January 14, 1988

Docket No. 50-289

Mr. Henry D. Hukill, Vice President
and Director - TMI-1
GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

Dear Mr. Hukill:

SUBJECT: ISSUANCE OF AMENDMENT (TAC #64800)

The Commission has issued the enclosed Amendment No. 136 to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit No. 1 (TMI-1). This amendment consists of changes to the Technical Specifications (TSs) in response to your letter dated February 24, 1987 (Technical Specification Change Request (TSCR) No. 158).

This amendment provides limiting conditions of operation for the chlorine detecting system to comply, in part, with NUREG-0737, Item III.D.3.4 "Control Room Habitability Requirements".

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's bi-weekly Federal Register notice.

Sincerely,

Original Signed By:
Gordon E. Edison

Gordon E. Edison, Senior Project Manager
Project Directorate I-4
Division of Reactor Projects I/II

Enclosures:
1. Amendment No. 136 to DPR-50
2. Safety Evaluation

cc w/enclosures:
See next page

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SNorris	GEdison;eh	JStolz for	See Lewis note
9/9/87	9/11/87	9/11/87	9/24/87

OGC-Beth
No legal objection, subject to addition as noted on p. 2 of SE.
d Lewis 10/25/87

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Mr. Henry D. Hukill
GPU Nuclear Corporation

Three Mile Island Nuclear Station,
Unit No. 1

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

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER AND LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

GPU NUCLEAR CORPORATION

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 136
License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by GPU Nuclear Corporation, et al. (the licensee) dated February 24, 1987, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.c.(2) of Facility Operating License No. DPR-50 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No.136 , are hereby incorporated in the license. GPU Nuclear Corporation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

H E Edison for

John F. Stolz, Director
Project Directorate I-4
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 14, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 136

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove	Insert
ii	ii
--	3-40f
4-7a	4-7a

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Amendment No. ~~59~~, ~~72~~, ~~78~~, ~~97~~, ~~98~~, ~~119~~, ~~122~~, 136

3.5.6 CHLORINE DETECTION SYSTEMS

Applicability

All modes of operation, when chlorine containers exceeding 150 pounds are located onsite.

Objective

To ensure that the Chlorine Detection Systems (CDS) located at the River Water Pump House Chlorinator House and at the Air Intake Structure are capable of providing alarm in the control room and isolating the control room in the event of an onsite chlorine gas release.

Specification

3.5.6.1 Two independent chlorine detection system channels at each of the above locations, shall be Operable. Each channel shall be capable of initiating isolation of the control building ventilation system and providing alarms which allow operators 2 minutes to don emergency breathing apparatus.

Action

3.5.6.2 a. With one chlorine detection system channel at either location inoperable, restore the inoperable channel to OPERABLE status within 7 days. If not restored to OPERABLE status within 7 days, within the next 6 hours, initiate and maintain operation of the control building ventilation system in the emergency recirculation mode of operation.

b. With both chlorine detection system channels at any one location inoperable, within 1 hour initiate and maintain operation of the control building ventilation system in the emergency recirculation mode of operation.

Bases

The Operability of the chlorine detection system ensures that sufficient capability is available to promptly detect and initiate protective action in the event of an accidental chlorine release. This capability is required to protect control room personnel (and satisfies the intent of Regulatory Guide 1.95, "Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release," Revision 1, January 1977.)

The Chlorine Detection System is designed so that the human toxicity limits of 15 ppm by volume (45 mg/m^3) is not exceeded in the control room within 2 minutes after the operators are made aware of the presence of chlorine.

