DCR 026

December 16, 1986

Docket No. 50-289

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

Dear Mr. Hukill:

SUBJECT: AMENDMENT NO. 123 TO FACILITY OPERATING LICENSE NO. DPR-50

The Commission has issued the enclosed Amendment No. 123 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 1, 1985, as revised September 30, 1985, titled "Technical Specification Change Request Number 143".

This amendment provides clarification to existing TSs to ensure that the regulating control rod power silicon controlled rectifier (SCR) electronic trips are trip tested monthly and prior to startup when the reactor has been shutdown greater than 24 hours. The amendment also provides conditions for operability for control rod drive trip breakers and diverse trip devices, and the regulating control rod power SCR electronic trips. Issuance of this amendment satisfies our concerns as documented in NRC Generic Letter 85-10 dated May 23, 1985. Issuance of this amendment, with its accompanying Safety Evaluation, also serves to complete Multiplant Activity (MPA) B-91. This multiplant activity concerns Item 4.4 of our Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events".

Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

/S/

John O. Thoma, Project Manager
PWR Project Directorate #6
Division of PWR Licensing-B

Enclosures:
1. Amendment No. 123 to DPR-50
2. Safety Evaluation

cc w/enclosures:
See next page

PBD-6	PBD-6	PBD-6	PBD-6	PBD-6	OGC
RIngram	JThoma:jak	TRoss	RWeller	JStolz	
12/2/86	12/02/86	12/4/86	12/4/86	12/4/86	12/11/86

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Mr. Henry D. Hukill
GPU Nuclear Corporation

Three Mile Island Nuclear Station,
Unit No. 1

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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.123
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 licensees) dated February 1, 1985, as revised September 30, 1985, 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. 123, 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

John F. Stolz, Director
PWR Project Directorate #6
Division of PWR Licensing-B

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 16, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 123

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
3-27	3-27
--	3-27a
3-28	3-28
--	3-28a
4-2	4-2
4-3	4-3

3.5 INSTRUMENTATION SYSTEMS

3.5.1 OPERATIONAL SAFETY INSTRUMENTATION

Applicability

Applies to unit instrumentation and control systems.

Objective

To delineate the conditions of the unit instrumentation and safety circuits necessary to assure reactor safety.

Specifications

3.5.1.1 The reactor shall not be in a startup mode or in a critical state unless the requirements of Table 3.5-1, Column 'A' and 'B' are met. Specification 3.0.1 applies.

3.5.1.2 For on-line testing or in the event of a protection instrument or channel failure, a key operated channel bypass switch associated with each reactor protection channel will be used to lock the reactor trip module in the untripped state as indicated by a light. Only one channel shall be locked in this untripped state at any one time. Unit operation at rated power shall be permitted to continue with Table 3.5-1, Column "A". Only one channel bypass key shall be kept in the control room.

3.5.1.3 In the event the number of protection channels operable falls below the limit given under Table 3.5-1, Column "A", operation shall be limited as specified in Column "C". Specification 3.0.1 applies.

3.5.1.4 The key operated shutdown bypass switch associated with each reactor protection channel shall not be used during reactor power operation (except for required maintenance or testing).

3.5.1.5 During START-UP when the intermediate range instruments come on scale, the overlap between the intermediate range and the source range instrumentation shall not be less than one decade.

3.5.1.6 During START-UP, HOT STANDBY or POWER OPERATION, in the event that a control rod drive trip breaker is inoperable, within one hour place the breaker in trip. Specification 3.0.1 applies.

3.5.1.7 During START-UP, HOT STANDBY or POWER OPERATION, in the event that one of the control rod drive trip breaker diverse trip features (shunt trip or undervoltage trip attachment) is inoperable:

a. Restore to OPERABLE status within 48 hours or

b. Within one additional hour place the breaker in trip.

Specification 3.0.1 applies.

3.5.1.7.1 Power may be restored through the breaker with the failed trip feature for up to two hours for surveillance testing per T.S. 4.1.1.

3.5.1.8 During START-UP, HOT STANDBY or POWER OPERATION, in the event that one of the two regulating control rod power SCR electronic trips is inoperable, within one hour:

a. Place the inoperable SCR electronic trip in the tripped condition or

b. Remove the power supplied to the associated SCRs.

Specification 3.0.1 applies.

3.5.1.8.1 Power may be restored through the SCRs with the failed electronic trip for up to two hours for surveillance testing per T.S. 4.1.1.

