



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 30, 2011

Site Vice President
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
P.O. Box 250
Governor Hunt Road
Vernon, VT 05354

**SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION - ISSUANCE OF
EMERGENCY AMENDMENT RE: MODIFICATION OF TECHNICAL
SPECIFICATION FOR SINGLE LOOP OPERATION (TAC NO. ME7202)**

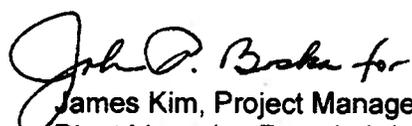
Dear Sir or Madam:

The Commission has issued the enclosed Amendment No. 249 to Renewed Facility Operating License DPR-28 for the Vermont Yankee Nuclear Power Station, in response to your application dated September 29, 2011, as supplemented by letter dated September 30, 2011.

The amendment revises the Technical Specifications (TS) to allow disarming either the supply breaker or the field breaker to the motor generator set for an idle recirculation pump when operating in single loop.

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

Sincerely,


James Kim, Project Manager
Plant Licensing Branch 1-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosures:

1. Amendment No. 249 to License No. DPR-28
2. Safety Evaluation

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ENERGY NUCLEAR VERMONT YANKEE, LLC

AND ENERGY NUCLEAR OPERATIONS, INC.

DOCKET NO. 50-271

VERMONT YANKEE NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 249
License No. DPR-28

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. (the licensee) dated September 29, 2011, as supplemented by letter dated September 30, 2011, 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.

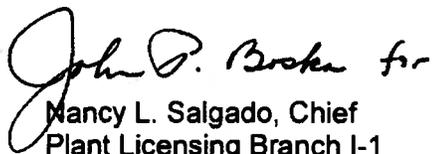
2. Accordingly, the license is amended as indicated in the attachment to this license amendment, and paragraph 3.B of the Renewed Facility Operating License No. DPR-28 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 249, are hereby incorporated in the license. Entergy Nuclear Operations, Inc. shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Nancy L. Salgado, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the License and
Technical Specifications

Date of Issuance: September 30, 2011

ATTACHMENT TO LICENSE AMENDMENT NO. 249
RENEWED FACILITY OPERATING LICENSE NO. DPR-28

DOCKET NO. 50-271

Replace the following page of the Renewed Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove
3

Insert
3

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
123
144

Insert
123
144

- D. Entergy Nuclear Operations, Inc., pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any Byproduct, source, or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components.
 - E. Entergy Nuclear Operations, Inc., pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not to separate, such byproduct and special nuclear material as may be produced by operation of the facility.
3. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations: 10 CFR Part 20, Section 30.34 of 10 CFR Part 30, Section 40.41 of 10 CFR Part 40, Section 50.54 and 50.59 of 10 CFR Part 50, and Section 70.32 of 10 CFR Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified below:

A. Maximum Power Level

Entergy Nuclear Operations, Inc. is authorized to operate the facility at reactor core power levels not to exceed 1912 megawatts thermal in accordance with the Technical Specifications (Appendix A) appended hereto.

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 249 are hereby incorporated in the license. Entergy Nuclear Operations, Inc. shall operate the facility in accordance with the Technical Specifications.

C. Reports

Entergy Nuclear Operations, Inc. shall make reports in accordance with the requirements of the Technical Specifications.

D. This paragraph deleted by Amendment No. 226.

E. Environmental Conditions

Pursuant to the Initial Decision of the presiding Atomic Safety and Licensing Board issued February 27, 1973, the following conditions for the protection of the environment are incorporated herein:

1. This paragraph deleted by Amendment No. 206, October 22, 2001.
2. This paragraph deleted by Amendment 131, 10/07/91.

3.6 LIMITING CONDITIONS FOR OPERATION

- b. The requirements for avoiding potentially unstable thermal hydraulic conditions defined in Technical Specification 3.6.J are met.
- c. The idle loop is isolated by electrically disarming the breaker to the recirculation pump motor generator set drive motor or the recirculation pump motor generator set field breaker prior to startup or, if disabled during reactor operation, within 24 hours, and until such time as the inactive recirculation loop is to be returned to service.
- d. The recirculation system controls will be placed in the manual flow control mode.

