



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 234 TO FACILITY OPERATING LICENSE NO. NPF-3

FIRSTENERGY NUCLEAR OPERATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated July 26, 1999, FirstEnergy Nuclear Operating Company (FENOC, or the licensee) requested a license amendment for the Davis-Besse Nuclear Power Station (DBNPS). The amendment would revise the Technical Specifications (TSs) and the associated Bases to—

- (1) relocate the requirements in TS 3/4.3.3.2, "Instrumentation - Incore Detectors," TS 3/4.3.3.9, "Instrumentation - Waste Gas System Oxygen Monitor," and TS 3/4.4.4.7, "Reactor Coolant System - Chemistry," to the DBNPS Updated Safety Analysis Report (USAR) Technical Requirements Manual (TRM);
- (2) revise TS 3/4.11.2, "Radioactive Effluents - Explosive Gas Mixture," to reflect the relocation of TS 3/4.3.3.9;
- (3) revise the requirements of TS 3/4.4.6.1, "Reactor Coolant System Leakage - Leakage Detection Systems," to require one (gaseous or particulate) of the containment atmosphere radioactivity monitoring systems to be operable, rather than requiring both systems to be operable simultaneously; and
- (4) revise TS 3/4.3.3.1, "Radiation Monitoring Instrumentation," to be consistent with the revision to TS 3/4.4.6.1.

Relocating the requirements related to the Incore Detectors, Waste Gas System Oxygen Monitor, and Reactor Coolant System (RCS) Chemistry is consistent with the guidance provided by Generic Letter (GL) 95-10, "Relocation of Selected Technical Specifications Requirements Related to Instrumentation," dated December 15, 1995, and/or NUREG-1430, Revision 1, "Standard Technical Specifications - Babcock and Wilcox Plants," dated April, 1995. Revising the requirements for RCS leakage detection is consistent with NUREG-1430, Revision 1.

2.0 EVALUATION

2.1 Relocated TS Requirements

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. In Section 50.36 of Title 10 of the Code of Federal Regulations (10 CFR 50.36), the Commission established the regulatory requirements related to the content of TSs. 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 the TSs.

The NRC developed criteria, as described in the "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (58 FR 39132), to determine which of the design conditions and associated surveillances should be located in the TSs as limiting conditions for operation. Four criteria were subsequently incorporated into the regulations by an amendment to 10 CFR 50.36 (60 FR 36953) 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.

The Commission's Final Policy Statement and documentation related to the revision of 10 CFR 50.36 acknowledged that implementation of these criteria may cause some requirements presently in TSs to be moved out of existing TSs to documents and programs controlled by licensees.

GL 95-10 addresses the relocation of selected TS requirements related to instrumentation as a result of applying the 10 CFR 50.36 criteria. On reviewing typical TSs for nuclear power reactors, the staff determined that, in accordance with the 10 CFR 50.36 criteria, several specifications did not warrant inclusion in the TSs. The staff also concluded that the instrumentation addressed by these specifications are not related to dominant contributors to plant risk. GL 95-10 stated the following typical TSs are among the candidates for relocation to licensee-controlled documents:

- Incore Detectors (Movable Incore Detectors, Traversing Incore Probe)
- Seismic Monitoring Instrumentation
- Meteorological Monitoring Instrumentation
- Chlorine Detection System

Loose-Part Detection System
Explosive Gas Monitoring Instrumentation
Turbine Overspeed Protection

The generic letter indicated that licensees could request a license amendment to relocate selected instrumentation requirements of this type from the TSs to licensee-controlled documents or programs.

In GL 95-10, the NRC requested licensees that request an amendment to relocate instrumentation requirements to include a commitment to relocate each selected requirement to a particular licensee-controlled document or program, (e.g., the USAR or the emergency plan) and to address the submittal of the revisions to these documents to the NRC in accordance with the applicable regulations (e.g., 10 CFR 50.71(e)). In addition, the licensee should clearly describe the program it will use to control changes to relocated provisions (e.g., 10 CFR 50.59 or 50.54(q)).

In its submittal, FENOC stated that, contingent upon NRC approval, it committed to relocate the three TSs to the USAR TRM. In addition, the licensee stated that future changes to the relocated requirements would be subjected to the requirements of 10 CFR 50.59, and submitted to the NRC in accordance with the requirements in 10 CFR 50.71(e).

