Entergy

Entergy Nuclear Northeast
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
295 Broadway, Suite 1
P.O. Box 249
Buchanan, NY 10511-0249

January 8, 2002

Re: Indian Point Unit No. 2
Docket No. 50-247
NL 02-004

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop 0-P1-17
Washington, DC 20555-0001

Subject: License Amendment Request (LAR No. 02-004) for Power Limits With Inoperable Steam Line Safety Valves

References:
1. Westinghouse Nuclear Safety Advisory No. NSAL-94-001, "Operation at Reduced Power Levels with Inoperable MSSVs," dated January 20, 1994
2. Nuclear Regulatory Commission Information Notice (IN) 94-60, "Potential Overpressurization of Main Steam System"

Pursuant to 10CFR50.90, Entergy Nuclear Operations, Inc. (ENO) hereby requests an amendment to the Indian Point Unit No. 2 (IP2) Technical Specifications (TS) Section 3.4, "Steam and Power Conversion System." The purpose of this License Amendment Request is to incorporate the use of a more conservative equation to calculate the power range high neutron trip setpoint when one or more main steam safety valves are inoperable. This more conservative equation is recommended by NSAL-94-001 (Ref. 1) as discussed in IN94-01 (Ref 2).

Attachment 1 to this letter provides the description and evaluation of the proposed change. The revised TS pages and TS Bases pages are provided in Attachment 2 (strikeout and shadow format).

The more conservative calculation will be implemented at IP2 using administrative controls. ENO requests approval of the proposed change within one year of the date of this submittal with a License Amendment implementation date within 60 days of approval.

The Station Nuclear Safety Committee (SNSC) and the Nuclear Facilities Safety Committee (NFSC) have reviewed the proposed change. Both committees concur that the proposed change does not involve a significant hazards consideration as defined by 10 CFR 50.92(c).

In accordance with 10 CFR 50.91, a copy of this submittal and the associated attachments are being submitted to the designated New York State official.

A001

This letter contains no new commitments.

Should you or your staff have any questions regarding this submittal, please contact Mr. John F. McCann, Manager, Nuclear Safety and Licensing at (914) 734-5074.

Very truly yours,

Fred Dacimo
Vice President – Operations
Indian Point 2

Attachments

cc: See page 3

cc:

Mr. Hubert J. Miller
Regional Administrator-Region I
US Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Patrick D. Milano, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
US Nuclear Regulatory Commission
Mail Stop O-8-2C
Washington, DC 20555

NRC Senior Resident Inspector
US Nuclear Regulatory Commission
PO Box 38
Buchanan, NY 10511

Mayor, Village of Buchanan
236 Tate Avenue
Buchanan, NY 10511

Mr. Paul Eddy
NYS Department of Public Service
3 Empire Plaza
Albany, NY 12223

Mr. William F. Flynn
NYS ERDA
Corporate Plaza West
286 Washington Ave. Extension
Albany, NY 12223-6399

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
ENTERGY NUCLEAR OPERATIONS, INC.	)	Docket No. 50-247
Indian Point Nuclear Generating Unit No. 2	)	

APPLICATION FOR AMENDMENT
TO OPERATING LICENSE

Pursuant to Section 50.90 of the Regulations of the Nuclear Regulatory Commission (NRC), Entergy Nuclear Operations, Inc., as holder of Facility Operating License No. DPR-26, hereby applies for amendment of the Technical Specifications contained in Appendix A of this license.

The specific proposed Technical Specification revision is set forth in Attachment 2. The associated assessment demonstrates that the proposed change does not involve a significant hazards consideration as defined in 10CFR50.92(c).

As required by 10CFR50.91(b)(1), a copy of this Application and our evaluation concluding that the proposed change does not involve a significant hazards consideration has been provided to the designated New York State official.

BY: _____
Fred Dacimo
Vice President – Operations
Indian Point 2

Subscribed and sworn to
before me this 8th day
January, 2002.

