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July 10, 1986
NRC/TMI-86-068

Docket No. 50-320

Mr. F.R. Standerfer
Vice President/Director
Three Mile Island Unit 2
GPU Nuclear Corporation
P.O. Box 480
Middletown, PA 17057

Dear Mr. Standerfer:

Subject: Safety Evaluation for the Waste Handling and Packaging Facility and Recovery Operations Plan Change No. 34

References: (1) GPU letter 4410-85-L-0128, F.R. Standerfer to W.D. Travers, Technical Evaluation Report for the Waste Handling and Packaging Facility, dated November 12, 1985.

(2) GPU letter 4410-86-L-0035, F.R. Standerfer to W.D. Travers, Recovery Operations Plan Change Request No. 36, dated April 16, 1986.

By letter dated November 12, 1985 (Reference 1), you submitted the Technical Evaluation Report (TER) for the TMI-2 Waste Handling and Packaging Facility (WHPF) for our review and approval. By letter dated April 16, 1986, (Reference 2), you submitted Recovery Operations Plan Change Request (ROPCR) No. 36 to support the operation of the WHPF. Based on our review of this information and additional information provided in discussions with your staff, we approve the design and proposed operation of the Waste Handling and Packaging Facility. We also approve ROPCR No. 36, which adds the WHPF vent radiation monitor to Table 4.3-3 of the TMI-2 Recovery Operations Plan. Our approval of your request No. 36 is NRC change approval No. 34 and is effective as of the date of this letter. Our safety evaluation and the revised ROP pages are enclosed.

Sincerely,

ORIGINAL SIGNED BY,
William D. Travers

William D. Travers
Director
TMI-2 Cleanup Project Directorate

Enclosures: As stated

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NRC STAFF SAFETY EVALUATION OF

THE WASTE HANDLING AND PACKAGING FACILITY

DESCRIPTION

The Waste Handling and Packaging Facility (WHPF), as described in the referenced Technical Evaluation Report (TER), is designed for the processing and packaging of solid radioactive waste generated during TMI-2 recovery operations. The recent increase in recovery related activities, primarily involving defueling operations, has resulted in an increase in generated solid wastes, including dry active wastes (DAW) such as contaminated clothing, tools, and equipment. As a result of the projected increase in volume and types of solid waste generated, the current processing facilities available in the Auxiliary and Fuel Handling Building (AFHB) were determined to be inadequate. The WHPF will provide the necessary area and equipment for the compaction, size reduction and/or decontamination of solid wastes, as appropriate. Fuel and core debris will not be processed in the WHPF, except for trace amounts that may contaminate tools and equipment.

The WHPF is located to the southwest of the more eastern Unit 2 cooling tower. It is a one-story, poured concrete/masonry block building with corrugated roof decking, with approximately 4000 square feet of floor space. The WHPF is physically separated from other Unit 2 structures; the plant fire protection system is the only Important to Safety (ITS) system that interfaces with the WHPF. The exterior walls of the structure will be constructed of reinforced concrete at least 12" in thickness, to provide shielding. The WHPF heating, ventilation, and cooling (HVAC) system is designed to perform the following functions: maintain acceptable temperatures in the building; maintain a slightly negative pressure in the building and filter exhausts from the

building to limit the release of radioactivity to the environment; and direct air flow within the building to limit the spread of contamination and minimize radiation exposure to workers. A portable airborne radioactivity monitor with local readout and alarm will be provided in the WHPF for worker protection. Additional area radiation monitors may be provided as required by radiological control procedures. The WHPF exhaust will be filtered, sampled, and monitored to assure that potential radioactive releases to the environment are maintained within applicable limits. The facility exhaust monitor will have a local alarm, readout and recorder, and a remote alarm in the main control room. The exhaust system will automatically shutdown if preset radiation limits are exceeded.

Solid waste processing operations to be conducted in the WHPF include: sectioning and disassembly of large pieces of equipment; decontamination of tools and equipment using electropolishers, paint digesters or abrasive blasters; compaction of DAW in 55 gallon drums; packaging of non-compactible trash and equipment in drums and low specific activity (LSA) boxes; receiving of solid radwaste from the reactor building and AFHB; and shipping of processed waste to an on-site staging facility. The WHPF will not be used to store solid wastes; it is anticipated that typically, wastes will be processed and shipped within several days of receipt at the WHPF.

SAFETY CONSIDERATIONS

Due to the physical separation of the Waste Handling and Packaging Facility from other TMI-2 structures and the nature of the operations to be conducted in the WHPF, the significant safety issues relating to WHPF operation consist of demonstrating that radiation exposure to workers and off-site releases of radiation under normal and postulated accident conditions will be maintained

within acceptable and applicable limits. The WHPF walls are designed to provide sufficient radiation shielding to meet set dose rate limits for areas within the facility and external to it. These dose rate limits are based on radiological protection guidelines specified in the licensee's General Project Design Criteria and on requirements for designation of Radiological Work Permit (RWP) areas. The source terms used in the design calculations are based on conservative estimates of dose rates and quantities of solid radwaste to be processed through the WHPF. Temporary shielding and administrative controls will be used as necessary to keep the actual radiation levels within the design limits during WHPF operations.

