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March 29, 1988
4410-88-L-0042/0135P

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Dear Sirs:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Canister Handling and Preparation for Shipment
Safety Evaluation Report

Attached for your information are revised pages 13, 14, 31-39 to the Safety Evaluation Report for Canister Handling and Preparation for Shipment. This revision reflects the deletion of the restriction requiring use of borated water to spray the defueling canisters during transfer from Fuel Pool "A". The deletion of this restriction was approved by the NRC via letter NRC/TMI-87-085 dated December 4, 1987, in response to GPU Nuclear letter 4410-87-L-0180, dated December 2, 1987.

Sincerely,

F. R. Standerfer
Director, TMI-2

RDW/emf

Attachment

cc: Senior NRC Resident Inspector, TMI - R. J. Conte
Regional Administrator, Region 1 - W. T. Russell
Director, Project Directorate IV - J. F. Stolz
System Engineer, TMI - L. H. Thonus

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SAFETY ANALYSIS

SA No. 4350-3256-85-1

Rev. No. 6

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TITLE

CANISTER HANDLING AND

PREPARATION FOR SHIPMENT

Originator M.O. Smith Date 3/14/88

CONCURRENCE

Lead Engineer [signature] Date 3/16/88 SRG [signature] Date 3-18-88

RTR [signature] Date 3/16/88

Design Cognizant Engineer [signature] Date 3/16/88 Rad Con [signature] Date 3-21-88

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APPROVAL

Mgr Eng. Section [signature] Date 3/16/88 Site Ops Director [signature] Date 3/23/88

FORM 4000-ENG-7310.09-1 (12/87)

GPU Nuclear	No. 4350-3256-85-1
Title Safety Evaluation Report for Canister Handling and Preparation for Shipment	

Rev.	SUMMARY OF CHANGE	Approval	Date
0	Issued for use.		12/85
1	Revised to incorporate site comments: added reference to SAR for transportation of core debris, revised canister monitoring and integrity verification section, noted the FHB crane modifications, and revised section on seimsic design.		1/86
2	Revised commitment pertaining to closing of FHB missile shield door, corrected lowering speeds for canister from transfer cask.		2/86
3	Revised to incorporate more detail on canister and shield plug lifting systems, provide more detail on canister dewatering, increase discussion on heavylead drops, add detail on railcar jacking system, and add discussion on truck bay fire hazards.		5/86
4	Revised to reflect the pressure in a "worst-case" canister "ready for shipment" following a one-year buildup of radio lytic gases and the canister dewatering criterion for determining the dewatered canister void volume.		4/87
5	Revised Section 2.3.1 to delete redundancy regarding canister dewatering and weighing. Revised Section 2.3.2 to delete the estimated holding time for canisters and revise Section 3.2 to delete the 5% restriction on the number of canisters weighing greater than 2800 pounds.		5/87
6	Revised Sections 2.4, 3.1, 6.2, and 11.0 to delete the restriction on use of borated water for spraying canister during transfer from Spent Fuel Pool "A".		3/88

FORM 4000-ENG-7310.06-2 (11/83)

2.4 Transfer of Canisters

Following final checks and preparations, the canister is moved to the FTC loading station by the FHB CHB. A single canister is placed in the support rack in the loading station. The FTC is rigged to the FHB 110 ton crane and the mini hot cell (MHC) is used to remove the first shield plug from the shipping cask. The MHC is moved by the work platform jib crane from its work platform storage location and placed on the SCLC following alignment of the SCLC to the proper shipping cask cavity. When the MHC is in place, an interlock allows opening of the SCLC foot valve (sliding door). The SCLC foot valve is opened and the MHC grapple is lowered, engaged to the shield plug, and raised, bringing the shield plug into the MHC. The SCLC foot valve is then closed and the MHC is returned to its storage location on the work platform with the shield plug.

