Review of Load Combinations for NSSS and BOP Piping and Equipment of Mark III Plants

Prepared by A. J. Philippacopoulos, M. Reich, P. C. Wang

Brookhaven National Laboratory

Prepared for
U.S. Nuclear Regulatory
Commission

DO NOT
REPLACE
COVER

MASTER

DISCLAIMER

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

DISCLAIMER

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

NOTICE

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, or any of their employees, makes any warranty, expressed or implied, or assumes any legal liability of responsibility for any third party's use, or the results of such use, of any information, apparatus, product or process disclosed in this report, or represents that its use by such third party would not infringe privately owned rights.

Availability of Reference Materials Cited in NRC Publications

Most documents cited in NRC publications will be available from one of the following sources:

1. The NRC Public Document Room, 1717 H Street, N.W.
Washington, DC 20555
2. The NRC/GPO Sales Program, U.S. Nuclear Regulatory Commission,
Washington, DC 20555
3. The National Technical Information Service, Springfield, VA 22161

Although the listing that follows represents the majority of documents cited in NRC publications, it is not intended to be exhaustive.

Referenced documents available for inspection and copying for a fee from the NRC Public Document Room include NRC correspondence and internal NRC memoranda; NRC Office of Inspection and Enforcement bulletins, circulars, information notices, inspection and investigation notices; Licensee Event Reports; vendor reports and correspondence; Commission papers; and applicant and licensee documents and correspondence.

The following documents in the NUREG series are available for purchase from the NRC/GPO Sales Program: formal NRC staff and contractor reports, NRC-sponsored conference proceedings, and NRC booklets and brochures. Also available are Regulatory Guides, NRC regulations in the *Code of Federal Regulations*, and *Nuclear Regulatory Commission Issuances*.

Documents available from the National Technical Information Service include NUREG series reports and technical reports prepared by other federal agencies and reports prepared by the Atomic Energy Commission, forerunner agency to the Nuclear Regulatory Commission.

Documents available from public and special technical libraries include all open literature items, such as books, journal and periodical articles, and transactions. *Federal Register* notices, federal and state legislation, and congressional reports can usually be obtained from these libraries.

Documents such as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings are available for purchase from the organization sponsoring the publication cited.

Single copies of NRC draft reports are available free upon written request to the Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at the NRC Library, 7920 Norfolk Avenue, Bethesda, Maryland, and are available there for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

Review of Load Combinations for NSSS and BOP Piping and Equipment of Mark III Plants

Manuscript Completed: February 1982
Date Published: May 1982

Prepared by
A. J. Philippopoulos, M. Reich, P. C. Wang

Brookhaven National Laboratory
Upton, NY 11973

NUREG/CR--2686

DE82 015213

Prepared for
Division of Engineering
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
NRC FIN A3358

NOTICE

PORTIONS OF THIS REPORT ARE ILLEGIBLE. It
has been reproduced from the best available
copy to permit the broadest possible avail-
ability.

DISCLAIMER

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

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

**THIS PAGE
WAS INTENTIONALLY
LEFT BLANK**

ABSTRACT

This report describes a review conducted by the Structural Analysis Division of Brookhaven National Laboratory (BNL) for the Mechanical Engineering Branch of the Nuclear Regulatory Commission (MEB/NRC) on combinations of dynamic responses related to Nuclear Steam Supply System (NSSS) and Balance-of-Plant (BOP) piping and equipment components of Mark III plants. A total of 167 combination cases were considered. The response combinations reviewed in this report were compiled by Structural Mechanics Associates for the General Electric Company, using time-histories and other technical data supplied by various architect-engineering firms working for the Mark III containment owners. The objective of the (BNL) review was to verify the results presented by SMA.

ACKNOWLEDGEMENT

This study was carried out during the period of October 1981 to November 1981. The authors would like to acknowledge the assistance given by Dr. S. Hou of the U.S. Nuclear Regulatory Commission on all phases of this study. The authors also wish to express their appreciation to Ms. J. Murray and Ms. L. Gilbert for the preparation of this manuscript.

TABLE OF CONTENTS

Title	Page
Abstract	iii
Acknowledgement	iv
List of Figures	vi
1. Introduction	1
2. Response Combination Evaluation	3
3. Assumption Regarding Time Phasing	5
4. Presentation of Results	7
5. Conclusions	10
References	12
Appendix A	A-1
Appendix B	B-1
Appendix C	C-1
Appendix D	D-1
Appendix E	E-1

List of Figures

Title	Page
1. CDF for Combination of Response Histories	4
2. Earthquake Response Record Range of Time Lag	6
3. Combination of SRV + CHUG	8

1. Introduction

The Nuclear Steam Supply System and the Balance-of-Plant piping and equipment of the Mark III plants must be designed to withstand combined effects due to a variety of dynamic loads. These include seismic loads such as the Operating Basis Earthquake or the Safe Shutdown Earthquake as well as hydrodynamic loads. The most significant of the hydrodynamic loads for Mark III plants are those resulting from loss-of-coolant-accidents (LOCA) and from safety/relief valve (SRV) actuations.

Among the various phenomena classified under LOCA, the so-called "chugging" could result in significant structural or equipment response. In common with all Boiling Water Reactor (BWR) plants the Mark III are equipped with safety/relief valves (SRV). These are mounted on the main steam lines and function to control pressure transients in the primary system. Whenever an SRV is actuated, the boundaries of the suppression pool are subjected to hydrodynamic pressure loads (SRV loads). Any NSSS or BOP piping and equipment attached to structures affected by these loads are thus also subjected to SRV loads.

The methods of combining the dynamic responses have been a subject of extensive study. Presently, it is common practice to use two alternate approaches: one is to add the absolute values of the response peaks (ABS) and the other is to use the square-root-of-the-sum-of-the-squares (SRSS). The ABS method is considered conservative, but usually results in an overly costly design. SRSS on the otherhand, can be used if certain criteria are satisfied. These are discussed in the text that follows.

In applying the SRSS method, it is important to emphasize that the time of occurrence and the amplitudes of the dynamic loads associated with nuclear facilities are probabilistic in nature. Thus, the combination of the responses due to the loads are also probabilistic in nature. Even if the dynamic loads are postulated to occur concurrently, there still remains the uncertainty as to the phasing or time lag between the loads and the

associated responses. The probabilistic approach of combining such responses has been investigated and reported upon by BNL (1,2) and others. As a result of these studies, NRC issued guidelines for using the SRSS method for response evaluation of mechanical and piping systems. These can be summarized as follows:

When the time-histories of two responses are available, a cumulative density function (CDF) can be plotted based on the random time lag between responses. The CDF curve represents the non-exceedance probability (NEP) versus the combined values of the peaks. The acceptable magnitude of the combined response to be used in the design must have a non-exceedance probability of at least 0.84. Essentially, if the NEP which corresponds to the SRSS value is greater than or equal to 0.84, then the use of SRSS value as the combined result is acceptable. In cases where the individual loads are known to be determined conservatively (i.e., with $NEP \geq 0.84$ or 1.15 times the mean) considering the probabilistic nature of magnitudes, frequency content, etc., then a different acceptance criterion for SRSS may be used. Because of the built-in conservatism in the choice of loads, the NEP may be set at 0.50, (instead of 0.84). In addition 1.2 times SRSS must have an $NEP \geq 0.85$.

At the completion of the BNL studies with reference to the Mark II SRSS piping applications, a meeting was held with NRC and Mark II representatives (i.e., Dr. Kennedy and et al.) in Bethesda, where other pertinent factors influencing the combinations of the response signals were discussed. BNL reiterated the significance of selecting the proper range of the time lag. It was pointed out that the NEP of SRSS can be substantially affected by the time lag choice. Furthermore, it was also shown that peak ratios between the signals being combined will effect the outcome of the NEP of SRSS. Thus, it was recommended that in future applications, considerations be given to the above affects.

A document entitled "Study to Demonstrate the Generic Applicability of SRSS Combination of Dynamic Responses for Mark III Nuclear Steam Supply System and Balance-of-Plant Piping and Equipment Component" (3) was prepared by the Structural Mechanics Associates (SMA) for the General Electric Company, Nuclear Energy Division and submitted to NRC for approval. BNL was asked by NRC to independently verify the results and conclusions reached by SMA.

The data used in the SMA study were obtained from six Mark III nuclear plants. Five of these plants belong to the Mark III Containment Owner's SRSS Subgroup. They include the Perry, River Bend, Allens Creek, Clinton and Grand Gulf plants. The sixth plant is a generic one.

2. Response Combination Evaluation

In order to evaluate the non-exceedance probability (NEP) of the combined responses, a method suggested by BNL (1) was followed. In this method it is assumed that the first response R_1 occurs at time zero, and the second response R_2 begins τ seconds later (see Figure 1). The time lag τ is considered to be a random variable with an appropriate probability distribution. Since each response signal, (response 1, response 2, or combined responses) can have either a positive or negative maximum, we define the maximum value as the larger of the absolute value of the positive or negative maximum, i.e.,

$$R_{\max} = \text{Larger of } (|R_{\max}|, |-R_{\max}|) \quad (1)$$

The solution to this probabilistic model involves computing either analytically or via Monte Carlo methods, the cumulative distribution function (CDF) for the maximum of the combined response $R_{\max}$ (see Figure 1) based on the random time lag τ . The CDF then displays the probability that the value of $R_{\max}$ is equal to or less than some value. Thus, the ordinate of the CDF curve is often called the non-exceedance probability, NEP.

(a) RESPONSE 1

(b) RESPONSE 2

SAMPLE PT.
R=LARGER OF
|+R MAX.| OR |-R MAX.|

(c) COMBINED RESPONSES FOR
A TYPICAL TIME LAG

(d) CDF CURVE

FIGURE 1. CDF FOR COMBINATION OF RESPONSE HISTORIES

3. Assumptions Regarding Time Phasing

The time phasing between the combined responses is characterized by the probability density function PDF of the time lag τ , used to generate the CDF curve. Unfortunately, the exact relative occurrence of the dynamic loading events such as earthquake, SRV or LOCA is unknown. Therefore an exact time phasing of the dynamic responses of structural and mechanical components of nuclear plants due to these loading events is not known and consequently assumptions need to be made.

In previous studies for Mark II plants various assumptions for the distribution as well as for the range of time lag were studied. It was found that a uniform probability distribution function can be assumed for the time lag and indeed this assumption was used in the study carried out by SMA.

In regard to the ranges of time lag, as mentioned in the introduction, great care must be exercised in this selection. This is particularly true when the previous time lag is shortened in such a manner that it is centered around the peak of the longer response. This will result in a conservative nonexceedance probability of the SRSS. In the particular study for Mark III plants by SMA,⁽³⁾ the relative time phasing for combinations involving earthquake and SRV-hydrodynamic responses is defined over the so-called "strong motion portion" of the earthquake response. The latter is assumed to be the time frame between the first and the last times that the amplitude of the response signal reaches approximately half of its peak. This is depicted in Figure 2. This assumption is in conformance with the BNL recommendations previously mentioned. The 50% cut-off, however, is a figure chosen by SMA. BNL believes that this range for τ is generally acceptable (see discussion regarding assumptions for time lag in Reference 1, page G-26).

SRV and CHUG responses have short duration times (i.e., mostly less than one second). In addition, the chugging load repeats itself with recurrence periods of one to five seconds and usually has responses with low peaks at the initiation and tail portions. In order to simulate this phenomenon conservatively, SMA assumed that the CHUG can initiate at any

FIGURE 2. EARTHQUAKE RESPONSE RECORD. RANGE OF TIME LAG.

time within one-second prior to the beginning of the SRV with repeated cycles at one-second intervals. This assumption of the repetition of the CHUG response signal seems reasonable on the basis of the definition of the chugging load⁽⁴⁾. A schematic presentation of SRV and CHUG response combination is depicted in Figure 3.

4. Presentation of Results

In this work a total of 167 combination cases were reviewed. The cases involve dynamic responses of NSSS and BOP piping and equipment associated with the of Mark III plants. A description of the response records is given in Appendix A. The combination case 164 should be SSE + SRV instead of OBE + SRV. According to SMA the record itself is correct, its characterization, however, was mislabeled.

The Absolute Sum (ABS) and Square-Root-of-the-Sum-of-the-Squares (SRSS) combination values of all cases is given in Appendix B. In addition for each response, the absolute peak values together with the time of their occurrence is also given. Combination case 93 has different ABS and SRSS values than those given in Reference (3). According to SMA, the reason for this is that wrong data was transmitted to BNL on the tape.

As indicated previously the definition of the upper and lower bounds of the range of the time lag or "window" effects the NEP levels of the combinations. In general, the longer the time window, the less conservative the NEP value. In order to demonstrate this, an evaluation of the 167 combination cases was performed based on the assumption that the uniform distribution of the time lag was taken over the entire duration of the longest response record. The results of these evaluations are demonstrated in Column 1 (under NEP of SRSS) of Appendix D. Values for NEP times 1.2 are given in the right-handed part of the table in the same appendix.

In order to verify the results given in the SMA report sent to BNL by MEB/NRC, the data on the tape was digitized (at BNL) to comply with the

FIGURE 3. COMBINATION OF SRV + CHUG

definition of range of time lag described in the report. This means that for the SRV and Chug response combinations, (as described previously in Figure 4), the random time lag for the chug ranges from -1.0 to 0 second with reference to the SRV load. For combination cases involving earthquake and SRV responses, however, the upper and lower bounds of the range of the time lag are not as obvious, and thus they were computed on a case-by-case basis. This was done by defining the strong motion portions of the earthquake response time history for each combination case. The computer was directed to search each earthquake response record and to determine the first and the last digitized time where the amplitude reaches half of its peak value. The results of these calculations are given in column 2 of Appendix D.

The results obtained by SMA and presented in their report are listed for comparative purposes in column 4 of Appendix D. As can be seen, there are differences between the BNL results and those gotten by SMA.

At a meeting held in Bethesda, Md. on December 16, 1981, these differences were pointed out by BNL. Subsequent discussions disclosed that the "windows" employed by SMA obtained before visual inspection of the earthquake response time histories. In general, they were found to be longer than those obtained by digitized computer scanning procedures. A table of the "windows" used by SMA sent to BNL after the meeting is attached here as Appendix C.

When the same "windows" were used by BNL, the combination results were as those shown in column 3 of Appendix D. Although the results are closer to those in column 4, some discrepancies still remain. Of 167 cases investigated, 4 cases show that the NEP of SRSS computed by BNL were smaller than those obtained by SMA. Obviously 4 out of 167 is a small percentage. Differences between columns 3 and 4 are within expected limits. One of the reasons could be that differences in random number generators used by the different organizations.

Finally, the CDF curves of the 167 combination cases obtained by BNL are given in Appendix E.

