



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

October 8, 1997

EAs 97-070  
97-117  
97-127  
97-256

Mr. James W. Langenbach  
Vice President and Director, TMI  
GPU Nuclear Corporation  
Three Mile Island Nuclear Station  
P. O. Box 480  
Middletown, PA 17057-0191

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL  
PENALTIES - \$210,000  
(NRC Inspection Reports Nos. 50-289/96-201; 97-01;  
97-02; 97-03; & 97-04)

Dear Mr. Langenbach:

This letter refers to the five referenced NRC inspections conducted between November 12, 1996, and May 15, 1997, at the Three Mile Island Nuclear Station in Middletown, Pennsylvania, the findings of which were discussed with you and members of your staff during several exit meetings, the last of which was held on May 28, 1997. These inspections included: (1) a design inspection conducted by the NRR Special Inspection Branch that focused on the capability of certain systems to safely perform functions required by their design basis, your adherence to the design and licensing basis, and the consistency of the plant configuration to the Final Safety Analysis Report (FSAR); (2) two routine inspections conducted by the Region I resident and region based staff during which the NRC reviewed your process for classification of plant components and the environmental qualification of the reactor building (RB) emergency cooling fans; and (3) two special inspections conducted by NRC Region I emergency preparedness staff to review your emergency response capabilities and performance during a full participation emergency exercise on March 5, 1997, as well as during a remedial exercise on May 13, 1997. The related inspection reports were sent to you previously.

On May 22, 1997, and July 25, 1997, predecisional enforcement conferences (conferences) were conducted with you and members of your staff, to discuss the violations, their causes, and your corrective actions. The apparent violations identified in NRC Inspection Report 97-03, issued on May 29, 1997, related to RB emergency cooling fans not being environmentally qualified, as well as your failure to address this condition in a timely manner, were discussed at the May 22, 1997, conference, even though the inspection report had not been issued at the time of that conference. On May 28, 1997, you informed Mr. P. Eselgroth of the NRC Region I office that you agreed that another conference was not needed to further discuss these environmental qualification issues.

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Based on the information developed during the five referenced inspections, and the information provided during the two conferences, a number of violations of NRC requirements are being cited and are described in the enclosed Notice of Violation and Proposed Imposition of Civil Penalties (Notice). The most significant violations relate to several areas of plant performance, and consist of: (1) inadequate engineering design controls, including incorrect design inputs for certain design basis calculations, inadequate verifications to assure the adequacy of design, and inadequate safety evaluations prior to making design changes; (2) poor implementation of the process for classifying components, resulting in a number of nuclear safety related components being downgraded to a lower classification without an appropriate safety evaluation or other supporting engineering documentation; (3) failure to ensure the RB emergency cooling fans were environmentally qualified; (4) failure to take timely and appropriate corrective actions for conditions adverse to quality that existed at the facility, including conditions related to the Decay Heat Removal system, to the quality assurance findings regarding inappropriate equipment classification downgrades, and to the environmental qualification deficiency; and (5) inadequate implementation of the emergency preparedness program.

With respect to the violations related to inadequate design engineering control and implementation, which are set forth in Section I of the enclosed Notice, several significant concerns were identified. For example, the design bases regarding the switchover of suction for the decay heat removal system (DHRS) pumps from the borated water storage tank (BWST) to the reactor building sump, were not correctly translated into operating procedures. The procedures are used by operators for commencing manual operations to perform this switchover during a large break loss of coolant accident (LOCA). In the calculation of the BWST level setpoint specified in the abnormal transient procedures, nonconservative assumptions and input data were used. As a result, the calculated BWST level setpoint determined for the switchover phase may not have prevented air entrainment in the DHRS pumps and the reactor building spray (RBS) pumps, due to vortexing in the BWST. In turn, this could have resulted in air binding and/or cavitation of the pumps, causing them to be inoperable during the critical recirculation phase of a large break LOCA. Additionally, design control measures were inadequate for changes that were made to remove the sodium thiosulfate tank and revise the BWST low-low level alarm setpoint. Specifically, containment overpressure was credited in DHRS pump net positive suction head (NPSH) calculations, contrary to the design bases, and the safety evaluation that was performed to support the changes failed to identify that the changes involved an unreviewed safety question. In addition to the calculational errors and inadequate safety evaluation, adequate design control measures did not exist for verifying or checking the adequacy of design in several instances, as described in the enclosed Notice.