The FTC is moved from its storage stand in the truck bay to the FTC loading station by the FHB 110 ton crane following the designated load path. The FTC is placed on its alignment plate on the loading station and the power source is connected. The FTC bottom doors are then opened and the grapple is lowered and engaged to the canister.

The transfer of the canister now begins with the raising of the canister into the FTC. The canister is raised at a speed of no greater than 1 foot per minute (fpm). As the canister breaches the surface of the pool water, it is sprayed with demineralized water. When the canister clears the spray pattern the spray is stopped and the canister is allowed to drip for at least 2 minutes prior to closing the FTC bottom doors. If the Defueling Water Cleanup System is not being continuously operated during this evolution, daily local dip samples of Spent Fuel Pool "A" shall be obtained in order to determine the boron concentration (References 18 and 19).

The FTC with the canister is then disconnected from its power source and moved through the designated load path to the shipping cask. At the shipping cask the FTC is aligned to the SCLC over the proper shipping cask cavity. When the FTC is in place and power is connected, an interlock allows the opening of the SCLC foot valve. The SCLC foot valve is opened and the FTC bottom doors are opened. The canister is lowered at the unit's nominal speed of no greater than 10 fpm. When the bottom of the canister is at least one foot before contacting the impact limiter, the unit's speed shifts automatically to no greater than 1 fpm until the canister rests on the impact limiter. It is unlikely that binding will occur during the lowering of the canisters into the shipping cask. However, the distance the canisters have been lowered can be determined by the height encoder provided for verification that the canister has "bottomed out." The FTC grapple is unloaded when the load cell indicates that the canister is resting in the shipping cask. This allows the grapple to be disengaged and retracted, the SCLC foot valve is closed and the FTC bottom doors are closed. Power to the FTC is disconnected and the FTC is then moved back to the loading station to pick up another canister. The MHC, with shield plug, is placed back on the SCLC, the foot valve is opened, the shield plug replaced and the foot valve closed.

To prepare for the next canister the MHC is lifted from the SCLC, the SCLC is rotated and aligned to the next of the six outer shipping cask cavities. The center shipping cask cavity may be accessed at any SCLC orientation by reversing the operation of the foot valve. Again, the MHC is used in the same manner as above to remove the shield plug, and the MHC is moved to its storage stand on the work platform.

3.0 DESCRIPTION OF EQUIPMENT

3.1 Fuel Transfer Cask Loading Station

The FTC loading station platform and Canister Loading and Decontamination (CLD) System are designed to be used during the loading of fuel canisters into the FTC and to provide a means of decontaminating the canisters during the loading operation. Once a canister has been prepared for shipping it will be placed into a single canister guide under the loading platform by the FHB CHB. The FTC will then be placed on the loading platform and aligned to the canister below by an alignment plate on the top of the platform. The FTC grapple will then be lowered to the canister and engaged. As the canister is lifted by the FTC canister lifting system into the FTC, it will be sprayed by the CLD system with demineralized water. The region where the decontamination spraying is performed is provided with vertical shielding between the bottom of the FTC and the surface of the pool water. The FTC will then transport the canister to the truck bay for loading into the shipping cask.

The upper platform of the FTC loading station will provide an equivalent of three (3) inches of lead shielding on the deck and one (1) inch of vertical lead shielding supported from the south edge of the platform.

The structural portions of the FTC loading station are constructed of stainless steel and are designed in accordance with the ASME Boiler and Pressure Vessel Code, Section III, Division 1, 1977 edition. The ASME code is used since the AISC manual of steel construction is not applicable to stainless steel construction. The piping and spray ring are designed in accordance with ANSI B31.1, 1983.

The FTC loading station is braced to the defueling water cleanup system hose platform and to the load test fixture on the wall of fuel pool 'A', for stability. The vertical column support legs are shimmed as required to ensure proper bearing on the fuel pool 'A' floor. The top surface of the platform consists of an adjustable alignment plate to mate with the FTC and align it to the canister below.