5. Conclusions

One-hundred and sixty-seven BNL cases combination cases involving NSSS and BOP piping and equipment components of the Mark III Containment Owners SRSS Subgroup plants were reviewed. A list of conclusions is given below:

- (a) Some data was not transmitted properly to BNL by SMA. Specifically, data regarding combination case 93 are not the same as those reported by SMA in Reference (3). In addition, the combination case 164 should be SSE + SRV instead of OBE + SRV.
- (b) When combining earthquake with SRV the idea of shortening the range (or window) of random time lag as recommended by BNL previously and adopted by SMA in the report is sound in principle. However, a specific threshold ratio such as 0.5 of the peak value needs close scrutiny. BNL has studied this problem and recommended that the threshold ratio be chosen on the bases of the peak ratios of the responses. (see Reference [5])
- (c) In carrying out the cut-off point for the window special care must be exercised so that the resultant windows are not excessively small. Such a window may become unreasonable in comparison with the duration of the response. In addition, narrow windows may need refinement with respect to the time step in order that they can contain the required number of Monte Carlo trials required for the construction of the CDF curve.

(d) As can be seen by comparison between column 1 and 4 of Appendix D, the NEP values obtained by SMA using a smaller range for the time lag are generally more conservative than those obtained by BNL using the entire duration of the longer response record. However, this is not true for all cases. There are some cases (i.e., 6, 31, 56, 79, 122, 128 and 134) where other methods gave somewhat more conservative results. This indicates that the selection of the range of time lag for both the SRV + Chug as well as the Earthquake + SRV combinations needs careful study.

As a final remark, the reviewers would like to emphasize that in general the work carried out by SMA for the 167 cases is satisfactory and the results are acceptable.

References

- 1) "Review of Methods and Criteria for Dynamic Combinations in Piping Systems", by M. Reich, P.C. Wang, J. Curreri, S. Hou and H. Goradia, March 1980.
- 2) "Dynamic Combinations for Mark II Containment Structures", by A.J. Philippacopoulos and M. Reich, NUREG/CR-2039, BNL-NUREG-51366, to be printed June 1982.
- 3) "Study to Demonstrate the Generic Applicability of SRSS Combination of Dynamic Responses for MARK-III Nuclear Steam Supply System and Balance-of-Plant Piping and Equipment Components", by Structural Mechanics Associates, Report No. SMA 12109.01-R001, November 1981.
- 4) "Interim Containment Loads Report (ICLR), MARK III Containment", Nuclear Energy Engineering Division, General Electric Company, San Jose, California 95125, Report No. 22A4365, October 1978.
- 5) "Evaluation of Concurrent Peak Response", by P.C. Wang, J. Curreri, M. Shooman, Y.K. Wang, A.P. Philippacopoulos, M. Reich and M. Subudhi, NUREG/CR-2685, BNL-NUREG-51529, May 1982.

APPENDIX A
DESCRIPTION OF RESPONSE RECORDS

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 1

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-5.
OBE LOADING - RECORD 505 - VERT. FORCE (LBS) ,NPTS = 1995, DT = .005

SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-5
SRV-1 LOADING - RECORD 515 - VERT. FORCE (LBS) ,NPTS = 400, DT = .002

COMBINATION CASE : 2

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-4
OBE LOADING - RECORD 504 - VERT. FORCE (LBS) ,NPTS = 1995, DT = .005

SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-4
SRV-ALL LOADING - RECORD 534 - VERT. FORCE (LBS) ,NPTS = 522, DT = .002

COMBINATION CASE : 3

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-5
OBE LOADING - RECORD 505 - VERT. FORCE (LBS) ,NPTS = 1995, DT = .005

SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-5
SRV-ADS LOADING - RECORD 525 - VERT. FORCE (LBS) ,NPTS = 417, DT = .002

COMBINATION CASE : 4

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-5.
SSE LOADING - RECORD 505 - VERT. FORCE (LBS) ,NPTS = 1995, DT = .005

SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-5
SRV-1 LOADING - RECORD 515 - VERT. FORCE (LBS) ,NPTS = 400, DT = .002

COMBINATION CASE : 5

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-4
SSE LOADING - RECORD 504 - VERT. FORCE (LBS) ,NPTS = 1995, DT = .005

SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-4
SRV-ALL LOADING - RECORD 534 - VERT. FORCE (LBS) ,NPTS = 522, DT = .002

COMBINATION CASE : 6

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-5
SRV-1 LOADING - RECORD 515 - VERT. FORCE (LBS) ,NPTS = 400, DT = .002

SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-5
CHUG LOADING - RECORD 545 - VERT. FORCE (LBS) ,NPTS = 749, DT = .001

COMBINATION CASE : 7

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 4-4
SRV-1 LOADING - RECORD 613 - HORIZ.MOMENT (IN-LBS) ,NPTS = 393, DT = .003

SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 4-4
CHUG12 LOADING - RECORD 643 - HORIZ.MOMENT (IN-LBS) ,NPTS = 995, DT = .001

COMBINATION CASE : 8

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-6
SRV-ADS LOADING - RECORD 526 - VERT. FORCE (LBS) ,NPTS = 417, DT = .002

SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNALS LOCATION 5-6
CHUG LOADING - RECORD 546 - VERT. FORCE (LBS) ,NPTS = 749, DT = .001

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 9

FIRST RESPONSE - NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNAL\$ LOCATION 4-3
 SRV-ADS LOADING - RECORD 621 - VERT. FORCE (LBS) ,NPTS = 393, DT = .003
 SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNAL\$ LOCATION 4-3
 CHUG10 LOADING - RECORD 641 - VERT. FORCE (LBS) ,NPTS = 995, DT = .001

COMBINATION CASE : 10

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNAL\$ LOCATION 4-2
 SRV-ADS LOADING - RECORD 622 - HORIZ. FORCE (LBS) ,NPTS = 393, DT = .003
 SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RPV+INTERNAL\$ LOCATION 4-2
 CHUG10 LOADING - RECORD 642 - HORIZ. FORCE (LBS) ,NPTS = 995, DT = .001

COMBINATION CASE : 11

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-4
 OBE LOADING - RECORD 804 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
 SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-4
 SRV-1 LOADING - RECORD 814 - MOMENT (IN-LBS) ,NPTS = 2393, DT = .001

COMBINATION CASE : 12

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-5
 OBE LOADING - RECORD 805 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
 SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-5
 SRV-1 LOADING - RECORD 815 - MOMENT (IN-LBS) ,NPTS = 2393, DT = .001

COMBINATION CASE : 13

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-7
 OBE LOADING - RECORD 807 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
 SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-7
 SRV-1 LOADING - RECORD 817 - MOMENT (IN-LBS) ,NPTS = 2393, DT = .001

COMBINATION CASE : 14

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-5
 OBE LOADING - RECORD 805 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
 SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-5
 SRV-ALL LOADING - RECORD 835 - MOMENT (IN-LBS) ,NPTS = 799, DT = .003

COMBINATION CASE : 15

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-6
 OBE LOADING - RECORD 806 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
 SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-6
 SRV-ALL LOADING - RECORD 836 - MOMENT (IN-LBS) ,NPTS = 799, DT = .003

COMBINATION CASE : 16

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-9
 OBE LOADING - RECORD 809 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
 SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-9
 SRV-ALL LOADING - RECORD 839 - MOMENT (IN-LBS) ,NPTS = 799, DT = .003

COMBINATION CASE : 17

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-4
 SSE LOADING - RECORD 804 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
 SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-4
 SRV-1 LOADING - RECORD 814 - MOMENT (IN-LBS) ,NPTS = 2393, DT = .001

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 18

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-8
SSE LOADING - RECORD 808 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-8
SRV-1 LOADING - RECORD 818 - MOMENT (IN-LBS) ,NPTS = 2393, DT = .001

COMBINATION CASE : 19

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-9
SSE LOADING - RECORD 809 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-9
SRV-1 LOADING - RECORD 819 - MOMENT (IN-LBS) ,NPTS = 2393, DT = .001

COMBINATION CASE : 20

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-8
SSE LOADING - RECORD 808 - MOMENT (IN-LBS) ,NPTS = 4989, DT = .006
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, MAIN STEAM PIPING LOCATION 6-8
SRV-ALL LOADING - RECORD 838 - MOMENT (IN-LBS) ,NPTS = 799, DT = .003

COMBINATION CASE : 21

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-8
OBE LOADING - RECORD 704 - MOMENT (FT-LBS)) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-8
SRV-1 LOADING - RECORD 714 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

COMBINATION CASE : 22

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-10
OBE LOADING - RECORD 706 - MOMENT (FT-LBS)) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-10
SRV-1 LOADING - RECORD 716 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

COMBINATION CASE : 23

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-11
OBE LOADING - RECORD 707 - MOMENT (FT-LBS)) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-11
SRV-1 LOADING - RECORD 717 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

COMBINATION CASE : 24

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-12
OBE LOADING - RECORD 708 - MOMENT (FT-LBS)) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-12
SRV-1 LOADING - RECORD 718 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

COMBINATION CASE : 25

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-9
OBE LOADING - RECORD 705 - MOMENT (FT-LBS)) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-9
SRV-ALL LOADING - RECORD 735 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

COMBINATION CASE : 26

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-12
OBE LOADING - RECORD 708 - MOMENT (FT-LBS)) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-12
SRV-ALL LOADING - RECORD 738 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 27

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-13
OBE LOADING - RECORD 709 - MOMENT (FT-LBS) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-13
SRV-ALL LOADING - RECORD 739 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

COMBINATION CASE : 28

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-9
SSE LOADING - RECORD 705 - MOMENT (FT-LBS) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-9
SRV-1 LOADING - RECORD 715 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

COMBINATION CASE : 29

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-10
SSE LOADING - RECORD 706 - MOMENT (FT-LBS) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-10
SRV-ALL LOADING - RECORD 736 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

COMBINATION CASE : 30

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-11
SSE LOADING - RECORD 707 - MOMENT (FT-LBS) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-11
SRV-ALL LOADING - RECORD 737 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025

COMBINATION CASE : 31

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-9
SRV-1 LOADING - RECORD 715 - MOMENT (FT-LBS) ,NPTS = 393, DT = .0025
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, RECIRCULATION PIPING LOCATION 4-9
CHUG LOADING - RECORD 745 - MOMENT (FT-LBS) ,NPTS = 995, DT = .0005

COMBINATION CASE : 32

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-2
OBE LOADING - RECORD 802 - ACCELERATION (G) ,NPTS = 4989, DT = .006
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-2
SRV-1 LOADING - RECORD 812 - ACCELERATION (G) ,NPTS = 2393, DT = .001

COMBINATION CASE : 33

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 4-6
OBE LOADING - RECORD 702 - ACCELERATION (G) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 4-6
SRV-1 LOADING - RECORD 712 - ACCELERATION (G) ,NPTS = 393, DT = .0025

COMBINATION CASE : 34

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-3
OBE LOADING - RECORD 803 - ACCELERATION (G) ,NPTS = 4989, DT = .006
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-3
SRV-ALL LOADING - RECORD 833 - ACCELERATION (G) ,NPTS = 799, DT = .003

COMBINATION CASE : 35

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 4-7
OBE LOADING - RECORD 703 - ACCELERATION (G) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 4-7
SRV-ALL LOADING - RECORD 733 - ACCELERATION (G) ,NPTS = 393, DT = .0025

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 36

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-1
SSE LOADING - RECORD 801 - ACCELERATION (G) ,NPTS = 4989, DT = .006
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-1
SRV-1 LOADING - RECORD 811 - ACCELERATION (G) ,NPTS = 2393, DT = .001

COMBINATION CASE : 37

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 4-5
SSE LOADING - RECORD 701 - ACCELERATION (G) ,NPTS = 2183, DT = .0100
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 4-5
SRV-1 LOADING - RECORD 711 - ACCELERATION (G) ,NPTS = 393, DT = .0025

COMBINATION CASE : 38

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-1
SSE LOADING - RECORD 801 - ACCELERATION (G) ,NPTS = 4989, DT = .006
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-1
SRV-ALL LOADING - RECORD 831 - ACCELERATION (G) ,NPTS = 799, DT = .003

COMBINATION CASE : 39

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 4-6
SRV-1 LOADING - RECORD 712 - ACCELERATION (G) ,NPTS = 393, DT = .0025
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 4-6
CHUG LOADING - RECORD 742 - ACCELERATION (G) ,NPTS = 995, DT = .0005

COMBINATION CASE : 40

FIRST RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-3
SRV-ALL LOADING - RECORD 833 - ACCELERATION (G) ,NPTS = 799, DT = .003
SECOND RESPONSE NUCLEAR STEAM SUPPLY SYSTEM TIME HISTORIES, PIPE MOUNTED EQUIP. LOCATION 6-3
CHUG LOADING - RECORD 843 - ACCELERATION (G) ,NPTS = 699, DT = .001

COMBINATION CASE : 41

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-2
OBE LOADING - RECORD 102 - SUPPORT FORCE (LBS) - NPTS = 1504, DT = .01
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-2
SRV-1 LOADING - RECORD 109 - SUPPORT FORCE (LBS) - NPTS = 401, DT = .002

COMBINATION CASE : 42

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-3
OBE LOADING - RECORD 103 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1504, DT = .01
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-3
SRV-1 LOADING - RECORD 110 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002

COMBINATION CASE : 43

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-5
OBE LOADING - RECORD 705 - PIPE MOMENT Y (FT-LBS) , NPTS = 2388, DT = .01
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-5
SRV-1 LOADING - RECORD 715 - PIPE MOMENT Y (FT-LBS) , NPTS = 397, DT = .0025

COMBINATION CASE : 44

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-8
OBE LOADING - RECORD 708 - AXIAL SUPPORT (LBS) , NPTS = 2388, DT = .01
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-8
SRV-1 LOADING - RECORD 718 - AXIAL SUPPORT (LBS) NPTS = 397, DT = .0025

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 45
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-1
 OBE LOADING - RECORD 101 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1504, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-1
 SRV-ALL LOADING- RECORD 122 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002

COMBINATION CASE : 46
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 OBE LOADING - RECORD 104 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1504, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 SRV-ALL LOADING- RECORD 125 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002

COMBINATION CASE : 47
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-6
 OBE LOADING - RECORD 706 - PIPE MOMENT Y (FT-LBS), NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-6
 SRV-ALL LOADING- RECORD 736 - PIPE MOMENT Y (FT-LBS), NPTS = 597, DT = .0025

COMBINATION CASE : 48
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-7
 SSE LOADING - RECORD 707 - PIPE MOMENT Y (FT-LBS), NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-7
 SRV-ALL LOADING- RECORD 737 - PIPE MOMENT Y (FT-LBS), NPTS = 597, DT = .0025

