

March 21, 1985

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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. 106 TO FACILITY OPERATING LICENSE NO. DPR-50

The Commission has issued the enclosed Amendment No. 106 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amendment consists of changes to the Technical Specifications (TSs) in response to your request of June 8, 1981, as superseded February 17, 1984 (Technical Specification Change Request No. 105).

This amendment adds TSs covering limiting conditions for operation and surveillance requirements for the plant snubbers installed on reactor safety systems.

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,

ORIGINAL SIGNED BY
JOHN F. STOLZ

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

Enclosures:

- 1. Amendment No. 106
- 2. Safety Evaluation

cc w/enclosures:
See next page

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UNITED STATES
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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. 106
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 - A. The application for amendment by GPU Nuclear Corporation, et al (the licensees) dated June 8, 1981, as superseded February 17, 1984, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and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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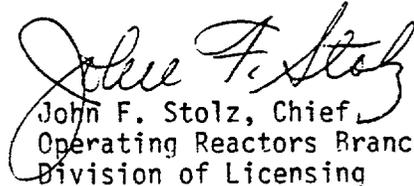
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.c.(2) of Facility Operating License No. DPR-50 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.106 , 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, Chief
Operating Reactors Branch #4
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 21, 1985

ATTACHMENT TO LICENSE AMENDMENT NO. 106

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.

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3.16 SHOCK SUPPRESSORS (SNUBBERS)

LIMITING CONDITION FOR OPERATION

3.16.1 Each safety related snubber shall be OPERABLE.

APPLICABILITY:

Whenever the system protected by the snubber is required to be OPERABLE.

ACTION:

With one or more snubbers inoperable, within 72 hours replace or restore the inoperable snubber(s) to OPERABLE status and perform an engineering evaluation per Specification 4.17.1.g.2 on the attached component or declare the attached system inoperable and follow the appropriate action statement for that system.

BASES

Snubbers are designed to prevent unrestrained pipe motion under dynamic loads as might occur during an earthquake or severe transient, while allowing normal thermal motion during startup and shutdown. The consequence of an inoperable snubber due to failure to activate (lockup) is an increase in the probability of structural damage to piping as a result of a seismic or other event initiating dynamic loads. The consequence of snubber inoperability due to failure to extend or retract is an increase in the probability of structural damage to piping as a result of thermal motion. It is therefore required that all snubbers required to protect the primary coolant system or any other safety system or component which is required to be operable must also be operable. During plant conditions other than operating, snubbers on those systems that are required to be operable during that plant condition are also required to be operable.

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4.17 SHOCK SUPPRESSORS (SNUBBERS)

SURVEILLANCE REQUIREMENTS

4.17.1 Each snubber shall be demonstrated OPERABLE by performance of the following inspection program.

a. Inspection Types

As used in this specification, type of snubber shall mean snubbers of the same design and manufacturer, irrespective of capacity.

b. Visual Inspections

Snubbers are categorized as inaccessible or accessible during reactor operation and may be treated independently. The inaccessibility of each snubber determined to be inaccessible shall be reviewed and approved by the TMI-1 Radiological Controls Manager or an authorized designee. The determination shall be based upon the then existing radiation levels in each snubber location and the expected time to perform the visual inspection and shall be in accordance with the recommendations of Regulatory Guides 8.8 and 8.10. Snubbers accessible during reactor operation shall be inspected in accordance with the schedule stated below. Snubbers inaccessible during reactor operation shall be inspected during each reactor shutdown greater than 48 hours where access is restored* unless previously inspected in accordance with the schedule stated below.

Visual inspections shall include all safety related snubbers and shall be performed in accordance with the following schedule:

<u>No. Inoperable Snubbers of each type per Inspection Period</u>	<u>Subsequent Visual Inspection Period**#</u>
0	18 months + 25%
1	12 months + 25%
2	6 months + 25%
3, 4	124 days + 25%
5, 6, 7	62 days + 25%
8 or more	31 days + 25%

* Snubbers may continue to be inaccessible during reactor shutdown greater than 48 hours (e.g. if purging of the reactor building is not permitted).