4.6 SURVEILLANCE REQUIREMENTS

VYNPS

BASES: 3.6 and 4.6 (Cont'd)

Agreement of indicated core flow with established power-core flow relationships provides the most assurance that recirculation flow is not bypassing the core through inactive or broken jet pumps. This bypass flow is reverse with respect to normal jet pump flow. The indicated total core flow is a summation of the flow indications for the twenty individual jet pumps. The total core flow measuring instrumentation sums reverse jet pump flow as though it were forward flow (except in the case of single loop operation when reverse flow is subtracted from the total jet pump flow). Thus, the indicated flow is higher than actual core flow by at least twice the normal flow through any backflowing pump. Reactivity inventory is known to a high degree of confidence so that even if a jet pump failure occurred during a shutdown period, subsequent power ascension would promptly demonstrate abnormal control rod withdrawal for any power-flow operating map point.

A nozzle-riser system failure could also generate the coincident failure of a jet pump body; however, the converse is not true. The lack of any substantial stress in the jet pump body makes failure impossible without an initial nozzle-riser system failure.

G. Single Loop Operation

Continuous operation with one recirculation loop was justified in "Vermont Yankee Nuclear Power Station Single Loop Operation", NEDO-30060, February 1983, with the adjustments specified in Technical Specification 3.6.G.1.a.

During single loop operation, the idle recirculation loop is isolated by electrically disarming the recirculation pump motor generator set drive motor breaker or the recirculation pump motor generator set field breaker, until ready to resume two loop operation. These methods provide a functionally equivalent means of preventing a cold water injection transient caused by an inadvertent pump start.

Under single loop operation, the flow control is placed in the manual mode to avoid control oscillations which may occur in the recirculation flow control system under these conditions.

H. Recirculation System

Twelve hours is a reasonable period of time to reach hot shutdown conditions. Operation of the reactor may not occur without forced recirculation flow.



UNITED STATES
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 249 TO

RENEWED FACILITY OPERATING LICENSE NO. DPR-28

ENTERGY NUCLEAR VERMONT YANKEE, LLC

AND ENTERGY NUCLEAR OPERATIONS, INC.

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

1.0 INTRODUCTION

By letter dated September 29, 2011, as supplemented by letter dated September 30, 2011, Entergy Nuclear Operations, Inc. (the licensee) submitted a request to amend the Vermont Yankee Nuclear Power Station (VY) Technical Specifications (TS). The amendment would revise TS 3.6.G.1.c to allow disarming either the supply breaker or the field breaker to the motor generator set for an idle recirculation pump when operating in single loop. This will allow the licensee to rotate the motor generator set, as desired, without energizing the motor on the recirculation pump.

1.1 Proposed Changes

The change that the licensee proposed is to TS 3.6.G.1.c, which would read:

The idle loop is isolated by electrically disarming the breaker to the recirculation pump motor generator set drive motor or the recirculation pump motor generator set field breaker prior to startup or, if disabled during reactor operation, within 24 hours, and until such time as the inactive recirculation loop is to be returned to service.

2.0 REGULATORY EVALUATION

The Commission's regulatory requirements related to the contents of TS, set forth in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.36, require that the TS limiting conditions for operations are consistent with assumed values of the initial conditions in the licensee's safety analyses. 10 CFR 50.36(c)(2)(i) states: "limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met."

The design basis requirement for VY with regard to fuel cladding integrity is as follows:

Fuel damage resulting from any abnormal operational transient shall be limited so that if the fission products are released to the environment via the normal discharge paths for radioactive material, at no time will the annual numerical concentration limits of Appendix B, Table 2 to 10 CFR 20.1001-2402, be exceeded by more than a factor of 10. This will limit the off-site dose rate to an equivalent value of no more than 500 mrem/year (Updated Final Safety Analysis Report (UFSAR) Section 14.2, Criterion 1).

For the purposes of this safety evaluation (SE), this requirement is satisfied by demonstrating compliance with Criterion 10 of Appendix A, "General Design Criteria for Nuclear Power Plants," 10 CFR 50, App. A. To comply with the criterion, it is required to demonstrate that, under all conditions of normal operation including anticipated operational occurrences, 99.9% of the fuel rods in the core will not undergo transition boiling.