COMBINATION CASE : 49
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-1
 SSE LOADING - RECORD 101 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1504, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-1
 SRV-1 LOADING - RECORD 108 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002

COMBINATION CASE : 50
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 SSE LOADING - RECORD 104 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1504, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 SRV-1 LOADING - RECORD 111 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002

COMBINATION CASE : 51
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-8
 SSE LOADING - RECORD 708 - AXIAL SUPPORT (LBS), NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-8
 SRV-1 LOADING - RECORD 718 - AXIAL SUPPORT (LBS) NPTS = 397, DT = .0025

COMBINATION CASE : 52
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-3
 SSE LOADING - RECORD 103 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1504, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-3
 SRV-ALL LOADING- RECORD 124 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002

COMBINATION CASE : 53
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 SSE LOADING - RECORD 104 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1504, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 SRV-ALL LOADING- RECORD 125 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 54
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-8
 SSE LOADING - RECORD 708 - AXIAL SUPPORT (LBS) NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-8
 SRV-ALL LOADING- RECORD 738 - AXIAL SUPPORT (LBS) NPTS = 597, DT = .0025

COMBINATION CASE : 55
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-2
 SRV-1 LOADING - RECORD 109 - SUPPORT FORCE (LBS) - NPTS = 401, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-2
 CHUG LOADING - RECORD 130 - SUPPORT FORCE (LBS) - NPTS = 1465, DT = .0005

COMBINATION CASE : 56
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 SRV-1 LOADING - RECORD 111 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 CHUG LOADING - RECORD 132 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1465, DT = .0005

COMBINATION CASE : 57
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-7
 SRV-1 LOADING - RECORD 717 - PIPE MOMENT Y (FT-LBS) , NPTS = 397, DT = .0025
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-7
 CHUG LOADING - RECORD 747 - PIPE MOMENT Y (FT-LBS) , NPTS = 948 , DT = .0005

COMBINATION CASE : 58
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-8
 SRV-1 LOADING - RECORD 718 - AXIAL SUPPORT (LBS) NPTS = 397, DT = .0025
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 2-8
 CHUG LOADING - RECORD 748 - AXIAL SUPPORT (LBS) NPTS = 948 , DT = .0005

COMBINATION CASE : 59
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-1
 SRV-ALL LOADING- RECORD 122 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-1
 CHUG LOADING - RECORD 129 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1465, DT = .0005

COMBINATION CASE : 60
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 SRV-ALL LOADING- RECORD 125 - PIPE MOMENT MB3 (FT-LBS), NPTS = 401, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, DRYWELL LOCATION 1-4
 CHUG LOADING - RECORD 132 - PIPE MOMENT MB3 (FT-LBS), NPTS = 1465, DT = .0005

COMBINATION CASE : 61
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 OBE LOADING - RECORD 311 - ACCELERATION (G), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 SRV-ALL LOADING- RECORD 344 - ACCELERATION (G), NPTS = 1501, DT = .0010

COMBINATION CASE : 62
 FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-3
 OBE LOADING - RECORD 313 - SUPPORT FORCE (LBS) , NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-3
 SRV-ALL LOADING- RECORD 346 - SUPPORT FORCE (LBS) , NPTS = 1501, DT = .0010

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 63

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 OBE LOADING - RECORD 311 - ACCELERATION (G), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 SRV-ADS LOADING- RECORD 341 - ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 64

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-3
 OBE LOADING - RECORD 313 - SUPPORT FORCE (LBS), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-3
 SRV-ADS LOADING- RECORD 343 - SUPPORT FORCE (LBS), NPTS = 1000, DT = .0010

COMBINATION CASE : 65

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 SSE LOADING - RECORD 311 - ACCELERATION (G), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 SRV-ADS LOADING- RECORD 341 - ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 66

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-2
 SSE LOADING - RECORD 312 - ACCELERATION (G), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-2
 SRV-ADS LOADING- RECORD 342 - ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 67

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 SRV-ADS LOADING- RECORD 341 - ACCELERATION (G), NPTS = 1000, DT = .0010
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 CHUG LOADING - RECORD 371 - ACCELERATION (G), NPTS = 833, DT = .001

COMBINATION CASE : 68

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-2
 SRV-ADS LOADING- RECORD 342 - ACCELERATION (G), NPTS = 1000, DT = .0010
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-2
 CHUG LOADING - RECORD 372 - ACCELERATION (G), NPTS = 833, DT = .001

COMBINATION CASE : 69

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 SRV-ALL LOADING- RECORD 344 - ACCELERATION (G), NPTS = 1501, DT = .0010
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-1
 CHUG LOADING - RECORD 371 - ACCELERATION (G), NPTS = 833, DT = .001

COMBINATION CASE : 70

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-2
 SRV-ALL LOADING- RECORD 345 - ACCELERATION (G), NPTS = 1501, DT = .0010
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-2
 CHUG LOADING - RECORD 372 - ACCELERATION (G), NPTS = 833, DT = .001

COMBINATION CASE : 71

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-18
 OBE LOADING -RECORD 1 - SUPPORT REACTION (LBS), NPTS = 2200,DT = .0100
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-18
 SRV-1 LOADING -RECORD 11 - SUPPORT REACTION (LBS), NPTS = 395 ,DT = .0025

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 72

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-21
 OBE LOADING -RECORD 1 - AXIAL X (LBS) , NPTS = 2200,DT = .0100
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-21
 SRV-1 LOADING -RECORD 11 - AXIAL X (LBS) , NPTS = 395 ,DT = .0025

COMBINATION CASE : 73

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-20
 OBE LOADING -RECORD 2 - MOMENT Y (FT-LBS) , NPTS = 2200,DT = .0100
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-20
 SRV-ALL LOADING -RECORD 22 - MOMENT Y (FT-LBS) , NPTS = 395 ,DT = .0025

COMBINATION CASE : 74

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-19
 OBE LOADING -RECORD 3 - SHEAR Y (LBS) , NPTS = 2200,DT = .0100
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-19
 SRV-ALL LOADING -RECORD 23 - SHEAR Y (LBS) , NPTS = 395 ,DT = .0025

COMBINATION CASE : 75

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-18
 SSE LOADING -RECORD 1 - SUPPORT REACTION (LBS), NPTS = 2200,DT = .0100
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-18
 SRV-1 LOADING -RECORD 11 - SUPPORT REACTION (LBS), NPTS = 395 ,DT = .0025

COMBINATION CASE : 76

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-20
 SSE LOADING -RECORD 2 - MOMENT Y (FT-LBS) , NPTS = 2200,DT = .0100
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-20
 SRV-ALL LOADING -RECORD 22 - MOMENT Y (FT-LBS) , NPTS = 395 ,DT = .0025

COMBINATION CASE : 77

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-17
 OBE LOADING - RECORD 1011 - MOMENT Y-AXIS (IN-LBS) , NPTS = 3324, DT = .003
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-17
 SRV-1 LOADING - RECORD 1031 - MOMENT Y-AXIS (IN-LBS), NPTS = 402, DT = .002

COMBINATION CASE : 78

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-14
 OBE LOADING -RECORD 1008 - FORCE Y-AXIS (LBS) , NPTS = 3324, DT = .003
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-14
 SRV-1 LOADING - RECORD 1028 - FORCE Y-AXIS (LBS) , NPTS = 402, DT = .002

COMBINATION CASE : 79

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-2
 OBE LOADING - RECORD 702 - PIPE MOMENT Y (FT-LBS) , NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-2
 SRV-ALL LOADING- RECORD 732 - PIPE MOMENT Y (FT-LBS) , NPTS = 597, DT = .0025

COMBINATION CASE : 80

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-3
 OBE LOADING - RECORD 703 - PIPE MOMENT Y (FT-LBS) , NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-3
 SRV-ALL LOADING- RECORD 733 - PIPE MOMENT Y (FT-LBS) , NPTS = 597, DT = .0025

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 81

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-16
 OBE LOADING - RECORD 1010 - MOMENT Y-AXIS (IN-LBS) , NPTS =3324, DT = .003
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-16
 SRV-ADS LOADING - RECORD 1050 - MOMENT Y-AXIS (IN-LBS) , NPTS = 419, DT = .002

COMBINATION CASE : 82

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-18
 OBE LOADING - RECORD 1012 - MOMENT Y-AXIS (IN-LBS) , NPTS =3324, DT = .003
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-18
 SRV-ADS LOADING - RECORD 1052 - MOMENT Y-AXIS (IN-LBS) , NPTS = 419, DT = .002

COMBINATION CASE : 83

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-15
 SSE LOADING - RECORD 1009 - FORCE Y-AXIS (LBS) , NPTS =3324, DT = .003
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-15
 SRV-1 LOADING - RECORD 1029 - FORCE Y-AXIS (LBS) , NPTS = 402, DT = .002

COMBINATION CASE : 84

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-1
 SSE LOADING - RECORD 701 - PIPE MOMENT Y (FT-LBS) , NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-1
 SRV-1 LOADING - RECORD 711 - PIPE MOMENT Y (FT-LBS) , NPTS = 397, DT = .0025

COMBINATION CASE : 85

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-4
 SSE LOADING - RECORD 704 - AXIAL SUPPORT (LBS) , NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-4
 SRV-1 LOADING - RECORD 714 - AXIAL SUPPORT (LBS) , NPTS = 397, DT = .0025

COMBINATION CASE : 86

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-19
 SSE LOADING - RECORD 1013 - FORCE X-AXIS (LBS) , NPTS =3324, DT = .003
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-19
 SRV-ALL LOADING - RECORD 1073 - FORCE X-AXIS (LBS) , NPTS = 524, DT = .002

COMBINATION CASE : 87

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-2
 SSE LOADING - RECORD 702 - PIPE MOMENT Y (FT-LBS) , NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-2
 SRV-ALL LOADING- RECORD 732 - PIPE MOMENT Y (FT-LBS) , NPTS = 597, DT = .0025

COMBINATION CASE : 88

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-3
 SSE LOADING - RECORD 703 - PIPE MOMENT Y (FT-LBS) , NPTS = 2388, DT = .01
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-3
 SRV-ALL LOADING- RECORD 733 - PIPE MOMENT Y (FT-LBS) , NPTS = 597, DT = .0025

COMBINATION CASE : 89

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-15
 SRV-1 LOADING - RECORD 1029 - FORCE Y-AXIS (LBS) , NPTS = 402, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-15
 CHUG LOADING - RECORD 1089 - FORCE Y-AXIS (LBS) , NPTS =376, DT = .002

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 90

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-16
 SRV-1 LOADING - RECORD 1030 - MOMENT Y-AXIS (IN-LBS), NPTS = 402, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-16
 CHUG LOADING - RECORD 1090A- MOMENT Y-AXIS (IN-LBS), NPTS = 376, DT = .002

COMBINATION CASE : 91

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-17
 SRV-ADS LOADING - RECORD 1051 - MOMENT Y-AXIS (IN-LBS), NPTS = 419, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-17
 CHUG LOADING - RECORD 1091 - MOMENT Y-AXIS (IN-LBS), NPTS = 376, DT = .002

COMBINATION CASE : 92

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-14
 SRV-ADS LOADING - RECORD 1048 - FORCE Y-AXIS (LBS)(LBS), NPTS = 419, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-14
 CHUG LOADING - RECORD 1088 - FORCE Y-AXIS (LBS), NPTS = 376, DT = .002

COMBINATION CASE : 93

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-16
 SRV-ALL LOADING - RECORD 1070 - MOMENT Y-AXIS (IN-LBS), NPTS = 524, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-16
 CHUG LOADING - RECORD 1090B- MOMENT Y-AXIS (IN-LBS), NPTS = 376, DT = .002

COMBINATION CASE : 94

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-20
 SRV-ALL LOADING - RECORD 1074 - FORCE Y-AXIS (LBS), NPTS = 524, DT = .002
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-20
 CHUG LOADING - RECORD 1094 - FORCE Y-AXIS (LBS), NPTS = 376, DT = .002

COMBINATION CASE : 95

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-8
 OBE LOADING - RECORD 305 - FORCE (LBS), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-8
 SRV-ALL LOADING- RECORD 355 - FORCE (LBS), NPTS = 1501, DT = .0010

COMBINATION CASE : 96

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-6
 OBE LOADING - RECORD 303 - ACCELERATION (G), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-6
 SRV-ALL LOADING- RECORD 353 - ACCELERATION (G), NPTS = 1501, DT = .0010

COMBINATION CASE : 97

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-4
 OBE LOADING - RECORD 301 - ACCELERATION (G), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-4
 SRV-ADS LOADING- RECORD 331 - ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 98

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-7
 OBE LOADING - RECORD 304 - MOMENT (FT-LBS), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-7
 SRV-ADS LOADING- RECORD 334 - MOMENT (FT-LBS), NPTS = 1000, DT = .0010

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 99

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-6
 OBE LOADING - RECORD 303 - ACCELERATION (G), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-6
 SRV-ADS LOADING- RECORD 333 - ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 100

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-4
 SSE LOADING - RECORD 301 - ACCELERATION (G), NPTS = 2001, DT = .005
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-4
 SRV-ADS LOADING- RECORD 331 - ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 101

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-5
 SRV-ADS LOADING- RECORD 332 - ACCELERATION (G), NPTS = 1000, DT = .0010
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-5
 CHUG LOADING - RECORD 362 - ACCELERATION (G), NPTS = 833, DT = .001

COMBINATION CASE : 102

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-6
 SRV-ADS LOADING- RECORD 333 - ACCELERATION (G), NPTS = 1000, DT = .0010
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-6
 CHUG LOADING - RECORD 363 - ACCELERATION (G), NPTS = 833, DT = .001

COMBINATION CASE : 103

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-4
 SRV-ALL LOADING- RECORD 351 - ACCELERATION (G), NPTS = 1501, DT = .0010
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-4
 CHUG LOADING - RECORD 361 - ACCELERATION (G), NPTS = 833, DT = .001

COMBINATION CASE : 104

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-5
 SRV-ALL LOADING- RECORD 352 - ACCELERATION (G), NPTS = 1501, DT = .0010
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 3-5
 CHUG LOADING - RECORD 362 - ACCELERATION (G), NPTS = 833, DT = .001

COMBINATION CASE : 105

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-17
 OBE LOADING -RECORD 4 - MOMENT Y (FT-LBS) , NPTS = 2200,DT = .0100
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-17
 SRV-1 LOADING -RECORD 14 - MOMENT Y (FT-LBS) , NPTS = 395 ,DT = .0025

COMBINATION CASE : 106

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-15
 OBE LOADING -RECORD 108- MOMENT Y (FT-LBS) , NPTS = 2200,DT = .0100
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-15
 SRV-1 LOADING -RECORD 208- MOMENT Y (FT-LBS) , NPTS = 395 ,DT = .0025