3.2 Fuel Transfer Cask

The FTC is a lead shielded, bottom loaded, cylindrical cask capable of raising/lowering, fully enclosing and transporting a single defueling canister. An integrally mounted, shielded bottom door provides the final closure of the cask during transport from the loading point in fuel pool 'A' and the unloading point in the truck bay.

The FTC is approximately 17 feet - 6 inches high, on a 5 foot - 2 inch by 4 foot - 3 inch base, and weighs approximately 40,600 pounds when loaded with a defueling canister.

The design features of the canisters and the handling equipment make the potential for a leak very small. It is expected, under design drop conditions, that no leakage will occur. If leakage does occur as a result of dropping a canister into the shipping cask the resulting off-site dose would be bounded by the analysis discussed in Section 5.2.2. Due to the presence of the impact limiters it is not considered credible that the shipping cask would be damaged due to a canister/grapple drop.

Further, an analysis has been performed to determine the effects on the truck bay floor slab due to the drop of a defueling canister/grapple into the shipping cask. This analysis showed that the structural integrity of the slab would not be impaired. Furthermore, little if any damage to the floor slab would result due to this drop.

In the event of a canister drop into the shipping cask, both the canister and shipping cask will be evaluated to verify their acceptability for shipment.

6.2 Criticality

The analyses presented in the criticality report (Reference 13) and the boron dilution report (Reference 14) demonstrate that any fuel debris configuration will remain subcritical if the debris is in water which is at a boron concentration of 4350 ppm or greater. Since fuel pool 'A' is maintained at a boron concentration of greater than 4350 ppm, any postulated accident which results in a reconfiguration of the fuel debris (e.g., canister damage) will not cause criticality within fuel pool 'A'. Since each canister is transferred individually, only an accident in fuel pool 'A' can result in damage to more than one canister. The use of demineralizer water for canister decontamination during transfer of a loaded canister into the FTC has been evaluated in References 18 and 19, and has been determined to be within the guidelines of the Boron Hazards Analysis (Reference 14) and will not increase the criticality potential of the Spent Fuel Pool.

Evaluations have also been performed which demonstrate that an undamaged canister can be transferred in the fuel transfer cask (surrounded by a lead reflector) and not cause the k_{eff} of the canister contents to exceed 0.95 (Reference 15).

6.3 Seismic Event

In general, equipment that is used or staged in the truck bay, including storage stands associated with the transfer and off-site shipment of defueling canisters, is designed such that the design basis seismic event will not cause that equipment to fail/collapse in such a way as to cause damage to Unit 1 safe shutdown equipment or systems. An evaluation was performed for canister and cask handling activities in the truck bay area to estimate the probability of the failure of equipment and structures used to perform the activity concurrent with the postulated seismic event. When the probability and/or consequences were acceptable, no seismic analysis was performed. The fuel handling building crane is designed to withstand the design basis seismic event, while retaining its design rated load, per the TMI-1 Final Safety

Analysis Report. Additionally, analyses of the truck bay with fuel shipping equipment installed has been performed to ensure the truck bay floor can withstand the loads imparted to it, for all load cases. Due to the low probability of a seismic event during the period when the FTC is stacked on the SCLC and shipping cask the seismic analyses will not include this case.

The MHC jib crane will be seismically designed structurally; however, it will not be seismically qualified when loaded. Additionally, the cask righting system and CUS are not designed to withstand a seismic event while raising or lowering the shipping cask/skid. These determinations were made due to the very low probability of the occurrence of a seismic event while the jib crane is moving a heavy load or the cask righting system or CUS is raising or lowering the cask.

The FTC loading station is classified as non-seismic, since the failure of the FTC loading station during a seismic event will not create any safety concerns.

6.4 Fire Hazards Analysis

The present fire analysis for this area (Zone 2) of the Fuel Handling Building includes the 305' Model Room, the 328', the 347' and the Truck Bay. The Model Room is technically a separate fire area from the remainder of the building but since the Atlas Door between the Model Room and the Truck Bay is normally open, it is included in the general area.