Karen L. Lancaster
Notary Public

KAREN L. LANCASTER
Notary Public, State of New York
No. 60-4643659
Qualified In Westchester County
Term Expires 9/30/05

ATTACHMENT 1 TO NL 02-004

LICENSE AMENDMENT REQUEST

POWER LIMITS WITH INOPERABLE STEAM LINE SAFETY VALVES

LICENSE AMENDMENT REQUEST

DESCRIPTION OF THE PROPOSED CHANGE

Entergy Nuclear Operations, Inc. (ENO) is requesting a change to the Indian Point Unit No. 2 (IP2) Technical Specifications (TS) 3.4, "Steam and Power Conversion System." The maximum allowable power range neutron flux high setpoint with inoperable steam line safety valves during four loop operation is being changed.

Associated TS Bases changes are included with this proposed change.

REASONS FOR THE CHANGE

The requested changes reflect a calculation that was performed using the more conservative methodology of NSAL 94-001 (Ref.1) as described in NRC Information Notice 94-60 (Ref. 2).

EVALUATION OF THE PROPOSED CHANGE

Requirements for the operability of the main steam line code safety valves are included in TS to satisfy criterion 3 of 10CFR50.36.

The operability of the twenty main steam line code safety valves ensures that the secondary system pressure will be limited to within 110% of its design pressure of 1085 psig during the most severe anticipated system operational transient. The maximum relieving capacity is associated with a turbine trip from 100% rated thermal power coincident with an assumed loss of condenser heat sink (i.e., no steam bypass to the condenser). This limiting decreased heat removal event is described in the IP2 UFSAR 14.1.12, "Loss of All AC Power to the Station Auxiliaries." The main steam line code safety valves also play a role in mitigating the consequences of some uncontrolled rod cluster assembly bank withdrawal accidents at power as described in the IP2 UFSAR 14.1.2, "Uncontrolled Rod Cluster Control Assembly Bank Withdrawal At Power."

The current TS allow main steam line code safety valves to be inoperable provided that the high flux trip setpoint is reduced. This allowance was incorporated into the IP2 TS in License Amendment 119 (Ref. 3). As explained in the TS Bases and the NRC Staff's Safety Evaluation for License Amendment 119, the high flux trip setpoint reduction calculation is based on the assumption that the maximum allowable power level is a linear function of main steam safety valve capacity. In NSAL 94-001, IP2 was notified that this assumption was not correct and there was a possibility of an overpressurization of the main steam system if main steam line code safety valves were inoperable at the time of the most severe anticipated system operational transient.

IP2 has initiated administrative controls to preclude the possibility of overpressurization and is submitting this proposed change to correct the inadequate TS.

The new calculation methodology is the same as proposed by NSAL 94-001. That is, the maximum allowable power range neutron flux high setpoint (SP) is calculated using the following simple, conservative heat balance equation:

$$SP = (100/Q) * (w_s h_{fg} N/K) * U$$

Where:

Q =	Nominal NSSS power rating of IP2
K =	Conversion factor MWt to BTU/sec
w_s =	Minimum total steam flow rate capability of the operable MSSVs on any one steam generator
h_{fg} =	Heat of vaporization for steam at the highest MSSV opening pressure
N =	Number of loops in the IP2 Reactor Coolant system
U =	Instrument and channel uncertainties

The proposed TS limits are more limiting than the existing limits, that is, the protective system will be set to trip the reactor at a lower neutron flux setpoint than currently exists.

The proposed change is consistent with NUREG-1431, "Standard Technical Specifications, Westinghouse Plants," as described in STS B 3.7.1, "Main Steam Safety Valves," on page B 3.7.1-1. The proposed change will facilitate the IP2 transition to Improved TS.

Other Licensees

This proposed calculation methodology is the same as that used by Indian Point Unit 3 (IP3) as described in the IP3 TS Bases 3.7.1, "Main Steam Safety Valves (MSSVs)."

