CORDOVA, IL	PATRICIA J. GARNIER Utility Office
85	QUAD CITIES 2 COMMONWEALTH EDISON COMPANY	09/10/89	BWR GENERAL ELECTRIC	2511 813	CORDOVA, IL	PATRICIA J. GARNIER Utility Office
86	R.E. GINNA ROCHESTER GAS AND ELECTRIC CORPORATION	06/20/89	PWR WESTINGHOUSE	1520 490	ONTARIO, NY	ANTON A. FUJERER Utility Office
87	RANCHO SECO 1 SACRAMENTO MUNICIPAL UTILITY DISTRICT	09/14/88	PWR BABCOCK & WILCOX	2772 963	HERALD, CA	TAJ KHAM Site Office
88	RIVER BEND 1 GULF STATES UTILITIES	07/19/88	BWR GENERAL ELECTRIC	2894 991	ST. FRANCISVILLE, LA	JOHN E. BARRY Utility Office
89	ROBINSON 2 CAROLINA POWER & LIGHT COMPANY	03/23/89	PWR WESTINGHOUSE	2300 700	HARTSVILLE, SC	ROBERT K. KUNITA Utility Office
90	SALEM 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	03/28/89	PWR WESTINGHOUSE	3411 1149	HANCOCKS BRIDGE, NJ	QURESH DAHODWALA Site Office

APPENDIX 1 (Continued)
Summary of the Site Visit Program

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Site Visit Date</u>	<u>Type of Facility / NSSS Vendor Name</u>	<u>MWh/ MWe</u>	<u>Plant Location: City, State</u>	<u>Utility Contact: Name Location</u>
91	SALEM 2 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	03/28/89	PWR WESTINGHOUSE	3411 1149	HANCOCKS BRIDGE, NJ	QURESH DAHODWALA Site Office
92	SAN ONOFRE 1 SOUTHERN CALIFORNIA EDISON COMPANY	11/03/88	PWR WESTINGHOUSE	1347 456	SAN CLEMENTE, CA	PAUL D. MYERS Utility Office
93	SAN ONOFRE 2 SOUTHERN CALIFORNIA EDISON COMPANY	11/03/88	PWR COMBUSTION ENGINEERING	3390 1127	SAN CLEMENTE, CA	PAUL D. MYERS Utility Office
94	SAN ONOFRE 3 SOUTHERN CALIFORNIA EDISON COMPANY	11/03/88	PWR COMBUSTION ENGINEERING	3390 1127	SAN CLEMENTE, CA	PAUL D. MYERS Utility Office
95	SEABROOK NEW HAMPSHIRE YANKEE DIVISION OF PSNH	02/16/89	PWR WESTINGHOUSE	3425 1200	SEABROOK, NH	WALTER B. STURGEON, JR. Site Office
96	SEQUOYAH 1 TENNESSEE VALLEY AUTHORITY	04/18/89	PWR WESTINGHOUSE	3411 1183	SODDY-DAISY, TN	BOB MULLIN Utility Office
97	SEQUOYAH 2 TENNESSEE VALLEY AUTHORITY	04/18/89	PWR WESTINGHOUSE	3411 1183	SODDY-DAISY, TN	BOB MULLIN Utility Office
98	SHOREHAM LONG ISLAND LIGHTING COMPANY	02/28/89	BWR GENERAL ELECTRIC	2436 820	WADING RIVER, NY	SHELDON I. SCHREINER Site Office
99	SOUTH TEXAS 1 HOUSTON LIGHTING AND POWER COMPANY	04/19/89	PWR WESTINGHOUSE	3800 1312	WADSWORTH, TX	J.R. WORDEN Site Office
100	SOUTH TEXAS 2 HOUSTON LIGHTING AND POWER COMPANY	04/19/89	PWR WESTINGHOUSE	3800 1312	WADSWORTH, TX	J.R. WORDEN Site Office
101	ST. LUCIE 1 FLORIDA POWER & LIGHT CO.	07/13/87	PWR COMBUSTION ENGINEERING	2700 872	FORT PIERCE, FL	GEORGE T. ZAMRY Utility Office
102	ST. LUCIE 2 FLORIDA POWER & LIGHT CO.	07/13/87	PWR COMBUSTION ENGINEERING	2700 882	FORT PIERCE, FL	GEORGE T. ZAMRY Utility Office
103	SURRY UNIT 1 VIRGINIA POWER	09/29/87	PWR WESTINGHOUSE	2441 823	SURRY, VA	MARVIN L. SMITH Utility Office
104	SURRY UNIT 2 VIRGINIA POWER	09/29/87	PWR WESTINGHOUSE	2441 823	SURRY, VA	MARVIN L. SMITH Utility Office
105	SUSQUEHANNA 1 PENNSYLVANIA POWER AND LIGHT COMPANY	02/28/89	BWR GENERAL ELECTRIC	3293 1085	BERWICK, PA	HOWARD R. VERNICK Utility Office

APPENDIX 1 (Continued)
Summary of the Site Visit Program

Facility Number	Name of Reactor / Name of Utility or Operator	Site Visit Date	Type of Facility / NSSS Vendor Name	MWth/ MWe	Plant Location: City, State	Utility Contact: Name Location
106	SUSQUEHANNA 2 PENNSYLVANIA POWER AND LIGHT COMPANY	02/28/89	BWR GENERAL ELECTRIC	3293 1085	BERWICK, PA	HOWARD R. VERNICK Utility Office
107	THREE MILE ISLAND 1 GPU NUCLEAR CORPORATION	10/19/89	PWR BABCOCK & WILCOX	2568 871	MIDDLETOWN, PA	JOHN A. VINCENT Utility Office
108	TROJAN PORTLAND GENERAL ELECTRIC COMPANY	12/07/88	PWR WESTINGHOUSE	3411 1153	RAINIER, OR	GARY BAIR Site Office
109	TURKEY POINT 3 FLORIDA POWER & LIGHT COMPANY	08/09/88	PWR WESTINGHOUSE	2200 700	MIAMI, FL	GEORGE T. ZAMRY Utility Office
110	TURKEY POINT 4 FLORIDA POWER & LIGHT COMPANY	08/09/88	PWR WESTINGHOUSE	2200 700	MIAMI, FL	GEORGE T. ZAMRY Utility Office
111	V.C. SUMNER 1 SOUTH CAROLINA ELECTRIC AND GAS COMPANY	01/25/89	PWR WESTINGHOUSE	2775 922	JENKINSVILLE, SC	DOUGLAS WARNER Site Office
112	VERMONT YANKEE VERMONT YANKEE NUCLEAR POWER CORPORATION	05/02/89	BWR GENERAL ELECTRIC	1593 535	VERNON, VT	H. MICHAEL METELL Utility Office
113	VOGTLE 1 GEORGIA POWER COMPANY	06/30/88	PWR WESTINGHOUSE	3411 1157	WAYNESBORO, GA	ROBERT FLORIAN Utility Office
114	VOGTLE 2 GEORGIA POWER COMPANY	06/30/88	PWR WESTINGHOUSE	3411 1157	WAYNESBORO, GA	ROBERT FLORIAN Utility Office
115	WASHINGTON NUCLEAR PLANT 2 WASHINGTON PUBLIC POWER SUPPLY SYSTEM	07/27/88	BWR GENERAL ELECTRIC	3323 1153	RICHLAND, WA	DAVID L. LARKIN Utility Office
116	WATERFORD 3 LOUISIANA POWER AND LIGHT COMPANY	06/29/88	PWR COMBUSTION ENGINEERING	3390 1075	KILLONA, LA	JOHN L. ETHERIDGE Utility Office
117	WATTS BAR 1 TENNESSEE VALLEY AUTHORITY	04/20/89	PWR WESTINGHOUSE	3411 1270	SPRING CITY, TN	BOB MULLIN Utility Office
118	WATTS BAR 2 TENNESSEE VALLEY AUTHORITY	04/20/89	PWR WESTINGHOUSE	3411 1270	SPRING CITY, TN	BOB MULLIN Utility Office
119	WOLF CREEK WOLF CREEK NUCLEAR OPERATING CORPORATION	05/18/88	PWR WESTINGHOUSE	3411 1181	BURLINGTON, KS	PAUL ADAM Site Office
120	YANKEE NUCLEAR POWER STATION YANKEE ATOMIC ELECTRIC COMPANY	07/08/88	PWR WESTINGHOUSE	600 183	ROME, MA	JOHN M. BUCHHEIT Utility Office

APPENDIX 1 (Continued)
Summary of the Site Visit Program

Facility Number	Name of Reactor / Name of Utility or Operator	Site Visit Date	Type of Facility / NSS Vendor Name	Mileage	Plant Location: City, State	Utility Contact: Name Location
121	ZION 1 COMMONWEALTH EDISON COMPANY	08/21/89	PAR WESTINGHOUSE	3250 1085	ZION, IL	PATRICIA J. GARNIER Utility Office
122	ZION 2 COMMONWEALTH EDISON COMPANY	08/21/89	PAR WESTINGHOUSE	3250 1085	ZION, IL	PATRICIA J. GARNIER Utility Office

Appendix 2.

FACILITY DATA — CURRENT CASK-HANDLING PARAMETER LIMITS

APPENDIX 2
Facility Data - Current Cask-Handling Parameter Limits

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Maximum Weight (Tons)</u>	<u>Maximum Width/Diameter (Feet)</u>	<u>Maximum Height/Length (Feet)</u>
1	ARKANSAS NUCLEAR ONE UNIT 1 ARKANSAS POWER AND LIGHT COMPANY	0.0	9' 6"	19' 2"
2	ARKANSAS NUCLEAR ONE UNIT 2 ARKANSAS POWER AND LIGHT COMPANY	100.0	9' 6"	19' 3"
3	BEAVER VALLEY 1 DUQUESNE LIGHT COMPANY	60.0	10' 0"	19' 7"
4	BEAVER VALLEY 2 DUQUESNE LIGHT COMPANY	100.0	10' 0"	19' 7"
5	BIG ROCK POINT 1 CONSUMERS POWER COMPANY	24.0	5' 1"	15' 11"
6	BRAIDWOOD 1 COMMONWEALTH EDISON COMPANY	110.0	10' 9"	17' 7"
7	BRAIDWOOD 2 COMMONWEALTH EDISON COMPANY	110.0	10' 9"	17' 7"
8	BROWNS FERRY 1 TENNESSEE VALLEY AUTHORITY	106.0	7' 3"	16' 6"
9	BROWNS FERRY 2 TENNESSEE VALLEY AUTHORITY	106.0	7' 3"	16' 6"
10	BROWNS FERRY 3 TENNESSEE VALLEY AUTHORITY	106.0	7' 3"	16' 6"
11	BRUNSWICK 1 CAROLINA POWER & LIGHT COMPANY	75.0	10' 3"	18' 0"
12	BRUNSWICK 2 CAROLINA POWER & LIGHT COMPANY	75.0	10' 3"	18' 0"
13	BYRON 1 COMMONWEALTH EDISON COMPANY	110.0	11' 0"	17' 7"
14	BYRON 2 COMMONWEALTH EDISON COMPANY	110.0	11' 0"	17' 7"
15	CALLAWAY 1 UNION ELECTRIC COMPANY	125.0	12' 1"	23' 8"
16	CALVERT CLIFFS 1 BALTIMORE GAS AND ELECTRIC COMPANY	25.0	8' 10"	17' 11"