6.4.1 Characterization/Classification of Combustibles

Zone 2 of the Fuel Handling Building contains predominately ordinary combustibles, IEEE 383 qualified fire resistant cable, some cable not qualified per IEEE 383, rubber (various types) hoses, and lubricants contained in as built and recovery components/systems. The most significant fire problem in Zone 2 is the DOE Trailer (sprinkler protected) in the Model Room.

6.4.2 Location of Combustibles

The present fire loading is distributed between the 305' Model Room and the 347' Fuel Pool. The truck bay and dock contains few combustibles.

6.4.3 Fire Protection Features

The individual elevations have been pre-planned.

The Model Room and Fuel Pool have fire detection and hose standpipe systems. The Model Room Atlas Door to the Truck Bay could be shut if necessary to reduce combustibles. These and other fire protection features are shown on the attached pre-plan sketches (see figures 6-1 through 6-4). Also, Unit 1 erected the Environmental Barrier using a 2 hour fire rated design with seals rated at 3 hours However, the wall and seals are not subject to fire surveillance.

6.4.4 Fire Loading

The present fire loading for Zone 2 is 3.09 X 10^8 BTU or 13,800 BTU/ft^2. This equates to approximately a 10 minute fire loading with a peak temperature of approximately 1300°F (based on ASTM E119 Time Temperature Curve). An administrative limit of 80,000 BTU/ft^2 has been established (limit prior to additional reviews for fixed suppression modifications or compensatory measures such as firewatches). This 80,000 BTU/ft^2 limit represents approximately a 1 hour fire load with a maximum temperature of 1700°F.

6.4.5 Conclusions

- o The fire loads in the truck bay are presently very low with the principle concentration in the Model Room which can be isolated from the truck bay.
- o The installed detection system would provide notification of a fire to enable prompt extinguishment by the fire brigade.
- o The Environmental Barrier is of a 2 hour fire rated design and provides separation from TMI-1 with exception of the 347'.

7.0 IMPACT ON UNIT 1

Although the fuel handling building crane and the truck bay are shared by the two units, their use by one unit or the other will be determined by operational considerations on a case by case basis.

Because the Unit 1 and Unit 2 FHB both join a common area in the truck bay the activities described in this SER have been evaluated for the possible radiological impact on Unit 1. The following concerns were considered: liquid release, airborne release, and direct radiation.

The activities described in this SER do not present a credible potential for radioactive liquid release to Unit 1. Any transfer of liquid, such as by the dewatering system, is controlled and maintained within the Unit 2 FHB. Since the activities described in this SER are not expected to generate significant quantities of airborne radioactivity, no increase in airborne radioactivity in Unit 1 is expected.

During loading of the defueling canisters into the shipping cask, however, the canister sources may increase the gamma dose rates in the Unit 1 FHB. To minimize the impact on Unit 1 operations and personnel exposures, operations in Unit 2 will be carried out in such a fashion, that the expected dose rate in Unit 1 from Unit 2 activities will not exceed 2.5 millirem/hr. The truck bay is normally considered part of Unit 1, however no Unit 1 work will be performed in the truck bay area when Unit 2 fuel shipment activities are being performed, without approved procedures. Consequently, for the purpose of this dose assessment, the Unit 1/Unit 2 boundary was considered to be at the interface between accessible areas of the Unit 1 FHB and the truck bay. Specific points of interest are the 347'-6" el. of the Unit 1 FHB, the open stairway on the Unit 1 side of the truck bay, and the environmental barrier. The environmental barrier is an unshielded structure in the north side of the truck bay which provides a separation of the Unit 1 and Unit 2 atmospheres below the 347'-6" elevation.

