ARKANSAS NUCLEAR ONE UNIT 2 CYCLE 10

PROPOSED CHANGES TO INCORE DETECTOR TECHNICAL SPECIFICATION

PREPARED BY:

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Signature / Date

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VERIFICATION STATUS

The information contained in this document has been verified in accordance with the ABB Combustion Engineering Nuclear Fuel Quality Assurance Program.

_✓_ Yes ____ No

ABB Combustion Engineering Nuclear Fuel

Purpose

This enclosure provides justification for the proposed (Reference 1) temporary changes to the ANO-2 Technical Specification operability requirements on in-core detectors. Attachment 1 contains the proposed change.

Justification of Temporary Changes to Technical Specifications

The following analyses have been performed in support of this revision. First, a new analysis of the overall CECOR power peaking factor measurement uncertainties has been performed by Entergy Operations, Inc (Reference 2). This analysis models the present instrument failures and combines them with various sets of additional postulated failures, so as to model up to 50% of the detectors as failed. The additional element failures are randomly chosen, and each resultant failure pattern is analyzed for its impact on the CECOR measurement uncertainties. The analyzed patterns do not exceed the tilt estimate requirements of the Tech Spec or the 50% operable location Tech Spec. From this analysis, the resultant overall uncertainty on CECOR measured Fxy increases by less than 0.5% compared to the value (6.92%) given in the Entergy CECOR Topical (Reference 3). Second, ABB-CENF has assessed the impact of up to 50% failed detector locations (including the increased CECOR Fxy measurement uncertainty) upon the calculations performed by the monitoring system (COLSS) and the protection system (CPCS). The impact is accounted for in revised values of certain addressable constants input to these systems as described in Enclosure 1 to this letter. For conservatism, a full 1.0% increase in overall uncertainty on the CECOR Fxy measurement was assumed for the generation of these new constants.

Change to Administrative Procedures

Since the in-core detector system continuously monitors azimuthal tilt and axial shape, any unusual behavior will be detected immediately. However, in order to address past NRC concerns about changes which may occur between surveillance intervals, it is recommended that Entergy/ANO-2 administratively change its surveillance interval. The change is described below.

> For the remainder of cycle 10, when the failure level of in-core detector locations exceeds 25%, Entergy/ANO-2 will check the planar radial peaking factor on a once per 15 day schedule, which is twice as often as the Technical Specifications now require. Entergy/ANO-2 will incorporate the results of the new ABB-CENF analysis as embodied in the revised COLSS database constant K09, the revised COLSS addressable constants EPOL2, EPOL4, and UNCERT and the revised CPCS addressable constants BERR1, BERR2, BERR3 and BERR4, as required.

References:

1. A-93-025, "Proposal To Support Reduction of Operable Incore Detectors for ANO-2 Cycle 10 and Beyond", 8 September, 1993, a letter from D. R. Earles (ABB-CE) to F. T. Philpott (Entergy Operations Inc).

2. R. B. Lang, "ANO-2 Cycle 10 CECOR Reliability Factors", 17 Sept, 1993, File Nos.: 041-01;QR-220-18 and CEO-93/00367.

3. MSS-NA3-P, "Verification of CECOR Coefficient Methodology for Application Pressurized Water Reactors of the Middle South Utilities System", August 1, 1984.

Attachments:

1. Proposed Temporary Technical Specification Changes.

ATTACHMENT 1

PROPOSED TEMPORARY TECHNICAL SPECIFICATIONS CHANGES

INSTRUMENTATION

INCORE DETECTORS

LIMITING CONDITION FOR OPERATION

3.3.3.2 The incore detection system shall be OPERABLE with:

a. At least ~~75~~ 50% of all incore detectors with at least one incore detector in each quadrant at each level, and

b. At least ~~38~~ 50% of all incore detector locations, and

c. Sufficient operable incore detectors to perform at least six tilt estimates with at least one tilt estimate at each of three levels.

An OPERABLE incore detector location shall consist of a fuel assembly containing either a fixed detector string with a minimum of three OPERABLE rhodium detectors or an OPERABLE movable incore detector capable of mapping the location.

A tilt estimate can be made from two sets of symmetric pairs of incore detectors. Two sets of symmetric pairs of incore detectors are formed by two pairs of diagonally opposite symmetric incore detectors, one incore detector per quadrant.

APPLICABILITY: When the incore detection system is used for monitoring the AZIMUTHAL POWER TILT, radial peaking factors, local power density or DNB margin.

ACTION:

With the incore detection system inoperable, do not use the system for the above applicable monitoring or calibration functions. The provisions of Specifications 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.2 The incore detection system shall be demonstrated OPERABLE:

a. By performance of a CHANNEL CHECK within 24 hours prior to its use and at least once per 7 days thereafter when required for monitoring the AZIMUTHAL POWER TILT, radial peaking factors, local power density or DNB margin.

b. At least once per 18 months by performance of a CHANNEL CALIBRATION operation which exempts the neutron detectors but includes all electronic components. The neutron detectors shall be calibrated prior to installation in the reactor core.