



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 168 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

INTRODUCTION

By letter dated April 2, 1990, the Power Authority of the State of New York (the licensee) proposed changes to the technical specifications (TS) for the operating license of the FitzPatrick Nuclear Power Plant. The proposed TS changes would delete the present 3.5.F.1 Specification and replace it with new operability requirements for minimum Emergency Core Cooling System (ECCS) availability when the plant is in the cold shutdown condition, add new ECCS surveillance requirements to be performed when the plant is in the cold shutdown condition, and add changes to the corresponding Bases sections and Table of Contents. In addition, the licensee proposed related changes to Specification 3.7.A.1 which would substitute the reference to TS Section 3.5.F.2 with a statement to indicate the conditions under which the statement would be applicable.

DISCUSSION

Currently TS Section 3.5.F.1 states that, "Any combination of inoperable components in the Core and Containment Cooling Systems shall not defeat the capability of the remaining operable components to fulfill the core and containment cooling function." The licensee has proposed deleting this statement since it is redundant to Specifications 3.5.A and 3.5.B, which specify the minimum operability requirements for the ECCS systems. It is the purpose of Specifications 3.5.A and 3.5.B to ensure that any combination of inoperable components do not prevent the ECCS and Containment Cooling Systems from performing their intended safety functions and are, consequently, operable. Therefore, Specification 3.5.F.1 is, by design, built into Specifications 3.5.A and 3.5.B and into the Emergency Core and Containment Cooling Systems operability requirements.

During the January 1988 maintenance outage inspection at the plant, the NRC raised concerns about the emergency core cooling requirements when in the cold shutdown condition (see Inspection Report No. 50-333/88-01, dated March 29, 1988). The present TS allow all Low Pressure Coolant Injection (LPCI), Core Spray (CS), and containment cooling subsystems to be inoperable whenever

irradiated fuel is in the reactor, the reactor is in the cold condition, and no work is being performed which has the potential for draining the reactor vessel. However, as noted in the inspection report, this does not address ECCS operability requirements for refueling outage work which does have the potential for draining the reactor vessel. The inspection report concluded that the ECCS requirements while in the cold shutdown condition should be more clearly defined.

The licensee agreed with the observation and proposed that the limiting conditions for operation (LCOs) be defined by changes to TS Section 3.5.F and that the corresponding surveillance requirements be specified by changes to TS Section 4.5.F. The proposed LCOs would: (1) require that at least two low pressure ECCS be operable whenever irradiated fuel is in the reactor, the reactor is in the cold condition, and work is being performed with the potential for draining the reactor vessel; (2) require that at least one low pressure ECCS be operable whenever irradiated fuel is in the reactor, the reactor is in the cold condition, and no work is being performed with the potential for draining the reactor vessel; (3) allow all ECCS to be inoperable provided that the reactor vessel head is removed, the cavity is flooded, the spent fuel pool gates are removed, and the minimum spent fuel pool water level requirements presently stated in the TS are satisfied; and (4) specify that if at least one of these three conditions are not satisfied, core alterations and operations with the potential for draining the reactor vessel be suspended and restore operability of at least one system within 4 hours or establish Secondary Containment integrity within the next 8 hours.

In addition the proposed changes to the surveillance test requirements when the plant is in the cold shutdown condition consist of: (1) performance of flow and differential pressure tests of the Core Spray pumps and the Residual Heat Removal pumps every 3 months with specified acceptance values; (2) monthly motor operated valve tests for the Core Spray and Residual Heat Removal (RHR) Systems; (3) once per shift verification that the suppression pool water level is at least 10.32 feet whenever the low pressure ECCS subsystems are aligned to it; and (4) once per shift verification that the level in the condensate storage tanks is at least 324 inches whenever the Core Spray system(s) is aligned to them.

#### EVALUATION

The proposed change to delete the present LCO defined in Specification 3.5.F.1 does not involve a modification to any existing equipment, systems, or components; nor does it relax any administrative controls or limitations applicable to existing plant equipment. The limitations which are the subject of this specification are adequately addressed in other specifications. For these reasons, the licensee request to remove this specification from the TS is acceptable.