The canister source term used to calculate the dose rates at the Unit 1/ Unit 2 boundaries was more conservative than that used to predict average dose rates to workers in Unit 2. Previous analyses were done to develop best estimates of anticipated dose rates. The analyses of Unit 1 dose rates were done to determine the maximum credible dose rate. Therefore, the source term used to predict Unit 1 dose rates included conservative parameters not used to provide best estimate average dose rates. These parameters use a maximum amount of cobalt-60 expected based on B&W material assay of cobalt-59 present in core structural materials and use of hot channel factor of 1.9 to account for areas of the core where higher specific activity of radioactive materials may occur. Other conservative parameters used in previous analyses, e.g., maximum loaded canister and no shielding credit for the canister or its internal structures, were maintained in the model used to determine the maximum credible dose rate in Unit 1.

Activities carried out within the confines of fuel pool 'A' will not affect dose rates in Unit 1, due to the distance to Unit 1, and the shielding provided by fuel pool 'A' concrete walls.

Canisters are transferred from the FTC loading platform to the shipping cask via the FTC. The canister is loaded into the FTC at the FTC loading station. The FTC is then moved along the west side of the FHB to the truck bay where it is lowered onto the shipping cask loading collar. The maximum dose rate at locations in Unit 1 from a single canister loaded in the FTC are given below for the following scenarios:

Activity	Dose Rates
FTC during transfer	1.6 millirem/hr at Unit 1 FHB el 347
FTC during transfer	1.7 millirem/hr at environmental barrier
FTC during transfer	1.7 millirem/hr at Unit 1 stairwell
FTC on shipping cask	0.3 millirem/hr at environmental barrier
FTC on shipping cask	1.7 millirem/hr at Unit 1 stairwell

In addition, the shipping cask may contain up to 7 canisters. The shipping cask was designed to meet Department of Transportation regulations for shipment on public highways. These requirements include a limit of 10 millirem/hour, 6.6 feet from the cask. The cask was designed to ensure that this limit would not be exceeded. The highest calculated dose rate from a fully loaded shipping cask was 6.3 millirem/hr at a distance of 6.6 feet (Reference 5). The total dose rate from a fully loaded shipping cask or from the FTC with a single canister and a shipping cask with up to six canisters is expected to be 2.5 millirem/hour or less at all accessible areas in Unit 1.

In conclusion, the activities described in this SER can be performed without an unacceptable increase in personnel exposure in Unit 1.

In addition, access to the FHB is gained via the FHB truck bay door. The aircraft missile shield for this door is controlled by Unit 1. Access to the

FHB is frequently required during normal plant operations; therefore, Unit 2 use of this door for fuel shipping activities will not affect normal operation of Unit 1.

Section 6.0 of this SER demonstrates that the activities described in this SER will not have an unacceptable impact on the safe operation of TMI-1.

8.0 UNREVIEWED SAFETY QUESTION EVALUATION (10 CFR 50.59)

10 CFR 50, Paragraph 50.59, permits the holder of an operating license to make changes to the facility or perform a test or experiment, provided the change, test, or experiment is determined not to be an unreviewed safety question and does not involve a modification of the plant technical specifications.

10 CFR 50, Paragraph 50.59, states a proposed change involves an unreviewed safety question if:

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report may be increased; or

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report may be created; or

c. The margin of safety, as defined in the basis for any technical specification, is reduced.

Canister handling and preparation for shipping is similar to normal spent fuel handling and shipping preparation. However, due to the nature of the TMI-2 fuel, certain additional activities are required that are not part of normal defueling activities. These activities include movement of canisters to a dewatering station, dewatering of canisters, weighing of canisters, and the use of a loading station and transfer cask. Normal fuel shipping activities place the shipping cask in the spent fuel pool whereas TMI-2 will use the FTC to move fuel canisters to the shipping cask located in the FHB truck bay. Although both activities are basically similar, minor variations exist. The planned activity is assessed below.