Overall Conclusion

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

NO SIGNIFICANT HAZARDS CONSIDERATION EVALUATION

ENO has determined that this proposed Technical Specification change does not involve a significant hazards consideration as defined by 10CFR50.92(c).

1. **Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated.**

The proposed change to the setpoints will cause a reactor trip on high neutron flux for a decreased heat removal event at an earlier (more conservative) condition. The consequences of an accident with the proposed setpoints are less severe than those predicted with the use of the current setpoints.

The main steam line code safety valves, in conjunction with the high neutron flux reactor trip mitigate the consequences of decreased heat removal and uncontrolled rod cluster assembly bank withdrawal events. The systems acting together do not initiate or cause any accident. Therefore, the probability of analyzed accidents is unchanged by the proposed TS change.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.**

There is no change to either the design or operation of the main steam line code safety valves. This proposed change only changes the high neutron flux trip setpoints in response to the inoperable main steam line code safety valves. This feature currently exists both in the plant and in the TS.

Therefore, the proposed change does not create a new accident initiator or precursor, or create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in the margin of safety.**

The current TS setpoints have been determined to be non-conservative and insufficient to guarantee safety. The proposed change would impose limits that were anticipated in the original TS and are conservative with respect to the current TS. Therefore, the margin of safety as defined in the TS (protection of the secondary system from overpressurization so that it is available for decay heat removal) will be restored to that intended with the original TS.

The ability to keep the core cooled in spite of the inoperability of some main steam line code safety valves is enhanced by the proposed change. Therefore, operation of the facility in accordance with the proposed amendment would not involve a significant reduction in the margin of safety.

CONCLUSIONS

Based on the above evaluation, ENO has concluded that the proposed change will not result in a significant increase in the probability or consequences of any accident previously analyzed; will not result in a new or different kind of accident from any accident previously analyzed, and does not result in a reduction in any margin of safety. Therefore, operation of IP2 in accordance with the proposed amendment does not involve a significant hazards consideration. In addition, the proposed change to the TS has been reviewed by both the Station Nuclear Safety Committee (SNSC) and the Nuclear Facilities Safety Committee (NFSC). Both committees concur that the proposed change does not involve a significant hazards consideration.

ENVIRONMENTAL ASSESSMENT

An environmental assessment is not required for the above proposed change because the requested change to the Indian Point Unit No. 2 Technical Specifications conforms to the criteria for "actions eligible for categorical exclusion," as specified in 10CFR51.22(c)(9). The requested change will have no impact on the environment. The proposed change does not involve a significant hazards consideration as discussed in the preceding section. The proposed change does not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed change does not involve a significant increase in individual or cumulative occupational radiation exposure.

References

1. Westinghouse Nuclear Safety Advisory No. NSAL-94-001, "Operation at Reduced Power Levels with Inoperable MSSVs," dated January 20, 1994
2. Nuclear Regulatory Commission Information Notice (IN) 94-60, "Potential Overpressurization of Main Steam System"
3. NRC letter (RA 87-101) to Consolidated Edison issuing Amendment 119 to Facility Operating License No. DPR-26 (TAC 64160), dated May 28, 1987

ATTACHMENT 2 TO NL 02-004

TECHNICAL SPECIFICATION PAGES IN

STRIKEOUT/SHADOW FORMAT

Deleted text is shown as ~~strikeout~~.

Added text is shown as shaded.

ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247

3. notify the NRC within 24 hours regarding the planned corrective action.

Basis

Reactor shutdown from power requires removal of core decay heat. Immediate decay heat removal requirements are normally satisfied by the steam bypass to the condensers. Thereafter, core decay heat can be continuously dissipated via the steam bypass to the condenser as feedwater in the steam generator is converted to steam by heat absorption. Normally, the capability to feed the steam generators is provided by operation of the turbine cycle feedwater system.

