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US Nuclear Regulatory Commission
Washington, DC 20555

Dear Sirs:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
10 CFR 50.59 Report for 1986

In accordance with the requirements of 10 CFR 50.59, "Changes, Tests, and Experiments," forwarded herein is a description of changes to facility systems and procedures described in the TMI-2 Final Safety Analysis Report (FSAR) which were effected during 1986. Also included is a summary of tests and experiments performed that are not described in the FSAR.

Sincerely,


F. R. Standerfer
Director, TMI-2

FRS/RDW/eml

Attachments

cc: Regional Administrator - Region 1, Dr. T. E. Murley
Director - TMI-2 Cleanup Project Directorate, Dr. W. D. Travers

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RECOVERY ACTIVITIES

During 1986 a number of plant recovery activities were performed. Many of these activities combined modifications, procedural changes, and tests or experiments. All of these activities were subject to numerous GPU Nuclear reviews and approvals. In addition, certain activities were subject to NRC review and approval prior to implementation. Changes to previously approved activities are submitted to the NRC for information under the yearly update program for Technical Evaluation Reports and System Descriptions. Updates to NRC-approved Safety Evaluation Reports are submitted on a "as needed" basis. Since the documentation for the activities listed previously was submitted to the NRC, the activities will not be discussed further in this report.

- o Auxiliary and Fuel Handling Building Decontamination

Changes to this program are provided in accordance with a quarterly update program. Updates submitted via GPU Nuclear letters 4410-86-L-0004 dated January 15, 1986; 4410-86-L-0065 dated April 14, 1986; 4410-86-L-0120 dated July 14, 1986; and 4410-86-L-0183 dated October 15, 1986.
- o Reactor Building Decontamination and Dose Reduction

Changes to this program are covered by updates to the Safety Evaluation Report. Updated information was submitted via GPU Nuclear letter 4410-86-L-0042 dated March 28, 1986.
- o EPICOR II

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Update submitted via GPU Nuclear letter 4410-86-L-0069 dated April 29, 1986.
- o Interim Solid Waste Staging Facility

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Update submitted via GPU Nuclear letter 4410-86-L-0110 dated June 26, 1986.
- o Processed Water Storage and Recycle System

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Update submitted via GPU Nuclear letter 4410-86-L-0169 dated October 1, 1986.

- o Reactor Building Sump Recirculation System

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Update submitted via GPU Nuclear letter 4410-86-L-0087 dated May 29, 1986.
- o Solid Waste Staging Facility

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Update submitted via GPU Nuclear letter 4410-86-L-0121 dated July 14, 1986.
- o Submerged Demineralizer System

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Update submitted via GPU Nuclear letter 4410-86-L-0125 dated August 29, 1986.
- o Core Region Defueling

Primary information forwarded via GPU Nuclear letters 4410-86-L-0049 dated May 15, 1986; 4410-86-L-0085 dated May 20, 1986; and 4410-86-L-0094 dated June 2, 1986. Project approved via NRC letter dated July 24, 1986.
- o Canister Handling and Preparation for Shipment System

Primary information forwarded via GPU Nuclear letters 4410-86-L-0010 dated February 17, 1986 and 4410-86-L-0099 dated June 11, 1986. Project approved via NRC letter dated June 20, 1986. Additional information submitted via GPU Nuclear letter 4410-86-L-0193 dated November 10, 1986.
- o Defueling Using The Core Stratification Equipment

Primary information forwarded via GPU Nuclear letters 4410-86-L-0123 dated July 23, 1986 and 4410-86-L-0162 dated September 19, 1986. Project approved via NRC letter dated October 16, 1986.
- o End Fitting Storage

Primary information forwarded via GPU Nuclear letters 4410-86-L-0132 dated August 16, 1986 and 4410-86-L-0160 dated September 9, 1986. Project approved via NRC letter dated September 10, 1986.

