

Industry/TSTF Standard Technical Specification Change Traveler

Correct References to Intermediate Range Flux Channel Indication

Classification: 1) Correct Specifications

NUREGs Affected: 1430 1431 1432 1433 1434

Description:

The term "THERMAL POWER level" is removed from the TS 3.3.9 Condition A, B, & C entry statements, from the TS 3.3.9 Required Action A.1 Completion Time and from TS 3.3.10 Required Action A.1. The cutoff for intermediate range neutron flux is revised to consistently be > 1E-10 amp and <= 1E-10 amp in both TS 3.3.9 and TS 3.3.10.

Justification:

These Condition entry statements are based on whether the intermediate range neutron flux instrumentation channel indicates > or <= 1.0 E-10 amp. These instruments provide a relative indication of neutron flux and are not calibrated against heat balance power. The correlation between THERMAL POWER level and intermediate range neutron flux indication, especially when low in the intermediate range, is not easily determined. Intermediate range instrument channel indications in the range of 1.0 E-10 amp are generally indicative of reactor power levels below "the point of adding heat" and therefore not detectable as THERMAL POWER which is defined as "the total reactor core heat transfer rate." By specifying that the requirements in the Conditions are based on THERMAL POWER level rather than indicated neutron flux, the entry Condition descriptions were unnecessarily confusing.

The Specification 3.3.10 references to intermediate range neutron flux indications are not consistent with the Specification 3.3.9 references.

Specification 3.3.9 uses > 1E-10 amp and <= 1E-10 amp, but also uses < 1E-10 amp.

Specification 3.3.10 uses >= 1E-10 amp and < 1E-10 amp.

Industry Contact: Clarkson, Noel

(864) 855-3077

ntclarks@duke-energy.com

NRC Contact: None Assigned

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Original Issue

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Affected Technical Specifications

LCO 3.3.9 Bases Source Range Neutron Flux

Action 3.3.9.A Source Range Neutron Flux

Action 3.3.9.A Bases Source Range Neutron Flux

Action 3.3.9.B Source Range Neutron Flux

Action 3.3.9.B Bases Source Range Neutron Flux

Action 3.3.9.C Source Range Neutron Flux

Action 3.3.9.C Bases Source Range Neutron Flux

Action 3.3.10.A Intermediate Range Neutron Flux

Action 3.3.10.A Bases Intermediate Range Neutron Flux

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3.3 INSTRUMENTATION

3.3.9 Source Range Neutron Flux

LCO 3.3.9 Two source range neutron flux channels shall be OPERABLE.

NOTE
High voltage to detector may be de-energized above 1E-10 amp on intermediate range channels.

with neutron flux

APPLICABILITY: MODES 2, 3, 4, and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One source range neutron flux channel inoperable with THERMAL POWER level $\leq 1E-10$ amp on the intermediate range neutron flux channels.</p> <p>Neutron flux</p>	<p>A.1 Restore channel to OPERABLE status.</p>	<p>Prior to increasing THERMAL POWER Neutron flux</p>
<p>B. Two source range neutron flux channels inoperable with THERMAL POWER level $\leq 1E-10$ amp on the intermediate range neutron flux channels.</p>	<p>B.1 Suspend operations involving positive reactivity changes.</p> <p>AND</p> <p>B.2 Initiate action to insert all CONTROL RODS.</p> <p>AND</p> <p>B.3 Open CONTROL ROD drive trip breakers.</p> <p>AND</p>	<p>Immediately</p> <p>Immediately</p> <p>1 hour</p>

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ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Verify SDM is $\geq 1\% \Delta k/k$.	1 hour <u>AND</u> Once per 12 hours thereafter
C. One or more source range neutron flux channel(s) inoperable with <u>THERMAL POWER</u> level $> 1E-10$ amp on the intermediate range neutron flux channels.	C.1 Initiate action to restore affected channel(s) to OPERABLE status.	1 hour

Neutron flux

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.9.1 Perform CHANNEL CHECK.	12 hours
SR 3.3.9.2 -----NOTE----- Neutron detectors are excluded from CHANNEL CALIBRATION. ----- Perform CHANNEL CALIBRATION.	[18] months

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3.3 INSTRUMENTATION

3.3.10 Intermediate Range Neutron Flux

LCO 3.3.10 Two intermediate range neutron flux channels shall be OPERABLE.

APPLICABILITY: MODE 2,
When any CONTROL ROD drive (CRD) trip breaker is in the closed position and the CRD System is capable of rod withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable.	A.1 Reduce ^{neutron flux} THERMAL POWER to $\leq 1E-10$ amp.	2 hours
B. Two channels inoperable.	B.1 Suspend operations involving positive reactivity changes.	Immediately
	<u>AND</u> B.2 Open CRD trip breakers.	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.10.1 Perform CHANNEL CHECK.	12 hours

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BASES

APPLICABLE
SAFETY ANALYSES
(continued)

The source range neutron flux channels satisfy Criterion 2 of the NRC Policy Statement.