COMBINATION CASE : 107

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-14
 OBE LOADING -RECORD 5 - SUPPORT REACTION (LBS), NPTS = 2200,DT = .0100
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-14
 SRV-ALL LOADING -RECORD 25 - SUPPORT REACTION (LBS), NPTS = 395 ,DT = .0025

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 108

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-16
OBE LOADING -RECORD 108- SHEAR Y (LBS) , NPTS = 2200,DT = .0100
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-16
SRV-ALL LOADING -RECORD 308- SHEAR Y (LBS) , NPTS = 395 ,DT = .0025

COMBINATION CASE : 109

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-17
SSE LOADING -RECORD 4 - MOMENT Y (FT-LBS) , NPTS = 2200,DT = .0100
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-17
SRV-1 LOADING -RECORD 14 - MOMENT Y (FT-LBS) , NPTS = 395 ,DT = .0025

COMBINATION CASE : 110

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-14
SSE LOADING -RECORD 5 - SUPPORT REACTION (LBS), NPTS = 2200,DT = .0100
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, SHIELD BUILDING LOCATION 4-14
SRV-ALL LOADING -RECORD 25 - SUPPORT REACTION (LBS), NPTS = 395 ,DT = .0025

COMBINATION CASE : 111

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-7
OBE LOADING - RECORD 1001 - FORCE Z-AXIS (LBS) ,NPTS = 3324, DT = .003
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-7
SRV-1 LOADING - RECORD 1021 - FORCE Z-AXIS (LBS) , NPTS = 601, DT = .00133

COMBINATION CASE : 112

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-10
OBE LOADING - RECORD 1004 - MOMENT Y-AXIS (IN-LBS), NPTS = 3324, DT = .003
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-10
SRV-1 LOADING - RECORD 1024 - MOMENT Y-AXIS (IN-LBS), NPTS = 601, DT = .00133

COMBINATION CASE : 113

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-11
OBE LOADING - RECORD 1005 - MOMENT Z-AXIS (IN-LBS), NPTS = 3324, DT = .003
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-11
SRV-ADS LOADING - RECORD 1045 - MOMENT Z-AXIS (IN-LBS), NPTS = 628, DT = .00133

COMBINATION CASE : 114

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-12
OBE LOADING - RECORD 1006 - FORCE Y-AXIS (LBS) ,NPTS = 3324, DT = .003
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-12
SRV-ADS LOADING - RECORD 1046 - FORCE Y-AXIS (LBS) , NPTS = 628, DT = .00133

COMBINATION CASE : 115

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-13
SSE LOADING - RECORD 1007 - FORCE Y-AXIS (LBS) ,NPTS = 3324, DT = .003
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-13
SRV-1 LOADING - RECORD 1027 - FORCE Y-AXIS (LBS) , NPTS = 601, DT = .00133

COMBINATION CASE : 116

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-8
SSE LOADING - RECORD 1002 - MOMENT Y-AXIS (IN-LBS), NPTS = 3324, DT = .003
SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-8
SRV-ALL LOADING - RECORD 1062 - MOMENT Y-AXIS (IN-LBS), NPTS = 785, DT = .00133

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 117

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-8
 SRV-1 LOADING - RECORD 1022 - MOMENT Y-AXIS (IN-LBS), NPTS = 601, DT = .00133
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-8
 CHUG LOADING - RECORD 1082 - MOMENT Y-AXIS (IN-LBS), NPTS = 751, DT = .001

COMBINATION CASE : 118

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-12
 SRV-1 LOADING - RECORD 1026 - FORCE Y-AXIS (LBS), NPTS = 601, DT = .00133
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-12
 CHUG LOADING - RECORD 1086 - FORCE Y-AXIS (LBS), NPTS = 751, DT = .001

COMBINATION CASE : 119

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-13
 SRV-ADS LOADING - RECORD 1047 - FORCE Y-AXIS (LBS), NPTS = 628, DT = .00133
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-13
 CHUG LOADING - RECORD 1087 - FORCE Y-AXIS (LBS), NPTS = 751, DT = .001

COMBINATION CASE : 120

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-11
 SRV-ADS LOADING - RECORD 1045 - MOMENT Z-AXIS (IN-LBS), NPTS = 628, DT = .00133
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-11
 CHUG LOADING - RECORD 1085 - MOMENT Z-AXIS (IN-LBS), NPTS = 751, DT = .001

COMBINATION CASE : 121

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-7
 SRV-ALL LOADING - RECORD 1061 - FORCE Z-AXIS (LBS), NPTS = 785, DT = .00133
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-7
 CHUG LOADING - RECORD 1081 - FORCE Z-AXIS (LBS), NPTS = 751, DT = .001

COMBINATION CASE : 122

FIRST RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-9
 SRV-ALL LOADING - RECORD 1063 - MOMENT Z-AXIS (IN-LBS), NPTS = 785, DT = .00133
 SECOND RESPONSE BALANCE OF PLANT PIPING TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-9
 CHUG LOADING - RECORD 1083 - MOMENT Z-AXIS (IN-LBS), NPTS = 751, DT = .001

COMBINATION CASE : 123

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-9
 OBE LOADING - RECORD 106 - VERT. ACCELERATION (G), NPTS = 1504, DT = .0100
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-9
 SRV-1 LOADING - RECORD 113 - VERT. ACCELERATION (G), NPTS = 402, DT = .0020

COMBINATION CASE : 124

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-13
 OBE LOADING - RECORD 107 - E - W ACCELERATION (G), NPTS = 1504, DT = .0100
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-13
 SRV-1 LOADING - RECORD 114 - TANG. ACCELERATION (G), NPTS = 402, DT = .0020

COMBINATION CASE : 125

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-6
 OBE LOADING - RECORD 105 - VERT. ACCELERATION (G), NPTS = 1504, DT = .0100
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-6
 SRV-ALL LOADING - RECORD 126 - VERT. ACCELERATION (G), NPTS = 402, DT = .0020

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 126

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-11
OBE LOADING - RECORD 107 - N - S ACCELERATION (G), NPTS = 1504, DT = .0100
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-11
SRV-ALL LOADING- RECORD 128 - RADIAL ACCELERATION (G), NPTS = 402, DT = .0020

COMBINATION CASE : 127

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-5
SRV-1 LOADING - RECORD 112 - RADIAL ACCELERATION (G), NPTS = 402, DT = .0020
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-5
CHUG LOADING - RECORD 133 - RADIAL ACCELERATION (G), NPTS = 1466, DT = .0005

COMBINATION CASE : 128

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-9
SRV-ALL LOADING- RECORD 127 - VERT. ACCELERATION (G), NPTS = 402, DT = .0020
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-9
CHUG LOADING - RECORD 134 - VERT. ACCELERATION (G), NPTS = 1466, DT = .0005

COMBINATION CASE : 129

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-12
SRV-ALL LOADING- RECORD 128 - VERT. ACCELERATION (G), NPTS = 402, DT = .0020
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, DRYWELL LOCATION 1-12
CHUG LOADING - RECORD 135 - VERT. ACCELERATION (G), NPTS = 1466, DT = .0005

COMBINATION CASE : 130

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-12
OBE LOADING RECORD 310 - VERT. ACCELERATION (G), NPTS = 2001, DT = .005
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-12
SRV-ALL LOADING - RECORD 360 - VERT. ACCELERATION (G), NPTS = 1500, DT = .0010

COMBINATION CASE : 131

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-11
OBE LOADING RECORD 309 - VERT. ACCELERATION (G), NPTS = 2001, DT = .005
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-11
SRV-ADS LOADING - RECORD 339 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 132

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-12
OBE LOADING RECORD 310 - VERT. ACCELERATION (G), NPTS = 2001, DT = .005
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-12
SRV-ADS LOADING - RECORD 340 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 133

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-11
SSE LOADING RECORD 309 - VERT. ACCELERATION (G), NPTS = 2001, DT = .005
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-11
SRV-ADS LOADING - RECORD 339 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 134

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-11
SRV-ADS LOADING - RECORD 339 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-11
CHUG LOADING - RECORD 369 - VERT. ACCELERATION (G), NPTS = 833, DT = .0010

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 135

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-12
 SRV-ADS LOADING - RECORD 340 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 3-12
 CHUG LOADING - RECORD 370 - VERT. ACCELERATION (G), NPTS = 833, DT = .0010

COMBINATION CASE : 136

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-23
 OBE LOADING - RECORD 10 - RADIAL ACCELERATION (G), NPTS = 2200, DT = .0100
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-23
 SRV-ALL LOADING- RECORD 30 - RADIAL ACCELERATION (G), NPTS = 395, DT = .0025

COMBINATION CASE : 137

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-23
 SSE LOADING - RECORD 10 - RADIAL ACCELERATION (G), NPTS = 2200, DT = .0100
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-23
 SRV-ALL LOADING- RECORD 30 - RADIAL ACCELERATION (G), NPTS = 395, DT = .0025

COMBINATION CASE : 138

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-22
 SRV-1 LOADING - RECORD 20A - VERT. ACCELERATION (G), NPTS = 395, DT = .0025
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 4-22
 CHUG LOADING - RECORD 40A - VERT. ACCELERATION (G), NPTS = 997, DT = .0005

COMBINATION CASE : 139

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-23
 OBE LOADING RECORD 403 N - S ACCELERATION (G), NPTS = 999, DT = .0100
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-23
 SRV-1 LOADING RECORD 413 - HORIZ. ACCELERATION (G), NPTS = 402, DT = .002

COMBINATION CASE : 140

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
 OBE LOADING - RECORD 709 - RADIAL ACCELERATION (G), NPTS = 2399, DT = .01
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
 SRV-1 LOADING - RECORD 719 - RADIAL ACCELERATION (G), NPTS = 399, DT = .0025

COMBINATION CASE : 141

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
 OBE LOADING - RECORD 709 - RADIAL ACCELERATION (G), NPTS = 2399, DT = .01
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
 SRV-ALL LOADING- RECORD 739 - RADIAL ACCELERATION (G), NPTS = 599, DT = .0025

COMBINATION CASE : 142

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-23
 OBE LOADING RECORD 403 E - W ACCELERATION (G), NPTS = 999, DT = .0100
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-23
 SRV-ADS LOADING RECORD 423 - HORIZ. ACCELERATION (G), NPTS = 419, DT = .002

COMBINATION CASE : 143

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-26
 OBE LOADING RECORD 404 - VERT. WALL ACCEL. (G), NPTS = 999, DT = .01
 SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-26
 SRV-ADS LOADING RECORD 424 - VERT. WALL ACCEL. (G), NPTS = 419, DT = .0020

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 144

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
SSE LOADING - RECORD 709 - RADIAL ACCELERATION (G), NPTS = 2399, DT = .01

SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
SRV-1 LOADING - RECORD 719 - RADIAL ACCELERATION (G) NPTS = 399, DT = .0025

COMBINATION CASE : 145

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-23
OBE LOADING RECORD 403 N - S ACCELERATION (G), NPTS = 999, DT = .0100

SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-23
SRV-1 LOADING RECORD 413 - HORIZ. ACCELERATION (G), NPTS = 402, DT = .002

COMBINATION CASE : 146

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
SSE LOADING - RECORD 709 - RADIAL ACCELERATION (G), NPTS = 2399, DT = .01

SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
SRV-ALL LOADING- RECORD 739 - RADIAL ACCELERATION (G) NPTS = 599, DT = .0025

COMBINATION CASE : 147

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-26
SRV-1 LOADING RECORD 414 - VERT. WALL ACCEL. (G), NPTS = 402, DT = .0020

SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-26
CHUG LOADING RECORD 444 - VERT. WALL ACCEL. (G), NPTS = 751, DT = .0010

COMBINATION CASE : 148

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
SRV-1 LOADING - RECORD 719 - RADIAL ACCELERATION (G) NPTS = 399, DT = .0025

SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 2-9
CHUG LOADING - RECORD 740 - RADIAL ACCELERATION (G) NPTS = 950, DT = .0005

COMBINATION CASE : 149

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-24
SRV-ADS LOADING RECORD 423 - VERT. WALL ACCEL. (G), NPTS = 419, DT = .0020

SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-24
CHUG LOADING RECORD 443 - VERT. WALL ACCEL. (G), NPTS = 751, DT = .0010

COMBINATION CASE : 150

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-27
SRV-ADS LOADING RECORD 422 - HORIZ. ACCELERATION (G), NPTS = 419, DT = .002

SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, CONTAINMENT VESSEL LOCATION 5-27
CHUG LOADING RECORD 442 - HORIZ. ACCELERATION (G), NPTS = 751, DT = .001

COMBINATION CASE : 151

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-10
OBE LOADING RECORD 307 - VERT. ACCELERATION (G), NPTS = 2001, DT = .005

SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-10
SRV-ALL LOADING - RECORD 357 - VERT. ACCELERATION (G), NPTS = 1500, DT = .0010

COMBINATION CASE : 152

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-9
OBE LOADING RECORD 306 - VERT. ACCELERATION (G), NPTS = 2001, DT = .005

SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-9
SRV-ADS LOADING - RECORD 336 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 153

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-10
OBE LOADING RECORD 307 - VERT. ACCELERATION (G), NPTS = 2001, DT = .005
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-10
SRV-ADS LOADING - RECORD 337 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 154

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-9
SSE LOADING RECORD 306 - VERT. ACCELERATION (G), NPTS = 2001, DT = .005
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-9
SRV-ADS LOADING - RECORD 336 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010

COMBINATION CASE : 155

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-9
SRV-ADS LOADING - RECORD 336 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-9
CHUG LOADING - RECORD 366 - VERT. ACCELERATION (G), NPTS = 833, DT = .0010

COMBINATION CASE : 156

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-10
SRV-ADS LOADING - RECORD 337 - VERT. ACCELERATION (G), NPTS = 1000, DT = .0010
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 3-10
CHUG LOADING - RECORD 367 - VERT. ACCELERATION (G), NPTS = 833, DT = .0010

COMBINATION CASE : 157

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 4-25
OBE LOADING - RECORD 6 - RADIAL ACCELERATION (G), NPTS = 2200, DT = .0100
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 4-25
SRV-1 LOADING - RECORD 16 - RADIAL ACCELERATION (G), NPTS = 395, DT = .0025

COMBINATION CASE : 158

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 4-25
OBE LOADING - RECORD 6 - RADIAL ACCELERATION (G), NPTS = 2200, DT = .0100
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 4-25
SRV-ALL LOADING - RECORD 26 - RADIAL ACCELERATION (G), NPTS = 395, DT = .0025

COMBINATION CASE : 159

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 4-25
SSE LOADING - RECORD 6 - RADIAL ACCELERATION (G), NPTS = 2200, DT = .0100
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 4-25
SRV-1 LOADING - RECORD 16 - RADIAL ACCELERATION (G), NPTS = 395, DT = .0025