With respect to the violations related to inappropriate downgrading of the classification of equipment, which are set forth in Section II of the enclosed Notice, the quality classification checklists (QCLs) for several components, including the nuclear river (NR) water discharge valve motor operator, decay river (DR) water strainer motor, and auxiliary building ventilation system (ABVS), were inappropriately revised to downgrade the components from nuclear safety related (NSR) to a non-safety related classification. As a result, the downgraded components were not subjected to the quality assurance (QA) program requirements needed to assure system operability for postulated accident conditions was maintained. More

specifically, these included requirements for the maintenance, testing, calibration, receipt inspection and procurement of parts. In addition, the procedure for performing the component classification and downgrade processes, did not receive the required review and, in some instances, was not followed by your engineering personnel, as detailed in the enclosed Notice.

With respect to the violation related to a lack of environmental qualification of certain equipment, which is set forth in Section V.A of the enclosed Notice, your staff determined that between March 17, 1986 and March 24, 1997, the three reactor building emergency cooling fans were not environmentally qualified in that the application of heat shrink tubing left a small length of exposed conductor at the spark plug connector to the fan motors. As a result, there was not reasonable assurance that the fans would function as required during post LOCA reactor building atmospheric conditions. Inoperability of these fans is contrary to the technical specifications, and given the eleven year duration of this problem, represents a significant regulatory concern. The NRC commends your engineering staff who, during repairs of a motor failure of one of the fans, questioned the qualification of the heat shrink tubing application which was not sealed. However, while the deficiency on the fan in question was promptly corrected, the same deficiency which existed on the other two fans was not corrected for an additional 33 days. The failure to take timely corrective action for this condition adverse to quality represented a violation of 10 CFR 50, Appendix B, Criterion XVI as described in Section III of the enclosed Notice.

With respect to the remaining violations related to inadequate identification and correction of problems in Section III of the enclosed Notice, several of the concerns previously discussed herein should have been identified and corrected sooner. In addition to the failure to correct the environmental qualification of the two reactor building emergency cooling fans after a third fan was found to not be environmentally qualified as discussed above, you also failed to take prompt corrective action to include the DHRS pump vent valves in the environmental qualification program, a deficiency that was identified during the safety system functional inspection (SSFI) of the DHRS conducted in 1993. Additionally, during several internal audits between June 1, 1992 and March 2, 1997, your staff identified concerns that the documentation to support the quality classification of components was insufficient. The Independent Safety Review (ISR) of one of those audits specifically raised concerns regarding the quality classification of components being changed without a documented or approved basis, without any independent review, and without a written safety evaluation documenting the basis for the change. Given the longstanding nature of some of these issues, and the failure to correct them, these failures represent an additional significant regulatory concern.

With respect to the violations related to emergency preparedness, which are set forth in Section IV of the enclosed Notice, the NRC observed, during the full-participation emergency exercise on March 5, 1997, that your Emergency Director failed to classify a general emergency when such a declaration was warranted due to the simulated loss of the three fission product barriers. In addition, your staff, in responding to the exercise scenario, did not assess the need for protective action recommendations (PARs) for residents beyond the 10-mile emergency planning zone (EPZ) when plume dose projections appeared to indicate that protective action guidelines would be exceeded beyond that zone. This was a result of inadequate training and procedures that did not contain guidance for considering protective action recommendations beyond the 10-mile EPZ. Following the identification of these



deficiencies, a Confirmatory Action Letter was issued on March 12, 1997, setting forth prompt corrective actions needed to address the exercise weaknesses, including the performance of a remedial exercise. The training and procedural weaknesses associated with the violations identified during the exercise, as well as the deficiencies associated with your dose assessment activities and qualification of ERO personnel which were identified as Severity Level IV violations in Inspection Report 97-04 issued on June 27, 1997, indicated that management oversight and involvement in EP was insufficient. Therefore, while citations are not normally made for violations involving emergency preparedness that occur during exercises, in this case, enforcement action is appropriate because of the seriousness of the weaknesses in your emergency preparedness program revealed by the exercise. Further, the NRC was concerned that your critique of the exercise did not identify two of the four exercise weaknesses, including the failure to assess PARs beyond the 10-mile EPZ. The NRC notes that the remedial exercise was successfully conducted on May 13, 1997.