- o Pressurizer Spray Line
Defueling System

Primary information forwarded via GPU Nuclear letter 4410-86-L-0191 dated November 26, 1986. Project approved via NRC letter dated December 22, 1986.
- o Reactor Building Sump
Criticality

Primary information forwarded via GPU Nuclear letters 4410-86-L-0009 dated January 23, 1986; 4410-86-L-0082 dated May 26, 1986 and 4410-86-1-0157 dated September 5, 1986. Project approved via letter dated September 11, 1986.
- o Reactor Vessel Water
Cleanup System

Primary information forwarded via GPU Nuclear letter 4410-86-L-0066 dated April 17, 1986. Project approved via NRC letter dated April 24, 1986.
- o Sediment Transfer System

Primary information forwarded via GPU Nuclear letters 4410-86-L-0006 dated March 18, 1986 and 4410-86-L-0083 dated June 4, 1986. Project approved via NRC letter dated September 25, 1986.
- o Temporary Reactor Vessel
Filtration System

Primary information forwarded via GPU Nuclear letters 4410-86-L-0029 dated February 2, 1986; 4410-86-L-0047 dated March 6, 1986; and 4410-86-L-0063 dated April 14, 1986. Project approved via NRC letter dated April 18, 1986.
- o Ultrahigh Pressure Water
Flush System

Primary information forwarded via GPU Nuclear letters 4410-86-L-0043 dated March 14, 1986 and 4410-86-L-0034 dated March 18, 1986. Project approved via NRC letter dated July 16, 1986.
- o Core Stratification Sample
Acquisition

Changes to this program are covered by updates to Safety Evaluation Reports. Updated information was submitted via GPU Nuclear letters 4410-85-L-0248 dated December 31, 1985; 4410-86-L-0077 dated May 13, 1986; 4410-86-L-0101 dated June 11, 1986; 4410-86-L-0091 dated June 23, 1986; 4410-86-L-0122 dated July 11, 1986; and 4410-86-L-0127 dated July 21, 1986. Project approved via NRC letters dated May 5, 1986; May 28, 1986; June 19, 1986; July 16, 1986; and July 25, 1986.

- o Defueling Canisters

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Update submitted via GPU Nuclear letter 4410-86-L-0039 dated March 6, 1986.
- o Defueling Canister Dewatering System

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Update submitted via GPU Nuclear letter 4410-86-L-0108 dated July 12, 1986.
- o Defueling Water Cleanup System

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Updates submitted via GPU Nuclear letters 4410-86-L-0011 dated February 7, 1986; 4410-86-L-0104 dated June 30, 1986; and 4410-86-L-0173 dated September 26, 1986.
- o Fuel Canister Storage Racks

Changes to this program are covered by the annual update program for System Descriptions and Technical Evaluation Reports. Update submitted via GPU Nuclear letter 4410-86-L-0086 dated May 29, 1986.
- o Heavy Load Handling in Containment

Changes to this program are covered by updates to the Safety Evaluation Reports. Updated information submitted via GPU Nuclear letter 4410-86-L-0084 dated June 6, 1986.
- o Addition of a Borate to the TMI-2 Reactor Coolant System

Primary information forwarded via GPU Nuclear letter 4410-86-L-0078 dated May 5, 1986. Project approved via NRC letter dated May 6, 1986.

PROCEDURE CHANGES

During the course of 1986, procedural requirements changed significantly due to the defueling and fuel shipping efforts. Additionally, in support of the recovery effort, a number of procedure changes were made and new procedures were issued. These recovery related procedures received NRC review and approval prior to implementation as required by Technical Specification Section 6.8.2. Additionally, many of these procedures performed activities in accordance with NRC-approved Safety Evaluation Reports. Since these procedures have received NRC approval, they will not be discussed further in this report. Procedures whose scope of activity was completed during 1986 were cancelled. Cancelled procedures determined to have review significance underwent SRG review to determine the potential impact on safety prior to cancellation. Due to the subject matter, some of these procedures received NRC review prior to cancellation.

A number of procedural changes were made to convert existing procedures into the new format being used at TMI-2. These format changes did not change the technical content of procedures; therefore, these changes are not applicable to the 10 CFR 50.59 report.