3.0 TECHNICAL EVALUATION

3.1 Disarming Isolation of Motor Generator (MG) Set Field Breaker

The NRC staff was concerned whether disarming isolation of MG set field breaker will provide equivalent isolation as that presently provided by the 4160 V feeder breaker to the drive motor. The NRC staff asked the licensee to confirm precautionary measures to prevent inadvertent auto or manual closing of MG set field breaker. Regarding this, the licensee provided the following explanation in a letter dated September 30, 2011:

In order for the recirculation pump to be started, the motor generator must develop an output voltage to the recirculation pump motor. Anything that will prevent the MG set from developing an output voltage will prevent the recirculation pump from starting. This could be 1) tagging the MG set 4KV bus breaker open to prevent the MG set motor from being energized, or 2) performing any step which will prevent the generator from developing a field and therefore an output voltage. One of the ways of doing this is to prevent the field breaker from supplying exciter output to the generator field by removing (racking out) the breaker from the "connect" position so that the primary disconnects of the breaker are not made up to the cubicle. Once the breaker is taken out of the connect position, a limit switch contact in the back of the cubicle closes to short out the generator field, preventing the generator from developing voltage.

Other ways of preventing the generator from developing voltage includes tagging out the power to the voltage regulator so that the voltage regulator cannot provide exciter field voltage or removing the generator brushes, tagging out the field breaker (removing the fuses in the breaker close coil) to prevent breaker closing or tagging out the start sequence timer so that the field will not flash and the regulator will not power up.

Any of these means of preventing the generator from developing an output voltage is functionally equivalent to having the 4KV bus feeder breaker open since the intent is to prevent the pump motor from energizing.

Vermont Yankee has an approved procedure for generator slip ring grinding that

uses these methods to prevent voltage from getting to the field (for personnel safety) but allows the 4KV feeder breaker to be closed so that the generator rotor will turn for the grinding evolution. This procedure is performed during outages.

The existing Tech. Specs requires the feeder breaker to be electrically disarmed when in single loop. The suggested change is to allow the use of the field breaker being disarmed as alternative adequate protection against the pump motor from energizing. Anytime the field breaker is not in the connect position, the shorting of the generator field by the cubicle mounted limit switch contact will prevent the generator from developing a field to produce a voltage to start the recirculation pump motor.

Blocking the recirculation pump motor start by preventing the generator from developing output voltage (by blocking its field) is functionally equivalent to having the 4KV motor feeder breaker open.

Inadvertent racking in of a closed field breaker to the Connect position is precluded by mechanical cubicle interlocks. The existing procedure for slip ring grinding also tags out the regulator power to prevent exciter field development.

In its letter dated September 30, 2011, the licensee also stated that slip ring grinding is performed, as required, based on inspections of the slip rings and brushes each refuel outage. The evolution of polishing the slip rings with the field breaker open has been performed over the past 5 years.

Furthermore, the letter stated that the method of electrically disarming the Recirculation pump motor currently described in the TS is accomplished by racking down the drive motor breaker. In the proposed option, the inadvertent racking in of a closed field breaker to the connect position is precluded by mechanical cubicle interlocks. If the breaker was open, the interlock would allow the breaker to move to the connect position but a separate manual action would be required to close the breaker. The existing procedure for slip ring grinding also tags out the regulator power to prevent exciter field development. In both cases, administrative actions are used to assure the positioning of components is not altered, i.e., our switching and tagging program. As such the risk of the options is not increased.

Based on the above, the NRC staff's concerns regarding the precautionary measures to prevent inadvertent auto or manual closing of MG set field breaker are adequately addressed.

3.2 Startup of an Idle Recirculation Pump

The present condition, in which a single reactor recirculation pump has tripped and it is required to close a supply breaker on the recirculation pump MG set to complete a repair, could leave the reactor susceptible to a cold water influx accompanied by an increase in reactor coolant flow. If the MG set were to begin supplying motive power to the recirculation pump, the pump would start, introducing the cooler liquid in the idle recirculation loop to the reactor coolant system. This would add reactivity by sweeping out voids and reducing the water temperature, both of which increase the moderator density and cause the reactor power to increase. This, in turn, causes an increase in the heat flux in the fuel, and thus a reduction in the fuel's critical power ratio.

As noted in UFSAR Section 14.5.6.2, the licensee had analyzed the startup of an idle recirculation pump at 60% of the original licensed thermal power (although procedures require the power to be maintained lower when in single loop operation) and determined that the results were acceptable. A short-duration neutron flux peak of less than 120% is produced, and there is no damage to the fuel. The licensee was approved for an extended power uprate (EPU) in 2006, but did not reanalyze the start of an idle recirculation pump because it was shown to be a non-limiting transient.

