
Industry/TSTF Standard Technical Specification Change Traveler

Revise Bases for RSPT SR 3.1.5.4

Classification: 2) Consistency/Standardization

NUREGs Affected: ☐ 1430 ☐ 1431 ☒ 1432 ☐ 1433 ☐ 1434

Description:

A change to the Bases is needed to clarify what is required for a CHANNEL FUNCTIONAL TEST of each reed switch position transmitter channel.

Justification:

NUREG SR 3.1.5.4 requires performance "of a CHANNEL FUNCTIONAL TEST of each reed switch position transmitter channel." The Bases for SR 3.1.5.4 provides a more detailed discussion of testing to verify the operability of the CEA reed switch indication system. CEA positions are measured by redundant and independent reed switch position transmitters (RSPTs) on each CEA. The RSPTs transmit signals to two independent CEACs. Each CEAC monitors the position of all CEAs. Should a CEA deviate by more than a specific deadband limit, the CEACs will detect the event, sound an annunciator alarm, and transmit appropriate penalty factors to the CPCs. Each RSPT consists of a series of magnetically actuated reed switches spaced at intervals along the CEA housing. A magnet attached to the CEA extension shaft actuates the adjacent reed switches, transmitting position signals for each RSPT. The Bases for the SR states that "Performance of a CHANNEL FUNCTIONAL TEST of each reed switch position transmitter channel ensures the channel is OPERABLE and capable of indicating CEA position over the entire length of the CEA's travel." The Bases for SR 3.1.5.4 appears to require that each reed switch position sensor be tested. This is different than the functional testing typically performed at CE Plants. The current functional testing verifies that the RSPT string is operable as a unit, without verifying actuation or the change of state for each individual switch in the string. This is based on the definition of Channel Functional Test, that does not require testing of the sensors, but allows a simulated signal to meet the surveillance requirement. In order to test each reed switch by verifying change of state, over one million data points would have to be collected and analyzed. Single reed switches do not affect the performance of a RSPT. If a reed switch does not change state, then the indicated position would be based on the last actuated reed switch and would not change until another reed switch was actuated. If two or more adjacent reed switches do not actuate, the CEAC associated with the affected CEA may indicate that the CEA is moving too fast. CEACs check CEA rate of change for both CEA insertion and withdrawal. If the CEAC rate of change limit is exceeded, a rate of change error would initiate a CEAC sensor failure alarm. The CEAC sensor failure alarm is initiated by a number of inputs including a rate of change error. This condition would require an evaluation to determine the effect on plant operation (penalty factors may be unacceptable). Therefore, even if reed switches do not actuate, the RSPTs would continue to perform their intended function. Based on the discussion above, the words "over the entire length of the CEA's travel" have been deleted from the Bases for ITS SR 3.1.5.4 to eliminate the requirement to test each reed switch. This change is consistent with the definition of Channel Functional Test and corrects an unnecessarily burdensome requirement in the Bases.

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Revision History**OG Revision 0****Revision Status: Active****Next Action: EXCEL**

Revision Proposed by: Palo Verde

Revision Description:
Original Issue

7/12/99

OG Revision 0

Revision Status: Active

Next Action: EXCEL

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CEOG only.

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Incorporation Into the NUREGs

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Affected Technical Specifications

SR 3.1.5.4 Bases

CEA Alignment (Digital)

7/12/99

BASES

TSTF-350

SURVEILLANCE
REQUIREMENTS

SR 3.1.5.3 (continued)

which add to the determination of OPERABILITY of the CEAs (Ref. 7). Between required performances of SR 3.1.5.3, if a CEA(s) is discovered to be immovable but remains trippable and aligned, the CEA is considered to be OPERABLE. At anytime, if a CEA(s) is immovable, a determination of the trippability (OPERABILITY) of that CEA(s) must be made, and appropriate action taken.

SR 3.1.5.4

Performance of a CHANNEL FUNCTIONAL TEST of each reed switch position transmitter channel ensures the channel is OPERABLE and capable of indicating CEA position ~~over the entire length of the CEA's travel~~. Since this test must be performed when the reactor is shut down, an 18 month Frequency to be coincident with refueling outage was selected. Operating experience has shown that these components usually pass this Surveillance when performed at a Frequency of once every 18 months. Furthermore, the Frequency takes into account other surveillances being performed at shorter frequencies, which determine the OPERABILITY of the CEA Reed Switch Indication System.

Therefore, the
Frequency was
concluded to
be acceptable
from a
reactor
operation

SR 3.1.5.5

Verification of full length CEA drop times determines that the maximum CEA drop time permitted is consistent with the assumed drop time used in the safety analysis (Ref. 7). Measuring drop times prior to reactor criticality, after reactor vessel head removal, ensures the reactor internals and CEDM will not interfere with CEA motion or drop time, and that no degradation in these systems has occurred that would adversely affect CEA motion or drop time. Individual CEAs whose drop times are greater than safety analysis assumptions are not OPERABLE. This SR is performed prior to criticality due to the plant conditions needed to perform the SR and the potential for an unplanned plant transient if the Surveillance were performed with the reactor at power.

(continued)