APPENDIX 2 (Continued)
Facility Data - Current Cask-Handling Parameter Limits

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Maximum Weight (Tons)</u>	<u>Maximum Width/Diameter (Feet)</u>	<u>Maximum Height/Length (Feet)</u>
17	CALVERT CLIFFS 2 BALTIMORE GAS AND ELECTRIC COMPANY	25.0	8' 10"	17' 11"
18	CATAWBA UNIT 1 DUKE POWER COMPANY	125.0	9' 0"	18' 2"
19	CATAWBA UNIT 2 DUKE POWER COMPANY	125.0	9' 0"	18' 2"
20	CLINTON 1 ILLINOIS POWER COMPANY	100.0	10' 0"	20' 4"
21	COMANCHE PEAK 1 TU ELECTRIC	130.0	13' 0"	23' 3"
22	COMANCHE PEAK 2 TU ELECTRIC	130.0	13' 0"	23' 3"
23	COOPER NUCLEAR STATION NEBRASKA PUBLIC POWER DISTRICT	100.0	6' 6"	14' 6"
24	CRYSTAL RIVER 3 FLORIDA POWER CORPORATION	0.0	8' 7"	17' 4"
25	DAVIS-BESSE NUCLEAR POWER STATION TOLEDO EDISON CO	125.0	14' 0"	22' 1"
26	DC COOK 1 INDIANA MICHIGAN POWER COMPANY	0.0	10' 4"	18' 11"
27	DC COOK 2 INDIANA MICHIGAN POWER COMPANY	0.0	10' 4"	18' 11"
28	DIABLO CANYON 1 PACIFIC GAS AND ELECTRIC COMPANY	67.5	10' 0"	22' 2"
29	DIABLO CANYON 2 PACIFIC GAS AND ELECTRIC COMPANY	67.5	10' 0"	22' 2"
30	DRESDEN 1 COMMONWEALTH EDISON COMPANY	24.0	6' 0"	21' 8"
31	DRESDEN 2 COMMONWEALTH EDISON COMPANY	75.0	6' 6"	16' 1"
32	DRESDEN 3 COMMONWEALTH EDISON COMPANY	75.0	6' 6"	16' 1"

APPENDIX 2 (Continued)
Facility Data - Current Cask-Handling Parameter Limits

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Maximum Weight (Tons)</u>	<u>Maximum Width/Diameter (Feet)</u>	<u>Maximum Height/Length (Feet)</u>
33	DUANE ARNOLD ENERGY CENTER IOWA ELECTRIC LIGHT & POWER COMPANY	85.0	9' 0"	17' 1"
34	FARLEY 1 ALABAMA POWER COMPANY	125.0	10' 8"	18' 1"
35	FARLEY 2 ALABAMA POWER COMPANY	125.0	10' 8"	18' 1"
36	FERMI 2 DETROIT EDISON COMPANY	100.0	9' 0"	16' 1"
37	FORT CALHOUN 1 OMAHA PUBLIC POWER DISTRICT	40.0	8' 0"	23' 1"
38	FORT SAINT VRAIN PUBLIC SERVICE COMPANY OF COLORADO	0.0	2' 5"	20' 0"
39	GRAND GULF 1 ENTERGY OPERATIONS, INC.	125.0	12' 0"	27' 3"
40	HADDAM NECK CONNECTICUT YANKEE ATOMIC POWER COMPANY	100.0	7' 3"	15' 7"
41	HARRIS 1 CAROLINA POWER & LIGHT COMPANY	97.5	6' 8"	16' 6"
42	HATCH 1 GEORGIA POWER COMPANY	0.0	10' 0"	15' 5"
43	HATCH 2 GEORGIA POWER COMPANY	0.0	10' 0"	15' 5"
44	HOPE CREEK 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	130.0	11' 0"	19' 9"
45	HUMBOLDT BAY POWER PLANT UNIT 3 PACIFIC GAS AND ELECTRIC COMPANY	0.0	10' 0"	20' 7"
46	INDIAN POINT 1 CONSOLIDATED EDISON COMPANY	0.0	3' 1"	12' 11"
47	INDIAN POINT 2 CONSOLIDATED EDISON COMPANY	0.0	7' 6"	15' 10"
48	INDIAN POINT 3 NEW YORK POWER AUTHORITY	40.0	8' 0"	16' 2"

APPENDIX 2 (Continued)
Facility Data - Current Cask-Handling Parameter Limits

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Maximum Weight (Tons)</u>	<u>Maximum Width/Diameter (Feet)</u>	<u>Maximum Height/Length (Feet)</u>
49	J.A. FITZPATRICK NEW YORK POWER AUTHORITY	62.5	11' 0"	17' 0"
50	KEWAUNEE 1 WISCONSIN PUBLIC SERVICE CORPORATION	120.0	6' 4"	16' 6"
51	LA CROSSE DAIRYLAND POWER COOPERATIVE	36.0	4' 6"	16' 10"
52	LASALLE 1 COMMONWEALTH EDISON COMPANY	100.0	12' 0"	20' 7"
53	LASALLE 2 COMMONWEALTH EDISON COMPANY	100.0	12' 0"	20' 7"
54	LIMERICK 1 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	110.0	9' 0"	20' 10"
55	LIMERICK 2 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	110.0	9' 0"	20' 10"
56	MAINE YANKEE MAINE YANKEE ATOMIC POWER COMPANY	0.0	10' 0"	17' 11"
57	MCGUIRE UNIT 1 DUKE POWER COMPANY	100.0	5' 0"	18' 2"
58	MCGUIRE UNIT 2 DUKE POWER COMPANY	100.0	7' 0"	18' 2"
59	HILLSTONE UNIT 1 NORTHEAST NUCLEAR ENERGY COMPANY	110.0	5' 6"	17' 6"
60	HILLSTONE UNIT 2 NORTHEAST NUCLEAR ENERGY COMPANY	100.0	9' 0"	17' 3"
61	HILLSTONE UNIT 3 NORTHEAST NUCLEAR ENERGY COMPANY	0.0	12' 10"	21' 3"
62	MONTICELLO NORTHERN STATES POWER COMPANY	85.0	6' 4"	16' 5"
63	MORRIS OPERATIONS MORRIS OPERATIONS	68.0	10' 0"	24' 4"
64	NINE MILE POINT 1 NIAGARA MOHAWK POWER CORPORATION	100.0	9' 0"	15' 3"

APPENDIX 2 (Continued)
Facility Data - Current Cask-Handling Parameter Limits

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Maximum Weight (Tons)</u>	<u>Maximum Width/Diameter (Feet)</u>	<u>Maximum Height/Length (Feet)</u>
65	NINE MILE POINT 2 NIAGARA MOHAWK POWER CORPORATION	100.0	10' 0"	15' 7"
66	NORTH ANNA 1 VIRGINIA POWER	105.0	9' 4"	20' 5"
67	NORTH ANNA 2 VIRGINIA POWER	105.0	9' 4"	20' 5"
68	OCONEE UNIT 1 DUKE POWER COMPANY	100.0	7' 0"	18' 0"
69	OCONEE UNIT 2 DUKE POWER COMPANY	100.0	7' 0"	18' 0"
70	OCONEE UNIT 3 DUKE POWER COMPANY	100.0	7' 1"	18' 0"
71	OYSTER CREEK 1 JERSEY CENTRAL POWER AND LIGHT COMPANY	100.0	9' 2"	17' 0"
72	PALISADES NUCLEAR PLANT CONSUMERS POWER COMPANY	25.0	6' 5"	16' 11"
73	PALO VERDE 1 ARIZONA PUBLIC SERVICE COMPANY	150.0	12' 0"	20' 3"
74	PALO VERDE 2 ARIZONA PUBLIC SERVICE COMPANY	150.0	12' 0"	20' 3"
75	PALO VERDE 3 ARIZONA PUBLIC SERVICE COMPANY	150.0	12' 0"	20' 3"
76	PEACH BOTTOM UNIT 2 PHILADELPHIA ELECTRIC COMPANY	100.0	8' 2"	16' 2"
77	PEACH BOTTOM UNIT 3 PHILADELPHIA ELECTRIC COMPANY	100.0	8' 2"	16' 2"
78	PERRY 1 CLEVELAND ELECTRIC ILLUMINATING COMPANY	125.0	10' 0"	20' 11"
79	PILGRIM 1 BOSTON EDISON CO	26.0	7' 6"	16' 3"
80	POINT BEACH 1 WISCONSIN ELECTRIC POWER COMPANY	125.0	7' 10"	18' 8"

APPENDIX 2 (Continued)
Facility Data - Current Cask-Handling Parameter Limits

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Maximum Weight (Tons)</u>	<u>Maximum Width/Diameter (Feet)</u>	<u>Maximum Height/Length (Feet)</u>
81	POINT BEACH 2 WISCONSIN ELECTRIC POWER COMPANY	125.0	7' 10"	18' 8"
82	PRAIRIE ISLAND NUCLEAR GENERATING PLANT 1 NORTHERN STATES POWER COMPANY	125.0	8' 10"	21' 8"
83	PRAIRIE ISLAND NUCLEAR GENERATING PLANT 2 NORTHERN STATES POWER COMPANY	125.0	8' 10"	21' 8"
84	QUAD CITIES 1 COMMONWEALTH EDISON COMPANY	75.0	9' 0"	16' 1"
85	QUAD CITIES 2 COMMONWEALTH EDISON COMPANY	75.0	9' 0"	16' 1"
86	R.E. GINHA ROCHESTER GAS AND ELECTRIC CORPORATION	30.0	8' 7"	16' 9"
87	RANCHO SECO 1 SACRAMENTO MUNICIPAL UTILITY DISTRICT	97.5	9' 11"	20' 8"
88	RIVER BEND 1 GULF STATES UTILITIES	125.0	12' 0"	18' 4"
89	ROBINSON 2 CAROLINA POWER & LIGHT COMPANY	77.5	8' 0"	18' 3"
90	SALEM 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	110.0	10' 0"	21' 4"
91	SALEM 2 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	110.0	10' 0"	21' 4"
92	SAN ONOFRE 1 SOUTHERN CALIFORNIA EDISON COMPANY	70.0	7' 0"	16' 6"
93	SAN ONOFRE 2 SOUTHERN CALIFORNIA EDISON COMPANY	125.0	11' 0"	22' 2"
94	SAN ONOFRE 3 SOUTHERN CALIFORNIA EDISON COMPANY	125.0	11' 0"	22' 2"
95	SEABROOK NEW HAMPSHIRE YANKEE DIVISION OF PSNH	125.0	10' 0"	24' 0"
96	SEQUOYAH 1 TENNESSEE VALLEY AUTHORITY	80.0	12' 0"	19' 9"

APPENDIX 2 (Continued)
Facility Data - Current Cask-Handling Parameter Limits

Facility Number	Name of Reactor / Name of Utility or Operator	Maximum Weight (Tons)	Maximum Width/Diameter (Feet)	Maximum Height/Length (Feet)
97	SEQUOYAH 2 TENNESSEE VALLEY AUTHORITY	80.0	12' 0"	19' 9"
98	SHOREHAM LONG ISLAND LIGHTING COMPANY	123.0	7' 4"	16' 1"
99	SOUTH TEXAS 1 HOUSTON LIGHTING AND POWER COMPANY	150.0	12' 0"	21' 11"
100	SOUTH TEXAS 2 HOUSTON LIGHTING AND POWER COMPANY	150.0	12' 0"	21' 11"
101	ST. LUCIE 1 FLORIDA POWER & LIGHT CO.	25.0	10' 0"	20' 11"
102	ST. LUCIE 2 FLORIDA POWER & LIGHT CO.	100.0	12' 0"	21' 4"
103	SURRY UNIT 1 VIRGINIA POWER	125.0	8' 4"	18' 6"
104	SURRY UNIT 2 VIRGINIA POWER	125.0	8' 4"	18' 6"
105	SUSQUEHANNA 1 PENNSYLVANIA POWER AND LIGHT COMPANY	125.0	13' 0"	17' 11"
106	SUSQUEHANNA 2 PENNSYLVANIA POWER AND LIGHT COMPANY	125.0	13' 0"	17' 11"
107	THREE MILE ISLAND 1 GPU NUCLEAR CORPORATION	110.0	8' 0"	20' 2"
108	TROJAN PORTLAND GENERAL ELECTRIC COMPANY	0.0	9' 0"	19' 6"
109	TURKEY POINT 3 FLORIDA POWER & LIGHT COMPANY	25.0	9' 3"	17' 1"
110	TURKEY POINT 4 FLORIDA POWER & LIGHT COMPANY	25.0	9' 3"	17' 1"
111	V.C. SUMNER 1 SOUTH CAROLINA ELECTRIC AND GAS COMPANY	125.0	11' 8"	19' 7"
112	VERMONT YANKEE VERMONT YANKEE NUCLEAR POWER CORPORATION	110.0	7' 0"	16' 0"

APPENDIX 2 (Continued)
Facility Data - Current Cask-Handling Parameter Limits

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Maximum Weight (Tons)</u>	<u>Maximum Width/Diameter (Feet)</u>	<u>Maximum Height/Length (Feet)</u>
113	VOGTLE 1 GEORGIA POWER COMPANY	91.0	8' 6"	21' 0"
114	VOGTLE 2 GEORGIA POWER COMPANY	91.0	8' 6"	21' 0"
115	WASHINGTON NUCLEAR PLANT 2 WASHINGTON PUBLIC POWER SUPPLY SYSTEM	125.0	10' 0"	16' 7"
116	WATERFORD 3 LOUISIANA POWER AND LIGHT COMPANY	125.0	11' 1"	12' 6"
117	WATTS BAR 1 TENNESSEE VALLEY AUTHORITY	100.0	12' 0"	19' 6"
118	WATTS BAR 2 TENNESSEE VALLEY AUTHORITY	100.0	12' 0"	19' 6"
119	WOLF CREEK WOLF CREEK NUCLEAR OPERATING CORPORATION	125.0	13' 8"	20' 11"
120	YANKEE NUCLEAR POWER STATION YANKEE ATOMIC ELECTRIC COMPANY	37.0	5' 0"	21' 3"
121	ZION 1 COMMONWEALTH EDISON COMPANY	110.0	9' 6"	16' 4"
122	ZION 2 COMMONWEALTH EDISON COMPANY	110.0	9' 6"	16' 4"

Appendix 3.