Transfer to the dewatering station, final dewatering, weighing, and transfer to the loading station are accomplished either underwater or within the canister transfer shield and involve a single canister. The types of activities required for this process are similar to those described in Reference 2 and the safety aspects of heavy load handling in fuel pool A are addressed in the SER for Heavy Load Handling Inside Containment (Reference 3). Additionally, dewatering activities are similar to the dewatering performed for SDS vessels.

The loading of the fuel canisters into the shipping cask is similar to normal fuel shipping activities. Fuel canisters are loaded into the FTC in fuel pool "A" and transported to the truck bay via a specified load path. This operation is similar to spent fuel transfer from the fuel racks to a shipping cask. The proposed activity varies from normal in that normally fuel bundles are loaded into a shipping cask under water where the proposed activity loads a single canister into the FTC which is above water. However, the canister is raised directly into the FTC from a submerged position and the FTC is shielded to compensate for the loss of water shielding. Additionally, as stated in this SER, the FTC is designed to meet NUREG-0612 and to provide single failure proof protection against the drop of a canister during transport. The movement of the FTC to the FHB truck bay is along a safe load path, as defined by Section 5.1.1 of NUREG-0612. Although the dropping of a canister is not considered to be a credible event, the consequences of a drop have been evaluated and are bounded by the analysis presented in Reference 11.

The loading of canisters into the canister shipping cask from the FTC may be compared to the loading of fuel assemblies into a shipping cask underwater. In each case the entire operation is shielded, the first by lead and the second by water. Note that the proposed fuel shipping activities involve more transfers from the fuel pool to the FHB Truck Bay than normal fuel shipping since only one canister is transferred at a time. The proposed loading operation is heavily shielded via the design of the FTC and the SCLC. Additionally, accidents involving more than one canister are precluded by design features. The canister shipping cask is designed to comply with the requirements of 10 CFR 71.63(b). The cask restraint system is designed to keep the cask upright under seismic conditions; since a drop of the FTC onto the canister shipping cask is not considered credible, an accident involving more than one canister in the shipping cask is not considered credible. However, the consequences of postulated events have been analyzed and are bounded by the analysis presented in Reference 11.

10 CFR 50.59 REVIEW

To determine if canister handling and preparation for shipment activities involve an unreviewed safety question, three questions must be evaluated.

Has the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report been increased?

A variety of events have been postulated in this SER. It has been demonstrated that these events are bounded by events in several documents previously submitted to the NRC. By analyzing the postulated events, it has been demonstrated that canister handling and shipping preparation activities will not increase the probability of occurrences or the consequences of an accident or malfunction of equipment important to safety over those previously evaluated.

Has the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report been created?

This SER considers the spectrum of event types which potentially could occur during canister handling and preparation for shipment and compares these activities to those associated with a 'normal' refueling and with similar activities in previously submitted SER's. These evaluations demonstrate that the type events postulated in this SER are similar to and are bounded by previous SER's and the TMI-2 Final Safety Analysis Report (TMI-2 FSAR). Therefore, the canister handling and preparation for shipping process has not created the possibility of occurrence of an accident or malfunction of a different type than evaluated in previously docketed licensing submittals.

Has the margin of safety, as defined in the basis for any technical specification been reduced?

Technical Specification safety margins at TMI are concerned with criticality control and releases to the environment. As demonstrated by this Safety Evaluation Report, Technical Specification safety margins will be maintained throughout fuel handling and fuel shipping preparations. Subcriticality is maintained by design of the canisters, the FTC, and the shipping cask. Potential releases to the environment are limited by design of the canisters and casks and by the FHB ventilation system and are bounded by previously submitted SERs.

SUMMARY

In conclusion, the canister handling and preparation for shipment activities do not:

- o increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the TMI-2 FSAR and SER's, or
- o create the possibility for an accident or malfunction of a different type than any evaluated previously in the TMI-2 FSAR, or
- o reduce the margin of safety as defined in the basis for any technical specification.

Therefore, the canister handling and preparation for shipment activities do not constitute an unreviewed safety question. Furthermore, no Technical Specification changes are required to conduct the activities bounded by this SER.

