

October 10, 2000

Mr. James Knubel
Chief Nuclear Officer
Power Authority of the State of New York
123 Main Street
White Plains, NY 10601

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - AMENDMENT FOR
TECHNICAL SPECIFICATION CHANGE REGARDING AUTOMATIC TRANSIENT
WITHOUT SCRAM RECIRCULATION PUMP TRIP/ALTERNATE ROD
INSERTION SETPOINT CHANGE (TAC NO. MA8171)

Dear Mr. Knubel:

The Commission has issued the enclosed Amendment No. 264 to Facility Operating License No. DPR-59 for the James A. FitzPatrick Nuclear Power Plant. The amendment consists of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated February 3, 2000.

The amendment provides changes to TS Table 3.2-7. Specifically, the TS change revises the reactor water level setpoint for the anticipated transient without scram, the recirculation pump trip function, and the alternate rod insertion function.

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/

Guy S. Vissing, Sr. Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-333

Enclosures: 1. Amendment No. 264 to DPR-59
2. Safety Evaluation

cc w/encls: See next page

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Accession Number: ML003752417 **Safety evaluation provided - no major changes made

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POWER AUTHORITY OF THE STATE OF NEW YORK

DOCKET NO. 50-333

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 264
License No. DPR-59

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Power Authority of the State of New York (the licensee) dated February 3, 2000, 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-59 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 264 , 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 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Marsha Gamberoni, 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: October 10, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 264

FACILITY OPERATING LICENSE NO. DPR-59

DOCKET NO. 50-333

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

56
76a

Insert Pages

56
76a

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 264 TO FACILITY OPERATING LICENSE NO. DPR-59

POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

1.0 INTRODUCTION

By letter dated February 3, 2000, the Power Authority of the State of New York (the licensee) submitted a request for changes to the James A. FitzPatrick Nuclear Power Plant Technical Specifications (TSs). The requested changes would revise TS Table 3.2-7 by changing the reactor water level setpoint for the anticipated transient without scram (ATWS), the recirculation pump trip (RPT) function and the alternate rod insertion (ARI) function. The licensee has also proposed to revise the associated TS bases section to reflect the proposed revised setpoint. The proposed change is expected to reduce the probability of unnecessary plant cooldown following events that result in an automatic reactor scram, thereby reducing the number of thermal transients the reactor pressure vessel is subjected to and the resulting challenges to plant operators.

2.0 BACKGROUND

In an ATWS event, the low-low reactor water level instrumentation mitigates the consequences of the event by tripping the reactor water recirculation pumps thereby decreasing forced circulation flow through the reactor core. The reduction in core flow reduces the core power because of the net reduction in moderator density. The low-low reactor water level setting also initiates the ARI system, which provides an alternative means of inserting rods by depressurizing the scram pilot air header in the event of a failure in the reactor protection system (RPS) or the control rod drive system.

In accordance with the existing design, high-pressure core injection (HPCI) and reactor core isolation cooling (RCIC) system initiation and ATWS-RPT/ARI functions share the same analog trip units used for monitoring the low-low reactor level condition. The proposed changes will result in a separate analog trip unit for ATWS-RPT/ARI functions. This allows the HPCI and RCIC setpoints to remain the same while lowering the ATWS-RPT/ARI setpoint. No other devices, in the ATWS-RPT/ARI instrument channels for logic and actuation, will be modified.

3.0 PROPOSED TS CHANGES

The following proposed changes to the existing TS sections are described in Attachment 2 to the licensee's submittal dated February 3, 2000.

TS Bases, Section 3.2, Page 55, 56

Replace -

“The low-low reactor water level instrumentation is set to trip when the reactor water level is 126.5 in. above the top of active fuel. This trip initiates the HPCI and RCIC systems and trips the recirculation pumps.”

With -

“The low-low reactor water level instrumentation is set to trip when the reactor water level is 126.5 in. above the top of active fuel. This trip initiates the HPCI and RCIC systems. The reactor water level instrumentation is set to trip the recirculation pumps when the reactor water level is 105.4 in. above the top of active fuel.”