ASSESSED FACILITY CASK-HANDLING

CAPABILITIES

APPENDIX 3
Assessed Facility Cask Handling Capabilities

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Capability With Current Cask Handling Capability				Cask Handling Capability With Revised License or Oper. Instr.				Facility Modification			
		LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton
1	ARKANSAS NUCLEAR ONE UNIT 1 ARKANSAS POWER AND LIGHT CO.	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
2	ARKANSAS NUCLEAR ONE UNIT 2 ARKANSAS POWER AND LIGHT CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
3	BEAVER VALLEY 1 DUQUESNE LIGHT CO.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
4	BEAVER VALLEY 2 DUQUESNE LIGHT CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	BIG ROCK POINT 1 CONSUMERS POWER CO.	No	No	No	No	No	No	No	No	Yes	Yes	No	No
6	BRAIDWOOD 1 COMMONWEALTH EDISON CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	BRAIDWOOD 2 COMMONWEALTH EDISON CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	BROWNS FERRY 1 TENNESSEE VALLEY AUTHORITY	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
9	BROWNS FERRY 2 TENNESSEE VALLEY AUTHORITY	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
10	BROWNS FERRY 3 TENNESSEE VALLEY AUTHORITY	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
11	BRUNSWICK 1 CAROLINA POWER & LIGHT CO.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
12	BRUNSWICK 2 CAROLINA POWER & LIGHT CO.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
13	BYRON 1 COMMONWEALTH EDISON CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	BYRON 2 COMMONWEALTH EDISON CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	CALLAWAY 1 UNION ELECTRIC CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	CALVERT CLIFFS 1 BALTIMORE GAS AND ELECTRIC CO.	No	No	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes

APPENDIX 3 (Continued)
Assessed Facility Cask Handling Capabilities

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Capability With Current Cask Handling Capability				Cask Handling Capability With Revised License or Oper. Instr.				Facility Modification			
		LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton
17	CALVERT CLIFFS 2 BALTIMORE GAS AND ELECTRIC CO.	No	No	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes
18	CATAWBA UNIT 1 DUKE POWER CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	CATAWBA UNIT 2 DUKE POWER CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	CLINTON 1 ILLINOIS POWER CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	COMANCHE PEAK 1 TU ELECTRIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	COMANCHE PEAK 2 TU ELECTRIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	COOPER NUCLEAR STATION NEBRASKA PUBLIC POWER DISTRICT	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
24	CRYSTAL RIVER 3 FLORIDA POWER CORPORATION	No	No	No	No	No	No	No	No	Yes	Yes	No	No
25	DAVIS-BESSE NUCLEAR POWER STATION TOLEDO EDISON CO	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	DC COOK 1 INDIANA MICHIGAN POWER CO.	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	DC COOK 2 INDIANA MICHIGAN POWER CO.	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	DIABLO CANYON 1 PACIFIC GAS AND ELECTRIC CO.	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	DIABLO CANYON 2 PACIFIC GAS AND ELECTRIC CO.	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	DRESDEN 1 COMMONWEALTH EDISON CO.	No	No	No	No	No	No	No	No	Yes	Yes	No	No
31	DRESDEN 2 COMMONWEALTH EDISON CO.	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
32	DRESDEN 3 COMMONWEALTH EDISON CO.	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes

APPENDIX 3 (Continued)
Assessed Facility Cask Handling Capabilities

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Capability With Current Cask Handling Capability				Cask Handling Capability With Revised License or Oper. Instr.				Facility Modification			
		LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton
33	DUANE ARNOLD ENERGY CENTER IOWA ELECTRIC LIGHT & POWER CO.	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
34	FARLEY 1 ALABAMA POWER CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	FARLEY 2 ALABAMA POWER CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	FERMI 2 DETROIT EDISON CO.	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
37	FORT CALHOUN 1 OMAHA PUBLIC POWER DISTRICT	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
38	FORT SAINT VRAIN PUBLIC SERVICE CO. OF COLORADO	No	No	No	No	No	No	No	No	Yes	Yes	No	No
39	GRAND GULF 1 ENTERGY OPERATIONS, INC.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	HADDAM NECK CONNECTICUT YANKEE ATOMIC POWER CO.	No	No	No	No	Yes	Yes	No	No	Yes	Yes	No	No
41	HARRIS 1 CAROLINA POWER & LIGHT CO.	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
42	HATCH 1 GEORGIA POWER CO.	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	HATCH 2 GEORGIA POWER CO.	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	HOPE CREEK 1 PUBLIC SERVICE ELECTRIC AND GAS CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	HUMBOLDT BAY POWER PLANT UNIT 3 PACIFIC GAS AND ELECTRIC CO.	No	No	No	No	Yes	Yes	No	No	Yes	Yes	No	No
46	INDIAN POINT 1 CONSOLIDATED EDISON CO.	No	No	No	No	No	No	No	No	Yes	Yes	No	No
47	INDIAN POINT 2 CONSOLIDATED EDISON CO.	No	No	No	No	No	No	No	No	Yes	Yes	No	No
48	INDIAN POINT 3 NEW YORK POWER AUTHORITY	No	No	No	No	Yes	Yes	No	No	Yes	Yes	No	No

APPENDIX 3 (Continued)
Assessed Facility Cask Handling Capabilities

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Capability With Current Cask Handling Capability				Cask Handling Capability With Revised License or Oper. Instr.				Facility Modification			
		LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton
49	J.A. FITZPATRICK NEW YORK POWER AUTHORITY	Yes	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
50	KEWAUNEE 1 WISCONSIN PUBLIC SERVICE CORPORATION	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
51	LA CROSSE DAIRYLAND POWER COOPERATIVE	No	No	No	No	No	No	No	No	No	No	No	No
52	LASALLE 1 COMMONWEALTH EDISON CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	LASALLE 2 COMMONWEALTH EDISON CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	LIMERICK 1 GENERATING STATION PHILADELPHIA ELECTRIC CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
55	LIMERICK 2 GENERATING STATION PHILADELPHIA ELECTRIC CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
56	MAINE YANKEE MAINE YANKEE ATOMIC POWER CO.	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	MCGUIRE UNIT 1 DUKE POWER CO.	Yes	No	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes
58	MCGUIRE UNIT 2 DUKE POWER CO.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
59	HILLSTONE UNIT 1 NORTHEAST NUCLEAR ENERGY CO.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
60	HILLSTONE UNIT 2 NORTHEAST NUCLEAR ENERGY CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
61	HILLSTONE UNIT 3 NORTHEAST NUCLEAR ENERGY CO.	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
62	MONTICELLO NORTHERN STATES POWER CO.	No	No	No	No	Yes	Yes	No	No	Yes	Yes	No	No
63	MORRIS OPERATIONS MORRIS OPERATIONS	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	NINE MILE POINT 1 NIAGARA MOHAWK POWER CORPORATION	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No

APPENDIX 3 (Continued)
Assessed Facility Cask Handling Capabilities

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Capability With Current Cask Handling Capability				Cask Handling Capability With Revised License or Oper. Instr.				Facility Modification			
		LWT	OUT	100 Ton	125 Ton	LWT	OUT	100 Ton	125 Ton	LWT	OUT	100 Ton	125 Ton
65	NINE MILE POINT 2 NIAGARA MOHAWK POWER CORPORATION	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	NORTH ANNA 1 VIRGINIA POWER	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	NORTH ANNA 2 VIRGINIA POWER	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	OCONEE UNIT 1 DUKE POWER CO.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
69	OCONEE UNIT 2 DUKE POWER CO.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
70	OCONEE UNIT 3 DUKE POWER CO.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
71	OYSTER CREEK 1 JERSEY CENTRAL POWER AND LIGHT CO.	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
72	PALISADES NUCLEAR PLANT CONSUMERS POWER CO.	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No
73	PALO VERDE 1 ARIZONA PUBLIC SERVICE CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
74	PALO VERDE 2 ARIZONA PUBLIC SERVICE CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
75	PALO VERDE 3 ARIZONA PUBLIC SERVICE CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
76	PEACH BOTTOM UNIT 2 PHILADELPHIA ELECTRIC CO.	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
77	PEACH BOTTOM UNIT 3 PHILADELPHIA ELECTRIC CO.	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
78	PERRY 1 CLEVELAND ELECTRIC ILLUMINATING CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
79	PILGRIM 1 BOSTON EDISON CO	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No
80	POINT BEACH 1 WISCONSIN ELECTRIC POWER CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Interface Capability Assessment (FICA) Project Report

APPENDIX 3 (Continued)
Assessed Facility Cask Handling Capabilities

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Capability With Current Cask Handling Capability				Cask Handling Capability With Revised License or Oper. Instr.				Facility Modification			
		LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton
81	POINT BEACH 2 WISCONSIN ELECTRIC POWER CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
82	PRAIRIE ISLAND PLANT 1 NORTHERN STATES POWER CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
83	PRAIRIE ISLAND PLANT 2 NORTHERN STATES POWER CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
84	QUAD CITIES 1 COMMONWEALTH EDISON CO.	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
85	QUAD CITIES 2 COMMONWEALTH EDISON CO.	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
86	R.E. GINNA ROCHESTER GAS AND ELECTRIC CORPORATION	No	No	No	No	Yes	No	No	No	Yes	No	No	No
87	RANCHO SECO 1 SACRAMENTO MUNICIPAL UTILITY DISTRICT	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
88	RIVER BEND 1 GULF STATES UTILITIES	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
89	ROBINSON 2 CAROLINA POWER & LIGHT CO.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
90	SALEM 1 PUBLIC SERVICE ELECTRIC AND GAS CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
91	SALEM 2 PUBLIC SERVICE ELECTRIC AND GAS CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
92	SAN ONOFRE 1 SOUTHERN CALIFORNIA EDISON CO.	No	No	No	No	Yes	Yes	No	No	Yes	Yes	No	No
93	SAN ONOFRE 2 SOUTHERN CALIFORNIA EDISON CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
94	SAN ONOFRE 3 SOUTHERN CALIFORNIA EDISON CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
95	SEABROOK NEW HAMPSHIRE YANKEE DIVISION OF PSNH	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
96	SEQUOYAH 1 TENNESSEE VALLEY AUTHORITY	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No