The operability of the twenty main steam line code safety valves ensure that the secondary system pressure will be limited to within 110% of its design pressure of 1085 psig during the most severe anticipated system operational transient. The maximum relieving capacity is associated with a turbine trip from 100% Rated Thermal Power coincident with an assumed loss of condenser heat sink (i.e., no steam bypass to the condenser).

The total relieving capacity of the twenty main steam safety valves is 15,108,000 lbs/hr which is 114 percent of the total secondary steam flow of 13,310,000 lbs/hr at 100% NSSS Power (3083.4 Mwt). Startup and/or power operation is allowable with main steam safety valves inoperable within the limitations of Table 3.4-1 on the basis of the reduction in secondary system steam flow and thermal power required by the reduced reactor trip settings of the Power Range Neutron Flux channels. The reactor trip setpoint reductions are ~~derived on the following basis:~~ based on the heat removal capacity of the remaining operable steam line safety valves. The maximum thermal power corresponding to the heat removal capacity of the remaining operable steam line safety valves is determined via a conservative heat balance calculation as described in the attachment to Ref. 2 with an appropriate allowance for calorimetric power uncertainty.

~~$$SP = \left[\frac{X - YV}{X}\right] \cdot 109$$~~

~~Where:~~

~~SP = Reduced reactor trip setpoint in percent of rated thermal power~~

~~V = Maximum number of inoperable safety valves per steam line~~

~~109 = Power Range Neutron Flux High Trip Setpoint for (4) loop operation~~

~~X = Total relieving capacity of all safety valves per steam line (3,777,000 lbs/hr.)~~

~~Y = Maximum relieving capacity of any one safety valve (823,000 lbs/hr.)~~

In the unlikely event of complete loss of electrical power to the station, decay heat removal would continue to be assured by the availability of either the steam-driven auxiliary feedwater pump or one of the two motor-driven auxiliary steam generator feedwater pumps, and steam discharge to the atmosphere via the main steam safety valves and atmospheric relief valves. One motor-driven auxiliary feedwater pump can supply sufficient feedwater for removal of decay heat from the plant. The minimum amount of water in the condensate storage tank is the amount needed for 24 hours at hot standby. When the condensate storage supply is exhausted, city water will be used.

The limit on secondary coolant total iodine activity of I-131 and I-133 is based on a postulated release of secondary coolant equivalent to the contents of four steam generators to the atmosphere due to a net load rejection with loss-of-offsite power. The limiting dose for this case would result from radioactive iodine in the secondary coolant. I-131 and I-133 are the dominant isotopes because of their low MPCs in air and because the other, shorter-lived isotopes cannot build up to significant concentrations in the secondary coolant under the limits of primary system leak rate and activity. One tenth of the iodine in the secondary coolant is assumed to reach the site boundary, making allowance for plate-out and retention in water droplets. The inhalation dose at the site boundary is then as follows:

$$\text{Dose(rem)} = \frac{C \cdot V}{10} \cdot B(t) \cdot X/Q \cdot DCF$$

where: C = secondary coolant activity (0.15 μCi/cc = 0.15 Ci/m^3)

V = water volume in four steam generators (7416 ft^3 = 210 m^3)

B(t) = breathing rate (3.47 x 10^{-4} m^3/sec)

X/Q = 7.5 X 10^{-4} sec/m^3

DCF = 1.00 x 10^6 rem/Ci Iodine (131 and 133) inhaled

The resultant dose is less than 1.0 rem.

Reference

1. UFSAR - Chapter 10 and Section 14.1.9
2. NRC Information Notice 94-60: Potential Overpressurization of Main Steam System

TABLE 3.4-1

Maximum Allowable Power Range Neutron Flux High Setpoint with Inoperable Steam Line Safety Valves During 4-Loop Operation

Maximum Number of Inoperable Safety Valves on Any Operating Steam Generator	Maximum Allowable Power Range Neutron Flux High Setpoint (Percent of Rated Thermal Power)
1	~~85~~ 67
2	~~61~~ 49
3	~~37~~ 30