Five separate Severity Level III problems or violations are being cited for the specific violations set forth in Sections I - V.A of the enclosed Notice. The violations in each section have been classified either individually, or in the aggregate, at Severity Level III in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600. Collectively, these violations demonstrate the need for, and importance of, management actively overseeing the implementation of important program activities and assuring that personnel are self-critical and aggressively pursue identification and correction of problems. For many of the issues described herein, adequate recognition and resolution of these violations did not occur in a timely manner.

In accordance with the Enforcement Policy, a base civil penalty in the amount of \$55,000 is considered for each of the five Severity Level III violations or problems<sup>1</sup>. Since Three Mile Island has been the subject of escalated enforcement actions within the last 2 years,<sup>2</sup> the NRC considered whether credit was warranted for *Identification* and *Corrective Action* in accordance with the civil penalty assessment process in Section VI.B.2 of the Enforcement Policy for each of the Severity Level III violations/problems. With the exception of the environmental qualification (EQ) violation in Section V.A, credit for identification is not warranted because all but one of the violations in Sections I, II, III, and IV were identified by the NRC. Credit for corrective actions is warranted for all five violations/problems because, in general, your actions were considered prompt and comprehensive. Your initial response to the problems identified by the inspectors with respect to the equipment downgrades tended to underestimate the scope, depth, and significance of the problems; however, once you recognized the significance of the problem, you took comprehensive corrective actions to address the problems at both Three Mile Island and Oyster Creek.

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<sup>1</sup>The violations in Sections I and II occurred prior to November 12, 1996, which is the date that the base amount for a Severity Level III violation or problem changed from \$50,000 to \$55,000. Therefore, the base penalty for the violations in Sections I and II is \$50,000.

<sup>2</sup>e.g., A Notice of Violation without a civil penalty was issued on March 26, 1996 for a repetitive violation of security requirements (EA 96-057), and a Notice of Violation without a civil penalty was issued on March 11, 1996 for a violation involving the failure to adequately control a modification to the reactor coolant system drain line piping (EA 95-238).

Therefore, to emphasize the importance of timely identification and comprehensive correction of problems and in recognition of your previous escalated enforcement actions, I have been authorized, after consultation with the Director, Office of Enforcement, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalties (Notice) in the total amount of \$210,000 (\$50,000 each for the violations in Sections I and II, and \$55,000 each for the violations in Sections III and IV). No civil penalty is proposed for the violation in Section V.A in recognition of your identification and correction of the problem with the 'A' reactor building emergency cooling fan.

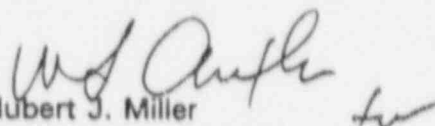
Overall, the penalties described above reflect the NRC concern about current station performance. The violations have brought to light weaknesses in operations and management oversight that need attention, and reflect a philosophy that has not led to aggressive identification and correction of problems in the areas cited. The fact that many of these issues were identified by the NRC, despite prior opportunities to identify and correct them, exacerbates the seriousness of these issues.

Several other violations were also identified during the design inspection and are described in Section V of the Notice. These violations are classified individually at Severity Level IV. Additionally, it was determined that the failure to update the FSAR to correct the discrepancies identified during the design inspection constituted violations of minor significance. These violations are being treated as Non-Cited Violations (NCVs) consistent with Section IV of the Enforcement Policy.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be placed in the NRC Public Document Room (PDR).

Sincerely,

  
Hubert J. Miller  
Regional Administrator

Docket No. 50-289  
License No. DPR-50

Enclosure: Notice of Violation and Proposed Imposition of  
Civil Penalties

cc w/encl:

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