The remainder of the changes were reviewed and it was determined that there were no changes which specifically constituted a FSAR change as defined by 10 CFR 50.59. However, there were a number of changes made to FSAR-type procedures. These changes were made to reflect changing plant conditions or to implement the recommendations of various activity-related analyses. Typical system-oriented procedures receiving these types of changes are:

- o Operation of Fuel Transfer Canal Fill and Tool Flushing System
- o Use of Polar Crane, Reactor Building Canister Handling Bridge, and Fuel Handling Building Canister Handling Bridge to Handle Reclaimed Filter Canisters
- o Fill of Spent Fuel Pool 'A', Fuel Transfer Canal and Borated Water Storage Tank from the Processed Water Storage Tanks
- o Nuclear Sampling System Boronmeter Operation and Calibration
- o Auxiliary and Fuel Handling Building Heating and Ventilation
- o Canister Handling and Transfer
- o Sampling of Reactor Coolant System and Reactor Coolant Bleed Tanks
- o Operation of Nuclear Services River Water System
- o Reactor Vessel Water Processing
- o Fire Protection System Operation for Air Intake Tunnel
- o Miscellaneous Liquid Radioactive Waste Disposal

Procedures receiving this type of update change to reflect current plant conditions were determined to not constitute an Unreviewed Safety Question.

TESTS AND EXPERIMENTS

A number of tests and experiments were performed during the year. The majority of these tests were covered by SER's provided for major recovery activities, as discussed previously in this report. The remainder of the tests or experiments were evaluated to determine if they constituted an Unreviewed Safety Question or a significant risk to the health and safety of the public or workers. In no case was there a determination of an Unreviewed Safety Question or significant risk. Below is a list of tests or experiments which is representative of those performed during 1986.

- o Lower Reactor Vessel Head Video Examinations
- o Core Debris Bed Probing
- o Evaluation of Fuel in the Pressurizer
- o Lower Reactor Vessel Head Core Debris Sampling
- o Examination of "A" Once Through Steam Generator Upper Tube Sheet for Fuel Characterization
- o Radiological Inspection and Sampling of Pressurizer
- o Reactor Building Basement Video Inspection and Sampling
- o Gamma-Spectra Measurements of the Reactor Building Basement Wall and Floor for Characterization
- o Lower Reactor Vessel Video Inspection
- o Reactor Building Concrete Core Sampling
- o Fuel Quantification of the Makeup Suction Valve Room, Makeup Discharge Valve Room, and Makeup Tank Room
- o Examination of "A" and "B" Once Through Steam Generators for Dislocated Fuel
- o Robotic Sediment Sampling
- o Reactor Coolant System Water Clarity
- o Defueling Test Assembly Bridge Crane Load Test
- o Deep Bed Filter Testing
- o Defueling Water Cleanup System Testing (e.g., deep suction, high pressure spray, centrifuge, bag filters, etc.)

None of the above tests or experiments involved the potential for significant release of radioactive materials or the potential to disable systems important to the safe operation of TMI-2. Although the above activities are not necessarily addressed by docketed SER, in all cases the activities are bounded by activities previously approved by the NRC. Thus, none of the above activities constitute an Unreviewed Safety Question.

FACILITY MODIFICATIONS

Items in this section were performed without prior approval of the NRC staff under the authority of 10 CFR 50.59. The items listed below cover specific activities performed under the authority of Engineering Change Memoranda (ECM's) or Engineering Change Authorizations (ECA's). ECM's and ECA's are tracking mechanisms for review, approval, and documentation of specific plant changes. ECM's and ECA's selected for inclusion were those for which turnover to Site Operations was completed during the calendar year 1986.

ECM 1288, Revision 0 - Respirator Cleaning Facility Radiation Monitoring System

This ECM documents the installation of a particulate monitor in the Respirator Cleaning facility ventilation exhaust.

Safety Evaluation Summary

The addition of the radiation monitor in the Respirator Cleaning Facility enhances safety by providing the means to detect radioactivity in the facility exhaust before it is released to the environment. The change does not constitute an Unreviewed Safety Question.

ECA 3330-84-0113, Revision 0 - Removal of VA-R-748 Condenser Vacuum Pump Exhaust Monitor

This ECA documents the removal of a radiation monitor from the Condenser Air Extraction System.