COMBINATION CASE : 160

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 4-26
SRV-1 LOADING - RECORD 17 - VERT. ACCELERATION (G), NPTS = 395, DT = .0025
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, SHIELD BUILDING LOCATION 4-26
CHUG LOADING - RECORD 37 - VERT. ACCELERATION (G), NPTS = 997, DT = .0005

COMBINATION CASE : 161

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-29
OBE LOADING RECORD 401 - VERT. SLAB ACCEL. (G), NPTS = 999, DT = .0100
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-29
SRV-1 LOADING RECORD 411 - VERT. SLAB ACCEL. (G), NPTS = 402, DT = .002

DESCRIPTION OF RESPONSE RECORDS

COMBINATION CASE : 162

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-29
OBE LOADING RECORD 401 - VERT. SLAB ACCEL. (G), NPTS = 999, DT = .0100
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-29
SRV-ADS LOADING RECORD 421 - VERT. SLAB ACCEL. (G), NPTS = 419, DT = .002

COMBINATION CASE : 163

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-22
OBE LOADING RECORD 401 - VERT. WALL ACCEL. (G), NPTS = 999, DT = .0100
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-22
SRV-ADS LOADING RECORD 421 - VERT. WALL ACCEL. (G), NPTS = 419, DT = .0020

COMBINATION CASE : 164

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-29
OBE LOADING RECORD 401 - VERT. SLAB ACCEL. (G), NPTS = 999, DT = .0100
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-29
SRV-ALL LOADING RECORD 431 - VERT. SLAB ACCEL. (G), NPTS = 524, DT = .002

COMBINATION CASE : 165

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-22
SRV-1 LOADING RECORD 411 - VERT. WALL ACCEL. (G), NPTS = 402, DT = .0020
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-22
CHUG LOADING RECORD 441 - VERT. WALL ACCEL. (G), NPTS = 751, DT = .0010

COMBINATION CASE : 166

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-22
SRV-ADS LOADING RECORD 421 - VERT. WALL ACCEL. (G), NPTS = 419, DT = .0020
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-22
CHUG LOADING RECORD 441 - VERT. WALL ACCEL. (G), NPTS = 751, DT = .0010

COMBINATION CASE : 167

FIRST RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-21
SRV-ALL LOADING RECORD 431 - HORIZ. ACCELERATION (G), NPTS = 524, DT = .002
SECOND RESPONSE BALANCE OF PLANT EQUIPMENT TIME HISTORIES, AUXILIARY BUILDING LOCATION 5-21
CHUG LOADING RECORD 441 - HORIZ. ACCELERATION (G), NPTS = 751, DT = .001

APPENDIX B
ABS AND SRSS VALUES

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
1	FIRST RESPONSE	9.97	430200.00	3.74	697000.00	506215.65
	SECOND RESPONSE	.80	266800.00	.33		
2	FIRST RESPONSE	9.97	44300.00	3.74	132090.00	98333.99
	SECOND RESPONSE	1.04	87790.00	.25		
3	FIRST RESPONSE	9.97	430200.00	3.74	726800.00	522535.74
	SECOND RESPONSE	.83	296600.00	.18		
4	FIRST RESPONSE	9.97	860400.00	3.74	1127200.00	900816.52
	SECOND RESPONSE	.80	266800.00	.33		
5	FIRST RESPONSE	9.97	88610.00	3.74	176400.00	124734.98
	SECOND RESPONSE	1.04	87790.00	.25		
6	FIRST RESPONSE	.80	266800.00	.33	531100.00	375548.57
	SECOND RESPONSE	.75	264300.00	.16		
7	FIRST RESPONSE	1.18	1612000.00	.53	2022500.00	1663446.50
	SECOND RESPONSE	.99	410500.00	.37		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
8	FIRST RESPONSE	.83	68550.00	.18	141010.00	99747.45
	SECOND RESPONSE	.75	72460.00	.16		
9	FIRST RESPONSE	1.18	48710.00	.47	65440.00	51502.98
	SECOND RESPONSE	.99	16730.00	.37		
10	FIRST RESPONSE	1.18	96720.00	.35	134830.00	103957.35
	SECOND RESPONSE	.99	38110.00	.34		
11	FIRST RESPONSE	29.93	115000.00	14.27	209880.00	149087.94
	SECOND RESPONSE	2.39	94880.00	.40		
12	FIRST RESPONSE	29.93	121700.00	8.61	201950.00	145777.06
	SECOND RESPONSE	2.39	80250.00	.40		
13	FIRST RESPONSE	29.93	173500.00	12.18	300300.00	214896.46
	SECOND RESPONSE	2.39	126800.00	.40		
14	FIRST RESPONSE	29.93	121700.00	8.61	245000.00	173244.86
	SECOND RESPONSE	2.39	123300.00	.39		
15	FIRST RESPONSE	29.93	126100.00	14.26	212760.00	153007.08
	SECOND RESPONSE	2.39	86660.00	.94		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
16	FIRST RESPONSE	29.93	50710.00	11.97	116450.00	83025.61
	SECOND RESPONSE	2.39	65740.00	.97		
17	FIRST RESPONSE	29.93	230000.00	14.27	324880.00	248801.56
	SECOND RESPONSE	2.39	94880.00	.40		
18	FIRST RESPONSE	29.93	131000.00	19.73	180740.00	140125.19
	SECOND RESPONSE	2.39	49740.00	.36		
19	FIRST RESPONSE	29.93	101400.00	11.97	161540.00	117893.09
	SECOND RESPONSE	2.39	60140.00	.40		
20	FIRST RESPONSE	29.93	131000.00	19.73	228030.00	163020.92
	SECOND RESPONSE	2.39	97030.00	.46		
21	FIRST RESPONSE	21.82	87140.00	6.47	117330.00	92221.56
	SECOND RESPONSE	.98	30190.00	.76		
22	FIRST RESPONSE	21.82	56390.00	17.10	94250.00	67920.63
	SECOND RESPONSE	.98	37860.00	.70		
23	FIRST RESPONSE	21.82	47350.00	6.87	70320.00	52627.40
	SECOND RESPONSE	.98	22970.00	.47		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
24	FIRST RESPONSE	21.82	59410.00	19.83	81500.00	63383.88
	SECOND RESPONSE	.98	22090.00	.84		
25	FIRST RESPONSE	21.82	12400.00	17.50	31280.00	22587.93
	SECOND RESPONSE	.98	18880.00	.75		
26	FIRST RESPONSE	21.82	59410.00	19.83	83180.00	63988.76
	SECOND RESPONSE	.98	23770.00	.33		
27	FIRST RESPONSE	21.82	12740.00	16.09	19715.00	14524.40
	SECOND RESPONSE	.98	6975.00	.35		
28	FIRST RESPONSE	21.82	24800.00	17.50	34820.00	26747.72
	SECOND RESPONSE	.98	10020.00	.44		
29	FIRST RESPONSE	21.82	112800.00	17.10	164130.00	123929.85
	SECOND RESPONSE	.98	51330.00	.34		
30	FIRST RESPONSE	21.82	94700.00	6.87	142080.00	105891.24
	SECOND RESPONSE	.98	47380.00	.34		
31	FIRST RESPONSE	.98	10020.00	.44	12701.00	10372.47
	SECOND RESPONSE	.50	2681.00	.40		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
32	FIRST RESPONSE	29.93	.16	10.87	.43	.31
	SECOND RESPONSE	2.39	.27	.49		
33	FIRST RESPONSE	21.82	.24	6.33	.35	.27
	SECOND RESPONSE	.98	.11	.84		
34	FIRST RESPONSE	29.93	.09	18.50	.21	.15
	SECOND RESPONSE	2.39	.12	1.09		
35	FIRST RESPONSE	21.82	.51	6.33	.92	.65
	SECOND RESPONSE	.98	.40	.35		
36	FIRST RESPONSE	29.93	.29	10.66	.59	.42
	SECOND RESPONSE	2.39	.30	.49		
37	FIRST RESPONSE	21.82	.04	6.28	.05	.04
	SECOND RESPONSE	.98	.01	.30		
38	FIRST RESPONSE	29.93	.29	10.66	.85	.63
	SECOND RESPONSE	2.39	.56	.86		
39	FIRST RESPONSE	.98	.11	.84	.14	.11
	SECOND RESPONSE	.50	.03	.15		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
40	FIRST RESPONSE	2.39	.12	1.09		
	SECOND RESPONSE	.70	.08	.14	.20	.15
41	FIRST RESPONSE	15.04	11710.00	3.16		
	SECOND RESPONSE	.80	9267.00	.21	20977.00	14933.23
42	FIRST RESPONSE	15.04	5994.00	2.64		
	SECOND RESPONSE	.80	7669.00	.06	13663.00	9733.53
43	FIRST RESPONSE	23.87	577.20	2.45		
	SECOND RESPONSE	.99	192.40	.83	769.60	608.42
44	FIRST RESPONSE	23.87	4.55	2.46		
	SECOND RESPONSE	.99	3.02	.22	7.57	5.46
45	FIRST RESPONSE	15.04	5259.00	4.12		
	SECOND RESPONSE	.80	3382.00	.17	8641.00	6252.60
46	FIRST RESPONSE	15.04	17.68	2.62		
	SECOND RESPONSE	.80	31.78	.15	49.46	36.37
47	FIRST RESPONSE	23.87	87.09	2.46		
	SECOND RESPONSE	1.49	37.37	.62	124.46	94.77

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
48	FIRST RESPONSE	23.87	73.66	3.64	98.94	77.88
	SECOND RESPONSE	1.49	25.28	.99		
49	FIRST RESPONSE	15.04	10520.00	4.12	18627.00	13281.33
	SECOND RESPONSE	.80	8107.00	.17		
50	FIRST RESPONSE	15.04	35.36	2.62	67.58	47.84
	SECOND RESPONSE	.80	32.22	.31		
51	FIRST RESPONSE	23.87	9.09	2.46	12.11	9.58
	SECOND RESPONSE	.99	3.02	.22		
52	FIRST RESPONSE	15.04	11990.00	2.64	23120.00	16359.61
	SECOND RESPONSE	.80	11130.00	.28		
53	FIRST RESPONSE	15.04	35.36	2.62	67.14	47.54
	SECOND RESPONSE	.80	31.78	.15		
54	FIRST RESPONSE	23.87	9.09	2.46	30.68	23.43
	SECOND RESPONSE	1.49	21.59	.42		
55	FIRST RESPONSE	.80	9267.00	.21	14308.00	10549.36
	SECOND RESPONSE	.73	5041.00	.16		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
56	FIRST RESPONSE	.80	32.22	.31	54.28	39.05
	SECOND RESPONSE	.73	22.06	.20		
57	FIRST RESPONSE	.99	5.69	.28	7.22	5.89
	SECOND RESPONSE	.47	1.53	.21		
58	FIRST RESPONSE	.99	3.02	.22	5.85	4.14
	SECOND RESPONSE	.47	2.83	.19		
59	FIRST RESPONSE	.80	3382.00	.17	9466.00	6960.82
	SECOND RESPONSE	.73	6084.00	.18		
60	FIRST RESPONSE	.80	31.78	.15	53.84	38.69
	SECOND RESPONSE	.73	22.06	.20		
61	FIRST RESPONSE	10.00	.05	5.63	.17	.13
	SECOND RESPONSE	1.50	.12	.53		
62	FIRST RESPONSE	10.00	160.40	5.41	782.80	642.74
	SECOND RESPONSE	1.50	622.40	.66		
63	FIRST RESPONSE	10.00	.05	5.63	.16	.12
	SECOND RESPONSE	1.00	.11	.34		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
64	FIRST RESPONSE	10.00	160.40	5.41	687.90	551.35
	SECOND RESPONSE	1.00	527.50	.34		
65	FIRST RESPONSE	10.00	.10	5.63	.21	.15
	SECOND RESPONSE	1.00	.11	.34		
66	FIRST RESPONSE	10.00	.12	5.63	.38	.28
	SECOND RESPONSE	1.00	.26	.37		
67	FIRST RESPONSE	1.00	.11	.34	.20	.14
	SECOND RESPONSE	.83	.09	.22		
68	FIRST RESPONSE	1.00	.26	.37	.40	.29
	SECOND RESPONSE	.83	.14	.25		
69	FIRST RESPONSE	1.50	.12	.53	.21	.15
	SECOND RESPONSE	.83	.09	.22		
70	FIRST RESPONSE	1.50	.36	.69	.50	.39
	SECOND RESPONSE	.83	.14	.25		
71	FIRST RESPONSE	21.99	47.44	11.94	72.40	53.61
	SECOND RESPONSE	.99	24.96	.33		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
72	FIRST RESPONSE	21.99	108.30	12.75	148.02	115.35
	SECOND RESPONSE	.99	39.72	.29		
73	FIRST RESPONSE	21.99	78.79	4.80	142.40	101.26
	SECOND RESPONSE	.99	63.61	.33		
74	FIRST RESPONSE	21.99	91.83	4.94	150.92	109.20
	SECOND RESPONSE	.99	59.09	.27		
75	FIRST RESPONSE	21.99	94.88	11.94	119.84	98.11
	SECOND RESPONSE	.99	24.96	.33		
76	FIRST RESPONSE	21.99	157.60	4.80	221.21	169.95
	SECOND RESPONSE	.99	63.61	.33		
77	FIRST RESPONSE	9.97	629.80	4.73	1302.20	921.29
	SECOND RESPONSE	.80	672.40	.42		
78	FIRST RESPONSE	9.97	73.50	3.68	137.98	97.77
	SECOND RESPONSE	.80	64.48	.29		
79	FIRST RESPONSE	23.87	8485.00	5.87	17104.00	12094.73
	SECOND RESPONSE	1.49	8619.00	.54		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
80	FIRST RESPONSE	23.87	3467.00	5.61	9289.00	6776.12
	SECOND RESPONSE	1.49	5822.00	.48		
81	FIRST RESPONSE	9.97	1979.00	2.35	4205.00	2978.51
	SECOND RESPONSE	.84	2226.00	.29		
82	FIRST RESPONSE	9.97	1387.00	4.11	2180.60	1597.99
	SECOND RESPONSE	.84	793.60	.18		
83	FIRST RESPONSE	9.97	87.92	3.68	175.63	124.19
	SECOND RESPONSE	.80	87.71	.20		
84	FIRST RESPONSE	23.87	2245.00	5.87	5362.00	3841.32
	SECOND RESPONSE	.99	3117.00	.79		
85	FIRST RESPONSE	23.87	3094.00	5.70	5647.00	4011.31
	SECOND RESPONSE	.99	2553.00	.24		
86	FIRST RESPONSE	9.97	496.60	2.57	938.10	664.48
	SECOND RESPONSE	1.05	441.50	.71		
87	FIRST RESPONSE	23.87	16970.00	5.87	25589.00	19033.34
	SECOND RESPONSE	1.49	8619.00	.54		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
88	FIRST RESPONSE	23.87	6935.00	5.61	12757.00	9054.83
	SECOND RESPONSE	1.49	5822.00	.48		
89	FIRST RESPONSE	.80	87.71	.20	159.76	113.51
	SECOND RESPONSE	.75	72.05	.21		
90	FIRST RESPONSE	.80	803.00	.29	1267.70	928.06
	SECOND RESPONSE	.75	463.90	.26		
91	FIRST RESPONSE	.84	350.10	.53	556.00	406.16
	SECOND RESPONSE	.75	205.90	.35		
92	FIRST RESPONSE	.84	45.88	.15	92.11	65.13
	SECOND RESPONSE	.75	46.23	.18		
93	FIRST RESPONSE	1.05	347.20	.59	730.30	517.02
	SECOND RESPONSE	.75	383.10	.25		
94	FIRST RESPONSE	1.05	20.09	.38	39.59	28.00
	SECOND RESPONSE	.75	19.50	.29		
95	FIRST RESPONSE	10.00	261.60	7.85	1121.70	899.00
	SECOND RESPONSE	1.50	860.10	.78		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
96	FIRST RESPONSE	10.00	.06	7.85		
	SECOND RESPONSE	1.50	.20	.69	.26	.21
97	FIRST RESPONSE	10.00	.07	5.41		
	SECOND RESPONSE	1.00	.15	.40	.22	.17
98	FIRST RESPONSE	10.00	396.20	7.85		
	SECOND RESPONSE	1.00	1129.00	.80	1525.20	1196.50
99	FIRST RESPONSE	10.00	.06	7.85		
	SECOND RESPONSE	1.00	.10	.34	.16	.12
100	FIRST RESPONSE	10.00	.15	5.42		
	SECOND RESPONSE	1.00	.15	.40	.30	.21
101	FIRST RESPONSE	1.00	.17	.34		
	SECOND RESPONSE	.83	.15	.27	.32	.22
102	FIRST RESPONSE	1.00	.10	.34		
	SECOND RESPONSE	.83	.12	.30	.22	.16
103	FIRST RESPONSE	1.50	.34	.68		
	SECOND RESPONSE	.83	.25	.36	.59	.42

