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Docket No. 50-289

October 5, 1983

Mr. Henry D. Hukill
Vice President
GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

October 5, 1983

DMB-016

Dear Mr. Hukill:

SUBJECT: AMENDMENT NO. 87 TO FACILITY OPERATING LICENSE NO. DPR-50

The Commission has issued Amendment No. 87 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 application dated January 26, 1982.

This amendment adds to the TSs limiting conditions of operation and surveillance requirements for a Hydrogen Recombiner System in accordance with our recommended requirements for restart of TMI-1.

We have incorporated certain changes to the TS proposed in your application. We have discussed these changes with your licensing staff.

A copy of our Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's next Monthly FEDERAL REGISTER notice.

Sincerely,

James Van Vliet, Project Manager
Operating Reactors Branch #4
Division of Licensing

Enclosures:
1. Amendment No. 87 to DPR-50
2. Safety Evaluation

cc w/enclosures:
See next page

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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. 87
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 January 26, 1982, 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.

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. 87 , are hereby incorporated in the license. GPU Nuclear Corporation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment becomes effective six weeks after its date of issuance or Cycle 5 criticality, whichever occurs first.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 5, 1983

ATTACHMENT TO LICENSE AMENDMENT NO. 37

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

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

Remove	Insert
3-41	3-41
3-41a	3-41a
3-42*	3-42*
----	4-38a (new page)

*Overleaf page; no change

3.6 REACTOR BUILDING

Applicability

Applies to the containment integrity of the reactor building.

Objective

To assure containment integrity.

Specification

3.6.1 Containment integrity, as defined in Section 1.7, shall be maintained whenever all three of the following conditions exist:

a. Reactor coolant pressure is 300 psig or greater.

b. Reactor coolant temperature is 200 °F or greater.

c. Nuclear fuel is in the core.

3.6.2 Containment integrity shall be maintained when both the reactor coolant system is open to the containment atmosphere and a shutdown margin exists that is less than that for a refueling shutdown.

3.6.3 Positive reactivity insertions which would result in a reduction in shutdown margin to less than 1%Δk/k shall not be made by control rod motion or boron dilution unless containment integrity is being maintained.

3.6.4 The reactor shall not be critical when the reactor building internal pressure exceeds 2.0 psig or 1.0 psi vacuum.

3.6.5 Prior to criticality following refueling shutdown, a check shall be made to confirm that all manual containment isolation valves which should be closed are closed and are conspicuously marked.

3.6.6 If, while the reactor is critical, a reactor building isolation valve is determined to be inoperable in a position other than the required position, the other reactor building isolation valve in the line shall be tested to insure operability. If the inoperable valve is not restored within 48 hours, the operable valve will be closed or the reactor shall be brought to the cold shutdown condition within an additional 24 hours.

3.6.7 The hydrogen recombiner shall be operable during REACTOR CRITICAL, HOT STANDBY and POWER OPERATION. With the hydrogen recombiner inoperable, restore the recombiner to operable status or bring the reactor to hot standby within seven (7) days.

3.7 UNIT ELECTRIC POWER SYSTEM

Applicability

Applies to the availability of electrical power for operation of the unit auxiliaries.

Objective

To define those conditions of electrical power availability necessary to ensure:

a. Safe unit operation

b. Continuous availability of engineered safeguards

Specification

3.7.1 The reactor shall not be made critical unless all of the following requirements are satisfied:

a. All engineered safeguards buses, engineered safeguards switchgear, and engineered safeguards load shedding systems are operable.

b. One 7200 volt bus is energized.

c. Two 230 kv lines are in service.

d. One 230 kv bus is in services.

e. Engineered safeguards diesel generators are operable and at least 25,000 gallons of fuel oil are available in the storage tank.

f. Station batteries are charged and in service. Two battery chargers per battery are in service.

3.7.2 The reactor shall not remain critical unless all of the following requirements are satisfied:

a. Two 230 kv lines are in service and capable of carrying auxiliary power to unit 1, except as specified in Specification 3.7.2e below.

b. Both 230/4.16 kv unit auxiliary transformers shall be in operation except that within a period not to exceed eight hours in duration from and after the time one Unit 1 auxiliary transformer is made or found inoperable, two diesel generators shall be operable, and one of the operable diesel generators will be started and run continuously until both unit auxiliary transformers are in operation. This mode of operation may continue for a period not exceeding 30 days. In lieu of running a diesel generator, a 4160 volt tie from a Unit 2 transformer shall be placed in service, thus supplying the second of two feeds to the engineered safeguard buses causing no degradation of the system and permitting continued operation indefinitely.

c. Both diesel generators shall be operable except that from the date that one of the diesel generators is made or found to be inoperable

Bases

The Reactor Coolant System conditions of cold shutdown assure that no steam will be formed and hence no pressure will build up in the containment if the Reactor Coolant System ruptures.

The selected shutdown conditions are based on the type of activities that are being carried out and will preclude criticality in any occurrence.