Bases

Every reasonable effort will be made to maintain all safety instrumentation in operation. A startup is not permitted unless three power range neutron instrument channels and two channels each of the following are operable: four reactor coolant temperature instrument channels, four reactor coolant flow instrument channels, four reactor coolant pressure instrument channels, four pressure-temperature instrument channels, four flux-imbalance flow instrument channels, four power-number of pumps instrument channels, and four high reactor building pressure instrument channels. The reactor trip, on loss of feedwater may be bypassed below 7% reactor power. The bypass is automatically removed when reactor power is raised above 7%. The reactor trip, on turbine trip, may be bypassed below 20% reactor power. The safety features actuation system must have two analog channels functioning correctly prior to startup. The anticipatory reactor trips on loss of feedwater pumps and turbine trip have been added to reduce the number of challenges to the safety valves and power operated relief valve but have not been credited in the safety analyses.

Operation at rated power is permitted as long as the systems have at least the redundancy requirements of Column "B" (Table 3.5-1). This is in agreement with redundancy and single failure criteria of IEEE 279 as described in FSAR Section 7.

There are four reactor protection channels. Normal trip logic is two out of four. Required trip logic for the power range instrumentation channels is two out of three. Minimum trip logic on other instrumentation channels is one out of two.

The four reactor protection channels were provided with key operated bypass switches to allow on-line testing or maintenance on only one channel at a time during power operation. Each channel is provided alarm and lights to indicate when that channel is bypassed. There will be one reactor protection system bypass switch key permitted in the control room.

Each reactor protection channel key operated shutdown bypass switch is provided with alarm and lights to indicate when the shutdown bypass switch is being used.

Power is normally supplied to the control rod drive mechanisms from two separate parallel 460 volt sources. Redundant trip devices are employed in each of these sources. The AC Trip Breaker is one means to trip a source. The redundant means is a parallel configuration consisting of two DC Trip Breakers and five SCR power supplies. The SCRs are turned off by the "electronic trip relays."

Diverse trip features are provided on each breaker. These are the undervoltage relay and shunt trip attachment. Each trip feature is tested separately. Failure of one breaker trip feature does not result in loss of redundancy and a reasonable time limit is provided for corrective action.

Failure in the untripped state of a breaker or SCR electronic trip results in loss of redundancy and prompt action is required. Failure of both trip features on one breaker is considered failure of the breaker.

Power may be restored through the failed breaker (SCRs) for a limited time to perform required testing.

Reference

FSAR, Section 7.1

Channels subject only to "drift" errors induced within the instrumentation itself can tolerate longer intervals between calibrations. Process system instrumentation errors induced by drift can be expected to remain within acceptance tolerances if recalibration is performed at the intervals of each refueling period.

Substantial calibration shifts within a channel (essentially a channel failure) will be revealed during routine checking and testing procedures.

Thus, minimum calibration frequencies set forth are considered acceptable.

Testing

On-line testing of reactor protection channels is required monthly on a rotational basis. The rotation scheme is designed to reduce the probability of an undetected failure existing within the system and to minimize the likelihood of the same systematic test errors being introduced into each redundant channel.

The rotation schedule for the reactor protection channels is as follows:

Channels A, B, C & D	Before Startup, when shutdown greater than 24 hours
Channel A	One Week After Startup
Channel B	Two Weeks After Startup
Channel C	Three Weeks After Startup
Channel D	Four Weeks After Startup

The reactor protection system instrumentation test cycle is continued with one channel's instrumentation tested each week. Upon detection of a failure that prevents trip action in a channel, the instrumentation associated with the protection parameter failure will be tested in the remaining channels. If actuation of a safety channel occurs, assurance will be required that actuation was within the limiting safety system setting.

The protection channels coincidence logic, the control rod drive trip breakers and the regulating control rod power SCRs electronic trips, are trip tested monthly. The trip test checks all logic combinations and is to be performed on a rotational basis. The logic and breakers of the four protection channels and the regulating control rod power SCRs shall be trip tested prior to startup when the reactor has been shutdown for greater than 24 hours.

Discovery of a failure that prevents trip action requires the testing of the instrumentation associated with the protection parameter failure in the remaining channels.