APPENDIX 3 (Continued)
Assessed Facility Cask Handling Capabilities

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Capability With Current Cask Handling Capability				Cask Handling Capability With Revised License or Oper. Instr.				Facility Modification			
		LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton
97	SEQUOYAH 2 TENNESSEE VALLEY AUTHORITY	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
98	SHOREHAM LONG ISLAND LIGHTING CO.	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
99	SOUTH TEXAS 1 HOUSTON LIGHTING AND POWER CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
100	SOUTH TEXAS 2 HOUSTON LIGHTING AND POWER CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
101	ST. LUCIE 1 FLORIDA POWER & LIGHT CO.	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	No
102	ST. LUCIE 2 FLORIDA POWER & LIGHT CO.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
103	SURRY UNIT 1 VIRGINIA POWER	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
104	SURRY UNIT 2 VIRGINIA POWER	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
105	SUSQUEHANNA 1 PENNSYLVANIA POWER AND LIGHT CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
106	SUSQUEHANNA 2 PENNSYLVANIA POWER AND LIGHT CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
107	THREE MILE ISLAND 1 GPU NUCLEAR CORPORATION	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
108	TROJAN PORTLAND GENERAL ELECTRIC CO.	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
109	TURKEY POINT 3 FLORIDA POWER & LIGHT CO.	No	No	No	No	Yes	No	No	No	Yes	Yes	Yes	No
110	TURKEY POINT 4 FLORIDA POWER & LIGHT CO.	No	No	No	No	Yes	No	No	No	Yes	Yes	Yes	No
111	V.C. SUMMER 1 SOUTH CAROLINA ELECTRIC AND GAS CO.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
112	VERMONT YANKEE VERMONT YANKEE NUCLEAR POWER CORPORATION	No	No	No	No	No	No	No	No	Yes	Yes	No	No

APPENDIX 3 (Continued)
Assessed Facility Cask Handling Capabilities

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Capability With Current Cask Handling Capability				Cask Handling Capability With Revised License or Oper. Instr.				Facility Modification			
		LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton	LWT	OWT	100 Ton	125 Ton
113	VOGTLE 1 GEORGIA POWER CO.	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
114	VOGTLE 2 GEORGIA POWER CO.	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
115	WASHINGTON NUCLEAR PLANT 2 WASHINGTON PUBLIC POWER SUPPLY SYSTEM	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
116	WATERFORD 3 LOUISIANA POWER AND LIGHT CO.	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
117	WATTS BAR 1 TENNESSEE VALLEY AUTHORITY	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
118	WATTS BAR 2 TENNESSEE VALLEY AUTHORITY	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
119	WOLF CREEK WOLF CREEK NUCLEAR OPERATING CORPORATION	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
120	YANKEE NUCLEAR POWER STATION YANKEE ATOMIC ELECTRIC CO.	Yes	No	No	No	Yes	No	No	No	Yes	No	No	No
121	ZION 1 COMMONWEALTH EDISON CO.	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
122	ZION 2 COMMONWEALTH EDISON CO.	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes

Appendix 4.

FACILITY DATA – CRANE PARAMETERS

APPENDIX 4
Facility Data - Crane Parameters

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Crane Capacities (Tons) Design / Operating	Aux. Crane Capacity (Tons)	Crane Hook Type	Date of Most- Recent Cask Drop Analysis	Single-Failure Proof, per NUREG-0612?	Redundant Status
1	ARKANSAS NUCLEAR ONE UNIT 1 ARKANSAS POWER AND LIGHT COMPANY	100 100	10	J	10/15/78	No	NON-REDUNDANT
2	ARKANSAS NUCLEAR ONE UNIT 2 ARKANSAS POWER AND LIGHT COMPANY	100 100	10	J	04/23/76	No	NON-REDUNDANT
3	BEAVER VALLEY 1 DUQUESNE LIGHT COMPANY	125 60	0	SISTER	None to date	No	NON-REDUNDANT
4	BEAVER VALLEY 2 DUQUESNE LIGHT COMPANY	125 100	30	SISTER	None to date	No	NON-REDUNDANT
5	BIG ROCK POINT 1 CONSUMERS POWER COMPANY	75 24	5	J	01/01/74	No	NON-REDUNDANT
6	BRAIDWOOD 1 COMMONWEALTH EDISON COMPANY	125 110	15	SISTER	01/01/76	No	NON-REDUNDANT
7	BRAIDWOOD 2 COMMONWEALTH EDISON COMPANY	125 110	15	SISTER	01/01/76	No	NON-REDUNDANT
8	BROWNS FERRY 1 TENNESSEE VALLEY AUTHORITY	125 106	5	SISTER	None to date	Yes	REDUNDANT
9	BROWNS FERRY 2 TENNESSEE VALLEY AUTHORITY	125 106	5	SISTER	None to date	Yes	REDUNDANT
10	BROWNS FERRY 3 TENNESSEE VALLEY AUTHORITY	125 106	5	SISTER	None to date	Yes	REDUNDANT
11	BRUNSWICK 1 CAROLINA POWER & LIGHT COMPANY	125 125	5	SISTER	None to date	Yes	REDUNDANT
12	BRUNSWICK 2 CAROLINA POWER & LIGHT COMPANY	125 125	5	SISTER	None to date	Yes	REDUNDANT
13	BYRON 1 COMMONWEALTH EDISON COMPANY	125 110	15	SISTER	01/01/76	No	NON-REDUNDANT
14	BYRON 2 COMMONWEALTH EDISON COMPANY	125 110	15	SISTER	01/01/76	No	NON-REDUNDANT
15	CALLAWAY 1 UNION ELECTRIC COMPANY	150 125	5	SISTER	05/21/81	No	NON-REDUNDANT
16	CALVERT CLIFFS 1 BALTIMORE GAS AND ELECTRIC COMPANY	150 150	15	SISTER	None to date	No	NON-REDUNDANT

APPENDIX 4 (Continued)
Facility Data - Crane Parameters

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Crane Capacities (Tons) Design / Operating		Aux. Crane Capacity (Tons)	Crane Hook Type	Date of Most-Recent Cask Drop Analysis	Single-Failure Proof, per NUREG-06127	Redundant Status
17	CALVERT CLIFFS 2 BALTIMORE GAS AND ELECTRIC COMPANY	150	150	15	SISTER	None to date	No	NON-REDUNDANT
18	CATAWBA UNIT 1 DUKE POWER COMPANY	125	125	10	SISTER	09/15/76	Yes	NON-REDUNDANT
19	CATAWBA UNIT 2 DUKE POWER COMPANY	125	125	10	SISTER	09/15/76	Yes	NON-REDUNDANT
20	CLINTON 1 ILLINOIS POWER COMPANY	125	125	10	SISTER	None to date	No	NON-REDUNDANT
21	COMANCHE PEAK 1 TU ELECTRIC	130	130	17	SISTER	07/01/88	Yes	NON-REDUNDANT
22	COMANCHE PEAK 2 TU ELECTRIC	130	130	17	SISTER	01/07/88	Yes	NON-REDUNDANT
23	COOPER NUCLEAR STATION NEBRASKA PUBLIC POWER DISTRICT	100	100	5	SISTER	None to date	Yes	REDUNDANT
24	CRYSTAL RIVER 3 FLORIDA POWER CORPORATION	120	72	9	SISTER	09/01/82	No	NON-REDUNDANT
25	DAVIS-BESSE NUCLEAR POWER STATION TOLEDO EDISON CO	140	140	20	SISTER	06/15/83	Yes	NON-REDUNDANT
26	DC COOK 1 INDIANA MICHIGAN POWER COMPANY	150	60	20	SISTER	01/01/75	Yes	REDUNDANT
27	DC COOK 2 INDIANA MICHIGAN POWER COMPANY	150	60	20	SISTER	01/01/75	Yes	REDUNDANT
28	DIABLO CANYON 1 PACIFIC GAS AND ELECTRIC COMPANY	125	125	15	SISTER	None to date	No	NON-REDUNDANT
29	DIABLO CANYON 2 PACIFIC GAS AND ELECTRIC COMPANY	125	125	15	SISTER	None to date	No	NON-REDUNDANT
30	DRESDEN 1 COMMONWEALTH EDISON COMPANY	75	24	10	SISTER	04/15/74	No	NON-REDUNDANT
31	DRESDEN 2 COMMONWEALTH EDISON COMPANY	125	75	5	SISTER	05/21/73	Yes	REDUNDANT
32	DRESDEN 3 COMMONWEALTH EDISON COMPANY	125	75	5	SISTER	05/21/73	Yes	REDUNDANT

APPENDIX 4 (Continued)
Facility Data - Crane Parameters

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Crane Capacities (Tons) Design / Operating		Aux. Crane Capacity (Tons)	Crane Hook Type	Date of Most- Recent Cask Drop Analysis	Single-Failure Proof, per NUREG-06127	Redundant Status
33	DUANE ARNOLD ENERGY CENTER IOWA ELECTRIC LIGHT & POWER COMPANY	100	100	5	SISTER	02/22/74	Yes	NON-REDUNDANT
34	FARLEY 1 ALABAMA POWER COMPANY	125	125	15	SISTER	None to date	Yes	REDUNDANT
35	FARLEY 2 ALABAMA POWER COMPANY	125	125	15	SISTER	None to date	Yes	REDUNDANT
36	FERMI 2 DETROIT EDISON COMPANY	125	117	5	SISTER	None to date	Yes	REDUNDANT
37	FORT CALHOUN 1 OMAHA PUBLIC POWER DISTRICT	75	75	10	SISTER	07/01/83	Yes	REDUNDANT
38	FORT SAINT VRAIN PUBLIC SERVICE COMPANY OF COLORADO	50	50	17	SISTER	10/15/85	No	NON-REDUNDANT
39	GRAND GULF 1 ENTERGY OPERATIONS, INC.	150	150	5	SISTER	None to date	Yes	REDUNDANT
40	HADDAM NECK CONNECTICUT YANKEE ATOMIC POWER COMPANY	100	100	10	SISTER	03/21/78	No	NON-REDUNDANT
41	HARRIS 1 CAROLINA POWER & LIGHT COMPANY	150	150	10	SISTER	04/01/81	No	NON-REDUNDANT
42	HATCH 1 GEORGIA POWER COMPANY	125	125	8	SISTER	None to date	Yes	REDUNDANT
43	HATCH 2 GEORGIA POWER COMPANY	125	125	8	SISTER	None to date	No	NON-REDUNDANT
44	HOPE CREEK 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	150	130	8	SISTER	None to date	Yes	REDUNDANT
45	HUMBOLDT BAY POWER PLANT UNIT 3 PACIFIC GAS AND ELECTRIC COMPANY	75	0	10	SISTER	None to date	No	NON-REDUNDANT
46	INDIAN POINT 1 CONSOLIDATED EDISON COMPANY	75	0	15	SISTER	None to date	N/A	NON-REDUNDANT
47	INDIAN POINT 2 CONSOLIDATED EDISON COMPANY	40	0	5	J	None to date	No	NON-REDUNDANT
48	INDIAN POINT 3 NEW YORK POWER AUTHORITY	40	40	25	J	06/15/74	No	NON-REDUNDANT