** The inspection interval for each type of snubber shall not be lengthened more than one step at a time unless a generic problem has been identified and corrected; in that event the inspection interval may be lengthened one step the first time and two steps thereafter if no inoperable snubbers of that type are found.

The provisions of Table 1.2 are not applicable.

SHOCK SUPPRESSORS (SNUBBERS)

SURVEILLANCE REQUIREMENTS (Continued)

c. Refueling Outage Inspections

At least once each refueling cycle during shutdown, a visual inspection shall be performed of all safety related snubbers attached to sections of safety systems piping that have experienced unexpected, potentially damaging transients as determined from a review of operational data and a visual inspection of the systems.

d. Visual Inspection Acceptance Criteria

Visual inspections shall verify: (1) that there are no visible indications of damage or impaired operability and (2) attachments to the foundation or supporting structure are secure. Snubbers which appear inoperable as a result of visual inspections may be determined OPERABLE for the purpose of establishing the next visual inspection interval, provided that: (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers that may be generically susceptible, and (2) the affected snubber is functionally tested in the as found condition and determined OPERABLE per Specification 4.17-1f. When the reservoir outlet port of a snubber is found to be uncovered by fluid, the snubber shall only be declared operable if functional testing in both extension and retraction directions is satisfactory and an engineering evaluation concludes that this snubber is operable.

e. Functional Tests

At least once each refueling cycle during shutdown, a representative sample of snubbers shall be tested using one of the following sample plans. The sample plan shall be selected prior to the test period and cannot be changed during the test period. The NRC Regional Administrator shall be notified in writing of the sample plan selected prior to the test period, or the sample plan used in the prior test period shall be used:

- 1) At least 10% of the total of each type of snubber in use in the plant shall be functionally tested either in-place or in a bench test. For each snubber of a type that does not meet the functional test acceptance criteria of Specification 4.17.1f, an additional 10% of that type of snubber shall be functionally tested until no more failures are found or until all snubbers of that type have been functionally tested; or

SHOCK SUPPRESSORS (SNUBBERS)

SURVEILLANCE REQUIREMENTS (Continued)

- 2) A representative sample of each type of snubber shall be functionally tested in accordance with Figure 4.17-1. "C" is the total number of snubbers of a type found not meeting the acceptance requirements of Specification 4.17.1f. The cumulative number of snubbers of a type tested is denoted by "N". At the end of each day's testing, the new values of "N" and "C" (previous day's total plus current day's increments) shall be plotted on Figure 4.17-1. If at any time the point plotted falls in the "Reject" region all snubbers of that type shall be functionally tested. If at any time the point plotted falls in the "Accept" region testing of that type of snubber may be terminated. When the point plotted lies in the "Continue Testing" region, additional snubbers of that type shall be tested until the point falls in the "Accept" region or the "Reject" region, or all the snubbers of that type have been tested. Testing equipment failure during functional testing may invalidate that day's testing and allow that day's testing to resume anew at a later time, provided all snubbers tested with the failed equipment during the day of equipment failure are retested.

The representative sample selected for functional test sample plans shall be randomly selected from the snubbers of each type and reviewed before beginning the testing. The review shall ensure as far as practicable that they are representative of the various configurations, operating environments, and the range of size and capacity of snubbers of each type. Snubbers placed in the same location as snubbers which failed the previous functional test shall be retested at the time of the next functional test but shall not be included in the sample plan. If, during the functional test, additional sampling is required due to failure of only one type of snubber, the functional test results shall be reviewed at that time to determine if additional samples should be limited to the type of snubber which has failed the functional testing.

f. Functional Test Acceptance Criteria

The snubber functional test shall verify that:

- 1) Snubber activation (restraining action or lockup) is achieved within the specified velocity range in both tension and compression.
- 2) Snubber release rate (bleed) is achieved in both tension and compression, within the specified range.
- 3) Fasteners for attachment of the snubber to the component and to the snubber anchorage, are secure.