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
104	FIRST RESPONSE	1.50	.26	.87	.41	.30
	SECOND RESPONSE	.83	.15	.27		
105	FIRST RESPONSE	21.99	1200.00	16.95	2507.00	1774.33
	SECOND RESPONSE	.99	1307.00	.33		
106	FIRST RESPONSE	21.99	2756.00	16.95	5499.00	3888.39
	SECOND RESPONSE	.99	2743.00	.36		
107	FIRST RESPONSE	21.99	1062.00	16.95	2100.00	1485.02
	SECOND RESPONSE	.99	1038.00	.31		
108	FIRST RESPONSE	21.99	1408.00	4.94	2481.00	1770.25
	SECOND RESPONSE	.99	1073.00	.26		
109	FIRST RESPONSE	21.99	2400.00	16.95	3707.00	2732.81
	SECOND RESPONSE	.99	1307.00	.33		
110	FIRST RESPONSE	21.99	2124.00	16.95	3162.00	2364.07
	SECOND RESPONSE	.99	1038.00	.31		
111	FIRST RESPONSE	9.97	508.50	3.68	901.30	642.55
	SECOND RESPONSE	.80	392.80	.26		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
112	FIRST RESPONSE	9.97	12350.00	3.68	24520.00	17338.73
	SECOND RESPONSE	.80	12170.00	.04		
113	FIRST RESPONSE	9.97	4067.00	3.70	7312.00	5202.93
	SECOND RESPONSE	.83	3245.00	.19		
114	FIRST RESPONSE	9.97	2157.00	3.70	3993.00	2832.59
	SECOND RESPONSE	.83	1836.00	.19		
115	FIRST RESPONSE	9.97	679.80	3.70	1201.30	856.79
	SECOND RESPONSE	.80	521.50	.06		
116	FIRST RESPONSE	9.97	4634.00	3.70	0630.00	0814.25
	SECOND RESPONSE	1.04	4996.00	.33		
117	FIRST RESPONSE	.80	2496.00	.16	4333.00	3099.13
	SECOND RESPONSE	.75	1837.00	.15		
118	FIRST RESPONSE	.80	834.00	.23	1305.10	957.86
	SECOND RESPONSE	.75	471.10	.16		
119	FIRST RESPONSE	.83	310.10	.19	536.60	384.01
	SECOND RESPONSE	.75	226.50	.16		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
120	FIRST RESPONSE	.83	3245.00	.19	6216.00	4399.64
	SECOND RESPONSE	.75	2971.00	.15		
121	FIRST RESPONSE	1.04	258.40	.30	506.80	358.43
	SECOND RESPONSE	.75	248.40	.17		
122	FIRST RESPONSE	1.04	1802.00	.28	3302.00	2344.61
	SECOND RESPONSE	.75	1500.00	.17		
123	FIRST RESPONSE	15.03	.13	2.37	.27	.19
	SECOND RESPONSE	.80	.14	.36		
124	FIRST RESPONSE	15.03	.12	12.07	.22	.15
	SECOND RESPONSE	.80	.10	.42		
125	FIRST RESPONSE	15.03	.13	2.37	.33	.24
	SECOND RESPONSE	.80	.20	.28		
126	FIRST RESPONSE	15.03	.22	9.97	.45	.32
	SECOND RESPONSE	.80	.23	.02		
127	FIRST RESPONSE	.80	.09	.16	.20	.14
	SECOND RESPONSE	.73	.11	.17		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
128	FIRST RESPONSE	.80	.17	.27	.28	.20
	SECOND RESPONSE	.73	.11	.15		
129	FIRST RESPONSE	.80	.11	.18	.28	.20
	SECOND RESPONSE	.73	.17	.15		
130	FIRST RESPONSE	10.00	.05	7.97	.19	.15
	SECOND RESPONSE	1.50	.15	.47		
131	FIRST RESPONSE	10.00	.05	7.97	.16	.12
	SECOND RESPONSE	1.00	.11	.23		
132	FIRST RESPONSE	10.00	.05	7.97	.14	.10
	SECOND RESPONSE	1.00	.09	.71		
133	FIRST RESPONSE	10.00	.10	7.97	.21	.15
	SECOND RESPONSE	1.00	.11	.23		
134	FIRST RESPONSE	1.00	.11	.23	.20	.14
	SECOND RESPONSE	.83	.09	.16		
135	FIRST RESPONSE	1.00	.09	.71	.17	.12
	SECOND RESPONSE	.83	.08	.14		

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
136	FIRST RESPONSE	21.99	.16	11.29		
	SECOND RESPONSE	.99	.12	.27	.28	.20
137	FIRST RESPONSE	21.99	.32	11.29		
	SECOND RESPONSE	.99	.12	.27	.44	.34
138	FIRST RESPONSE	.99	.03	.01		
	SECOND RESPONSE	.50	.01	.13	.04	.03
139	FIRST RESPONSE	9.98	.13	.53		
	SECOND RESPONSE	.80	.13	.29	.25	.18
140	FIRST RESPONSE	23.98	.14	2.63		
	SECOND RESPONSE	1.00	.14	.30	.28	.20
141	FIRST RESPONSE	23.98	.14	2.63		
	SECOND RESPONSE	1.50	.33	.39	.47	.36
142	FIRST RESPONSE	9.98	.13	.54		
	SECOND RESPONSE	.84	.17	.16	.30	.22
143	FIRST RESPONSE	9.98	.15	3.67		
	SECOND RESPONSE	.84	.11	.07	.26	.10

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
144	FIRST RESPONSE	23.98	.28	2.63		
	SECOND RESPONSE	1.00	.14	.30	.42	.32
145	FIRST RESPONSE	9.98	.25	.53		
	SECOND RESPONSE	.80	.13	.29	.38	.28
146	FIRST RESPONSE	23.98	.28	2.63		
	SECOND RESPONSE	1.50	.33	.39	.61	.44
147	FIRST RESPONSE	.80	.03	.18		
	SECOND RESPONSE	.75	.02	.15	.05	.04
148	FIRST RESPONSE	1.00	.14	.30		
	SECOND RESPONSE	.47	.03	.14	.17	.15
149	FIRST RESPONSE	.84	.06	.13		
	SECOND RESPONSE	.75	.04	.14	.10	.07
150	FIRST RESPONSE	.84	.05	.18		
	SECOND RESPONSE	.75	.05	.15	.10	.07
151	FIRST RESPONSE	10.00	.08	5.41		
	SECOND RESPONSE	1.50	.23	.48	.31	.24

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
152	FIRST RESPONSE	10.00	.06	5.41		
	SECOND RESPONSE	1.00	.11	.24	.17	.13
153	FIRST RESPONSE	10.00	.08	5.41		
	SECOND RESPONSE	1.00	.14	.21	.22	.16
154	FIRST RESPONSE	10.00	.13	5.41		
	SECOND RESPONSE	1.00	.11	.24	.24	.17
155	FIRST RESPONSE	1.00	.11	.24		
	SECOND RESPONSE	.83	.05	.19	.16	.12
156	FIRST RESPONSE	1.00	.14	.21		
	SECOND RESPONSE	.83	.03	.17	.17	.14
157	FIRST RESPONSE	21.99	.11	16.00		
	SECOND RESPONSE	.99	.17	.03	.28	.20
158	FIRST RESPONSE	21.99	.11	16.00		
	SECOND RESPONSE	.99	.24	.24	.34	.26
159	FIRST RESPONSE	21.00	.21	16.00		
	SECOND RESPONSE	.99	.17	.03	.39	.27

CASE	RECORDS	DURATION	PEAK	AT TIME	ABS VALUE	SRSS VALUE
160	FIRST RESPONSE	.99	.01	.03		
	SECOND RESPONSE	.50	.00	.14	.02	.01
161	FIRST RESPONSE	9.98	.35	3.70		
	SECOND RESPONSE	.80	.12	.23	.47	.37
162	FIRST RESPONSE	9.98	.35	3.70		
	SECOND RESPONSE	.84	.17	.19	.52	.39
163	FIRST RESPONSE	9.98	.11	3.67		
	SECOND RESPONSE	.84	.03	.46	.14	.12
164	FIRST RESPONSE	9.98	.70	3.70		
	SECOND RESPONSE	1.05	.45	.33	1.15	.83
165	FIRST RESPONSE	.80	.03	.19		
	SECOND RESPONSE	.75	.01	.14	.04	.03
166	FIRST RESPONSE	.84	.03	.46		
	SECOND RESPONSE	.75	.01	.14	.04	.03
167	FIRST RESPONSE	1.05	.02	.55		
	SECOND RESPONSE	.75	.00	.15	.02	.02

APPENDIX C
TIME WINDOWS USED BY SMA

MARK III SRSS TIME PHASING ENVELOPES

CDF	TSTART	TEND	CDF	TSTART	TEND
B-1	2.760	7.690	26	2.770	20.690
2	2.760	7.690	27	2.510	20.050
3	2.760	7.690	28	2.450	19.620
4	2.760	7.690	29	2.770	19.890
5	2.760	7.690	30	2.830	19.950
6	-1.000	0.000	31	-1.000	0.000
7	-1.000	0.000	32	4.330	22.670
8	-1.000	0.000	33	2.620	19.360
9	-1.000	0.000	34	4.000	22.000
10	-1.000	0.000	35	2.720	19.520
11	3.840	23.330	36	6.670	22.330
12	3.790	22.610	37	2.500	19.460
13	5.950	23.330	38	6.670	22.330
14	3.790	22.610	39	-1.000	0.000
15	4.640	25.490	40	-1.000	0.000
16	5.970	23.330	41	2.720	13.470
17	3.840	23.330	42	2.050	12.690
18	4.000	25.950	43	1.550	9.330
19	5.970	23.330	44	1.230	11.840
20	4.000	25.950	45	1.380	13.250
21	2.770	19.570	46	2.210	13.490
22	2.770	19.890	47	2.130	9.920
23	2.830	19.950	48	2.030	9.870
24	2.770	20.690	49	1.380	13.250
25	2.950	19.620	50	2.210	13.490

MARK III SRSS TIME PHASING ENVELOPES

CDF	TSTART	TEND	CDF	TSTART	TEND
51	1.230	11.840	76	2.690	18.990
52	2.050	12.690	77	3.070	9.960
53	2.210	13.490	78	1.840	9.810
54	1.230	11.840	79	1.890	16.850
55	-1.000	0.000	80	1.920	16.910
56	-1.000	0.000	81	.564	9.880
57	-1.000	0.000	82	3.750	9.630
58	-1.000	0.000	83	1.970	5.910
59	-1.000	0.000	84	2.560	16.800
60	-1.000	0.000	85	2.130	16.640
61	1.770	9.040	86	.430	8.936
62	2.120	8.750	87	1.890	16.850
63	1.770	9.040	88	1.920	16.910
64	2.120	8.750	89	-1.000	0.000
65	1.770	9.040	90	-1.000	0.000
66	1.110	9.050	91	-1.000	0.000
67	-1.000	0.000	92	-1.000	0.000
68	-1.000	0.000	93	-1.000	0.000
69	-1.000	0.000	94	-1.000	0.000
70	-1.000	0.000	95	2.050	8.610
71	2.420	19.470	96	1.770	9.170
72	1.560	20.830	97	1.850	8.740
73	2.690	18.990	98	2.050	9.250
74	2.160	19.510	99	1.770	9.170
75	2.420	19.470	100	1.850	8.740

MARK III SRSS TIME PHASING ENVELOPES

CDF	TSTART	TEND	CDF	TSTART	TEND
101	-1.000	0.000	126	2.400	12.490
102	-1.000	0.000	127	-1.000	0.000
103	-1.000	0.000	128	-1.000	0.000
104	-1.000	0.000	129	-1.000	0.000
105	2.800	19.950	130	.451	9.130
106	2.830	19.930	131	.461	9.030
107	2.800	19.950	132	.451	9.130
108	2.430	19.470	133	.461	9.030
109	2.800	19.950	134	-1.000	0.000
110	2.800	19.950	135	-1.000	0.000
111	.307	7.560	136	2.430	20.640
112	.307	7.550	137	2.430	20.640
113	2.750	7.150	138	-1.000	0.000
114	2.750	7.150	139	.300	7.050
115	2.730	7.130	140	1.570	12.110
116	3.000	7.010	141	1.570	12.110
117	-1.000	0.000	142	.300	7.050
118	-1.000	0.000	143	1.490	9.980
119	-1.000	0.000	144	1.570	12.110
120	-1.000	0.000	145	.300	7.050
121	-1.000	0.000	146	1.570	12.110
122	-1.000	0.000	147	-1.000	0.000
123	2.010	12.690	148	-1.000	0.000
124	1.240	13.230	149	-1.000	0.000
125	2.000	12.710	150	-1.000	0.000