APPENDIX 4 (Continued)
Facility Data - Crane Parameters

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Cask Handling Crane Capacities (Tons) Design / Operating</u>	<u>Aux. Crane Capacity (Tons)</u>	<u>Crane Hook Type</u>	<u>Date of Most- Recent Cask Drop Analysis</u>	<u>Single-Failure Proof, per NUREG-06127</u>	<u>Redundant Status</u>
49	J.A. FITZPATRICK NEW YORK POWER AUTHORITY	125 62	20	SISTER	06/15/91	No	NON-REDUNDANT
50	KEWAUNEE 1 WISCONSIN PUBLIC SERVICE CORPORATION	125 125	10	SISTER	None to date	No	NON-REDUNDANT
51	LA CROSSE DAIRYLAND POWER COOPERATIVE	50 50	5	SISTER	06/15/79	No	NON-REDUNDANT
52	LASALLE 1 COMMONWEALTH EDISON COMPANY	125 100	10	SISTER	12/19/74	Yes	
53	LASALLE 2 COMMONWEALTH EDISON COMPANY	125 100	10	SISTER	12/19/74	Yes	
54	LIMERICK 1 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	125 110	7	SISTER	None to date	Yes	REDUNDANT
55	LIMERICK 2 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	125 110	7	SISTER	None to date	Yes	REDUNDANT
56	MAINE YANKEE MAINE YANKEE ATOMIC POWER COMPANY	125 125	20	SISTER	06/15/88	No	NON-REDUNDANT
57	MCGUIRE UNIT 1 DUKE POWER COMPANY	125 100	4	SISTER	06/01/86	Yes	NON-REDUNDANT
58	MCGUIRE UNIT 2 DUKE POWER COMPANY	125 100	4	SISTER	06/01/86	Yes	NON-REDUNDANT
59	MILLSTONE UNIT 1 NORTHEAST NUCLEAR ENERGY COMPANY	110 110	7	SISTER	None to date	Yes	REDUNDANT
60	MILLSTONE UNIT 2 NORTHEAST NUCLEAR ENERGY COMPANY	100 100	15	SISTER	05/15/83	No	NON-REDUNDANT
61	MILLSTONE UNIT 3 NORTHEAST NUCLEAR ENERGY COMPANY	125 125	5	SISTER	10/08/85	No	NON-REDUNDANT
62	MONTICELLO NORTHERN STATES POWER COMPANY	85 85	5	SISTER	06/15/75	Yes	REDUNDANT
63	MORRIS OPERATIONS MORRIS OPERATIONS	125 125	5	J	06/01/84	No	NON-REDUNDANT
64	NINE MILE POINT 1 NIAGARA MOHAWK POWER CORPORATION	125 100	25	SISTER	None to date	Yes	REDUNDANT

**APPENDIX 4 (Continued)
Facility Data - Crane Parameters**

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Crane Capacities (Tons) Design / Operating		Aux. Crane Capacity (Tons)	Crane Hook Type	Date of Most- Recent Cask Drop Analysis	Single-Failure Proof, per NUREG-0612?	Redundant Status
65	NINE MILE POINT 2 NIAGARA MOHAWK POWER CORPORATION	125	120	25	SISTER	None to date	Yes	REDUNDANT
66	NORTH ANNA 1 VIRGINIA POWER	125	125	10	SISTER	08/23/76	Yes	NON-REDUNDANT
67	NORTH ANNA 2 VIRGINIA POWER	125	125	10	SISTER	08/23/76	Yes	NON-REDUNDANT
68	OCONEE UNIT 1 DUKE POWER COMPANY	100	100	2	SISTER	11/16/89	Yes	NON-REDUNDANT
69	OCONEE UNIT 2 DUKE POWER COMPANY	100	100	2	SISTER	11/16/89	Yes	NON-REDUNDANT
70	OCONEE UNIT 3 DUKE POWER COMPANY	100	100	2	SISTER	11/16/89	Yes	NON-REDUNDANT
71	OYSTER CREEK 1 JERSEY CENTRAL POWER AND LIGHT COMPANY	100	100	5	SISTER	02/15/84	No	NON-REDUNDANT
72	PALISADES NUCLEAR PLANT CONSUMERS POWER COMPANY	100	100	15	J	08/01/74	No	NON-REDUNDANT
73	PALO VERDE 1 ARIZONA PUBLIC SERVICE COMPANY	150	150	15	SISTER	None to date	No	NON-REDUNDANT
74	PALO VERDE 2 ARIZONA PUBLIC SERVICE COMPANY	150	150	15	SISTER	None to date	No	NON-REDUNDANT
75	PALO VERDE 3 ARIZONA PUBLIC SERVICE COMPANY	150	150	15	SISTER	None to date	No	NON-REDUNDANT
76	PEACH BOTTOM UNIT 2 PHILADELPHIA ELECTRIC COMPANY	125	110	2	SISTER	09/01/84	Yes	REDUNDANT
77	PEACH BOTTOM UNIT 3 PHILADELPHIA ELECTRIC COMPANY	125	110	2	SISTER	09/01/84	Yes	REDUNDANT
78	PERRY 1 CLEVELAND ELECTRIC ILLUMINATING COMPANY	125	125	20	SISTER	None to date	Yes	REDUNDANT
79	PILGRIM 1 BOSTON EDISON CO	100	26	5	SISTER	06/15/85	No	NON-REDUNDANT
80	POINT BEACH 1 WISCONSIN ELECTRIC POWER COMPANY	125	125	20	SISTER	11/29/88	Yes	NON-REDUNDANT

APPENDIX 4 (Continued)
Facility Data - Crane Parameters

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Cask Handling Crane Capacities (Tons) Design / Operating</u>		<u>Aux. Crane Capacity (Tons)</u>	<u>Crane Hook Type</u>	<u>Date of Most- Recent Cask Drop Analysis</u>	<u>Single-Failure Proof, per NUREG-0612?</u>	<u>Redundant Status</u>
81	POINT BEACH 2 WISCONSIN ELECTRIC POWER COMPANY	125	125	20	SISTER	11/29/88	Yes	NON-REDUNDANT
82	PRAIRIE ISLAND NUCLEAR GENERATING P NORTHERN STATES POWER COMPANY	125	125	25	SISTER	12/15/84	Yes	NON-REDUNDANT
83	PRAIRIE ISLAND NUCLEAR GENERATING P NORTHERN STATES POWER COMPANY	125	125	25	SISTER	12/15/84	Yes	NON-REDUNDANT
84	QUAD CITIES 1 COMMONWEALTH EDISON COMPANY	125	75	9	SISTER	11/15/74	Yes	REDUNDANT
85	QUAD CITIES 2 COMMONWEALTH EDISON COMPANY	125	75	9	SISTER	06/15/74	Yes	REDUNDANT
86	R.E. GINHA ROCHESTER GAS AND ELECTRIC CORPORATION	40	30	0	SISTER	None to date	Yes	REDUNDANT
87	RANCHO SECO 1 SACRAMENTO MUNICIPAL UTILITY DISTRICT	100	100	35	SISTER	None to date	No	NON-REDUNDANT
88	RIVER BEND 1 GULF STATES UTILITIES	125	125	15	SISTER	04/08/85	No	NON-REDUNDANT
89	ROBINSON 2 CAROLINA POWER & LIGHT COMPANY	125	125	5	SISTER	None to date	Yes	REDUNDANT
90	SALEM 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	110	110	3	SISTER	None to date	Yes	REDUNDANT
91	SALEM 2 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	110	110	3	SISTER	None to date	Yes	REDUNDANT
92	SAN ONOFRE 1 SOUTHERN CALIFORNIA EDISON COMPANY	105	105	25	SISTER	04/25/88	No	NON-REDUNDANT
93	SAN ONOFRE 2 SOUTHERN CALIFORNIA EDISON COMPANY	125	125	25	J-HOOK	12/31/81	No	NON-REDUNDANT
94	SAN ONOFRE 3 SOUTHERN CALIFORNIA EDISON COMPANY	125	125	25	J-HOOK	12/31/81	No	NON-REDUNDANT
95	SEABROOK NEW HAMPSHIRE YANKEE DIVISION OF PSNH	125	125	5	SISTER	None to date	No	NON-REDUNDANT
96	SEQUOYAH 1 TENNESSEE VALLEY AUTHORITY	125	80	10	SISTER	None to date	Yes	REDUNDANT

APPENDIX 4 (Continued)
Facility Data - Crane Parameters

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Cask Handling Crane Capacities (Tons) Design / Operating</u>		<u>Aux. Crane Capacity (Tons)</u>	<u>Crane Hook Type</u>	<u>Date of Most- Recent Cask Drop Analysis</u>	<u>Single-Failure Proof, per NUREG-0612?</u>	<u>Redundant Status</u>
97	SEQUOYAH 2 TENNESSEE VALLEY AUTHORITY	125	80	10	SISTER	None to date	Yes	REDUNDANT
98	SHOREHAM LONG ISLAND LIGHTING COMPANY	125	123	15	SISTER	None to date	Yes	REDUNDANT
99	SOUTH TEXAS 1 HOUSTON LIGHTING AND POWER COMPANY	150	150	15	SISTER	10/15/84	No	NON-REDUNDANT
100	SOUTH TEXAS 2 HOUSTON LIGHTING AND POWER COMPANY	150	150	15	SISTER	10/15/84	No	NON-REDUNDANT
101	ST. LUCIE 1 FLORIDA POWER & LIGHT CO.	105	25	15	J	01/01/75	No	NON-REDUNDANT
102	ST. LUCIE 2 FLORIDA POWER & LIGHT CO.	150	100	15	SISTER	10/01/78	No	NON-REDUNDANT
103	SURRY UNIT 1 VIRGINIA POWER	125	125	10	SISTER	01/17/83	Yes	NON-REDUNDANT
104	SURRY UNIT 2 VIRGINIA POWER	125	125	10	SISTER	01/17/83	Yes	NON-REDUNDANT
105	SUSQUEHANNA 1 PENNSYLVANIA POWER AND LIGHT COMPANY	125	125	5	SISTER	None to date	Yes	REDUNDANT
106	SUSQUEHANNA 2 PENNSYLVANIA POWER AND LIGHT COMPANY	125	125	5	SISTER	None to date	Yes	REDUNDANT
107	THREE MILE ISLAND 1 GPU NUCLEAR CORPORATION	110	110	15	SISTER	06/15/78	No	NON-REDUNDANT
108	TROJAN PORTLAND GENERAL ELECTRIC COMPANY	125	0	25	SISTER	None to date	No	REDUNDANT
109	TURKEY POINT 3 FLORIDA POWER & LIGHT COMPANY	105	25	15	SISTER	06/01/76	Yes	NON-REDUNDANT
110	TURKEY POINT 4 FLORIDA POWER & LIGHT COMPANY	105	25	15	SISTER	06/01/76	Yes	NON-REDUNDANT
111	V.C. SUMMER 1 SOUTH CAROLINA ELECTRIC AND GAS COMPANY	125	125	25	SISTER	None to date	N/A	NON-REDUNDANT
112	VERMONT YANKEE VERMONT YANKEE NUCLEAR POWER CORPORATION	110	110	5	SISTER	None to date	Yes	REDUNDANT

APPENDIX 4 (Continued)
Facility Data - Crane Parameters

Facility Number	Name of Reactor / Name of Utility or Operator	Cask Handling Crane Capacities (Tons) Design / Operating		Aux. Crane Capacity (Tons)	Crane Hook Type	Date of Most- Recent Cask Drop Analysis	Single-Failure Proof, per NUREG-0612?	Redundant Status
113	VOGTLE 1 GEORGIA POWER COMPANY	125	109	15	SISTER	None to date	Yes	NON-REDUNDANT
114	VOGTLE 2 GEORGIA POWER COMPANY	125	109	15	SISTER	None to date	Yes	NON-REDUNDANT
115	WASHINGTON NUCLEAR PLANT 2 WASHINGTON PUBLIC POWER SUPPLY SYSTEM	125	125	15	SISTER	None to date	N/A	REDUNDANT
116	WATERFORD 3 LOUISIANA POWER AND LIGHT COMPANY	125	125	15	SISTER	None to date	No	NON-REDUNDANT
117	WATTS BAR 1 TENNESSEE VALLEY AUTHORITY	125	125	10	SISTER	None to date	Yes	REDUNDANT
118	WATTS BAR 2 TENNESSEE VALLEY AUTHORITY	125	125	10	SISTER	None to date	Yes	REDUNDANT
119	WOLF CREEK WOLF CREEK NUCLEAR OPERATING CORPORATION	150	150	5	SISTER	None to date	N/A	NON-REDUNDANT
120	YANKEE NUCLEAR POWER STATION YANKEE ATOMIC ELECTRIC COMPANY	75	37	15	SISTER	05/01/88	Yes	NON-REDUNDANT
121	ZION 1 COMMONWEALTH EDISON COMPANY	125	110	15	SISTER	06/15/83	Yes	NON-REDUNDANT
122	ZION 2 COMMONWEALTH EDISON COMPANY	125	110	15	SISTER	06/15/83	Yes	NON-REDUNDANT

Appendix 5.