SHOCK SUPPRESSORS (SNUBBERS)

SURVEILLANCE REQUIREMENTS (Continued)

Testing methods may be used to measure parameters indirectly, or parameters other than those specified, if those results can be correlated to the specified parameters through established methods.

g. Functional Test Failure Analysis

1. Cause of Failure Evaluation

An engineering evaluation shall be made of each failure to meet the functional test acceptance criteria to determine the cause of the failure. The results of this evaluation shall be used, if applicable, in selecting snubbers to be tested in an effort to determine the operability of other snubbers, irrespective of type, which may be subject to the same failure mode.

2. Damage Evaluation

For the snubbers found inoperable, an engineering evaluation shall be performed on the components to which the inoperable snubbers are attached. The purpose of this engineering evaluation shall be to determine if the components to which the inoperable snubbers are attached were adversely affected by the inoperability of the snubbers in order to ensure that the component remains capable of meeting the designed service.

If any snubber selected for functional testing either fails to activate (lockup) or fails to extend or retract, i.e., frozen-in-place, the cause will be evaluated and, if caused by manufacturer or design deficiency, all snubbers of the same type which are subject to the same defect shall be evaluated in a manner to ensure operability. This testing requirement shall be independent of the requirements stated in Specification 4.17.1e for snubbers not meeting the functional test acceptance criteria.

h. Functional Testing of Repaired and Replaced Snubbers

Snubbers which fail the visual inspection or the functional test acceptance criteria shall be repaired or replaced. Replacement snubbers and snubbers which have repairs which might affect the functional test result shall have been tested to meet the functional test criteria before installation in the unit.

SHOCK SUPPRESSORS (SNUBBERS)

SURVEILLANCE REQUIREMENTS (Continued)

i. Snubber Seal Replacement Program

A snubber seal replacement program shall be developed whereby the seal service life of hydraulic snubbers is monitored to ensure that the service life is not exceeded between surveillance inspections. The maximum expected service life for the various seals shall be established based on engineering information. The seals shall be replaced so that the maximum expected service life will not be exceeded during a period when the snubber is required to be OPERABLE. The seal replacements shall be documented and the documentation shall be retained in accordance with Specification 6.10.2. The program shall be fully implemented by startup following cycle 7 refueling.

Bases

All safety related hydraulic snubbers are visually inspected for overall integrity and operability. The inspection includes verification of proper orientation, adequate hydraulic fluid level, and proper attachment of snubber to piping and structures.

The visual inspection frequency is based upon maintaining a constant level of snubber protection. Thus, the required inspection interval varies inversely with the observed snubber failures. The number of inoperable snubbers found during a required inspection determines the time interval for the next required inspection. Inspections performed before that interval has elapsed may be used as a new reference point to determine the next inspection. However, the results of such early inspections performed before the original required time interval has elapsed (nominal time less 25%) may not be used to lengthen the required inspection interval. Any inspection whose results require a shorter inspection interval will override the previous schedule. Those snubbers which are inaccessible during reactor operation are not required to be inspected in accordance with the indicated inspection interval but must be inspected during the next shutdown when access is restored.

When the cause of the rejection of a snubber by visual inspection is clearly established and remedied for that snubber and for any other snubbers that may be generically susceptible, that snubber may be exempted from being counted as inoperable if it is determined operable by functional testing. Generically susceptible snubbers are those snubbers which are of a specific make or model and have the same design features directly related to rejection of the snubbers by visual inspection, or are similiarly located or exposed to the same environmental conditions such as temperature, radiation, and vibration.

When a snubber is found inoperable, an engineering evaluation is performed, in addition to the determination of the snubber mode of failure, in order to determine if any safety-related component or system has been adversely affected by the inoperability of the snubber. The engineering evaluation shall determine whether or not the snubber mode of failure has imparted a significant effect or degradation on the supported component or system.

To provide assurance of snubber functional reliability, one of the two sampling and acceptance criteria methods are used:

1. Functionally test 10% of a type of snubber with an additional 10% tested for each functional testing failure, or
2. Functionally test a sample size and determine sample acceptance or rejection using Figure 4.17-1.

Figure 4.17-1 was developed using "Wald's Sequential Probability Ratio Plan" as described in "Quality Control and Industrial Statistics" by Acheson J. Duncan.