The following sections provide the staff's evaluation of each of the relocated TSs.

2.1.1 Instrumentation - Incore Detectors

FENOC has proposed to remove TS 3/4.3.3.2, "Instrumentation - Incore Detectors," from the Technical Specifications and relocate the requirements to the TRM. Incore instrumentation is used periodically to calculate reactor core power leaking factors to verify nuclear design predictions, ensure operation within established fuel performance limits, and calibrate other instrumentation. The measurements are used in a confirmatory manner and do not provide direct input to reactor protection system or safety features actuation system functions.

These instruments are not used for and are not capable of detecting a significant abnormal degradation of the reactor coolant pressure boundary before a design basis accident. These instruments do not function as a primary success path to mitigate events which assume a failure of or a challenge to the integrity of fission produce barriers. Core power distributions (measured by the incore detectors) constitute an important initial condition to design-basis accidents (DBAs) and therefore need to be addressed by technical specifications. However, the detectors themselves are not an active design feature needed to preclude analyzed accidents or transients. Therefore, the staff found that the incore detector requirements do not meet the criteria of 10 CFR 50.36 for inclusion in technical specifications. Therefore, removal of the incore instrumentation requirements from the DNBPS TSs and relocation of the corresponding requirements to the TRM is acceptable. Any subsequent changes to the provisions will be controlled pursuant to 10 CFR 50.59. Thus, under 10 CFR 50.59, sufficient regulatory controls exist to ensure continued protection of the public health and safety.

2.1.2 Instrumentation - Waste Gas System Oxygen Monitor

FENOC has proposed to remove TS 3/4.3.3.9, "Instrumentation - Waste Gas System Oxygen Monitor," from the TSs and relocate the requirements for the system to the TRM. The waste gas oxygen monitoring instrumentation is used to ensure that the concentration of potentially explosive gas mixtures contained in the waste gas processing system is adequately monitored, which helps to ensure that the concentration is maintained below the flammability limits. However, the system does not prevent or mitigate a DBA or transient which assumes the failure of or presents a challenge to a fission product barrier. The concentration of oxygen in the gaseous waste processing system is not an initial assumption of any DBA or transient analysis. Therefore, TS 3/4.3.3.9 does not meet any of the criteria in 10 CFR 50.36 and may be removed from the DBNPS TSs and relocated to the TRM. Any changes to the former requirements regarding the waste gas monitoring instrumentation, as relocated to the TRM, will be subject to the requirements of 10 CFR 50.59. Thus, under 10 CFR 50.59, sufficient regulatory controls exist to ensure continued protection of the public health and safety.

2.1.3 Reactor Coolant System - Chemistry

FENOC has proposed to remove TS 3/4.4.7, "Reactor Coolant System - Chemistry," from the TSs and relocate the requirements to the TRM. Poor coolant water chemistry contributes to the long-term degradation of system materials of construction, but is not of immediate importance to the plant operator. Reactor coolant water chemistry is monitored for a variety of reasons. One reason is to reduce the possibility of failures in the RCS pressure boundary caused by corrosion. However, the chemistry monitoring activity serves a long-term preventative rather than mitigative purpose. Therefore, TS 3/4.4.7 does not meet any of the criteria in 10 CFR 50.36 and may be relocated to the TRM. Any changes to the requirements regarding the RCS chemistry, as relocated to the TRM, will be subjected to the requirements of 10 CFR 50.59. Thus, under 10 CFR 50.59, sufficient regulatory controls exist to ensure continued protection of the public health and safety.

2.2 RCS Leakage Detection Requirement Changes

General Design Criterion (GDC) 30, "Quality of Reactor Coolant Pressure Boundary," of Appendix A to 10 CFR Part 50 requires means of detecting and, to the extent practical, identifying the location of the source of RCS leakage. Regulatory Guide (RG) 1.45 describes acceptable methods for selecting leakage detection systems. The RG states that it is essential for leakage detection systems to have the capability to detect significant reactor coolant pressure boundary degradation as soon after occurrence as practical to minimize the potential for gross boundary failure. Thus, an early indication or warning signal is necessary to permit proper evaluation of all unidentified leakage. RG 1.45 focuses on using diverse and redundant systems that are capable of rapidly detecting small increases in unidentified RCS leakage.

