

Other channels are subject only to "drift" errors induced within the instrumentation itself and, consequently, can tolerate longer intervals between calibrations. Process system instrumentation errors induced by drift can be expected to remain within acceptable tolerances if recalibration is performed once every 18 months.

Substantial calibration shifts within a channel (essentially a channel failure) will be revealed during routine checking and testing procedures.

Thus, minimum calibration frequencies for the nuclear flux (power range) channels, and once every 18 months for the process system channels is considered acceptable.

#### Testing

On-line testing of reactor protective channel and EFIC channels is required once every 4 weeks on a rotational or staggered basis. The rotation scheme is designed to reduce the probability of an undetected failure existing within the system and to minimize the likelihood of the same systematic test errors being introduced into each redundant channel.

The rotation schedule for the reactor protective channels is as follows:

Channels A, B, C, D	Before Startup if the individual channel rotational frequency has been discontinued or if outage activities could potentially have affected the operability of one or more channel
Channel A	One Week After Startup
Channel B	Two weeks After Startup
Channel C	Three Weeks After Startup
Channel D	Four Weeks After Startup

The reactor protective system instrumentation and EFIC test cycle is continued with one channel's instrumentation tested each week. Upon detection of a failure that prevents trip action, all instrumentation associated with the protective channels will be tested after which the rotational test cycle is started again. If actuation of a safety channel occurs, assurance will be required that actuation was within the limiting safety system setting.

The protective channels coincidence logic and control rod drive trip breakers are trip tested every six months. The trip test checks all logic combinations and is to be performed on a rotational basis. The logic and breakers of the four protective channels shall be trip tested prior to startup and their individual channels trip tested on a cyclic basis. Discovery of a failure requires the testing of all channel logic and breakers, after which the trip test cycle is started again.

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Table 4.1-1  
Instrument Surveillance Requirements

<u>Channel Description</u>	<u>Check</u>	<u>Test</u>	<u>Calibrate</u>	<u>Remarks</u>
1. Protective Channel Coincidence Logic	NA	SA	NA	
2. Control Rod Drive Trip Breaker	NA	SA(1)	NA	(1) To include independent testing of the shunt and undervoltage trip attachments.
3. Power Range Amplifier	NA	NA	T/W(1)	(1) Heat balance calibration twice weekly under steady state operating conditions, daily under non-steady state operating conditions.
4. Power Range Channel	S M(1)	M	M(1) (2)	(1) Using core instrumentation. (2) Axial offset upper and lower chambers monthly and after each startup if not done previous week.
5. Intermediate Range Channel	S	P/M	NA	
6. Source Range Channel	S(1)	P	NA	(1) When in service.
7. Reactor Coolant Temperature Channel	S	M	R	
8. High Reactor Coolant Pressure Channel	S	M	R	
9. Low Reactor Coolant Pressure Channel	S	M	R	
10. Flux-Reactor Coolant Flow Comparator	S	M	R	
11. Reactor Coolant Pressure Temperature Comparator	S	M	R	
12. Pump Flux Comparator	S	M	R	

Table 4.1-1 (Cont.)

Channel Description	Check	Test	Calibrate	Remarks
d. SG A High Range Level High-high	S	M	R	
e. SG B High Range Level High-high	S	M	R	
57. Containment High Range Radiation Monitors	D	M	R	
58. Containment Pressure-High	M	NA	R	
59. Containment Water Level-Wide Range	M	NA	R	
60. Low Temperature Overpressure Protection Alarm Logic	NA	R	R	
61. Core-exit Thermocouples	M	NA	R	
62 Electronic (SCR) Trip Relays	NA	SA	NA	
63 RVLMS	M	NA	R	
64 HLLMS	M	NA	R	

NOTE:

S - Each Shift  
W - Weekly  
M - Monthly  
D - Daily

T/W - Twice per Week  
Q - Quarterly  
P - Prior to each  
startup if not done  
previous week  
B/M - Every 2 months

R - Once every 18 months  
PC - Prior to going Critical if not  
done within previous 31 days  
NA - Not Applicable  
SA - SA Twice per Year

MARKUP OF CURRENT ANO-1 TECHNICAL SPECIFICATIONS

(FOR INFO ONLY)

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The protective channels coincidence logic and control rod drive trip breakers are trip tested every ~~four weeks~~ six months. The trip test checks all logic combinations and is to be performed on a rotational basis. The logic and breakers of the four protective channels shall be trip tested prior to startup and their individual channels trip tested on a cyclic basis. Discovery of a failure requires the testing of all channel logic and breakers, after which the trip test cycle is started again.

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1. Protective Channel Coincidence Logic	NA	MSA	NA	
2. Control Rod Drive Trip Breaker	NA	MSA(1)	NA	(1) To include independent testing of the shunt and undervoltage trip attachments.
3. Power Range Amplifier	NA	NA	T/W(1)	(1) Heat balance calibration twice weekly under steady state operating conditions, daily under non-steady state operating conditions.
4. Power Range Channel	S M(1)	M	M(1) (2)	(1) Using core instrumentation. (2) Axial offset upper and lower chambers monthly and after each startup if not done previous week.
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PROPOSED GENERIC CHANGES TO

NUREG 1430



ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more ETA relays inoperable.	C.1 Transfer affected CONTROL ROD group to power supply with OPERABLE ETA relays.	1 hour
	<u>OR</u> C.2 Trip corresponding AC CRD trip breaker.	1 hour
D Required Action and associated Completion Time not met in MODE 1, 2, or 3.	D.1 Be in MODE 3.	6 hours
	<u>AND</u> D.2.1 Open all CRD trip breakers	6 hours
	<u>OR</u> D.2.2 Remove all power to the CRD System.	6 hours
E. Required Action and associated Completion Time not met in MODE 4 or 5.	E.1 Open all CRD trip breakers.	6 hours
	<u>OR</u> E.2 Remove all power to the CRD System.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.4.1 Perform CHANNEL FUNCTIONAL TEST.	<del>34</del> [184] days

BASES

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ACTIONS

C.1 and C.2 (continued)

The 1 hour Completion Time is sufficient to perform the Required Action.

D.1, D.2.1, and D.2.2

If the Required Actions of Condition A, B, or C are not met within the required Completion Time in MODE 1, 2, or 3, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3, with all CRD trip breakers open or with all power to the CRD System removed within 6 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems.

E.1 and E.2

If the Required Actions of Condition A, B, or C are not met within the required Completion Time in MODE 4 or 5, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, all CRD trip breakers must be opened or all power to the CRD System removed within 6 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to open all CRD trip breakers or remove all power to the CRD System without challenging unit systems.

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.4.1

SR 3.3.4.1 is to perform a CHANNEL FUNCTIONAL TEST every 31[184] days. This test verifies the OPERABILITY of the trip devices by actuation of the end devices. Also, this test independently verifies the undervoltage and shunt trip mechanisms of the AC breakers. The Frequency of 31[184] days is based on operating experience, which has demonstrated that failure of more than one channel of a given function in any 31[184] day interval is a rare event.

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REFERENCES

1. FSAR, Chapter [7].
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