The proposed LCOs for operability of the ECCS pumps when in the cold shutdown condition establishes that the CS and the LPCI mode of the RHR system are the primary sources of emergency core cooling in the event of an inadvertent draindown of the reactor vessel. If an inadvertent draindown should occur, the consequences are bounded by the loss-of-coolant accident (LOCA) analysis. This analysis, as shown in the Final Safety Analysis Report and the LOCA analysis report prepared for the plant, shows that only one low pressure ECCS subsystem is required post-LOCA to satisfy the long term cooling criteria. This analysis evaluated the entire spectrum of LOCA break sizes and determined that the most limiting break size is the double-ended guillotine break of the recirculation system suction line. This is a larger opening than any opening associated with an inadvertent draindown of the reactor vessel.

Therefore, the proposed TS change to require that two ECCS pumps be operable whenever work is being performed which has the potential for inadvertent draindown, satisfies the single-failure criteria. Should the operability requirements not be met, the TS would require the suspension of all operations with the potential for draining the reactor vessel. In addition, since only one RHR pump in the RHR subsystem would be necessary to satisfy the reactor vessel flooding capability due to its high flow rate, a proposed change to the Bases indicates that for the cold shutdown condition, an RHR "subsystem" consists of one RHR pump (rather than the usual two-pump requirement).

One low pressure ECCS subsystem provides sufficient reactor vessel flooding capability to recover from an inadvertent vessel draindown. However, the overall system reliability is reduced because a single failure in the system concurrent with a vessel draindown could result in the ECCS not being able to perform its function. Therefore, the proposed TS change would not allow activities which have the potential for draining the reactor vessel when only one ECCS is available.

However, the proposed change would allow all ECCS systems to be inoperable, and the performance of core alterations with the potential for draining the reactor vessel, if certain specified plant conditions exist. These plant conditions ensure that a sufficient inventory of water exists over the top of the reactor vessel flange and allows for timely operator action to terminate an inadvertent draindown prior to fuel uncovering.

In the event that no low pressure ECCS subsystems are operable and the spent fuel pool water level requirements are not met, the proposed TS change would require immediate suspension of core alterations and operations with the potential to drain the reactor vessel. The proposed change would then require timely restoration of ECCS or establishment of secondary containment integrity. These actions are designed to prevent the potential release of radioactivity in the event of an inadvertent draindown.

To ensure availability of the ECCS while in the cold shutdown condition, the proposed TS change includes many surveillance tests. The operability tests for the pumps and valves have the same acceptance criteria and frequency that is presently specified for normal plant operation. In addition, when the source of water for the ECCS pumps is the suppression chamber, the proposed TS change



would require that a minimum level of 10.33 feet be maintained and checked each shift. This level is equivalent to 800,000 gallons of water and ensures that a sufficient inventory of water is available for reactor vessel flooding and that adequate net positive suction head for the pumps is maintained.

Also, in the event that the suppression chamber is not available as a source of water, the Core Spray pumps could be aligned so that their source of water is the condensate storage tanks. In this event, the proposed TS change would require that a minimum level of 324 inches be maintained and checked once per shift. This level corresponds to 183,000 gallons in each of the two tanks and is sufficient inventory for adequate core flooding should it be needed.

These proposed changes consist of new LCOs and surveillance requirements and corresponding Bases. They address safety equipment requirements for plant conditions which are not presently included in the TS. They more clearly define the requirements for the ECCS when the reactor is in the cold shutdown condition and they result in an enhancement of the system requirements. They do not require modifications to any plant systems, equipment, or components; nor do they allow plant operation in an unanalyzed configuration. The proposed changes do not relax any administrative controls or limitations imposed on existing plant equipment and are consistent with the current Boiling Water Reactor Standard Technical Specifications. Based on this analysis, the proposed changes are acceptable.

Another related proposed change included in the submittal would change Specification 3.7.A.1, Primary Containment, by substituting the reference to TS Section 3.5.F.2 with a statement to indicate the conditions under which the volume and temperature limits of the primary containment are applicable (rather than a statement indicating when they are not applicable). The present reference to TS Section 3.5.F.2 indicates that, with the plant in the cold shutdown condition, the volume and temperature limits are in effect when there is irradiated fuel in the reactor vessel except when no work is being done which has the potential for draining the reactor vessel. The proposed change would require that the limits be in effect whenever the reactor is critical or whenever the reactor coolant temperature is greater than 212 F and irradiated fuel is in the reactor vessel. This change is consistent with the primary containment integrity requirements. It does not result in any change to present limitations or requirements. Based on this analysis it is acceptable.

#### ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. The 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this

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: February 13, 1991

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