TABLE 4.1-1 (Continued)

	CHANNEL DESCRIPTION	CHECK	TEST	CALIBRATE	REMARKS
49.	Saturation Margin Monitor	S(1)	M(1)	R	(1) When T_{ave} is greater than 525°F
50.	Emergency Feedwater Flow Instrumentation	NA	M(1)	R	(1) When T_{ave} is greater than 250°F
51.	Heat Sink Protection System				(1) Includes logic test only
	a. EFW Auto Initiation Instrument Channels				
	1. Loss of both Feedwater Pumps	NA	Q(1)	R	
	2. Loss of all RC Pumps	NA	Q(1)	R	
	3. Reactor Building Pressure	NA	Q	R	
	4. OTSG Low Level	W	Q	R	
	b. MFW Isolation OTSG Low Pressure	NA	Q	R	
	c. EFW Control Valve Control System				
	1. OTSG Level Loops	W	Q	R	
	2. Controllers	W	NA	R	
	d. HSPS Train Actuation Logic	NA	Q(1)	R	
52.	Backup Incore Thermocouple Display	M(1)	NA	R	(1) When T_{ave} is greater than 250°F
53.	Chlorine Detection System Instrumentation	W	M	R(1)	(1) Calibration is a one concentration point check (need not be traceable to NBS standards)

S - Each Shift
D - Daily
W - Weekly
M - Monthly

T/W - Twice per week
B/M - Every 2 months
Q - Quarterly
P - Prior to each startup if not done previous week

R - Each Refueling Period
NA - Not Applicable
B/W - Every two weeks

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 136 TO FACILITY OPERATING LICENSE NO. DPR-50

METROPOLITAN EDISON COMPANY
JERSEY CENTRAL POWER AND LIGHT COMPANY
PENNSYLVANIA ELECTRIC COMPANY
GPU NUCLEAR CORPORATION

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-289

INTRODUCTION

In a letter dated February 24, 1987, GPU Nuclear Corporation, (GPU or the licensee) submitted Technical Specification Change Request (TSCR) No. 158 for Three Mile Island Nuclear Station, Unit 1. This change added limiting conditions for operation regarding chlorine detection systems to comply, in part, with NUREG-0737, Item III.D.3.4 "Control Room Habitability Requirements". This item requires, in part, that licensees assure that control room operators be adequately protected against the effects of accidental release of toxic gases.

DISCUSSION

Many nuclear power plants use chlorine as an algicide treatment for circulating water systems. The chlorine is usually stored on site as a liquified gas in quantities up to several tons. An accidental release of gaseous chlorine could be drawn into the control room via the air intake structure and potentially incapacitate the control room operators. Recommendations for protection of the operators against such a release are found in Regulatory Guide (RG) 1.95. The guide states that adequate protection of control room operators will be achieved if features are included in the plant design to: (1) automatically isolate the control room if there is a release: (2) make the control room sufficiently leak tight, and (3) provide equipment and procedures for ensuring the use of breathing apparatus by the control room operators.

The licensee submittal provides a system to comply with these criteria by providing a system to detect chlorine gas and automatically isolate the control room.

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EVALUATION

The acceptability of change request #158 was reviewed primarily with respect to criteria found in RG 1.95 "Protection of Nuclear Power Plant Control Room Operators against an Accidental Chlorine Release." Additional guidance is found in Standard Review Plan (SRP) 6.4 "Control Room Habitability System" and RG 1.78 "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release."

There are two storage locations for chlorine on site. The River Water Pump House (RWPH) - Chlorine House is located 100 meters west of the control room intake structure and the Unit 1 Circulating Water Chlorine House (U-1 Circ Water) is 350 meters to the northeast. Two chlorine detectors are located at the intake structure and two detectors at the RWPH Chlorine House. The control room has an air exchange rate of 2 to 9 turnovers per hour in normal operation and .08 turnovers in the isolated mode.

Comparing these data with table 1 of RG 1.95 it can be determined that the maximum allowable capacity of a single storage container at the RWPH-Chlorine House is 8,000 pounds. This container size is allowed primarily due to the presence of the remote chlorine detectors at the location. For the Unit 1 Circ. Water Chlorine House, a similar comparison results in a maximum allowable container capacity of 4,000 pounds. The proposed T.S. section 3.5.6 states that the chlorine detection system will be operable whenever containers exceeding 150 pounds are on site. The licensee has stated that 2,000 pound containers are normally used at both locations. This is acceptable. However, the licensee should implement administrative controls to ensure that the maximum container size is limited per RG 1.95 paragraph C.3.

