



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 163 TO

FACILITY OPERATING LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT NO.2

DOCKET NO. 50-368

1.0 INTRODUCTION

By application dated October 27, 1993, Entergy Operations, Inc. (the licensee), submitted a request for changes to the Arkansas Nuclear One, Unit No. 2 (ANO-2) Technical Specifications (TSs). The requested changes would remove the incore detection system requirements from the TSs. The requirements are to be included in the updated final safety analysis report (UFSAR) and controlled through 10 CFR 50.59.

2.0 BACKGROUND

Section 182a of the Atomic Energy Act (the "Act") requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The Commission's regulatory requirements related to the content of TSs are set forth in 10 CFR 50.36. That regulation requires that the TSs include items in five specific categories, including (1) safety limits, limiting safety system settings and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls. However, the regulation does not specify the particular requirements to be included in a plant's TSs.

The Commission has provided guidance for the contents of TSs in its "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" ("Final Policy Statement"), 58 FR 39132 (July 22, 1993), in which the Commission indicated that compliance with the Final Policy Statement satisfies Section 182a of the Act. In particular, the Commission indicated that certain items could be relocated from the TSs to licensee-controlled documents, consistent with the standard enunciated in *Portland General Electric Co.* (Trojan Nuclear Plant), ALAB-531, 9 NRC 263, 273 (1979). In that case, the Atomic Safety and Licensing Appeal Board indicated that "technical specifications are to be reserved for those matters as to which the imposition of rigid conditions or limitations upon reactor operation is deemed necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety."

Consistent with this approach, the Final Policy Statement identified four criteria to be used in determining whether a particular matter is required to be included in the TS, as follows: (1) installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary; (2) a process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier; (3) a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier; (4) a structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.¹ As a result, existing TS requirements which fall within or satisfy any of the criteria in the Final Policy Statement must be retained in the TSs, while those TS requirements which do not fall within or satisfy these criteria may be relocated to other, licensee-controlled documents.

3.0 EVALUATION

The purpose of incore detection instrumentation is to provide inputs for determination of core power distributions, perform validation of the core protection calculator (CPC) power distribution, and provide inputs to the core operating limit supervisory system (COLSS). The incore detectors provide a signal representative of core neutron flux to the plant monitoring computer (PMC). The COLSS software within the PMC uses the incore detector signals to generate axial shape index, azimuthal power tilt, linear heat rate margin, and departure from nucleate boiling margin. The COLSS serves to monitor reactor core conditions accurately and provide indication and alarm functions to aid the operator. The incore detectors and the COLSS are not safety related and the COLSS is independent of the plant protection system. CPCs operate independently of COLSS using excore detectors to monitor plant safety parameters. The CPCs provide input to the safety-related plant protection system. Thus the incore instrumentation system is used in a confirmatory manner and does not provide direct input to reactor protection system or engineered safety features actuation system functions.

¹ The Commission recently adopted amendments to §50.36, pursuant to which the rule was revised to codify and incorporate these criteria. See Final Rule, "Technical Specifications," July 19, 1995, (60 FR 36953). The Commission indicated that reactor core isolation cooling, isolation condenser, residual heat removal, standby liquid control, and recirculation pump trip are to be included in the TS under Criterion 4, although it recognized that other structures, systems and components could also meet this criterion.

These instruments do not detect degradation of the reactor coolant pressure boundary nor do they function as a primary success path to mitigate events which assume the failure of or challenge the integrity of fission product barriers.

Although the core power distributions measured by the incore detectors constitute an important initial condition to design basis accidents and therefore need be addressed by TSs, the detectors themselves are not an active design feature needed to preclude analyzed accidents or transients. The staff has determined therefore that the incore detector requirements do not satisfy the Final Policy Statement criteria and their inclusion in TSs is not necessary.

Essentially all PWR TSs contain a requirement for operability of 75% of the incore detectors within specific locations for mapping of the core power distribution. Incore detector data are used to calculate power peaking factors which are used to verify compliance with fuel performance limits. A significant safety concern relating to degradation of incore mapping ability is the ability to detect anomalous conditions in the core. One of these is the inadvertent loading of a fuel assembly into an improper position. Since this is a loading problem, it is of significant concern if long-term operation with fewer than 75 percent of the detectors is considered.

On occasion, for various reasons, failures of detector strings may exceed 25%, and relaxation of the 75% requirement may be permitted for the duration of the affected operating cycle. This relaxation is acceptable if the startup physics tests had been performed with at least 75% of the incore detector locations operable, general trends for the cycle had been established and the uncertainties on the measurements has been increased to account for fewer operable detectors. The relaxation of the 75% requirement should expire at the end of the cycle and the failed detectors restored to full (or nearly full) compliment before beginning the following cycle. This is necessary to assure meeting the 75% acceptable requirement discussed above for startup physics and general trends testing.

The requirements of TS 3.3.3.2 were established to ensure adequate core coverage. Relocation of the incore detector requirements from the TSs to the UFSAR does not imply any reduction in their importance in confirming that core power distributions are bounded by safety analysis limits. By the provisions of 10 CFR 50.59, the number and/or distribution requirements may be changed within acceptable limits which preserve the margins of safety. Evaluations related to changes in incore detector requirements are expected to consider such factors as the need to identify the inadvertent loading of a fuel assembly into an improper location, the adequacy of core coverage, the validity of tilt estimates, the calibration of protection systems using incore measurements, and the increase in allowances for measured and nuclear design uncertainties, as well as a commitment to restore the system to full or nearly full service before the beginning of each cycle. Should these or other considerations lead to the identification of a proposed change as an unreviewed safety question, the licensee should request NRC review and approval in accordance with 10 CFR 50.59(c).

In conclusion, the above relocated requirements relating to incore detectors are not required to be in the TSs under 10 CFR 50.36 or 182a of the Atomic Energy Act, and are not required to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety. Further, they do not fall within any of the four criteria set forth in the Commission's Final Policy Statement, discussed above. In addition, the staff finds that sufficient regulatory controls exist under 10 CFR 50.59 to address any future changes to this system. Accordingly, the staff has concluded that the proposed change to relocate the incore detectors instrumentation requirements, TS 3.3.3.2 and surveillance requirement 4.3.3.2, from the TSs to the UFSAR is acceptable. With this action, the table of contents entry and the BASES section for TS 3.3.3.2 may be removed from the TSs.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Louisiana 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 and changes surveillance requirements. 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 (58 FR 64606). 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.

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