FACILITY DATA – ON-SITE TRANSPORTATION CAPABILITIES

APPENDIX 5
Facility Data - Onsite Transportation Capabilities

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Distance to Interstate Hwy. Miles / (Name)</u>	<u>On-Site Rail Facility?</u>	<u>Extends Into Receiving Area?</u>	<u>Status</u>	<u>On-Site Barge Facility?</u>	<u>Status</u>
1	ARKANSAS NUCLEAR ONE UNIT 1 ARKANSAS POWER AND LIGHT COMPANY	6.50 (I-40)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
2	ARKANSAS NUCLEAR ONE UNIT 2 ARKANSAS POWER AND LIGHT COMPANY	6.50 (I-40)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
3	BEAVER VALLEY 1 DUQUESNE LIGHT COMPANY	30.00 (I-79)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
4	BEAVER VALLEY 2 DUQUESNE LIGHT COMPANY	30.00 (I-79)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
5	BIG ROCK POINT 1 CONSUMERS POWER COMPANY	34.00 (I-75)	No	N/A		No	
6	BRAIDWOOD 1 COMMONWEALTH EDISON COMPANY	6.00 (I-55)	Yes	Yes	OPERATIONAL	No	
7	BRAIDWOOD 2 COMMONWEALTH EDISON COMPANY	6.00 (I-55)	Yes	Yes	OPERATIONAL	No	
8	BROWNS FERRY 1 TENNESSEE VALLEY AUTHORITY	12.00 (I-65)	No	N/A		Yes	OPERATIONAL
9	BROWNS FERRY 2 TENNESSEE VALLEY AUTHORITY	12.00 (I-65)	No	N/A		Yes	OPERATIONAL
10	BROWNS FERRY 3 TENNESSEE VALLEY AUTHORITY	12.00 (I-65)	No	N/A		Yes	OPERATIONAL
11	BRUNSWICK 1 CAROLINA POWER & LIGHT COMPANY	98.00 (I-95)	Yes	Yes	OPERATIONAL	No	
12	BRUNSWICK 2 CAROLINA POWER & LIGHT COMPANY	98.00 (I-95)	Yes	Yes	OPERATIONAL	No	
13	BYRON 1 COMMONWEALTH EDISON COMPANY	15.60 (I-39)	Yes	Yes	OPERATIONAL	No	
14	BYRON 2 COMMONWEALTH EDISON COMPANY	15.60 (I-39)	Yes	Yes	OPERATIONAL	No	
15	CALLAWAY 1 UNION ELECTRIC COMPANY	20.55 (I-70)	No	N/A		No	
16	CALVERT CLIFFS 1 BALTIMORE GAS AND ELECTRIC COMPANY	60.00 (I-95)	No	N/A		Yes	INACTIVE

APPENDIX 5 (Continued)
Facility Data - Onsite Transportation Capabilities

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Distance to Interstate Hwy. Miles / (Name)</u>	<u>On-Site Rail Facility?</u>	<u>Extends Into Receiving Area?</u>	<u>Status</u>	<u>On-Site Barge Facility?</u>	<u>Status</u>
17	CALVERT CLIFFS 2 BALTIMORE GAS AND ELECTRIC COMPANY	60.00 (I-95)	No	N/A		Yes	INACTIVE
18	CATAWBA UNIT 1 DUKE POWER COMPANY	16.70 (I-77)	Yes	Yes	INACTIVE	No	
19	CATAWBA UNIT 2 DUKE POWER COMPANY	16.70 (I-77)	Yes	Yes	INACTIVE	No	
20	CLINTON 1 ILLINOIS POWER COMPANY	13.40 (I-74)	Yes	No	OPERATIONAL	No	
21	COMANCHE PEAK 1 TU ELECTRIC	45.90 (I-20)	Yes	No	INACTIVE	No	
22	COMANCHE PEAK 2 TU ELECTRIC	45.90 (I-20)	Yes	No	INACTIVE	No	
23	COOPER NUCLEAR STATION NEBRASKA PUBLIC POWER DISTRICT	8.70 (I-29)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
24	CRYSTAL RIVER 3 FLORIDA POWER CORPORATION	45.00 (I-75)	Yes	No	OPERATIONAL	Yes	OPERATIONAL
25	DAVIS-BESSE NUCLEAR POWER STATION TOLEDO EDISON CO	20.00 (I-80/90)	Yes	Yes	OPERATIONAL	No	
26	DC COOK 1 INDIANA MICHIGAN POWER COMPANY	4.25 (I-94)	Yes	Yes	INACTIVE	No	
27	DC COOK 2 INDIANA MICHIGAN POWER COMPANY	4.25 (I-94)	Yes	Yes	INACTIVE	No	
28	DIABLO CANYON 1 PACIFIC GAS AND ELECTRIC COMPANY	100.00 (I-5)	No	N/A		No	
29	DIABLO CANYON 2 PACIFIC GAS AND ELECTRIC COMPANY	100.00 (I-5)	No	N/A		No	
30	DRESDEN 1 COMMONWEALTH EDISON COMPANY	6.70 (I-55)	Yes	No	OPERATIONAL	Yes	INACTIVE
31	DRESDEN 2 COMMONWEALTH EDISON COMPANY	6.70 (I-55)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
32	DRESDEN 3 COMMONWEALTH EDISON COMPANY	6.70 (I-55)	Yes	Yes	OPERATIONAL	Yes	INACTIVE

APPENDIX 5 (Continued)
Facility Data - Onsite Transportation Capabilities

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Distance to Interstate Hwy. Miles / (Name)</u>	<u>On-Site Rail Facility?</u>	<u>Extends Into Receiving Area?</u>	<u>Status</u>	<u>On-Site Barge Facility?</u>	<u>Status</u>
33	DUANE ARNOLD ENERGY CENTER IOWA ELECTRIC LIGHT & POWER COMPANY	11.20 (I-380)	Yes	Yes	OPERATIONAL	No	
34	FARLEY 1 ALABAMA POWER COMPANY	45.00 (I-10)	Yes	No	OPERATIONAL	Yes	INACTIVE
35	FARLEY 2 ALABAMA POWER COMPANY	45.00 (I-10)	Yes	No	OPERATIONAL	Yes	INACTIVE
36	FERNI 2 DETROIT EDISON COMPANY	7.00 (I-75)	Yes	No	INACTIVE	Yes	INACTIVE
37	FORT CALHOUN 1 OMAHA PUBLIC POWER DISTRICT	14.50 (I-680)	No	N/A		Yes	INACTIVE
38	FORT SAINT VRAIN PUBLIC SERVICE COMPANY OF COLORADO	7.00 (I-25)	Yes	No	INACTIVE	No	
39	GRAND GULF 1 ENTERGY OPERATIONS, INC.	33.00 (I-20)	No	N/A		Yes	INACTIVE
40	HADDAM NECK CONNECTICUT YANKEE ATOMIC POWER COMPANY	19.00 (I-91)	No	N/A		Yes	INACTIVE
41	HARRIS 1 CAROLINA POWER & LIGHT COMPANY	16.00 (I-40)	Yes	Yes	OPERATIONAL	No	
42	HATCH 1 GEORGIA POWER COMPANY	35.00 (I-16)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
43	HATCH 2 GEORGIA POWER COMPANY	35.00 (I-16)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
44	HOPE CREEK 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	21.00 (I-295)	No	N/A		Yes	OPERATIONAL
45	HUMBOLDT BAY POWER PLANT UNIT 3 PACIFIC GAS AND ELECTRIC COMPANY	160.00 (I-5)	Yes	No	OPERATIONAL	No	
46	INDIAN POINT 1 CONSOLIDATED EDISON COMPANY	16.00 (I-287)	No	N/A		Yes	OPERATIONAL
47	INDIAN POINT 2 CONSOLIDATED EDISON COMPANY	16.00 (I-287)	No	N/A		Yes	OPERATIONAL
48	INDIAN POINT 3 NEW YORK POWER AUTHORITY	16.00 (I-287)	No	N/A		Yes	OPERATIONAL

APPENDIX 5 (Continued)
Facility Data - Onsite Transportation Capabilities

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Distance to Interstate Hwy. Miles / (Name)</u>	<u>On-Site Rail Facility?</u>	<u>Extends Into Receiving Area?</u>	<u>Status</u>	<u>On-Site Barge Facility?</u>	<u>Status</u>
49	J.A. FITZPATRICK NEW YORK POWER AUTHORITY	17.10 (I-81)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
50	KEWAUNEE 1 WISCONSIN PUBLIC SERVICE CORPORATION	30.00 (I-43)	No	N/A		No	
51	LA CROSSE DAIRYLAND POWER COOPERATIVE	51.40 (I-90)	Yes	Yes	INACTIVE	Yes	OPERATIONAL
52	LASALLE 1 COMMONWEALTH EDISON COMPANY	13.60 (I-80)	Yes	Yes	OPERATIONAL	No	
53	LASALLE 2 COMMONWEALTH EDISON COMPANY	13.60 (I-80)	Yes	Yes	OPERATIONAL	No	
54	LIMERICK 1 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	15.00 (I-76)	Yes	No	INACTIVE	No	
55	LIMERICK 2 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	15.00 (I-76)	Yes	No	INACTIVE	No	
56	MAINE YANKEE MAINE YANKEE ATOMIC POWER COMPANY	20.00 (I-95)	Yes	Yes	OPERATIONAL	Yes	OPERATIONAL
57	MCGUIRE UNIT 1 DUKE POWER COMPANY	4.90 (I-77)	Yes	Yes	INACTIVE	No	
58	MCGUIRE UNIT 2 DUKE POWER COMPANY	4.90 (I-77)	Yes	Yes	INACTIVE	No	
59	HILLSTONE UNIT 1 NORTHEAST NUCLEAR ENERGY COMPANY	8.20 (I-95)	Yes	Yes	INACTIVE	Yes	INACTIVE
60	HILLSTONE UNIT 2 NORTHEAST NUCLEAR ENERGY COMPANY	8.20 (I-95)	Yes	Yes	INACTIVE	Yes	INACTIVE
61	HILLSTONE UNIT 3 NORTHEAST NUCLEAR ENERGY COMPANY	8.20 (I-95)	Yes	Yes	INACTIVE	Yes	INACTIVE
62	MONTICELLO NORTHERN STATES POWER COMPANY	4.20 (I-94)	Yes	Yes	OPERATIONAL	No	
63	MORRIS OPERATIONS MORRIS OPERATIONS	7.50 (I-55)	Yes	Yes	OPERATIONAL	No	
64	NINE MILE POINT 1 NIAGARA MOHAWK POWER CORPORATION	17.00 (I-81)	Yes	Yes	OPERATIONAL	No	