MARK III SRSS TIME PHASING ENVELOPES

CDF	TSTART	TEND	CDF	TSTART	TEND
151	1.860	8.730			
152	1.860	8.730			
153	1.860	8.730			
154	1.860	8.730			
155	-1.000	0.000			
156	-1.000	0.000			
157	1.560	20.790			
158	1.560	20.790			
159	1.560	20.790			
160	-1.000	0.000			
161	2.740	7.290			
162	2.740	7.290			
163	2.620	9.980			
164	2.740	7.290			
165	-1.000	0.000			
166	-1.000	0.000			
167	-1.000	0.000			

APPENDIX D
NED OF SRSS AND 1.2 SRSS VALUES

COMBINATION CASE	NEP OF SRSS				NEP OF 1.2 SRSS			
	1	2	3	4	1	2	3	4
1	75.0	44.0	50.5	53.2	96.0	87.0	94.0	90.2
2	80.0	59.5	59.5	63.0	99.0	98.5	97.0	96.1
3	89.0	73.5	75.5	78.6	99.0	98.5	99.0	97.1
4	93.0	73.0	73.0	77.7	100.0	99.0	99.0	97.4
5	86.0	72.0	74.5	75.7	98.0	98.0	97.5	97.8
6	67.0	73.5	73.5	71.0	88.0	91.0	91.0	90.6
7	82.0	42.5	42.5	42.5	99.0	99.0	99.0	99.4
8	75.0	72.0	72.0	75.5	95.0	90.5	90.5	94.0
9	90.0	61.0	61.0	62.6	95.0	94.5	94.5	98.3
10	99.0	76.5	76.5	75.2	99.0	98.5	98.5	97.5
11	86.0	78.0	83.0	78.8	100.0	97.5	99.0	96.7
12	81.0	71.5	77.0	73.7	97.0	97.5	98.0	95.2
13	85.0	79.0	83.0	71.7	99.0	96.0	99.5	96.2
14	85.0	67.5	72.5	66.4	99.0	96.5	98.5	96.5
15	81.0	60.0	73.5	76.6	95.0	85.0	92.0	94.5
16	74.0	40.5	45.0	37.9	96.0	91.0	95.5	94.2
17	91.0	91.0	94.0	85.0	100.0	100.0	100.0	99.0
18	92.0	88.0	92.0	91.0	99.0	99.5	99.5	99.0
19	88.0	81.5	80.5	79.7	99.0	99.0	99.5	97.2
20	90.0	81.0	86.0	84.0	99.0	97.5	98.0	98.0
21	93.0	91.0	90.5	94.1	100.0	99.5	99.5	99.4
22	99.0	92.0	95.5	94.5	100.0	99.5	98.5	97.0
23	94.0	89.0	93.0	86.8	99.0	99.5	100.0	97.8
24	92.0	93.5	93.5	90.6	100.0	100.0	99.5	98
25	76.0	72.5	73.0	71.0	99.0	97.0	97.5	96.0

COMBINATION CASE	NEP OF SRSS				NEP OF 1,2 SRSS			
	1	2	3	4	1	2	3	4
26	97.0	90.5	92.5	91.1	100.0	100.0	100.0	99.3
27	84.0	84.5	78.5	83.7	100.0	99.5	99.5	98.0
28	88.0	84.5	84.0	86.1	100.0	100.0	100.0	99.5
29	99.0	97.5	96.5	97.2	100.0	100.0	99.5	99.4
30	92.0	88.5	93.5	90.7	100.0	99.5	100.0	99.2
31	77.0	75.5	75.5	82.5	97.0	98.5	98.5	98.4
32	81.0	61.5	61.5	59.6	98.0	95.0	94.0	93.6
33	97.0	96.0	95.0	96.5	100.0	99.0	100.0	99.0
34	79.0	61.5	58.5	61.8	100.0	98.5	99.0	97.1
35	95.0	93.0	95.0	93.1	100.0	99.5	100.0	99.4
36	87.0	68.5	70.5	70.6	97.0	99.0	97.5	97.0
37	98.0	94.5	93.5	96.0	100.0	99.5	100.0	99.5
38	71.0	50.0	49.0	46.9	99.0	96.0	92.5	95.1
39	93.0	83.0	83.0	88.0	100.0	100.0	100.0	99.5
40	92.0	84.0	84.0	78.7	100.0	99.0	99.0	90.6
41	72.0	55.5	60.5	60.4	94.0	92.0	87.5	86.9
42	61.0	43.0	42.0	44.2	87.0	83.0	82.5	82.6
43	97.0	91.0	92.5	92.7	100.0	98.5	99.5	99.0
44	94.0	70.0	87.5	91.0	98.0	93.0	98.0	99.0
45	79.0	79.0	78.0	72.3	97.0	98.0	96.5	95.5
46	72.0	60.0	59.0	60.8	99.0	96.0	98.5	96.6
47	96.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
48	95.0	79.5	87.0	90.8	100.0	98.0	98.0	99.5
49	71.0	68.5	68.5	67.0	89.0	95.5	91.5	91.9
50	77.0	64.5	67.0	67.3	97.0	96.5	96.0	94.9

COMBINATION CASE	NEP OF SRSS				NEP OF 1.2 SRSS			
	1	2	3	4	1	2	3	4
51	95.0	73.0	90.5	88.0	100.0	100.0	100.0	99.0
52	76.0	62.0	58.5	65.1	96.0	92.5	92.0	92.1
53	78.0	61.5	68.5	69.7	98.0	96.0	96.5	97.1
54	83.0	58.0	81.0	79.0	100.0	93.0	99.0	98.4
55	84.0	81.0	81.0	81.4	97.0	95.5	95.5	99.0
56	65.0	66.0	66.0	70.3	89.0	90.5	90.5	96.9
57	78.0	68.0	68.0	65.6	100.0	99.0	99.0	98.0
58	71.0	64.5	64.5	69.5	99.0	96.0	96.0	98.1
59	56.0	60.5	60.5	55.2	100.0	97.5	97.5	98.2
60	71.0	51.5	51.5	58.8	99.0	91.5	91.5	92.5
61	53.0	38.5	34.0	46.4	96.0	93.0	97.5	96.2
62	70.0	53.5	49.0	53.4	100.0	100.0	100.0	99.0
63	39.0	29.5	30.0	27.2	95.0	94.0	92.0	94.2
64	33.0	14.5	17.0	16.1	99.0	99.0	97.0	97.9
65	57.0	44.5	39.5	47.4	94.0	90.0	88.5	90.8
66	52.0	38.0	37.5	41.0	100.0	96.0	96.5	95.8
67	70.0	59.0	59.0	67.7	90.0	85.0	85.0	88.6
68	66.0	55.0	55.0	65.2	85.0	87.5	87.5	87.1
69	73.0	70.0	70.0	69.4	91.0	94.0	94.0	95.0
70	82.0	76.5	76.5	76.0	97.0	98.0	98.0	97.0
71	88.0	86.5	89.0	86.5	99.0	98.0	99.0	98.3
72	87.0	84.0	85.0	85.0	100.0	99.5	99.5	98.7
73	77.0	66.0	64.0	63.3	98.0	94.5	92.0	93.1
74	80.0	77.0	78.5	75.6	99.0	98.5	98.0	97.7
75	94.0	93.5	93.5	92.6	100.0	100.0	100.0	100.0

COMBINATION CASE	NEP OF SRSS				NEP OF 12 SRSS			
	1	2	3	4	1	2	3	4
76	88.0	83.0	81.0	85.8	99.0	97.5	98.5	100.0
77	98.0	94.0	92.0	89.9	100.0	99.5	98.5	98.4
78	98.0	78.5	97.0	97.6	100.0	95.5	100.0	98.9
79	87.0	72.5	90.0	92.9	98.0	91.5	98.0	99.5
80	78.0	54.5	81.5	78.0	100.0	92.0	98.5	97.3
81	52.0	44.0	51.0	50.0	93.0	88.0	91.5	91.0
82	97.0	84.0	95.0	94.5	98.0	95.5	99.5	98.7
83	89.0	36.5	72.0	62.9	98.0	86.5	92.0	89.2
84	83.0	43.0	75.0	77.0	99.0	83.5	92.5	94.4
85	94.0	86.5	92.0	90.3	100.0	99.5	99.0	98.5
86	44.0	34.5	36.0	42.5	82.0	76.0	76.0	77.5
87	91.0	74.5	91.5	93.0	100.0	96.5	99.5	99.0
88	92.0	64.0	87.5	82.2	100.0	91.0	98.0	96.0
89	76.0	38.5	38.5	51.3	93.0	85.0	85.0	89.9
90	82.0	57.0	57.0	70.9	97.0	97.0	97.0	98.0
91	67.0	43.5	43.5	48.8	92.0	89.5	89.5	92.9
92	78.0	59.5	59.5	64.4	100.0	94.0	94.0	93.7
93	40.0	26.0	26.0	56.2	77.0	81.0	81.0	97.4
94	81.0	66.5	66.5	74.5	93.0	91.0	91.0	95.1
95	52.0	46.0	47.0	43.4	100.0	100.0	100.0	99.5
96	34.0	15.5	25.5	19.8	100.0	99.5	100.0	96.8
97	71.0	64.0	67.5	65.2	98.0	98.5	98.0	96.6
98	38.0	22.0	27.0	26.3	98.0	97.0	99.0	97.5
99	45.0	32.5	39.0	41.0	96.0	93.5	93.5	93.4
100	81.0	70.5	70.0	74.8	97.0	98.5	97.5	96.6

COMBINATION CASE	NEP OF SRSS				NEP OF 1.2 SRSS			
	1	2	3	4	1	2	3	4
101	49.0	23.0	23.0	30.9	85.0	81.5	81.5	88.7
102	46.0	16.5	16.5	24.4	89.0	76.5	76.5	79.1
103	73.0	75.0	75.0	74.6	94.0	92.0	92.0	91.6
104	70.0	56.5	56.5	58.5	96.0	95.0	95.0	91.3
105	80.0	71.0	73.5	72.3	96.0	99.0	98.0	97.3
106	86.0	79.0	82.0	79.8	99.0	99.0	99.5	99.2
107	93.0	88.5	92.5	84.5	99.0	99.0	100.0	97.8
108	84.0	83.0	85.0	85.9	95.0	98.0	98.5	97.8
109	93.0	89.0	91.0	90.8	97.0	99.5	98.0	99.4
110	97.0	93.5	95.0	96.5	100.0	99.0	100.0	99.5
111	81.0	64.5	77.5	73.5	96.0	95.5	96.5	96.2
112	79.0	57.0	72.0	72.2	94.0	95.0	96.0	92.6
113	95.0	24.5	81.0	81.0	100.0	82.0	96.5	95.6
114	97.0	25.0	82.0	82.6	100.0	83.0	96.5	95.1
115	94.0	35.0	84.0	80.6	99.0	78.5	96.5	93.7
116	90.0	32.0	76.5	78.7	97.0	75.5	93.5	91.0
117	93.0	85.5	85.5	82.6	99.0	98.5	98.5	98.3
118	83.0	70.0	70.0	78.3	94.0	97.0	97.0	97.2
119	80.0	76.0	76.0	71.2	94.0	92.5	92.5	94.1
120	77.0	75.0	75.0	75.5	96.0	91.0	91.0	91.4
121	76.0	77.5	77.5	76.4	96.0	97.0	97.0	94.0
122	81.0	83.0	83.0	85.2	95.0	96.5	96.5	97.6
123	66.0	46.5	45.5	51.5	95.0	89.0	88.0	90.6
124	51.0	33.0	38.0	38.6	82.0	79.0	76.5	80.7
125	64.0	52.5	43.0	45.6	98.0	90.5	90.5	89.9

COMBINATION CASE	NEP OF SRSS				NEP OF 12 SRSS			
	1	2	3	4	1	2	3	4
126	76.0	73.5	71.0	67.1	95.0	95.5	94.0	95.8
127	51.0	47.5	47.5	49.4	95.0	86.0	86.0	90.3
128	63.0	72.5	72.5	68.7	90.0	92.5	92.5	94.5
129	79.0	78.5	78.5	77.0	94.0	93.5	93.5	93.1
130	56.0	49.5	53.5	45.0	99.0	95.0	97.0	97.7
131	37.0	21.0	29.5	20.4	94.0	89.5	91.0	91.5
132	69.0	48.5	53.5	50.0	98.0	97.5	94.5	95.3
133	61.0	41.0	47.0	39.8	94.0	87.5	87.5	84.6
134	59.0	63.5	63.5	69.5	88.0	88.0	88.0	89.7
135	73.0	73.5	73.5	74.5	94.0	95.5	95.5	95.1
136	93.0	94.0	93.0	88.3	98.0	99.0	99.5	99.0
137	94.0	97.0	94.5	92.8	99.0	99.5	100.0	99.5
138	99.0	92.5	92.5	96.6	100.0	99.5	99.5	99.5
139	74.0	54.0	65.0	66.9	96.0	90.0	92.0	95.5
140	87.0	58.0	81.0	80.2	95.0	87.0	93.5	90.8
141	80.0	44.5	63.5	62.0	100.0	94.0	98.5	96.3
142	80.0	66.5	74.0	70.7	97.0	97.0	96.5	95.3
143	99.0	84.0	97.0	98.7	100.0	94.0	100.0	99.3
144	91.0	71.0	86.0	91.9	96.0	91.0	94.5	96.2
145	87.0	75.5	81.5	81.1	98.0	96.0	96.0	87.2
146	90.0	57.5	79.0	78.1	97.0	91.5	97.0	95.7
147	76.0	44.0	44.0	49.0	96.0	91.0	91.0	92.5
148	90.0	90.0	90.0	92.6	100.0	100.0	100.0	100.0
149	98.0	88.0	88.0	92.7	100.0	97.5	97.5	99.3
150	85.0	89.0	89.0	89.6	98.0	98.5	98.5	99.5