Safety Evaluation Summary

Removal of the radiation monitor does not affect plant safety as the Condenser Air Extraction System is not inservice during the Recovery period. Therefore, this change does not constitute an Unreviewed Safety Question.

ECA 3814-86-0324, Revision 0 - Fire Protection for Robotics Modular Office/Computer Center

This ECA documents the addition of a wet pipe automatic sprinkler fire protection system for the Robotics Modular Office/Computer Center located on the 281'-6" elevation of the Unit 2 Turbine Building.

Safety Evaluation Summary

The fire protection system will provide protection for robotic equipment housed in the building (i.e., controls, CRT, consoles, etc.). Plant safety is enhanced and an Unreviewed Safety Question does not exist.

ECA 3663-86-0325, Revision 0 - Seismic Monitoring System Removal

This ECA documents the removal of TMI-2 Seismic Monitoring System Components in the Fuel Handling Building Annulus Area.

Safety Evaluation Summary

The components were removed to permit access to the annulus area for decontamination activities. The seismic monitoring system was deleted from the Technical Specifications and is no longer required. The modification does not constitute a Unreviewed Safety Question.

ECA 3221-85-0181, Revisions 0 and 1 - Reactor Vessel/IIF Temperature Monitoring

This ECA documents the installation of three (3) resistance temperature detectors (RTD's) in the Internals Indexing Fixture to monitor the Reactor Coolant System (RCS) bulk temperature.

Safety Evaluation Summary

The installation of the RTDs provides a temperature monitoring capabilities other than that provided by the incore thermocouples. During defueling, the incore thermocouples eventually will be destroyed and the RTD will provide the monitoring of the RCS temperature. The operability of the RTDs is ensured by placement in the Technical Specifications. The modification does not constitute a Unreviewed Safety Question.

ECA 3162-84-0054, Revision 0 - Ventilation Modification to Support Remodeling the HP-2 Area

This ECA documents the installation of an exhaust duct from the HP-2 count area to the Service Building soiled exhaust system.

Safety Evaluation Report

This modification provides a tie-in to the Service Building soiled exhaust for the HP-2 area count room exhaust. The count room is considered a potentially contaminated area and, thus, must be served by a monitored and filtered exhaust. The modification does not constitute a Unreviewed Safety Question.

ECA 3611-85-0003, Revision 0 - Control Room Alarm for Air Intake Tunnel Chlorine Monitor AH-CIS-5 484

This ECA documents the addition of a Control Room fault alarm for the Chlorine Monitor of the Air Intake Tunnel.

Safety Evaluation Summary

The addition of the fault alarm does not change the function or operation of the Chlorine Monitor. The alarm alerts operation personnel to an abnormal condition (i.e., an inoperable chlorine monitor). Thus, plant safety is enhanced, and the change does not constitute an Unreviewed Safety Question.

ECM 1162, Revision 0 - Addition of Fire Detection to Chemical Cleaning Building

This ECA documents the addition of a central fire detection and alarm system for the Chemical Cleaning Building.

Safety Evaluation Summary

The addition of a central fire detection and alarm system in the Chemical Cleaning Building enhances plant safety by providing a means of detecting a fire in the building. The modification does not constitute an Unreviewed Safety Question.

ECA 3212-85-0237, Revision 0 - BWST Sample Line

This ECA documents the addition of two (2) valves to the original Borated Water Storage Tank (BWST) sample line:

Safety Evaluation Summary

The addition of the two (2) new valves to the original design BWST sample line will provide double valve isolation to prevent leakage. The modification does not constitute an Unreviewed Safety Question.

ECM 1106, Revision 2; ECM 1114, Revision 0 - Modifications for Fuel Transfer Canal Fill

These ECM's documented the installation of hoses, manifolds and valves in the Auxiliary Building and Reactor Building to provide a means of supplying borated water to the Fuel Transfer Canal.

Safety Evaluation Summary

This modification does not represent an Unreviewed Safety Question. The modifications in the Fuel Handling Building include changes to the Spent Fuel Cooling System. However, the system was modified to perform an original function, fuel transfer canal fill, which had been lost due to an inaccessible closed valve.