RG 1.95 has specific acceptance criteria for the chlorine detection system and allied actuating electronics. These criteria and an evaluation of the licensee's submittal are as follows:

(1) Chlorine Concentration Level. Detectors should be able to detect and signal a chlorine concentration of 5 ppm. The 5 ppm level is specified in the licensee's Preventative Maintenance Procedure PM-1C145.

(2) System Response Time. The system response time, which incorporates the detector response time, the valve closure time, and associated instrument delays, should be less than or equal to the required isolation time. The basic criteria that applies is stated in RG 1.78, that the chlorine concentration within the central control room should not exceed 15 ppm by volume within two minutes after the operators are made aware of the presence of chlorine.

Per RG 1.95, if the chlorine detectors are upstream from the isolation dampers, credit is allowed for the travel time between the detectors and the dampers.

The licensee indicated that overall system response time is 20 seconds. A site-specific analysis was performed by an engineering firm (Pickard, Lowe and Garrick, Inc.) for the licensee and issued on May 1, 1984. This analysis showed that for detectors located at the River Water Pump House, and at the Air Intake Structure, the response time and the criterion of RG 1.78 was met. This is acceptable.

(3) Single Failure Criteria. The chlorine detection system should be redundant and physically separate to accomplish decoupling of the effects of unsafe environmental factors, electric transients, physical accidents, and component failure. The system described by the licensee fully meets this criterion.

(4) Seismic Qualification. The chlorine detection system should be designed as Seismic Category I and be qualified as such. The licensee stated that the equipment has been certified as Seismic Category I by the manufacturer in accordance with standard IEEE 344-185.

(5) Environmental Qualification. The detection system should be qualified for all expected environments and for severe environments that could clearly lead to or be a result of a chlorine release. The licensee stated that the system was qualified to IEEE 383-1974 by the manufacturer. This is acceptable.

(6) Maintenance, Testing, and Calibration. A routine operational check should be conducted at one-week intervals. Verification testing and calibration of the chlorine detectors and verification testing of the system response time should be conducted at six-month intervals. However, detector calibration requires the equipment to be removed and sent to an offsite laboratory for standardized testing with known gas concentrations. To avoid disruption of operations, the licensee prefers to do this during refueling (normally every 17 to 18 months), and to compensate by performing special checking and testing more frequently. In the proposed table 4.1-1 item 53 the Chlorine Detection System Instrumentation is checked weekly, tested monthly and calibrated at each refueling. The monthly test uses a dummy probe; however, the weekly test is conducted with a 5 ppm known standardized test gas per procedure PM-1C-145. The 5 ppm gas concentration is the lower level which detectors are required to detect. This approach is acceptable.

The proposed specification does not fully comply with RG 1.95 in that:

(a) no limits are placed on chlorine container sizes stored on site, and

(b) the response time is not periodically tested.

Regarding container size limits ((a) above), the licensee currently has a physical storage facility with piping and racks which cannot accept larger container sizes without modifications. In addition, the licensee has committed to administratively control the container size to conform to RG 1.95. Regarding response time testing ((b) above), the licensee has tested the system response time and determined it to be adequate. In addition the licensee stated that monthly tests are performed to assure the dampers/valves in the system operate properly. Also, the weekly tests demonstrate the detector response is adequate. Since detector response and damper/valve operation are the main components of the response time, there is reasonable assurance that adequate response time is maintained. This is acceptable.

The licensee's proposed Technical Specification Change Request No. 158 provides additional controls on the Chlorine Detection System and is acceptable.

ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. We have determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: January 14, 1988

Principal Contributor:
Thomas Dragoun