

June 4, 2002

Mr. Michael R. Kansler  
Senior Vice President and  
Chief Operating Officer  
Entergy Nuclear Operations, Inc.  
440 Hamilton Avenue  
White Plains, NY 10601

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NO. 2 - AMENDMENT RE:  
POWER RANGE NEUTRON FLUX HIGH SETPOINT WITH INOPERABLE  
MAIN STEAM SAFETY VALVE (TAC NO. MB3918)

Dear Mr. Kansler:

The Commission has issued the enclosed Amendment No. 228 to Facility Operating License No. DPR-26 for the Indian Point Nuclear Generating Unit No. 2. The amendment consists of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated January 8, 2002, as supplemented on April 15, 2002.

The amendment revises TS 3.4.1, "Main Steam Safety Valves," to reduce the maximum allowable power range neutron flux high setpoint when one or more main steam line safety valves are inoperable. The amendment also revises the associated TS Basis to incorporate a more conservative equation to calculate this setpoint.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly *Federal Register* notice.

Sincerely,

*/RA/*

Patrick D. Milano, Sr. Project Manager, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-247

Enclosures: 1. Amendment No. 228 to DPR-26  
2. Safety Evaluation

cc w/encls: See next page

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Package: ML021560284

TSs: ML021560280

Accession Number: ML021360159

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DATE	06/03/02	06/3/02	05/21/02	05/29/02	06/3/02

Official Record Copy

DATED: June 4, 2002

AMENDMENT NO. 228 TO FACILITY OPERATING LICENSE NO. DPR-26 INDIAN POINT  
UNIT 2

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ENERGY NUCLEAR INDIAN POINT 2, LLC

ENERGY NUCLEAR OPERATIONS, INC.

DOCKET NO. 50-247

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 228  
License No. DPR-26

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Entergy Nuclear Operations, Inc. (the licensee) dated January 8, 2002, as supplemented on April 15, 2002, 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-26 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 228, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Richard J. Laufer, Chief, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: June 4, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 228

FACILITY OPERATING LICENSE NO. DPR-26

DOCKET NO. 50-247

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

3.4-3  
3.4-4  
3.4-5  
Table 3.4-1

Insert Pages

3.4-3  
3.4-4  
3.4-5  
Table 3.4-1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 228 TO FACILITY OPERATING LICENSE NO. DPR-26  
ENERGY NUCLEAR OPERATIONS, INC.  
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2  
DOCKET NO. 50-247

## 1.0 INTRODUCTION

By letter dated January 8, 2002, as supplemented on April 15, 2002 (References 1 and 2), Entergy Nuclear Operations, Inc. (the licensee) submitted a request for changes to the Indian Point Nuclear Generating Unit No. 2 (IP2) Technical Specifications (TSs). The requested changes would revise TS 3.4.1, "Main Steam Safety Valves," to reduce the maximum allowable power range neutron flux high setpoint with inoperable main steam line safety valves (MSSVs). The associated TS Basis would be revised to incorporate a more conservative equation to calculate this setpoint. The April 15 letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

## 2.0 REGULATORY EVALUATION

The Basis Section for TS 3.4 state that the operability of the 20 MSSVs ensures that the secondary system pressure will be limited to within 110 percent if 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 percent (full) rated thermal power with an assumed loss of the condenser heat sink.

The shell side of the IP2 steam generators is designed to the 1995 Edition of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Class C. The purpose of this TS change is to correct a nonconservatism in the high flux trip setting in order to satisfy the ASME Code requirements to prevent steam generator pressures over 110 percent of the design pressure.

## 3.0 TECHNICAL EVALUATION

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's regulatory and technical analyses in support of its proposed license amendment which are described in the January 8 and April 15, 2002, submittals. The detailed evaluation below supports the conclusions that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed changes for IP2, (2) 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 the health and safety of the public.

### 3.1 Background

The calculation for the current maximum power range neutron flux setpoint with an inoperable MSSV is based on the assumption that the maximum allowable power level is a linear function of the MSSV discharge capacity. However, in Information Notice 94-60 (IN 94-60), "Potential Overpressurization of Main Steam System," dated August 22, 1994 (Ref. 3), the NRC alerted licensees to a potential for overpressurizing the main steam system during periods when one or more MSSVs are inoperable. IN 94-60 was prompted by a Westinghouse Nuclear Safety Advisory Letter (NSAL) 94-001, "Operation at Reduced Power Levels with Inoperable MSSVs," January 20, 1994. This NSAL described a deficiency in the basis for Standard Technical Specification (STS) Table 3.7.1, "Operable Main Steam Safety Valves Versus Applicable Power in Percent of Rated Power." The STS basis assumed that the maximum allowable initial power level is a linear function of MSSV capacity. Westinghouse determined that this assumption was not correct and noted that, when operating at low power in accordance with STS Table 3.7.1, with one or more safety valves inoperable, a loss-of-load/ turbine trip transient concurrent with a loss of feedwater could result in overpressurization of the main steam system.