LCO

Two source range neutron flux channels shall be OPERABLE whenever the control rods are capable of being withdrawn to provide the operator with redundant source range neutron instrumentation. The source range instrumentation is the primary power indication at low power levels $\leq 1E-10$ amp on intermediate range instrumentation and must remain OPERABLE for the operator to continue increasing power.

A Note has been added allowing detector high voltage to be de-energized above $1E-10$ amp on the intermediate range channels. Above this point, the source range instrumentation is no longer the primary power indicator. As such, the high voltage to the source range detectors may be de-energized.

APPLICABILITY

Two source range neutron flux channels shall be OPERABLE in MODE 2 to provide redundant indication during an approach to criticality. Neutron flux level is sufficient for monitoring on the intermediate range and on the power range instrumentation prior to entering MODE 1; therefore, source range instrumentation is not required in MODE 1.

In MODES 3, 4, and 5, source range neutron flux instrumentation shall be OPERABLE to provide the operator with a means of monitoring changes in SDM and to provide an early indication of reactivity changes.

The requirements for source range neutron flux instrumentation during MODE 6 refueling operations are addressed in LCO 3.9.2., "Nuclear Instrumentation."

ACTIONS

A.1

The Required Action for one channel of the source range neutron flux indication inoperable with ~~THERMAL POWER~~ $\leq 1E-10$ amp on the intermediate range neutron flux

Neutron flux

(continued)

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BASES

ACTIONS

A.1 (continued)

instrumentation is to delay increasing reactor power until the channel is repaired and restored to OPERABLE status. This limits power increases in the range where the operators rely solely on the source range instrumentation for power indication. The Completion Time ensures the source range is available prior to further power increases. Furthermore, it ensures that power remains below the point where the intermediate range channels provide primary protection until both source range channels are available to support the overlap verification required by SR 3.3.9.4.

B.1, B.2, B.3, and B.4

With both source range neutron flux channels inoperable with Thermal Power $\leq 1E-10$ amp on the intermediate range neutron flux instrumentation, the operators must place the reactor in the next lowest condition for which source range instrumentation is not required. This is done by immediately suspending positive reactivity additions, initiating action to insert all CONTROL RODS, and opening the CONTROL ROD drive trip breakers within 1 hour. Periodic SDM verification of $\geq 1\% \Delta k/k$ is then required to provide a means for detecting the slow reactivity changes that could be caused by mechanisms other than control rod withdrawal or operations involving positive reactivity changes. Since the source range instrumentation provides the only reliable direct indication of power in this condition, the operators must continue to verify the SDM every 12 hours until at least one channel of the source range instrumentation is returned to OPERABLE status. Required Action B.1, Required Action B.2, and Required Action B.3 preclude rapid positive reactivity additions. The 1 hour Completion Time for Required Action B.3 and Required Action B.4 provides sufficient time for operators to accomplish the actions. The 12 hour Frequency for performing the SDM verification ensures that the reactivity changes possible with CONTROL RODS inserted are detected before SDM limits are challenged.

Neutron Flux

C.1

With Reactor Power $> 1E-10$ amp in MODE 2, 3, 4, or 5 on the intermediate range neutron flux instrumentation, continued

(continued)

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BASES

LCO (continued) neutron flux transients that could result in reactor trip during power escalation.

APPLICABILITY The intermediate range neutron flux channels shall be OPERABLE in MODE 2 and when any CONTROL ROD drive (CRD) trip breaker is in the closed position and the CRD System is capable of rod withdrawal.

The intermediate range instrumentation is designed to detect power changes during initial criticality and power escalation when the power range and source range instrumentation cannot provide reliable indications. Since those conditions can exist in all of these MODES, the intermediate range instrumentation must be OPERABLE.

ACTIONS

A.1

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If one intermediate range channel becomes inoperable when the channels indicate $1E-10$ amp, the unit is exposed to the possibility that a single failure will disable all neutron monitoring instrumentation. To avoid this, the inoperable channel must be repaired or power must be reduced to the point where source range channels can provide neutron flux indication. Completion of Required Action A.1 places the unit in this state, and LCO 3.3.9, "Source Range Neutron Flux," requires OPERABILITY of two source range detectors once this state is reached. If the one channel failure occurs when indicated power is $1E-10$ amp, the Required Action prohibits increases in power above the source range capability.

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The 2 hour Completion Time allows controlled reduction of power into the source range and is based on unit operating experience that demonstrates the improbability of the second intermediate range channel failing during the allowed interval.

B.1 and B.2

With two intermediate range neutron flux channels inoperable when THERMAL POWER is $\leq 5\%$ RTP, the operators must place the

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