APPENDIX 5 (Continued)
Facility Data - Onsite Transportation Capabilities

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Distance to Interstate Hwy. Miles / (Name)</u>	<u>On-Site Rail Facility?</u>	<u>Extends Into Receiving Area?</u>	<u>Status</u>	<u>On-Site Barge Facility?</u>	<u>Status</u>
65	NINE MILE POINT 2 NIAGARA MOHAWK POWER CORPORATION	17.00 (I-81)	Yes	No	OPERATIONAL	No	
66	NORTH ANNA 1 VIRGINIA POWER	35.00 (I-64)	Yes	No	OPERATIONAL	No	
67	NORTH ANNA 2 VIRGINIA POWER	35.00 (I-64)	Yes	No	OPERATIONAL	No	
68	OCONEE UNIT 1 DUKE POWER COMPANY	27.00 (I-85)	No	N/A		No	
69	OCONEE UNIT 2 DUKE POWER COMPANY	27.00 (I-85)	No	N/A		No	
70	OCONEE UNIT 3 DUKE POWER COMPANY	27.00 (I-85)	No	N/A		No	
71	OYSTER CREEK 1 JERSEY CENTRAL POWER AND LIGHT COMPANY	25.00 (I-195)	No	N/A		Yes	OPERATIONAL
72	PALISADES NUCLEAR PLANT CONSUMERS POWER COMPANY	2.50 (I-196)	No	N/A		Yes	INACTIVE
73	PALO VERDE 1 ARIZONA PUBLIC SERVICE COMPANY	6.50 (I-10)	Yes	Yes	OPERATIONAL	No	
74	PALO VERDE 2 ARIZONA PUBLIC SERVICE COMPANY	6.50 (I-10)	Yes	Yes	OPERATIONAL	No	
75	PALO VERDE 3 ARIZONA PUBLIC SERVICE COMPANY	6.50 (I-10)	Yes	Yes	OPERATIONAL	No	
76	PEACH BOTTOM UNIT 2 PHILADELPHIA ELECTRIC COMPANY	21.70 (I-95)	No	N/A		No	
77	PEACH BOTTOM UNIT 3 PHILADELPHIA ELECTRIC COMPANY	21.70 (I-95)	No	N/A		No	
78	PERRY 1 CLEVELAND ELECTRIC ILLUMINATING COMPANY	13.50 (I-90)	Yes	No	OPERATIONAL	Yes	INACTIVE
79	PILGRIM 1 BOSTON EDISON CO	26.00 (I-495)	No	N/A		Yes	INACTIVE
80	POINT BEACH 1 WISCONSIN ELECTRIC POWER COMPANY	16.00 (I-43)	No	N/A		No	

APPENDIX 5 (Continued)
Facility Data - Onsite Transportation Capabilities

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Distance to Interstate Hwy. Miles / (Name)</u>	<u>On-Site Rail Facility?</u>	<u>Extends Into Receiving Area?</u>	<u>Status</u>	<u>On-Site Barge Facility?</u>	<u>Status</u>
81	POINT BEACH 2 WISCONSIN ELECTRIC POWER COMPANY	16.00 (I-43)	No	N/A		No	
82	PRAIRIE ISLAND NUCLEAR GENERATING P NORTHERN STATES POWER COMPANY	72.00 (I-90)	Yes	Yes	INACTIVE	Yes	INACTIVE
83	PRAIRIE ISLAND NUCLEAR GENERATING P NORTHERN STATES POWER COMPANY	72.00 (I-90)	Yes	Yes	INACTIVE	Yes	INACTIVE
84	QUAD CITIES 1 COMMONWEALTH EDISON COMPANY	12.00 (I-80)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
85	QUAD CITIES 2 COMMONWEALTH EDISON COMPANY	12.00 (I-80)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
86	R.E. GINNA ROCHESTER GAS AND ELECTRIC CORPORATION	25.00 (I-90)	No	N/A		No	
87	RANCHO SECO 1 SACRAMENTO MUNICIPAL UTILITY DISTRICT	20.00 (I-5)	Yes	Yes	INACTIVE	No	
88	RIVER BEND 1 GULF STATES UTILITIES	28.00 (I-10)	Yes	No	INACTIVE	Yes	INACTIVE
89	ROBINSON 2 CAROLINA POWER & LIGHT COMPANY	25.50 (I-20)	Yes	Yes	OPERATIONAL	No	
90	SALEM 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	21.00 (I-295)	No	N/A		Yes	OPERATIONAL
91	SALEM 2 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	21.00 (I-295)	No	N/A		Yes	OPERATIONAL
92	SAN ONOFRE 1 SOUTHERN CALIFORNIA EDISON COMPANY	1.00 (I-5)	Yes	Yes	OPERATIONAL	No	
93	SAN ONOFRE 2 SOUTHERN CALIFORNIA EDISON COMPANY	1.00 (I-5)	Yes	Yes	OPERATIONAL	No	
94	SAN ONOFRE 3 SOUTHERN CALIFORNIA EDISON COMPANY	1.00 (I-5)	Yes	Yes	OPERATIONAL	No	
95	SEABROOK NEW HAMPSHIRE YANKEE DIVISION OF PSNH	1.00 (I-95)	Yes	No	INACTIVE	No	
96	SEQUOYAH 1 TENNESSEE VALLEY AUTHORITY	24.90 (I-75)	Yes	Yes	INACTIVE	Yes	INACTIVE

APPENDIX 5 (Continued)
Facility Data - Onsite Transportation Capabilities

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Distance to Interstate Hwy. Miles / (Name)</u>	<u>On-Site Rail Facility?</u>	<u>Extends Into Receiving Area?</u>	<u>Status</u>	<u>On-Site Barge Facility?</u>	<u>Status</u>
97	SEQUOYAH 2 TENNESSEE VALLEY AUTHORITY	24.90 (I-75)	Yes	Yes	INACTIVE	Yes	INACTIVE
98	SHOREHAM LONG ISLAND LIGHTING COMPANY	7.00 (I-495)	No	N/A		Yes	OPERATIONAL
99	SOUTH TEXAS 1 HOUSTON LIGHTING AND POWER COMPANY	70.00 (I-10)	Yes	No	OPERATIONAL	Yes	INACTIVE
100	SOUTH TEXAS 2 HOUSTON LIGHTING AND POWER COMPANY	70.00 (I-10)	Yes	No	OPERATIONAL	Yes	INACTIVE
101	ST. LUCIE 1 FLORIDA POWER & LIGHT CO.	16.00 (I-95)	No	N/A		Yes	OPERATIONAL
102	ST. LUCIE 2 FLORIDA POWER & LIGHT CO.	16.00 (I-95)	No	N/A		Yes	OPERATIONAL
103	SURRY UNIT 1 VIRGINIA POWER	62.00 (I-64)	No	N/A		Yes	OPERATIONAL
104	SURRY UNIT 2 VIRGINIA POWER	62.00 (I-64)	No	N/A		Yes	OPERATIONAL
105	SUSQUEHANNA 1 PENNSYLVANIA POWER AND LIGHT COMPANY	10.00 (I-80)	Yes	Yes	OPERATIONAL	No	
106	SUSQUEHANNA 2 PENNSYLVANIA POWER AND LIGHT COMPANY	10.00 (I-80)	Yes	Yes	OPERATIONAL	No	
107	THREE MILE ISLAND 1 GPU NUCLEAR CORPORATION	6.00 (I-76)	Yes	Yes	OPERATIONAL	No	
108	TROJAN PORTLAND GENERAL ELECTRIC COMPANY	12.50 (I-5)	Yes	No	OPERATIONAL	Yes	INACTIVE
109	TURKEY POINT 3 FLORIDA POWER & LIGHT COMPANY	9.50 (I-95)	No	N/A		Yes	OPERATIONAL
110	TURKEY POINT 4 FLORIDA POWER & LIGHT COMPANY	9.50 (I-95)	No	N/A		Yes	OPERATIONAL
111	V.C. SUMMER 1 SOUTH CAROLINA ELECTRIC AND GAS COMPANY	20.10 (I-26)	Yes	Yes	OPERATIONAL	No	
112	VERMONT YANKEE VERMONT YANKEE NUCLEAR POWER CORPORATION	11.50 (I-91)	Yes	Yes	OPERATIONAL	No	

APPENDIX 5 (Continued)
Facility Data - Onsite Transportation Capabilities

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Distance to Interstate Hwy. Miles / (Name)</u>	<u>On-Site Rail Facility?</u>	<u>Extends Into Receiving Area?</u>	<u>Status</u>	<u>On-Site Barge Facility?</u>	<u>Status</u>
113	VOGTLE 1 GEORGIA POWER COMPANY	30.00 (I-520/I-20)	Yes	Yes	INACTIVE	Yes	INACTIVE
114	VOGTLE 2 GEORGIA POWER COMPANY	30.00 (I-520/I-20)	Yes	Yes	INACTIVE	Yes	INACTIVE
115	WASHINGTON NUCLEAR PLANT 2 WASHINGTON PUBLIC POWER SUPPLY SYSTEM	16.00 (I-82)	No	N/A		No	
116	WATERFORD 3 LOUISIANA POWER AND LIGHT COMPANY	15.00 (I-10)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
117	WATTS BAR 1 TENNESSEE VALLEY AUTHORITY	17.50 (I-75)	Yes	Yes	INACTIVE	Yes	INACTIVE
118	WATTS BAR 2 TENNESSEE VALLEY AUTHORITY	17.50 (I-75)	Yes	Yes	INACTIVE	Yes	INACTIVE
119	WOLF CREEK WOLF CREEK NUCLEAR OPERATING CORPORATION	16.75 (I-35)	Yes	Yes	INACTIVE	No	
120	YANKEE NUCLEAR POWER STATION YANKEE ATOMIC ELECTRIC COMPANY	67.20 (I-87)	No	N/A		No	
121	ZION 1 COMMONWEALTH EDISON COMPANY	9.30 (I-94)	Yes	Yes	OPERATIONAL	Yes	INACTIVE
122	ZION 2 COMMONWEALTH EDISON COMPANY	9.30 (I-94)	Yes	Yes	OPERATIONAL	Yes	INACTIVE

Appendix 6.

FACILITY DATA – CASK SHIPMENT EXPERIENCE

APPENDIX 6
Facility Data - Cask Shipment Experience

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Experience with Cask Shipment Modes</u>			<u>Date of Most- Recent Cask Operations</u>
1	ARKANSAS NUCLEAR ONE UNIT 1 ARKANSAS POWER AND LIGHT COMPANY	Truck	-	-	07/17/87
2	ARKANSAS NUCLEAR ONE UNIT 2 ARKANSAS POWER AND LIGHT COMPANY	Truck	-	-	05/18/90
3	BEAVER VALLEY 1 DUQUESNE LIGHT COMPANY	-	-	-	-
4	BEAVER VALLEY 2 DUQUESNE LIGHT COMPANY	-	-	-	-
5	BIG ROCK POINT 1 CONSUMERS POWER COMPANY	-	Rail	-	01/01/74
6	BRAIDWOOD 1 COMMONWEALTH EDISON COMPANY	-	-	-	-
7	BRAIDWOOD 2 COMMONWEALTH EDISON COMPANY	-	-	-	-
8	BROWNS FERRY 1 TENNESSEE VALLEY AUTHORITY	-	-	-	-
9	BROWNS FERRY 2 TENNESSEE VALLEY AUTHORITY	-	-	-	-
10	BROWNS FERRY 3 TENNESSEE VALLEY AUTHORITY	-	-	-	-
11	BRUNSWICK 1 CAROLINA POWER & LIGHT COMPANY	Truck	Rail	-	06/01/86
12	BRUNSWICK 2 CAROLINA POWER & LIGHT COMPANY	Truck	Rail	-	08/01/87
13	BYRON 1 COMMONWEALTH EDISON COMPANY	-	-	-	-
14	BYRON 2 COMMONWEALTH EDISON COMPANY	-	-	-	-
15	CALLAWAY 1 UNION ELECTRIC COMPANY	Truck	-	-	04/10/91
16	CALVERT CLIFFS 1 BALTIMORE GAS AND ELECTRIC COMPANY	Truck	-	-	09/10/90