COMBINATION CASE	NEP OF SRSS				NEP OF 1,2 SRSS			
	1	2	3	4	1	2	3	4
151	71.0	68.0	66.0	65.8	100.0	99.0	98.0	98.7
152	55.0	33.0	35.5	36.9	96.0	87.5	87.0	88.9
153	63.0	44.0	41.5	48.1	97.0	92.5	93.5	92.6
154	77.0	51.0	53.0	54.8	95.0	88.5	87.5	89.2
155	86.0	80.5	80.5	81.0	99.0	98.0	98.0	98.1
156	91.0	67.0	67.0	70.4	100.0	100.0	100.0	100.0
157	58.0	48.5	52.0	49.9	97.0	95.5	96.5	95.0
158	45.0	35.5	38.0	35.8	96.0	94.0	93.5	94.9
159	75.0	67.5	74.5	71.5	98.0	98.5	96.5	94.5
160	98.0	85.0	85.0	87.2	100.0	100.0	100.0	100.0
161	96.0	53.0	86.0	87.7	99.0	99.0	100.0	99.2
162	96.0	36.0	82.5	83.7	100.0	89.0	97.5	97.7
163	95.0	67.0	92.0	94.1	100.0	96.5	100.0	99.5
164	97.0	47.0	86.0	96.6	97.0	83.0	95.5	94.9
165	85.0	76.5	76.5	78.5	98.0	97.0	97.0	96.9
166	85.0	88.0	88.0	84.5	98.0	99.5	99.5	99.2
167	95.0	95.0	95.0	84.8	100.0	100.0	100.0	100.0

APPENDIX E
CDF CURVES OF THE COMBINATIONS

CUMULATIVE DISTRIBUTION FUNCTION-CASE 1

CUMULATIVE DISTRIBUTION FUNCTION-CASE 2

CUMULATIVE DISTRIBUTION FUNCTION-CASE 3

CUMULATIVE DISTRIBUTION FUNCTION-CASE 4

CUMULATIVE DISTRIBUTION FUNCTION-CASE 5

CUMULATIVE DISTRIBUTION FUNCTION-CASE 6

CUMULATIVE DISTRIBUTION FUNCTION-CASE 7

CUMULATIVE DISTRIBUTION FUNCTION-CASE 8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 9

CUMULATIVE DISTRIBUTION FUNCTION-CASE 10

CUMULATIVE DISTRIBUTION FUNCTION-CASE 11

CUMULATIVE DISTRIBUTION FUNCTION-CASE 12

CUMULATIVE DISTRIBUTION FUNCTION-CASE 13

CUMULATIVE DISTRIBUTION FUNCTION-CASE 14

CUMULATIVE DISTRIBUTION FUNCTION-CASE 15

CUMULATIVE DISTRIBUTION FUNCTION-CASE 16

CUMULATIVE DISTRIBUTION FUNCTION-CASE 17

CUMULATIVE DISTRIBUTION FUNCTION-CASE 18

CUMULATIVE DISTRIBUTION FUNCTION-CASE 19

CUMULATIVE DISTRIBUTION FUNCTION-CASE 20

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 21

CUMULATIVE DISTRIBUTION FUNCTION-CASE 22

CUMULATIVE DISTRIBUTION FUNCTION-CASE 23

CUMULATIVE DISTRIBUTION FUNCTION-CASE 24

CUMULATIVE DISTRIBUTION FUNCTION-CASE 25

CUMULATIVE DISTRIBUTION FUNCTION-CASE 26

CUMULATIVE DISTRIBUTION FUNCTION-CASE 27

CUMULATIVE DISTRIBUTION FUNCTION-CASE 28

CUMULATIVE DISTRIBUTION FUNCTION-CASE 31

CUMULATIVE DISTRIBUTION FUNCTION-CASE 32

B

CUMULATIVE DISTRIBUTION FUNCTION-CASE 29

CUMULATIVE DISTRIBUTION FUNCTION-CASE 30

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 33

CUMULATIVE DISTRIBUTION FUNCTION-CASE 34

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 35

CUMULATIVE DISTRIBUTION FUNCTION-CASE 36

CUMULATIVE DISTRIBUTION FUNCTION-CASE 39

CUMULATIVE DISTRIBUTION FUNCTION-CASE 40

CUMULATIVE DISTRIBUTION FUNCTION-CASE 41

CUMULATIVE DISTRIBUTION FUNCTION-CASE 42

CUMULATIVE DISTRIBUTION FUNCTION-CASE 43

CUMULATIVE DISTRIBUTION FUNCTION-CASE 44

CUMULATIVE DISTRIBUTION FUNCTION-CASE 45

CUMULATIVE DISTRIBUTION FUNCTION-CASE 46

CUMULATIVE DISTRIBUTION FUNCTION-CASE 47

CUMULATIVE DISTRIBUTION FUNCTION-CASE 48

CUMULATIVE DISTRIBUTION FUNCTION-CASE 49

CUMULATIVE DISTRIBUTION FUNCTION-CASE 50

CUMULATIVE DISTRIBUTION FUNCTION-CASE 51

CUMULATIVE DISTRIBUTION FUNCTION-CASE 52

CUMULATIVE DISTRIBUTION FUNCTION-CASE 53

CUMULATIVE DISTRIBUTION FUNCTION-CASE 54

CUMULATIVE DISTRIBUTION FUNCTION-CASE 57

CUMULATIVE DISTRIBUTION FUNCTION-CASE 58

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 59

CUMULATIVE DISTRIBUTION FUNCTION-CASE 60

CUMULATIVE DISTRIBUTION FUNCTION-CASE 61

CUMULATIVE DISTRIBUTION FUNCTION-CASE 62

CUMULATIVE DISTRIBUTION FUNCTION-CASE 63

CUMULATIVE DISTRIBUTION FUNCTION-CASE 64

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 65

CUMULATIVE DISTRIBUTION FUNCTION-CASE 66

CUMULATIVE DISTRIBUTION FUNCTION-CASE 67

CUMULATIVE DISTRIBUTION FUNCTION-CASE 68

CUMULATIVE DISTRIBUTION FUNCTION-CASE 69

CUMULATIVE DISTRIBUTION FUNCTION-CASE 70

CUMULATIVE DISTRIBUTION FUNCTION-CASE 71

CUMULATIVE DISTRIBUTION FUNCTION-CASE 72

CUMULATIVE DISTRIBUTION FUNCTION-CASE 73

CUMULATIVE DISTRIBUTION FUNCTION-CASE 74

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 75

CUMULATIVE DISTRIBUTION FUNCTION-CASE 76

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 77

CUMULATIVE DISTRIBUTION FUNCTION-CASE 78

CUMULATIVE DISTRIBUTION FUNCTION-CASE 79

CUMULATIVE DISTRIBUTION FUNCTION-CASE 80

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 81

CUMULATIVE DISTRIBUTION FUNCTION-CASE 82

CUMULATIVE DISTRIBUTION FUNCTION-CASE 83

CUMULATIVE DISTRIBUTION FUNCTION-CASE 84

CUMULATIVE DISTRIBUTION FUNCTION-CASE 85

CUMULATIVE DISTRIBUTION FUNCTION-CASE 86

CUMULATIVE DISTRIBUTION FUNCTION-CASE 87

CUMULATIVE DISTRIBUTION FUNCTION-CASE 88

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 89

CUMULATIVE DISTRIBUTION FUNCTION-CASE 90.

B

CUMULATIVE DISTRIBUTION FUNCTION-CASE 91

CUMULATIVE DISTRIBUTION FUNCTION-CASE 92

CUMULATIVE DISTRIBUTION FUNCTION-CASE 93

CUMULATIVE DISTRIBUTION FUNCTION-CASE 94

CUMULATIVE DISTRIBUTION FUNCTION-CASE 95

CUMULATIVE DISTRIBUTION FUNCTION-CASE 96

CUMULATIVE DISTRIBUTION FUNCTION-CASE 97

CUMULATIVE DISTRIBUTION FUNCTION-CASE 98

CUMULATIVE DISTRIBUTION FUNCTION-CASE 99

CUMULATIVE DISTRIBUTION FUNCTION-CASE 100

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 101

CUMULATIVE DISTRIBUTION FUNCTION-CASE 102

CUMULATIVE DISTRIBUTION FUNCTION-CASE 103

CUMULATIVE DISTRIBUTION FUNCTION-CASE 104

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 107

CUMULATIVE DISTRIBUTION FUNCTION-CASE 108

CUMULATIVE DISTRIBUTION FUNCTION-CASE 105

CUMULATIVE DISTRIBUTION FUNCTION-CASE 106

CUMULATIVE DISTRIBUTION FUNCTION-CASE 109

CUMULATIVE DISTRIBUTION FUNCTION-CASE 110

8

CUMULATIVE DISTRIBUTION FUNCTION-CASE 111

CUMULATIVE DISTRIBUTION FUNCTION-CASE 112

CUMULATIVE DISTRIBUTION FUNCTION-CASE 113

CUMULATIVE DISTRIBUTION FUNCTION-CASE 114

CUMULATIVE DISTRIBUTION FUNCTION-CASE 115

CUMULATIVE DISTRIBUTION FUNCTION-CASE 116

CUMULATIVE DISTRIBUTION FUNCTION-CASE 117

CUMULATIVE DISTRIBUTION FUNCTION-CASE 118

CUMULATIVE DISTRIBUTION FUNCTION-CASE 119

CUMULATIVE DISTRIBUTION FUNCTION-CASE 120

CUMULATIVE DISTRIBUTION FUNCTION-CASE 121

CUMULATIVE DISTRIBUTION FUNCTION-CASE 122

CUMULATIVE DISTRIBUTION FUNCTION-CASE 123

CUMULATIVE DISTRIBUTION FUNCTION-CASE 124

CUMULATIVE DISTRIBUTION FUNCTION-CASE 125

CUMULATIVE DISTRIBUTION FUNCTION-CASE 126

CUMULATIVE DISTRIBUTION FUNCTION-CASE 127

CUMULATIVE DISTRIBUTION FUNCTION-CASE 128

CUMULATIVE DISTRIBUTION FUNCTION-CASE 129

CUMULATIVE DISTRIBUTION FUNCTION-CASE 130

CUMULATIVE DISTRIBUTION FUNCTION-CASE 131

CUMULATIVE DISTRIBUTION FUNCTION-CASE 132

CUMULATIVE DISTRIBUTION FUNCTION-CASE 133

CUMULATIVE DISTRIBUTION FUNCTION-CASE 134

CUMULATIVE DISTRIBUTION FUNCTION-CASE 135

CUMULATIVE DISTRIBUTION FUNCTION-CASE 136

CUMULATIVE DISTRIBUTION FUNCTION-CASE 137

CUMULATIVE DISTRIBUTION FUNCTION-CASE 138

CUMULATIVE DISTRIBUTION FUNCTION-CASE 139

CUMULATIVE DISTRIBUTION FUNCTION-CASE 140

CUMULATIVE DISTRIBUTION FUNCTION-CASE 141

CUMULATIVE DISTRIBUTION FUNCTION-CASE 142

CUMULATIVE DISTRIBUTION FUNCTION-CASE 143

CUMULATIVE DISTRIBUTION FUNCTION-CASE 144

CUMULATIVE DISTRIBUTION FUNCTION-CASE 145

CUMULATIVE DISTRIBUTION FUNCTION-CASE 146

CUMULATIVE DISTRIBUTION FUNCTION-CASE 147

CUMULATIVE DISTRIBUTION FUNCTION-CASE 148

CUMULATIVE DISTRIBUTION FUNCTION-CASE 149

CUMULATIVE DISTRIBUTION FUNCTION-CASE 150

CUMULATIVE DISTRIBUTION FUNCTION-CASE 151

CUMULATIVE DISTRIBUTION FUNCTION-CASE 152

CUMULATIVE DISTRIBUTION FUNCTION-CASE 153

CUMULATIVE DISTRIBUTION FUNCTION-CASE 154

CUMULATIVE DISTRIBUTION FUNCTION-CASE 155

CUMULATIVE DISTRIBUTION FUNCTION-CASE 156

CUMULATIVE DISTRIBUTION FUNCTION-CASE 157

CUMULATIVE DISTRIBUTION FUNCTION-CASE 158

CUMULATIVE DISTRIBUTION FUNCTION-CASE 159

CUMULATIVE DISTRIBUTION FUNCTION-CASE 160

CUMULATIVE DISTRIBUTION FUNCTION-CASE 161

CUMULATIVE DISTRIBUTION FUNCTION-CASE 162

CUMULATIVE DISTRIBUTION FUNCTION-CASE 163

CUMULATIVE DISTRIBUTION FUNCTION-CASE 164

CUMULATIVE DISTRIBUTION FUNCTION-CASE 165

CUMULATIVE DISTRIBUTION FUNCTION-CASE 166

CUMULATIVE DISTRIBUTION FUNCTION-CASE 166

CUMULATIVE DISTRIBUTION FUNCTION-CASE 167

NRC FORM 335 (11-81)		U.S. NUCLEAR REGULATORY COMMISSION BIBLIOGRAPHIC DATA SHEET		1. REPORT NUMBER (Assigned by DDC) NUREG/CR-2686 BNL-NUREG-51530	
4. TITLE AND SUBTITLE (Add Volume No., if appropriate) Review of Load Combinations for NSSS and BOP Piping and Equipment of Mark III Plants				2. (Leave blank)	
7. AUTHOR(S) A. J. Philippacopoulos, M. Reich, P.C. Wang				3. RECIPIENT'S ACCESSION NO.	
9. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code) Brookhaven National Laboratory Upton, New York 11973				5. DATE REPORT COMPLETED MONTH YEAR February 1982	
12. SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code) Division of Engineering Office of Nuclear Reactor Regulation U.S. Nuclear Regulatory Commission Washington, DC 20555				6. (Leave blank)	
13. TYPE OF REPORT Technical Report				7. (Leave blank)	
15. SUPPLEMENTARY NOTES				8. (Leave blank)	
16. ABSTRACT (200 words or less) This report describes a review conducted by the Structural Analysis Division of Brookhaven National Laboratory (BNL) for the Mechanical Engineering Branch of the Nuclear Regulatory Commission (MEB/NRC) on combinations of dynamic responses related to Nuclear Steam Supply System (NSSS) and Balance-of-Plant (BOP) piping and equipment components of Mark III plants. A total of 167 combination cases were considered. The response combinations reviewed in this report were compiled by Structural Mechanics Associates for the General Electric Company, using time-histories and other technical data supplied by various architect-engineering firms working for the Mark III containment owners. The objective of the (BNL) review was to verify the results presented by SMA.				10. PROJECT/TASK/WORK UNIT NO.	
17. KEY WORDS AND DOCUMENT ANALYSIS Dynamic responses, Response Combinations, Mark III responses				11. FIN NO. A3358	
17a. DESCRIPTORS				14. (Leave blank)	
17b. IDENTIFIERS/OPEN-ENDED TERMS					
18. AVAILABILITY STATEMENT Unlimited		19. SECURITY CLASS (This report) Unclassified		21. NO. OF PAGES	
		20. SECURITY CLASS (This page)		22. PRICE \$	

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

POSTAGE AND FEES PAID
U.S. NUCLEAR REGULATORY
COMMISSION