TABLE 4.1-1
INSTRUMENT SURVEILLANCE REQUIREMENTS

	CHANNEL DESCRIPTION	CHECK	TEST	CALIBRATE	REMARKS
1.	Protection Channel Coincidence Logic	NA	M	NA	
2.	Control Rod Drive Trip Breaker & Regulating Rod Power SCRs	NA	M	NA	Includes independent testing of shunt trip and undervoltage trip features.
3.	Power Range Amplifier	D(1)	NA	(2)	(1) When reactor power is greater than 15%. (2) When above 15% reactor power run a heat balance check once per shift. Heat balance calibration shall be performed whenever heat balance exceeds indicated neutron power by more than 2%.
4.	Power Range Channel	S	M	M(1)(2)	(1) When reactor power is greater than 60% verif imbalance using incore instrumentation. (2) When above 15% reactor power calculate axial offset upper and lower chambers after each startup if not done within the previous 7 da
5.	Intermediate Range Channel	S(1)	P	NA	(1) When in service.
6.	Source Range Channel	S(1)	P	NA	(1) When in service.
7.	Reactor Coolant Temperature Channel	S	M	R	
8.	High Reactor Coolant Pressure Channel	S	M	R	
9.	Low Reactor Coolant Pressure Channel	S	M	R	

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 123 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

By letter dated February 1, 1985, as revised September 30, 1985, GPU Nuclear Corporation (GPU or the licensee) requested amendment to the Technical Specifications (TSs) appended to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit No. 1 (TMI-1). The proposed amendment would provide clarification that the regulating control rod power silicon controlled rectifier (SCR) electronic trips are trip tested monthly and prior to startup when the reactor has been shutdown for greater than 24 hours. It would also provide conditions for operability for control rod drive trip breakers and diverse trip devices, and the regulating control rod power SCR electronic trips. The amendment was submitted in response to NRC Generic Letter 85-10, dated May 23, 1985, pertaining to reactor protection system instrumentation and surveillance.

NRC Generic Letter 83-28 describes intermediate term actions to be taken by licensees and applicants to address the generic issues raised as a result of the NRC staff's evaluation of the two anticipated transient without scram (ATWS) events that occurred at Unit 1 of the Salem Nuclear Power Plant. Item 4.4 of Generic Letter 83-28 required licensees and applicants to confirm that safety-related maintenance and test procedures are applied to the diverse reactor trip feature provided by interrupting power to the control rods through the SCRs. This test procedure should verify that the SCRs have de-gated, thereby removing power from the control rods. Furthermore, SCRs shall be included in the surveillance and test requirements sections of the TSs. The licensee for TMI-1 responded to the requirements of Item 4.4 with submittals dated November 8, 1983, September 30, 1985, and October 9, 1985. These submittals coupled with this amendment request serve to respond to all information requested in Generic Letters 85-10 and 83-28.

EVALUATION

The licensee's proposed TS changes would remove existing Specification 3.5.1.6 regarding action to be taken in the event that one of the trip devices fails. We find this to be acceptable because the new specification statements will supersede it.

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The licensee proposes to change and expand the description under the Bases Section of 3.5.1 (Operational Safety Instrumentation). We find that these additions clarify the way the system operates and provide description of the diverse trip features of the control rod drive trip breakers. We find these changes to be acceptable.

The licensee proposes minor changes and additions to the Bases discussion of Section 4 (Surveillance Standards). We find that these changes clarify the testing of the regulating control rod power SCR electronic trips and are therefore acceptable.

The licensee proposes to add new specifications 3.5.1.6, 3.5.1.7, 3.5.1.7.1, 3.5.1.8 and 3.5.1.8.1 to Section 3.5 (Instrumentation Systems). These specifications denote action to be taken for inoperability of (1) a control rod drive trip breaker, (2) one of the diverse trip features of a control rod drive trip breaker, or (3) one of the two regulating control rod power SCR electronic trips. We find the proposed actions consistent with Generic Letter 85-10 and therefore acceptable.

The licensee proposes to make an addition to Table 4.1-1 (Instrument Surveillance Requirements). Channel Description Item 2 would be expanded to apply to the regulating rod power SCRs as well as to the control rod drive trip breaker. Also, a "Remarks" statement would be added to require independent testing of the shunt trip and undervoltage trip features. The tests would be made monthly. For the control rod drive trip breakers, tests would also be made prior to startup in accordance with the testing requirements of Section 4.1 (Operational Safety Review) of the TSs. We find these proposed changes consistent with those of Generic Letter 85-10 and therefore acceptable.

We conclude that the proposed amendment is consistent with the provisions of Generic Letter 85-10 and is therefore acceptable.

The licensee's responses to Generic Letter 83-28 confirm that the SCRs are maintained and tested using safety-related procedures and the testing will confirm the opening of the power supply to the control rods. These responses coupled with the issuance of this amendment satisfy our concerns as detailed in Item 4.4 of Generic Letter 83-28 and complete Multiplant Activity B-91 for TMI-1.

ENVIRONMENTAL CONSIDERATION

This amendment involves changes in the installation or use of facility components 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: December 16, 1986

Principal Contributors: D. Lasher, A. Toalston