APPENDIX 6 (Continued)
Facility Data - Cask Shipment Experience

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Experience with Cask Shipment Modes</u>			<u>Date of Most- Recent Cask Operations</u>
17	CALVERT CLIFFS 2 BALTIMORE GAS AND ELECTRIC COMPANY	Truck	-	-	09/10/90
18	CATAWBA UNIT 1 DUKE POWER COMPANY	-	-	-	-
19	CATAWBA UNIT 2 DUKE POWER COMPANY	-	-	-	-
20	CLINTON 1 ILLINOIS POWER COMPANY	-	-	-	-
21	COMANCHE PEAK 1 TU ELECTRIC	-	-	-	-
22	COMANCHE PEAK 2 TU ELECTRIC	-	-	-	-
23	COOPER NUCLEAR STATION NEBRASKA PUBLIC POWER DISTRICT	-	Rail	-	01/30/89
24	CRYSTAL RIVER 3 FLORIDA POWER CORPORATION	Truck	-	-	08/15/78
25	DAVIS-BESSE NUCLEAR POWER STATION TOLEDO EDISON CO	-	-	-	-
26	DC COOK 1 INDIANA MICHIGAN POWER COMPANY	-	-	-	-
27	DC COOK 2 INDIANA MICHIGAN POWER COMPANY	-	-	-	-
28	DIABLO CANYON 1 PACIFIC GAS AND ELECTRIC COMPANY	-	-	-	-
29	DIABLO CANYON 2 PACIFIC GAS AND ELECTRIC COMPANY	-	-	-	-
30	DRESDEN 1 COMMONWEALTH EDISON COMPANY	Truck	Rail	-	01/01/78
31	DRESDEN 2 COMMONWEALTH EDISON COMPANY	Truck	Rail	-	01/01/83
32	DRESDEN 3 COMMONWEALTH EDISON COMPANY	Truck	Rail	-	01/01/83

APPENDIX 6 (Continued)
Facility Data - Cask Shipment Experience

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Experience with Cask Shipment Modes</u>			<u>Date of Most- Recent Cask Operations</u>
33	DUANE ARNOLD ENERGY CENTER IOWA ELECTRIC LIGHT & POWER COMPANY	-	Rail	-	12/15/86
34	FARLEY 1 ALABAMA POWER COMPANY	-	-	-	-
35	FARLEY 2 ALABAMA POWER COMPANY	-	-	-	-
36	FERMI 2 DETROIT EDISON COMPANY	-	-	-	-
37	FORT CALHOUN 1 OMAHA PUBLIC POWER DISTRICT	Truck	-	-	06/01/85
38	FORT SAINT VRAIN PUBLIC SERVICE COMPANY OF COLORADO	Truck	-	-	11/30/86
39	GRAND GULF 1 ENTERGY OPERATIONS, INC.	-	-	-	-
40	HADDAM NECK CONNECTICUT YANKEE ATOMIC POWER COMPANY	Truck	-	-	05/31/80
41	HARRIS 1 CAROLINA POWER & LIGHT COMPANY	-	-	-	06/29/90
42	HATCH 1 GEORGIA POWER COMPANY	-	-	-	-
43	HATCH 2 GEORGIA POWER COMPANY	-	-	-	-
44	HOPE CREEK 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	-	-	-	-
45	HUMBOLDT BAY POWER PLANT UNIT 3 PACIFIC GAS AND ELECTRIC COMPANY	Truck	Rail	-	06/03/71
46	INDIAN POINT 1 CONSOLIDATED EDISON COMPANY	Truck	-	-	12/31/70
47	INDIAN POINT 2 CONSOLIDATED EDISON COMPANY	-	-	-	-
48	INDIAN POINT 3 NEW YORK POWER AUTHORITY	-	-	-	-

APPENDIX 6 (Continued)
Facility Data - Cask Shipment Experience

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Experience with Cask Shipment Modes</u>			<u>Date of Most- Recent Cask Operations</u>
49	J.A. FITZPATRICK NEW YORK POWER AUTHORITY	-	-	-	-
50	KEWAUNEE 1 WISCONSIN PUBLIC SERVICE CORPORATION	-	-	-	-
51	LA CROSSE DAIRYLAND POWER COOPERATIVE	Truck	-	-	01/01/81
52	LASALLE 1 COMMONWEALTH EDISON COMPANY	-	-	-	-
53	LASALLE 2 COMMONWEALTH EDISON COMPANY	-	-	-	-
54	LIMERICK 1 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	-	-	-	-
55	LIMERICK 2 GENERATING STATION PHILADELPHIA ELECTRIC COMPANY	-	-	-	-
56	MAINE YANKEE MAINE YANKEE ATOMIC POWER COMPANY	Truck	-	-	10/15/84
57	MCGUIRE UNIT 1 DUKE POWER COMPANY	Truck	-	-	05/22/86
58	MCGUIRE UNIT 2 DUKE POWER COMPANY	Truck	-	-	02/22/88
59	MILLSTONE UNIT 1 NORTHEAST NUCLEAR ENERGY COMPANY	Truck	Rail	-	06/01/88
60	MILLSTONE UNIT 2 NORTHEAST NUCLEAR ENERGY COMPANY	-	Rail	-	06/01/87
61	MILLSTONE UNIT 3 NORTHEAST NUCLEAR ENERGY COMPANY	-	-	-	-
62	MONTICELLO NORTHERN STATES POWER COMPANY	Truck	Rail	-	04/24/87
63	MORRIS OPERATIONS MORRIS OPERATIONS	Truck	Rail	-	01/26/89
64	NINE MILE POINT 1 NIAGARA MOHAWK POWER CORPORATION	-	Rail	-	03/12/91

APPENDIX 6 (Continued)
Facility Data - Cask Shipment Experience

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Experience with Cask Shipment Modes</u>	<u>Date of Most- Recent Cask Operations</u>
65	NINE MILE POINT 2 NIAGARA MOHAWK POWER CORPORATION	Truck - -	-
66	NORTH ANNA 1 VIRGINIA POWER	- - -	-
67	NORTH ANNA 2 VIRGINIA POWER	- - -	-
68	OCONEE UNIT 1 DUKE POWER COMPANY	Truck - -	09/30/89
69	OCONEE UNIT 2 DUKE POWER COMPANY	Truck - -	09/30/89
70	OCONEE UNIT 3 DUKE POWER COMPANY	Truck - -	02/28/88
71	OYSTER CREEK 1 JERSEY CENTRAL POWER AND LIGHT COMPANY	Truck - -	07/08/85
72	PALISADES NUCLEAR PLANT CONSUMERS POWER COMPANY	- - -	-
73	PALO VERDE 1 ARIZONA PUBLIC SERVICE COMPANY	- - -	-
74	PALO VERDE 2 ARIZONA PUBLIC SERVICE COMPANY	- - -	-
75	PALO VERDE 3 ARIZONA PUBLIC SERVICE COMPANY	- - -	-
76	PEACH BOTTOM UNIT 2 PHILADELPHIA ELECTRIC COMPANY	Truck - -	04/01/77
77	PEACH BOTTOM UNIT 3 PHILADELPHIA ELECTRIC COMPANY	- - -	-
78	PERRY 1 CLEVELAND ELECTRIC ILLUMINATING COMPANY	- - -	-
79	PILGRIM 1 BOSTON EDISON CO	- - -	-
80	POINT BEACH 1 WISCONSIN ELECTRIC POWER COMPANY	Truck - -	01/28/90

APPENDIX 6 (Continued)
Facility Data - Cask Shipment Experience

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Experience with Cask Shipment Modes</u>			<u>Date of Most- Recent Cask Operations</u>
81	POINT BEACH 2 WISCONSIN ELECTRIC POWER COMPANY	Truck	-	-	01/28/90
82	PRAIRIE ISLAND NUCLEAR GENERATING PLANT 1 NORTHERN STATES POWER COMPANY	-	-	-	-
83	PRAIRIE ISLAND NUCLEAR GENERATING PLANT 2 NORTHERN STATES POWER COMPANY	-	-	-	-
84	QUAD CITIES 1 COMMONWEALTH EDISON COMPANY	Truck	-	-	06/15/86
85	QUAD CITIES 2 COMMONWEALTH EDISON COMPANY	Truck	-	-	06/15/86
86	R.E. GINNA ROCHESTER GAS AND ELECTRIC CORPORATION	Truck	-	-	01/01/86
87	RANCHO SECO 1 SACRAMENTO MUNICIPAL UTILITY DISTRICT	-	-	-	-
88	RIVER BEND 1 GULF STATES UTILITIES	-	-	-	-
89	ROBINSON 2 CAROLINA POWER & LIGHT COMPANY	Truck	Rail	-	07/31/89
90	SALEM 1 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	-	-	-	-
91	SALEM 2 PUBLIC SERVICE ELECTRIC AND GAS COMPANY	-	-	-	-
92	SAN ONOFRE 1 SOUTHERN CALIFORNIA EDISON COMPANY	Truck	-	-	02/10/89
93	SAN ONOFRE 2 SOUTHERN CALIFORNIA EDISON COMPANY	Truck	-	-	02/10/89
94	SAN ONOFRE 3 SOUTHERN CALIFORNIA EDISON COMPANY	Truck	-	-	02/10/89
95	SEABROOK NEW HAMPSHIRE YANKEE DIVISION OF PSNH	-	-	-	-
96	SEQUOYAH 1 TENNESSEE VALLEY AUTHORITY	-	-	-	-

APPENDIX 6 (Continued)
Facility Data - Cask Shipment Experience

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Experience with Cask Shipment Modes</u>			<u>Date of Most- Recent Cask Operations</u>
97	SEQUOYAH 2 TENNESSEE VALLEY AUTHORITY	-	-	-	-
98	SHOREHAM LONG ISLAND LIGHTING COMPANY	-	-	-	-
99	SOUTH TEXAS 1 HOUSTON LIGHTING AND POWER COMPANY	-	-	-	-
100	SOUTH TEXAS 2 HOUSTON LIGHTING AND POWER COMPANY	-	-	-	-
101	ST. LUCIE 1 FLORIDA POWER & LIGHT CO.	-	-	-	-
102	ST. LUCIE 2 FLORIDA POWER & LIGHT CO.	-	-	-	-
103	SURRY UNIT 1 VIRGINIA POWER	Truck	-	Barge	02/01/88
104	SURRY UNIT 2 VIRGINIA POWER	Truck	-	Barge	02/01/88
105	SUSQUEHANNA 1 PENNSYLVANIA POWER AND LIGHT COMPANY	-	-	-	-
106	SUSQUEHANNA 2 PENNSYLVANIA POWER AND LIGHT COMPANY	-	-	-	-
107	THREE MILE ISLAND 1 GPU NUCLEAR CORPORATION	-	-	-	-
108	TROJAN PORTLAND GENERAL ELECTRIC COMPANY	-	-	-	-
109	TURKEY POINT 3 FLORIDA POWER & LIGHT COMPANY	Truck	-	-	04/01/83
110	TURKEY POINT 4 FLORIDA POWER & LIGHT COMPANY	Truck	-	-	04/01/83
111	V.C. SUMMER 1 SOUTH CAROLINA ELECTRIC AND GAS COMPANY	-	-	-	09/24/90
112	VERMONT YANKEE VERMONT YANKEE NUCLEAR POWER CORPORATION	Truck	-	-	12/31/85

APPENDIX 6 (Continued)
Facility Data - Cask Shipment Experience

<u>Facility Number</u>	<u>Name of Reactor / Name of Utility or Operator</u>	<u>Experience with Cask Shipment Modes</u>			<u>Date of Most- Recent Cask Operations</u>
113	VOGTLE 1 GEORGIA POWER COMPANY	-	-	-	-
114	VOGTLE 2 GEORGIA POWER COMPANY	-	-	-	-
115	WASHINGTON NUCLEAR PLANT 2 WASHINGTON PUBLIC POWER SUPPLY SYSTEM	-	-	-	-
116	WATERFORD 3 LOUISIANA POWER AND LIGHT COMPANY	-	-	-	-
117	WATTS BAR 1 TENNESSEE VALLEY AUTHORITY	-	-	-	-
118	WATTS BAR 2 TENNESSEE VALLEY AUTHORITY	-	-	-	-
119	WOLF CREEK WOLF CREEK NUCLEAR OPERATING CORPORATION	-	-	-	-
120	YANKEE NUCLEAR POWER STATION YANKEE ATOMIC ELECTRIC COMPANY	Truck	Rail	-	06/01/71
121	ZION 1 COMMONWEALTH EDISON COMPANY	Truck	-	-	06/09/83
122	ZION 2 COMMONWEALTH EDISON COMPANY	-	-	-	06/09/83

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- 34—35. Laboratory Records
- 36. Laboratory Records - RC
- 37—38. CR Library
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EXTERNAL DISTRIBUTION

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