Table 3 3.1.1-1 (page 1 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Intermediate Range Monitor					
a. Neutron Flux - High	2	2(d)	G	SR 3 3 1.1.1 SR 3.3 1.1.4 SR 3 3.1.1.6 SR 3 3.1.1.7 SR 3 3.1.1.13 SR 3.3.1.1.15	≤ 120/125 divisions of full scale
	5(a)	2(d)	H	SR 3.3.1.1.1 SR 3.3.1.1.5 SR 3 3 1.1.13 SR 3.3 1.1.15	≤ 120/125 divisions of full scale
b Inop	2	2(d)	G	SR 3.3.1.1.4 SR 3 3 1.1.15	NA
	5(a)	2(d)	H	SR 3 3 1.1.5 SR 3.3 1.1.15	NA
2. Average Power Range Monitor					
a. Neutron Flux - High (Setdown)	2	3(c)	G	SR 3.3.1.1.1 SR 3.3 1.1.7 SR 3 3.1.1.8 SR 3.3 1.1.10 SR 3.3 1.1.13	≤ 20% RTP
b Simulated Thermal Power - High	1	3(c)	F	SR 3.3.1.1.1 SR 3.3.1.1.2 SR 3.3.1.1.8 SR 3.3 1.1.10 SR 3.3 1.1.13	≤ 0 58 W + 58% RTP and ≤ 115 5% RTP(b)
c Neutron Flux - High	1	3(c)	F	SR 3.3.1.1.1 SR 3.3.1.1.2 SR 3.3 1.1.8 SR 3.3.1.1.10 SR 3.3 1.1.13	≤ 120% RTP
d Inop	1, 2	3(c)	G	SR 3.3.1.1.10	NA

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(b) 0.58 W + 58% - 0 58 ΔW RTP when reset for single loop operation per LCO 3.4 1, "Recirculation Loops Operating "

(c) Each APRM channel provides inputs to both trip systems.

(d) One channel in each quadrant of the core must be OPERABLE whenever the IRMs are required to be OPERABLE Both the RWM and a second licensed operator must verify compliance with the withdrawal sequence when less than three channels in any trip system are OPERABLE.

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APPLICABLE SAFETY ANALYSES LCO, and APPLICABILITY (continued)

(LCO 3.3.2.1) does not allow any control rod to be withdrawn. In MODE 5, control rods withdrawn from a core cell containing no fuel assemblies do not affect the reactivity of the core and, therefore, are not required to have the capability to scram. Provided all other control rods remain inserted, no RPS Function is required. In this condition, the required SDM (LCO 3.1.1) and refuel position one-rod-out interlock (LCO 3.9.2) ensure that no event requiring RPS will occur.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

1. Intermediate Range Monitor (IRM)

1.a. Intermediate Range Monitor Neutron Flux - High

The IRMs monitor neutron flux levels from the upper range of the source range monitor (SRM) to the lower range of the average power range monitors (APRMs). The IRMs are capable of generating trip signals that can be used to prevent fuel damage resulting from abnormal operating transients in the intermediate power range. In this power range, the most significant source of reactivity change is due to control rod withdrawal. The IRM mitigates control rod withdrawal error events and is diverse from the rod worth minimizer (RWM), which monitors and controls the movement of control rods at low power. The RWM prevents the withdrawal of an out of sequence control rod during startup that could result in an unacceptable neutron flux excursion (Ref. 5). The IRM provides mitigation of the neutron flux excursion. To demonstrate the capability of the IRM System to mitigate control rod withdrawal events, generic analyses have been performed (Ref. 6) to evaluate the consequences of control rod withdrawal events during startup that are mitigated only by the IRM. This analysis, which assumes that one IRM channel in each trip system is bypassed, demonstrates that the IRMs provide protection against local control rod withdrawal errors and results in peak fuel energy depositions below the 170 cal/gm fuel failure threshold criterion. Reference 19 provides a more recent analysis which shows that even with reduced IRM OPERABILITY requirements, the 170 cal/gm criterion is still satisfied.

The IRMs are also capable of limiting other reactivity excursions during startup, such as cold water injection events, although no credit is specifically assumed.

The IRM System is divided into two groups of IRM channels, with four IRM channels inputting to each trip system. The analysis of

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a. Intermediate Range Monitor Neutron Flux - High (continued)

Reference 6 assumes that one channel in each trip system is bypassed. Therefore, six channels with three channels in each trip system are required for IRM OPERABILITY to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. This trip is active in each of the 10 ranges of the IRM, which must be selected by the operator to maintain the neutron flux within the monitored level of an IRM range.

The analysis of Reference 6 has adequate conservatism to permit an IRM Allowable Value of 120 divisions of a 125 division scale.

The Intermediate Range Monitor Neutron Flux - High Function must be OPERABLE during MODE 2 when control rods may be withdrawn and the potential for criticality exists. In MODE 5, when a cell with fuel has its control rod withdrawn, the IRMs provide monitoring for and protection against unexpected reactivity excursions. In MODE 1, the APRM System and the RWM provide protection against control rod withdrawal error events and the IRMs are not required.

1.b. Intermediate Range Monitor - Inop

This trip signal provides assurance that a minimum number of IRMs are OPERABLE. Any time an IRM mode switch is moved to any position other than "Operate," the detector voltage drops below a preset level, or when a module is not plugged in, an inoperative trip signal will be received by the RPS unless the IRM is bypassed.

This Function was not specifically credited in the accident analysis but it is retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

Four channels of Intermediate Range Monitor - Inop with two channels in each trip system are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal.

Since this Function is not assumed in the safety analysis, there is no Allowable Value for this Function.

This Function is required to be OPERABLE when the Intermediate Range Monitor Neutron Flux - High Function is required.

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BASES

REFERENCES (continued)

15. NEDO-32465-A, "BWR Owners' Group Long-Term Stability Detect and Suppress Solutions Licensing Basis Methodology and Reload Applications," March 1996.

16. NEDO-32410P-A, Supplement 1, "Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function," November 1997.

17. Letter, L.A. England (BWROG) to M.J. Virgilio, "BWR Owners' Group Guidelines for Stability Interim Corrective Action," June 6, 1994.

18. NRC Safety Evaluation Report for Amendment 232.

19. GE Letter NSA 02-250, "Plant Hatch IRM Technical Specifications," April 19, 2002.