While the licensee’s safety evaluation listed Bases page number 55, page 55 was not submitted since it was not changed.

TS Limiting Condition for Operation, Table 3.2-7, Page 76a

ATWS Recirculation Pump Trip Instrumentation Requirements

Replace:

Reactor Water level - Low Low ≥ 126.5 in.
Above TAF [top of active fuel]

With:

Reactor Water level - Low Low ≥ 105.4 in.
Above TAF

4.0 EVALUATION

4.1 Instrumentation Considerations

In its submittal the licensee stated that the proposed TS change revises the actuation setpoint only for the ATWS-RPT and ARI systems, and does not revise HPCI and RCIC initiation settings. The ATWS-RPT and ARI systems are intended to provide mitigation functions during a postulated ATWS event and do not provide any plant control function. The licensee further added that for the proposed change, the plant-specific analyses of postulated ATWS events were performed by General Electric Company (GE) with NRC-approved methods. The specific events evaluated include the main steam line isolation valve closure event, the inadvertent opening of a relief valve and the loss of feedwater. The analyses demonstrated that all criteria were adequately met with the proposed TS change implemented, further ensuring no increase in the consequences of the postulated events. Calculations for the revised setpoint were performed in accordance with the guidance of the staff approved standards. Therefore, the selected setpoint is acceptable to the staff.

The existing analog trip units for the low-low reactor level function are shared by HPCI/RCIC initiation and ATWS-RPT/ARI functions. The design of the system is based on one-out-of-two-taken-twice logic, which ensures that a single failure in the system cannot cause or inhibit the ATWS-RPT and ARI functions. For the proposed change, new analog trip units for ATWS-RPT/ARI functions will be installed and the existing level transmitters and wiring will be used. The new analog trip units will separate the ATWS-RPT/ARI signals from the HPCI and the RCIC signals. This signals separation is required because, HPCI and RCIC setpoints are not being revised. The new analog trip units will be of different design than those used in the RPS, thereby, satisfying diversity requirements of 10 CFR 50.62(c)(3). Therefore, the proposed implementation of new analog trip units is acceptable to the staff.

4.2 Transient and Accident Considerations

An ATWS is defined as an anticipated operational occurrence (such as loss of normal feedwater, loss of condenser vacuum or loss of offsite power) combined with an assumed failure of the reactor trip system to shut down the reactor.

The FitzPatrick plant design includes diverse instrumentation and equipment to detect and mitigate the consequences of an ATWS event. The ATWS-RPT function is designed to mitigate the consequences of an ATWS event, by providing an alternate means of reducing reactor power. This is accomplished by tripping the recirculation pumps to zero speed, thus causing a rapid reduction in core flow, and a reduction in core power. The ARI function is designed to provide an alternate means of inserting control rods by depressurizing the scram pilot air header in the event of a failure in the reactor protection system or control rod drive system. The ATWS instrumentation initiates the RPT and ARI functions on two signals, high reactor pressure and reactor low-low water level, both indicative of continued energy generation in the reactor following a failure to scram.

During abnormal operational transients such as turbine trips or load rejections, the reactor recirculation pumps will runback to minimum speed and remain in service following the reactor scram. A reactor water level transient following the reactor scram is common, due to the rapid reduction in power and core voiding with the resultant shrink of the reactor coolant. This momentary level reduction is quickly restored by the response of the feedwater system. If the reactor water level transient is sufficient to reach the low-low reactor water level setpoint, the ATWS-RPT instrumentation will initiate a trip of the recirculation pumps.

Post scram recovery requiring restart of tripped recirculation pumps is often complicated by the rapid cooldown of the water in the idle recirculation loops. The FitzPatrick TS prohibit idle recirculation loop startup if the temperature difference between the idle loops and the reactor coolant system (RCS) exceeds 50 °F, or if the temperature difference between the RCS and the reactor vessel bottom head drain line exceeds 145 °F. As there is no convenient means to heat an idle recirculation loop, a cooldown of the entire nuclear steam supply system is required to < 140 °F. The cooldown introduces an unnecessary thermal cycle on the plant, the potential for plant challenges due to operating mode changes and the resulting challenges to plant operators.