To limit the spread of radioactive contamination and thus provide additional protection for workers in the WHPF, all incoming radwaste will be packaged or wiped down to maintain smearable surface activity levels below 1000 disintegrations per minute (dpm) per 100 square centimeters for beta and gamma activity and below 20 dpm/100 cm^2 for alpha activity. These limits, established in the June 2, 1986 revision to the Corporate Radiation Protection Plan, will be maintained for any radwaste that is staged in the WHPF. The facility HVAC system is also designed to minimize the spread of airborne contamination within the WHPF and to the environment. The system will operate to maintain a negative pressure of at least 0.20 inches w.g. with respect to ambient conditions, thereby restricting exfiltration from the WHPF. Air flow within the facility will be directed from relatively uncontaminated areas to areas of greater contamination. Separate HVAC systems will serve areas of the building that are radiologically clean. Exhaust hoods or flexarm devices will be used in areas where fumes or airborne contamination could be generated by processing operations. HEPA filters will be used to treat exhausts from

these devices prior to discharge. HEPA filters will also process all building exhaust prior to release to the environment.

In addition to filtering exhausts from the WHPF, a radiation monitor will be provided at the exhaust release point. This monitor will sample the exhaust for particulate activity and is provided with local alarm, readout, and recorder with a remote alarm in the TMI-2 control room. In Recovery Operations Plan (ROP) Change Request No. 36, dated April 16, 1986, the licensee proposed the addition of the WHPF exhaust radiation monitor described above to Table 4.3-3, "Radiation Monitoring Instrumentation Surveillance Requirements", of the ROP. As proposed, with this monitor inoperable, the facility ventilation system would be isolated and all movement of radioactive materials or activities causing the generation of airborne contamination would be suspended until the monitor was restored to operable status. This monitor will provide for the rapid detection of a release of radiation to the environment, thereby allowing sufficient time for the licensee to initiate mitigating actions to protect the public. We therefore approve the licensee's proposed ROP Change Request No. 36. Periodic air samples from the building exhaust will be analyzed for alpha activity and appropriate measures will be taken as necessary, based on that analysis. A portable airborne radioactivity monitor will also be provided in the WHPF for personnel protection. Area radiation monitors will be used as required based on a review by radiological controls personnel.

A fire suppression deluge system and portable fire extinguishers are provided for fire protection in the WHPF. The deluge system will be actuated by a signal from a temperature or ionization detector or manually. Fire alarms will also be triggered by the detectors and will annunciate at a local panel and in the Unit 2 control room.

The licensee has performed off-site dose calculations for WHPF normal operation and accident conditions. The radioactive source terms used for these calculations are based on the projected quantities of solid radwaste to be processed in the WHPF and on historical data for fission product inventories for various contaminated materials. Small calculated quantities of transuranic isotopes were also included as part of the source term. The dose calculations were performed using conservative assumptions, including neglecting the effects of the HEPA filters on the WHPF exhaust, which would reduce calculated doses by a factor of 1000. For normal operations, the licensee's maximum calculated off-site doses are less than 1% of the limits specified in 10 CFR Part 50 Appendix I. For the worst-case postulated accident, a fire in the WHPF, the maximum calculated off-site doses are several orders of magnitude below the accident dose guidelines specified in 10CFR Part 100 and are actually below the 10CFR Part 50 Appendix I limits for off-site doses resulting from normal operations.

The Waste Handling and Packaging Facility is physically separated from the TMI-2 reactor building and AFHB, will serve no nuclear safety related function and will not affect the performance of any safety-related features associated with Unit 2. The proposed activities are within the scope of those addressed in NUREG-0683, the NRC staff's Final Programmatic Environmental Impact Statement (PEIS), relating to the cleanup of TMI-2. The dose consequences conservatively calculated for normal and accident conditions during WHPF operations are less than those calculated in the PEIS for similar waste handling activities. The WHPF will serve to limit the occupational exposure incurred during TMI-2 solid waste processing activities by providing a separate dedicated facility designed specifically to handle the expected volume and types of solid radwaste generated by cleanup operations.

Procedures and equipment for control of radioactive contamination during handling and processing of wastes will be used to further minimize personnel exposure.

The staff concludes that the design and proposed operation of the WHPF do not pose a significant risk to the health and safety of the public or the on-site workforce. Therefore, we approve the licensee's proposed use of the facility, as documented in the Technical Evaluation Report, and we also approve the request for the addition of the WHPF ventilation monitor to Table 4.3-3 of the Recovery Operations Plan.

Enclosure

FACILITY OPERATING LICENSE NO. DPR-73

DOCKET NO. 50-320

Replace the following pages of the TMI-2 Recovery Operations Plan with the enclosed pages as indicated:

4.3-4a

4.3-5a

TABLE 4.3-3 (Cont'd)

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
5. FUEL TRANSFER CANAL						
a. Criticality Monitor	S	R	M	1	Note 11	Note 12
6. FUEL POOL "A"						
a. Criticality Monitor	S	R	M	1	Note 11	Note 12
7. FUEL HANDLING BUILDING TRUCK BAY						
a. Criticality Monitor	S	R	M	1	Note 11	Note 12
8. WASTE HANDLING AND PACKAGING FACILITY						
a. Exhaust Monitor	D	SA	W	1	Note 1	Note 13

(See following pages for Notes.)

TABLE 4.3-3 (Cont'd)

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

NOTES:

11. During either of the following operations:

    a. Handling of canisters containing core material.

    b. Handling of any heavy load over canisters containing core materials.

12. With less than one channel operable, terminate the following operations:

    a. Handling of canisters containing core material. *

    b. Handling of any heavy load over canisters containing core material.

13. With the required monitor inoperable, secure the ventilation system and suspend all operations involving movement of radioactive materials or generation of airborne contamination until the inoperable monitor is restored to operable status.

*This shall not prohibit placing a canister in transit in a safe storage location.

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