Snubber seal service life is evaluated via manufacturer input and information through consideration of the snubber service conditions and associated installation and maintenance records. The requirement to monitor the snubber seal service life is included to ensure that the seals periodically undergo a performance evaluation in view of their age and operating conditions. These records will provide statistical bases for future consideration of snubber seal service life. The requirements for the maintenance of records and the snubber seal service life are not intended to affect plant operation.

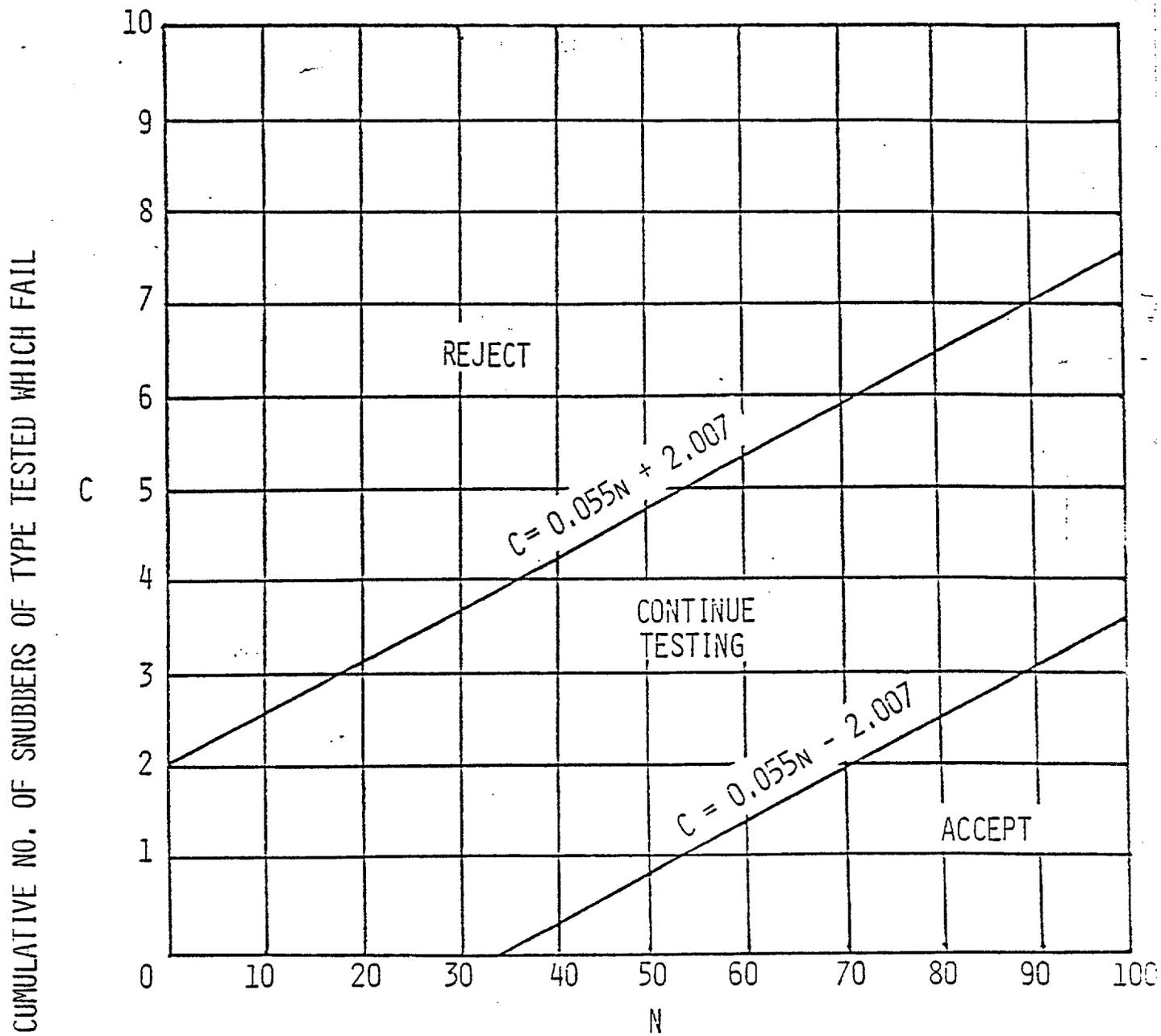
A technique and method for functional testing of the 550,000 lb. reactor coolant pump snubbers is currently under development. The functional test program shall be submitted for NRC approval by cycle 6 refueling.