To reduce the probability of unnecessary plant cooldown following events that result in an automatic reactor scram, the licensee has proposed to modify TS table 3.2-7 to reduce the reactor water level setpoint associated with the initiation of the ATWS-RPT function from

126.5 inches above the top of active fuel (TAF) to 105.4 inches above the TAF. The ARI initiation setpoint is not specified in the FitzPatrick TS. However, the ARI setpoint on reactor water level will also be changed to be consistent with that proposed for the ATWS-RPT function. New analog trip units will be incorporated which are identical to existing low-low reactor water level trip units currently shared with the HPCI and RCIC systems. This allows the HPCI and RCIC system setpoints to remain the same while only lowering the ATWS-RPT/ARI setpoint.

The licensee has submitted plant-specific ATWS analysis (Reference 2) to support decreasing the ATWS-RPT reactor water level setpoint. This analysis was performed by General Electric using the same NRC-approved analytical models (Reference 3) as previous FitzPatrick ATWS analyses and using the same input assumptions in accordance with the requirements of NUREG-0460 (Reference 4).

The analysis evaluated the impact of the ATWS-RPT water level setpoint on the ATWS response. The most limiting ATWS events were reanalyzed to substantiate that the ATWS acceptance criteria are still met with the revised setpoint. These events are the main steam isolation valve (MSIV) closure event, the inadvertent opening of a relief valve (IORV) event, and the loss of feedwater (LOFW) event. The MSIV closure event is most limiting for peak reactor pressure. The acceptance criterion for this event is that peak reactor pressure (maximum one safety relief valve out of service) must remain below 1500 psig. The calculated peak reactor pressure was 1155 psig which is significantly below the value of the acceptance criterion. The limiting event for peak suppression pool bulk temperature is the IORV event. The acceptance criterion for this event is that the suppression pool bulk temperature must remain less than 190 °F. The peak suppression pool temperature remained 179.4 °F as in the previous FitzPatrick ATWS analyses which meets the acceptance criterion. The event most affected by the low level RPT setpoint change is the LOFW event, which is evaluated to confirm that the fuel remains cooled (i.e., the core two phase coolant level remains above the TAF). The results of the analysis of the LOFW event indicate that lowering the low level RPT setpoint would result in a slightly lower minimum downcomer water level during the transient, but would not introduce a level 1 isolation event during the transient. The core coolant level remains above the TAF as in the previous FitzPatrick ATWS analyses which meets the acceptance criterion.

The staff has reviewed the licensee's submittal and supporting analyses. The analyses were performed using approved methods, and the licensee has demonstrated that all acceptance criteria for ATWS events are met for performance during postulated ATWS events with the proposed low level RPT setpoint. Therefore, the staff finds the proposed change acceptable.

4.3 Conclusions on the Technical Evaluation

On the basis of this evaluation, the staff agrees with the licensee's conclusion that the proposed TS changes related to revising the reactor water level setpoint for the ATWS-RPT function in TS Table 3.2-7 will not alter assumptions relative to the mitigation of an accident or transient event and will not adversely affect normal plant operation and testing, and the GE analysis conclusion that the proposed changes are consistent with the current safety analyses. Also, the design change is based on diversity requirements of 10 CFR 50.62(c)(3). Therefore, the proposed changes are acceptable to the staff.

5.0 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.

6.0 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 (65 FR 15383). 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.

7.0 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.

8.0 REFERENCES

1. Letter from J. Knubel, New York Power Authority, to U.S. NRC, "Request for Technical Specification Change Regarding Automatic (sic) Transient Without Scram Recirculation Pump Trip/Alternate Rod Insertion Setpoint Change (JPTS-99-008)," dated February 3, 2000.
2. Power Authority of the State of New York, to U.S. NRC, "ATWS Analysis for Recirculation Pump Trip Setpoint Changes High Pressure Trip Setpoint Evaluation," dated September 26, 1996.
3. Assessment of BWR Mitigation of ATWS, Vol. II, NEDE-24222, December 1979.
4. Anticipated Transients Without Scram for Light Water Reactors, NUREG-0460, April 1978.

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Date: October 10, 2000

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