The NRC staff also noted that, should a plant operating at full power experience a loss-of-load initiating event, the transient would be terminated by a reactor trip. The reactor would trip on either high pressurizer pressure, overtemperature delta temperature (OTΔT), or steam generator low-low level. Secondary-side overpressure protection is provided by the actuation of the MSSVs. When a plant is operating at a reduced power level, a reactor trip may not be initiated early in the transient resulting in a longer time during which primary heat is transferred to the steam generator secondary side. The OTΔT trip will not be actuated because the thermal margins are increased at lower power levels. Likewise, a high pressurizer pressure trip will not activate because the primary pressure does not increase fast enough. The licensee estimated that the reactor eventually will trip on a steam generator level low-low signal. In this case, if one or more MSSVs are inoperable, the steam generator shell side pressure would exceed 110 percent of the design pressure before the reactor trips. The licensee proposed to remedy the situation by reducing the power range neutron flux trip setpoint for operation with one or more MSSVs inoperable. The revised setpoint would be based on a corrected calculation methodology.

### 3.2 New Setpoint Methodology

The reduced power, power range neutron flux high setpoint must be at a value that allows the operable MSSVs to remove the available heat. To calculate this setpoint the licensee used the equation proposed in IN 94-60 and subtracted instrument uncertainty i.e.:

$$Hi\phi = [(100W_s h_{fg} N)/QK] - U$$

where:

- Hiφ Is the power range high neutron flux setpoint in percent (%)
- W<sub>s</sub> Is the minimum total steam flow rate of the operable MSSVs in lbm/sec
- h<sub>fg</sub> Is the heat of vaporization at the highest MSSV opening pressure in BTU/lbm
- N Is the number of loops
- Q Is the rated plant power in MWt
- K Is the conversion factor MWt to BTU/sec, and
- U Is the instrument uncertainty in percent (%)

The above equation results in lower power range neutron flux high trip settings than the previous calculation. For one, two or three inoperable MSSVs, the new settings are: 64 percent, 44 percent and 24 percent versus 85 percent, 61 percent and 37 percent, respectively, for the current settings.

The discharge capacity for each of the five safety valves in each main steam lines from the steam generators is provided by the manufacturer for the pressure setting of each valve. In case a steam generator safety valve is inoperable, it is assumed that it is the one with the highest discharge capacity. If two are inoperable it is assumed that they are the two with the highest discharge capacity, and so on. The valve lift setpoints are fixed and increase in sequence from the lowest to the highest capacity MSSV. Knowing the total discharge capacity, the above equation is used to calculate the highest power level allowable for the reactor, taking into account the instrument uncertainties. The calculation also assumes that the MSSVs will lift at the high point of the allowed lift setting range. After opening, an MSSV will close when steam line pressure falls below the lower reset (blowdown) pressure setting.

### 3.3 TS Changes

The NRC staff reviewed the changes in TS Table 3.4-1 and the associated Basis section. The setpoint calculation produces conservative values which are further lowered to account for the instrument uncertainty (about 9 percent). The setpoint conservatism comes from the assumption that the MSSV will open at their highest pressure setting including the uncertainty. In addition, the rated power includes the heat addition from the reactor coolant pumps. The staff finds the methodology used to calculate the power range neutron flux high setpoint to be conservative and that steam generator overpressurization will be avoided. The proposed TS changes are based on a new equation for the estimation of the power range neutron flux high setpoints that incorporates the corrections discussed in IN 94-60. The new setpoint calculation directly relates the heat generated to that which can be dissipated through the MSSVs. Therefore, the staff concludes that the new setpoint methodology and setpoint values are acceptable.

### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New York State official was notified of the proposed issuance of the amendment. The State official had no comments.

### 5.0 ENVIRONMENTAL CONSIDERATION

The 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. The NRC staff has 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (67 FR 10012). Accordingly, the 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 the amendment.

## 6.0 CONCLUSION

The Commission has 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, (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.

## 7.0 REFERENCES

1. Letter from F. Dacimo, Entergy Nuclear Operations to U.S. NRC "License Amendment Request (LAR No. 02-004) for Power Limits with Inoperable Steam Line Safety Valves" dated January 8, 2002.
2. Letter from F. Dacimo, Entergy Nuclear Operations to U.S. NRC "Response to Request for Additional Information Indian Point 2 License Amendment Request for Power Limits with Inoperable Steam Line Safety Valves" dated April 15, 2002.
3. U.S. Nuclear Regulatory Commission: Information Notice 94-60, "Potential Overpressurization of Main Steam System" dated August 22, 1994.

Principal Contributor: L. Lois

Date: June 4, 2002