As a basis for permanent deletion of a snubber from the list of safety related snubbers, an engineering analysis must be performed to verify that the original safety analysis design criteria are either met or exceeded. Snubber additions and deletions are reported to the NRC in accordance with 10 CFR 50.59 requirements.

Pages 4-67 through 4-71

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Amendment No. 106



CUMULATIVE NO. OF SNUBBERS OF TYPE TESTED

FIGURE 4.17-1
 SNUBBER FUNCTIONAL TEST - SAMPLE PLAN 2

- m. Records of the service lives of all safety related hydraulic snubbers including the date at which the service life commences and associated installation and maintenance records.
- n. Records for Environmental Qualification which are covered under the provision of paragraph 6.15.

6.11 RADIATION PROTECTION PROGRAM

Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained and adhered to for all operations involving personnel radiation exposure.

6.12 HIGH RADIATION AREA

6.12.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.203(c)(2) of 10 CFR 20:

- a. Each High Radiation Area shall be barricaded and conspicuously posted as a High Radiation Area, and personnel desiring entrance shall obtain a Radiation Work Permit (RWP). Any individual entering a High Radiation Area shall (a) use a continuously indicating dose rate monitoring device or (b) use a radiation dose rate integrating device which alarms at a pre-set dose level, or (c) assure that a radiological control technician provides periodic radiation surveillance with a dose rate monitoring instrument.
- b. Any area accessible to personnel where a major portion of the body could receive in any one hour a dose in excess of one thousand mrem shall be locked or guarded to prevent unauthorized entry. The keys to these locked barricades shall be maintained under the administrative control of the Radiological Controls Foreman on duty.

The Radiation Work Permit is not required by Radiological Controls personnel during the performance of their assigned radiation protection duties provided they are following radiological control procedures for entry into High Radiation Areas.

6.13 PROCESS CONTROL PROGRAM (PCP)

6.13.1 The PCP shall be approved by the Commission prior to implementation.

6.13.2 GPU Nuclear Corporation initiated changes to the PCP:

- 1. Shall be submitted to the NRC in the Semiannual Radioactive Effluent Release Report for the period in which the changes were made. This submittal shall contain:
 - a. sufficiently detailed information to justify the changes without benefit of additional or supplemental information;
 - b. a determination that the changes did not reduce the overall conformance of the solidified waste product to existing criteria for solid wastes; and



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 106 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

1. INTRODUCTION

Operating experiences, advances in the state-of-the-art, voids in some specific requirements, and nonuniform interpretations indicated the need for changes, clarifications, and improvements in the Standard Technical Specifications (STS) for inservice operability and surveillance requirements for snubbers. To reflect accumulated experience obtained in the past several years, the NRC staff issued Revision 1 of the snubber STS. By letters dated November 20, 1980, to power reactor licensees (except SEP licensees) and March 23, 1981, to SEP licensees, the NRC requested all licensees to incorporate the requirements of this STS revision into their plant specific Technical Specifications (TS).

The revised STS included:

- Addition of mechanical snubbers to the surveillance program;
- Deletion of the blanket exemption for testing of greater than 50,000 lb. rated capacity snubbers (Snubbers of greater than 50,000 lb. capacity are now included in the testing program.);
- Deletion of the requirement that seal material receive NRC approval;
- Clarification of test requirements;
- Provision for in-place testing; and
- Addition of a service life monitoring program.

Recently, by letter dated May 3, 1984, the NRC advised licensees that an amendment request may be submitted to delete the snubber Table listing from their TS if the licensee so chooses.

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2. DISCUSSION

In response to the NRC request, by letter dated June 8, 1981, the licensee submitted an application for license amendment and proposed TS changes for operability and surveillance requirements for snubbers. By letter dated February 17, 1984, the licensee resubmitted a revised proposed snubber TS change which superseded the previous request in its entirety.