9.0 ENVIRONMENTAL ASSESSMENT

The activities associated with canister handling and preparation for shipment have been assessed and it has been concluded that these activities will be performed with no unacceptable consequences to the health and safety of the public or workers.

Releases to the public resulting from planned canister handling activities are not expected to be significant. Past releases of radioactivity to the environment have been well within the limits of the TMI-2 Environmental Technical Specification. Specifically regarding the potential for a tritium release, Section 5.2.1 states why releases to the environment will not be significant. In order to further limit the potential for environmental releases due to canister handling, loose contamination will be removed by spraying the canisters, the FTC bottom doors will be closed during canister transfer and the canisters will be sealed during all handling activities.

A single accident with the potential for off-site dose consequences has been evaluated. This accident is the dropping of a defueling canister. The analysis of this accident was performed using extremely conservative assumptions in order to provide bounding results. Using the conservative assumptions the results were found to be within past analyses that have been found to have acceptable consequences. The canister drop resulted in doses that were less than a fuel handling accident as described in the TMI-2 FSAR.

Therefore, the planned activities will be performed with no significant environmental impact.

10.0 CONCLUSION

The descriptions and evaluations presented in this SER demonstrate that activities associated with fuel canister handling and preparation for shipment will be performed in a safe manner. Accident conditions will not result in a criticality event nor will they cause site release levels which exceed allowable limits. Normal site releases are also shown to be within allowable limits. Consequently it can be concluded that the activities described in the SER can be performed without unacceptable risk to the health and safety of the public.

11.0 REFERENCES

1. NRC Letter from B. J. Snyder to B. K. Kanga dated January 5, 1984.

2. Safety Evaluation Report for Defueling of the TMI-2 Reactor Vessel, 4350-3261-85-1, Revision 10, May 5, 1986.

3. Safety Evaluation Report for Heavy Load Handling Inside Containment, 4350-3153-85-1, Revision 3, June 2, 1986.

4. NRC Letter from J. F. Stolz to H. D. Hukill dated January 11, 1985.

5. Safety Analysis Report for the NuPac 125-B Fuel Shipping Cask, Revision 2, May 1985.

6. NRC Generic Letter 81-07, "Control of Heavy Loads", December 22, 1980.

7. NRC Letter from B. J. Snyder to G. K. Hovey dated February 27, 1981.

8. NRC Generic Letter 85-11, Completion of Phase II of "Control of Heavy Loads at Nuclear Power Plants" NUREG 0612, June 28, 1985.

9. NRC Letter from B.J. Snyder to F.R. Standerfer dated July 17, 1985.

10. Evaluation of Heavy Load Handling Operations at TMI-1, Fuel Handling Building, November 16, 1983, TERA Corporation.

11. Safety Evaluation Report Supporting Exemption from Seismic Design Requirements, SA #4430-7322-85-1, Revision 0, April 1985.

12. TMI-2 Defueling Canisters Final Design Technical Report, B&W Document 77-1153937-05, March 1986.

13. Criticality Report for the Reactor Coolant System, Revision 0, October 1984.

14. Hazards Analysis: Potential for Boron Dilution of Reactor Coolant System, Revision 2.

15. Technical Evaluation Report for Defueling Canisters, 3527-016, Revision 2, March 1986.

16. Safety Analysis Report for Transportation of TMI-2 Core Debris to INEL, September 1985.

17. Evaluation of Special Safety Issues Associated with Handling the TMI-2 Core Debris GEND-051, Rockwell Handford Operations, June 1985.

18. GPU Nuclear letter 4410-87-L-0180, dated December 2, 1987, "Safety Evaluation Report for Use of Non-Borated Water in the Canister Loaded Decontamination System."

19. NRC/TMI-87-085, dated December 4, 1987, "Safety Evaluation Report for Use of Non-Borated Water in the Canister Loaded Decontamination System."