TS 3/4.4.6.1 currently requires the following three leakage detection systems to be operable in Modes 1, 2, 3 and 4:

- Containment atmosphere particulate radioactivity monitoring,
- Containment atmosphere gaseous radioactivity monitoring system, and
- Containment sump level and flow monitoring system.

The current Action statement allows plant operation to continue for up to 30 days if one of the three required leakage detection systems (particulate, gaseous, or sump) is inoperable. If the inoperable system is either the particulate or gaseous radioactivity monitoring system, compensatory grab sampling and analysis must be performed at least once every 24 hours. No compensatory action is required if the sump level and flow monitoring system is inoperable. If two of the three required detection systems are inoperable, then the plant must be shut down.

The licensee proposed to reduce the number of operable leakage detection systems and provide revised compensatory actions if those systems are inoperable. The proposed TS 3/4.4.6.1 would require two operable trains of leakage detection as follows:

- One containment atmosphere radioactivity monitor (either gaseous or particulate), and
- The containment sump level and flow monitoring system

The proposed Action statements would:

- Allow the containment sump level and flow monitoring system to be inoperable for up to 30 days provided an RCS water inventory balance (TS Surveillance Requirements 4.4.6.2.1.d) is performed once per 24 hours as a compensatory action.
- Allow the required containment atmosphere radioactivity monitor (either particulate or gaseous) to be inoperable for up to 30 days provided containment atmosphere grab samples are obtained and analyzed at least once per 24 hours, or an RCS water inventory balance is performed at least once per 24 hours.
- Require an immediate plant shutdown if both required leakage detection means are inoperable.

The DBNPS leakage detection systems are described in Section 5.2.4 of the USAR. Each containment atmosphere radioactivity monitoring system consists of two separate and redundant trains, and incorporate monitors which are seismic and supplied with essential power. The containment atmosphere particulate radioactivity monitoring system consists of two trains, each with a particulate monitor. The containment atmosphere gaseous radioactivity system consists of two trains, each with a gaseous radioactivity monitor. The containment sump level and flow monitoring system includes normal, narrow, and wide range sump level indications. Flow rate is determined by pump run time. The station also conducts an RCS water inventory balance in accordance with TS 4.4.6.2.1.d.

The proposed TS will require diverse and redundant means of detecting RCS leakage by requiring one containment atmosphere radioactivity monitoring system and the containment sump level and flow monitoring system to be operable. The proposed Action statements require appropriate compensatory methods of detecting RCS leakage in the event that one of the required systems is inoperable. The proposed out-of-service times are acceptable considering the adequacy of the remaining operable leakage detection system and the compensatory measures. Further, the proposed changes are consistent with the guidance provided in NUREG-1430, "Standard Technical Specifications - Babcock and Wilcox Plants," for RCS leakage detection systems. The staff finds that the proposed changes meet the requirements of GDC 30 and are therefore acceptable.

2.3 Administrative Changes

The licensee proposes to make administrative changes to TS 3/4.11.2, "Radioactive Effluents - Explosive Gas Mixture," and TS 3/4.3.3.1, "Radiation Monitoring Instrumentation," to be consistent with the changes described above. TS 3/4.11.2 and its associated Bases are being changed to reflect the relocation of TS 3/4.3.3.9 to the TRM. TS 4.11.2 is revised to delete the reference to TS 3.3.3.9, and the TS 3/4.11.2 Bases are revised to clarify that the concentration of oxygen in the waste gas system is determined as required by the TRM. TS 3/4.3.3.1 is being changed to reflect the revision to the TS 3/4.4.6.1 requirements on containment radiation monitors. A footnote is being added to TS Tables 3.3-6 and 4.3-3 to clarify that the requirements only apply to those channels (either the gaseous or particulate radioactivity monitor) that are required to be operable by TS 3.4.6.1. The staff finds these administrative changes to be acceptable.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

This 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 or changes a surveillance requirement. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent 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 (64 FR 46436). 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.

5.0 CONCLUSION

The staff 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 this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: S. Bailey

Date: November 16, 1999