The NRC staff has reviewed the licensee's February 17, 1984, resubmittal of proposed snubber TS changes. In addition, an inspection relating to snubbers was performed at the licensee's plant and discussions were held with cognizant licensee personnel regarding the proposed TS changes. The staff review compared the proposed snubber TS with the model STS and TS recently approved for Near Term Operating Licenses (NTOLs). The facility inspection and discussions with cognizant personnel provided a means to observe snubber installation and testing practices and to review the supplementary procedural documentation needed for implementation of the TS, and to obtain clarification of several of the proposed changes.

3. EVALUATION

The staff has evaluated the licensee's snubber TS submittal and has found it to be in substantial agreement with the intent of the STS and the recently approved TS for NTOLs. The licensee's proposed snubber TS clarify and increase snubber surveillance, define testing and acceptance criteria, include a snubber seal service life program (this plant only has hydraulic snubbers), and commits the licensee to develop a functional test program for the four 550,000 lb. reactor coolant pump snubbers. The specific aspects of the licensee's proposed snubber TS which are different than the STS or the recently approved TS for NTOLs and require further explanation are addressed below.

3.1 VISUAL INSPECTION ACCESS

The licensee's proposed TS 4.17.1.b contains the provision to visually inspect snubbers in accordance with the STS tabular schedule. The licensee's proposed TS 4.17.1.b also contains the provision that snubbers inaccessible during normal operation shall be inspected during each reactor shutdown greater than 48 hours where access is restored, unless previously inspected in accordance with the tabular schedule. The access restoration provision is related to radiation in the reactor building. Restoring access is recognized to be dependent on the licensee's capability to establish appropriate habitability in the areas to be inspected. Based on the licensee's stated intent to make every reasonable effort to restore access, the staff finds the licensee's provision for access restoration to perform visual inspection to be acceptable.

3.2 FUNCTIONAL TESTING OF LARGE SNUBBERS

The licensee's submittal implicitly excludes the reactor coolant pump snubbers from proposed TS 4.17.1.e because the bases section contains the commitment to develop a functional test program for the 550,000 lb. reactor coolant pump snubbers and to submit this program to the NRC for approval by Cycle 6 refueling. The staff realizes that functional testing of these exceptionally large size snubbers in accordance with the STS cannot be done until a testing program has been developed. Based on the licensee's commitment to develop the test program and to submit it to NRC for review, the staff finds this limited time delay in testing of these large snubbers to be acceptable.

3.3 SNUBBER SEAL SERVICE LIFE PROGRAM

The licensee's proposed TS 4.17.1.i contains the provision that a snubber seal replacement program shall be developed to monitor and replace seals so their service life will not be exceeded. The proposed TS includes the provision to fully implement this program by startup following Cycle 7 refueling. The staff recognized that the STS inclusion of a service life program would require time to develop and implement the necessary procedures. A recent inspection of the facility verified that the licensee has already partially implemented the program and is proceeding with revisions for full implementation of the program. Based on the licensee's commitment and the staff's verification of progress made, the staff finds the licensee's schedule for implementation to be acceptable.

3.4 TS SNUBBER TABLES

The licensee's proposed snubber TS does not contain a table listing of snubbers. The licensee has provided acceptable justification for the proposed table deletion; that a complete safety related snubber list with appropriate detailed information is maintained in plant procedures and any change to the list of safety related snubbers would be subject to 10 CFR 50.59 review. The most recent NRC letter to licensees dated May 3, 1984, permits removal of snubber TS Tables on the same premise as the licensee's proposal; therefore the staff finds the proposed TS snubber table deletion acceptable.

3.5 PLANT SPECIFIC INSTALLATION DIFFERENCES

The licensee's proposed snubber TS does not contain the STS provisions related to mechanical snubbers or to common hydraulic fluid reservoirs. The licensee has stated that these items are not installed at the facility; therefore the staff finds the omission of these provisions to be acceptable.

4. ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and surveillance requirements. 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.

5. 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: March 21, 1985

The following NRC personnel have contributed to this Safety Evaluation:
Harold Gregg, and Donald Haverkamp.