A condition requiring integrity of containment exists whenever the reactor coolant system is open to the atmosphere and there is insufficient soluble poison in the reactor coolant to maintain the core one percent subcritical in the event all control rods are withdrawn.

The reactor building is designed for an internal pressure of 55 psig, and an external pressure 2.5 psi greater than the internal pressure.

The recombiner unit is capable of controlling the expected hydrogen generation associated with 1) zirconium-water reactions, 2) radiodlytic decomposition of water and 3) corrosion of metals within containment. The recombiner is designed in accordance with the recommendations of Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a LOCA", March 1971, the acceptance criteria of the Standard Review Plan (S.R.P.) 6.2.5., and NUREG 0578, July 1979. In addition to the installed hydrogen recombiner, a second recombiner including all piping, electrical, and structural provisions is available on site.

The hydrogen mixing is provided by the reactor building ventilation system to ensure adequate mixing of the containment atmosphere following a LOCA. This mixing action will prevent localized accumulations of hydrogen from exceeding the flammable limit.

REFERENCES

FSAR Section 5.2.2.4.3

4.4.4 Hydrogen Recombiner System

Applicability

Applies to the testing of the hydrogen recombiner and associated controls.

Objective

To verify that the hydrogen recombiner and associated controls are operable.

4.4.4.1 Specification

a. At least once per 92 days, during REACTOR CRITICAL, HOT STANDBY or POWER OPERATION, perform a hydrogen recombiner system functional test to demonstrate that the minimum reaction chamber gas temperature is maintained $\geq$ 600°F for at least 2 hours. This test shall also be performed prior to STARTUP following a reactor outage greater than 90 days.

b. At least once per 18 months, perform the following surveillances:

1. A channel calibration of all recombiner instrumentation and control circuits.

2. Verify through a visual examination that there is no evidence of abnormal conditions (i.e., loose wiring or structural connections, deposits of foreign materials, etc.)

3. Verify during a recombiner system functional test that the reaction chamber gas temperature is maintained $\geq$ 1200°F for at least 4 hours.

4. Verify the integrity of the heater electrical circuits by performing a continuity and resistance to ground test following the above required functional test. The resistance to ground for any heater phase shall be $\geq$ 10,000 ohms.

Bases

The surveillance program described above provides high assurance that the hydrogen recombiner system will be available to perform its post-LOCA function of maintaining the containment hydrogen concentration to below 4.1 volume percent.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 87 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 January 26, 1982, GPU Nuclear Corporation (the licensee) submitted a proposed license amendment to add Technical Specifications defining the applicable modes of operation, actions to be taken for system inoperability, and surveillance requirements for the hydrogen recombiner system at TMI-1. The hydrogen recombiner system and the dedicated penetration for the external recombiners have been evaluated by the NRC staff, and the results of that evaluation are included in the "TMI-1 Restart" report, NUREG-0680, dated June 1980. The dedicated penetration and hydrogen recombiner system were found acceptable in NUREG-0680 except for an evaluation by the licensee that potential leakage and discharge to the atmosphere of the Intermediate Building air used for recombiner cooling will not result in offsite dose releases in excess of 10 CFR Part 100 limits. This Safety Evaluation, therefore, is limited to the review of the potential releases due to recombiner cooling leakage and to the Technical Specifications as adopted from the Standard Technical Specifications for Babcock & Wilcox reactors, NUREG-0103.

Evaluation

The licensee's analysis of the potential leakage and discharge to the atmosphere of the Intermediate Building air used for recombiner cooling has been documented in the licensee's "Report in Response to NRC Staff Recommended Requirements for Restart of Three Mile Island Nuclear Station, Unit 1" four volumes. The specific reference is Supplement 1, Part 2, Question 91b. In the report, the licensee states that the hydrogen recombiner system is an engineered safeguards welded piping system with the exception of the recombiner connection and flow element flanges. After installation of the redundant recombiner, the piping system shall be pneumatically tested to demonstrate the integrity of the piping system.

The addition of any possible leakage from the closed piping system will be an insignificant contribution to the total containment leakage and will not affect the accident dose evaluation previously made for the plant.

We have reviewed the licensee's report and agree that the establishment of the system's integrity and demonstration that any leakage is within acceptable limits are sufficient. The licensee's analysis is therefore acceptable.

In the proposed Technical Specifications, the licensee described the testing procedures for the hydrogen recombiner and the associated control system. These testing procedures provide for the following:

(a) A recombiner functional test once per 92 days; and

(b) The following surveillance every 18 months: channel calibration of the recombiner's instrumentation, visual examination of the heater, heater functional test and heater electrical circuit integrity test.

The proposed testing procedures for the hydrogen recombiner and the associated control system are consistent with those established for other engineered safety features. Therefore, we conclude that the proposed test procedures for the hydrogen recombiners are acceptable and that the associated proposed change to the Technical Specifications should be approved.

Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5 (d)(4), that an environmental statement, or negative declaration and environmental impact appraisal need not 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: October 5, 1983

The following NRC personnel have contributed to this Safety Evaluation: P. Hearn, D. Wigginton.