The licensee's proposed revision to the TS would allow a condition where the present limiting condition for operation (LCO) 3.6.G.c is not met. Specifically, the licensee will close the breaker to the recirculation pump MG set in order to perform some of the required repairs to return the pump to service. The licensee proposes to modify the TS to allow the opening of the recirculation pump motor generator set field breaker.

Closing the supply breaker to the MG set would cause the flow transient above if the field breaker were not open; however, since the field breaker will be open when the MG set breaker is closed, the recirculation pump will not start. The NRC evaluation, concluding the field breaker provides the same protection against an inadvertent pump start as the supply breaker, appears in another section of this SE.

The NRC staff concludes that the proposed revision provides equivalent safety margins because it still precludes an initiating event for the analyzed transient sequence above. Additional safety margin is maintained in that, were the idle pump to start, the ensuing transient would not result in fuel damage. The NRC staff recognizes that the safety analysis in UFSAR Section 14.5.6.2 was performed in a pre-EPU operating condition. The NRC staff finds that the EPU effects would be relatively minor, since the power of the peak fuel bundle where the critical power margin would be lowest does not increase as a result of the EPU. Based on these considerations, the NRC staff finds the proposed TS revisions acceptable. The proposed change will not affect the licensee's compliance with specified acceptable limits for the nuclear system process barriers as set forth in Section 14.2 of the Vermont Yankee UFSAR.

4.0 EMERGENCY CIRCUMSTANCES

The NRC's regulations in 10 CFR 50.91 contain provisions for issuance of an amendment where the Commission finds that an emergency situation exists in that failure to act in a timely manner would result in shutdown of a nuclear power plant. In such a situation, the NRC may issue a license amendment involving no significant hazards consideration without prior notice and opportunity for a hearing or for public comment. In such a situation, the Commission will not publish a notice of proposed determination of no significant hazards consideration, but will publish a notice of issuance under 10 CFR 2.106.

Regulation 10 CFR 50.91(a)(5) states that where the NRC finds that an emergency situation exists, in that failure to act in a timely manner would result in derating or shutdown of a nuclear power plant or in prevention of either resumption of operation or of increase in power output up to the plant's licensed power level, it may issue a license amendment involving no significant hazards consideration without prior notice and opportunity for a hearing or for public comment. The regulation also states that the NRC will decline to dispense with notice and comment on the determination of no significant hazards if it determines that the licensee has abused the emergency provision by failing to make timely application for the amendment and thus itself creating the emergency. The regulation requires that a licensee requesting an emergency

amendment explain why the emergency situation occurred and why the licensee could not avoid the situation.

In its September 29, 2011, application, the licensee stated that an emergency amendment is needed to allow the licensee to run the motor generator set drive motor to perform maintenance prior to putting the system back in service. This would allow the licensee to increase the power level of the reactor. The motor generator set had tripped during power operation, and the plant is restricted from going up in power until it is repaired and returned to service.

In this instance, an emergency situation exists in that the proposed amendment is needed to allow the licensee to increase power. Based on the above, the requirements for an emergency situation as stipulated in 10 CFR 50.91(a)(5) have been satisfied.

The Commission expects its licensees to apply for license amendments in a timely fashion. In this situation, the NRC staff has determined that the licensee has explained, as set forth above, why this emergency situation occurred and why it could not avoid this situation. Based on the licensee's reasons set forth above, the NRC staff has determined that the licensee could not reasonably have foreseen the failure of the recirculation system, and thus, could not have applied for the amendment in a timely fashion. Accordingly, the NRC staff has determined that the licensee made a timely application for the amendment, has not abused the emergency provisions of 10 CFR 50.91(a)(5), and did not itself create the emergency.

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations at 10 CFR 50.92(c) states that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) result in a significant reduction in a margin of safety. The following analysis was provided by the licensee in its September 29, 2011, letter:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No. The Reactor Recirculation System is not an initiator or mitigator of any Updated Final Safety Analysis Report (UFSAR) Chapter 14.6 Design Basis Accidents. UFSAR Chapter 14.5 evaluates malfunctions associated with the Reactor Recirculation System and concludes that none of these malfunctions results in any fuel damage. This proposed change provides an alternative for preventing the recirculation pump from starting. The TS will now allow either electrically disarming the MG [motor generator] set drive motor breaker or electrically disarming the MG set field breaker. This is considered a functionally equivalent level of protection. System operation continues to be bounded by the station safety analysis. This request does not in any way affect operability of systems required by the TS that will be used to mitigate the consequences of an accident. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?