

### 3/4.3 INSTRUMENTATION

#### 3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

##### LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protection system instrumentation channels shown in Table 3.3.1-1 shall be OPERABLE\* with the REACTOR PROTECTION SYSTEM RESPONSE TIME as shown in Table 3.3.1-2.

APPLICABILITY: As shown in Table 3.3.1-1.

##### ACTION:

- a. For all functional units of Table 3.3.1-1 other than Reactor Mode Switch Shutdown Position.
  1. With one of the four channels required for any Trip Function inoperable, operation may continue provided the inoperable channel is placed in the tripped condition within 48 hours. The provisions of Specification 3.0.4 are not applicable.
  2. With two of the four channels required for any Trip Function inoperable, place one channel in the tripped condition within ~~one hour~~ six hours provided no tripped channel for that Trip Function already exists. The provisions of Specification 3.0.4 are not applicable.
  3. With three of the four channels required for any Trip Function inoperable, take the ACTION required by Table 3.3.1-1.
- b. For Reactor Mode Switch Shutdown Position take the ACTION as shown in Table 3.3.1-1.

##### SURVEILLANCE REQUIREMENTS

4.3.1.1 Each reactor protection system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations for the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.1.1-1.

4.3.1.2 LOGIC SYSTEM FUNCTIONAL TESTS shall be performed at least once per 18 months. Reactor protection system divisional logic and portions of the channel coincident logic shall be manually tested independent of the SELF TEST SYSTEM during each refueling outage such that all trip functions are tested at least once every four fuel cycles.

\*A channel may be placed in an inoperable status for up to 6 hours for required surveillance provided at least two OPERABLE channels are monitoring that parameter.

~~Manual testing for the purpose of satisfying Specification 4.3.1.2 is not required until after shutdown during the first regularly scheduled refueling outage.~~

CLINTON - UNIT 1

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9109300200 910920  
PDR ADOCK 05000441  
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TABLE 4.3.1.1-1

## REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS



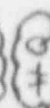

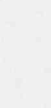
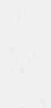
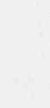
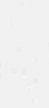
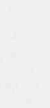
FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION (a)	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. Intermediate Range Monitors:				
a. Neutron Flux - High	S/U, S, (b) S	S/U(c), W W	R R	2 3, 4, 5
b. Inoperative	NA	W	NA	2, 3, 4, 5
2. Average Power Range Monitor: (f)				
a. Neutron Flux - High, Shutdown	S/U, S, (b) S	S/U(c), W W	SA SA	2 3, 4, 5
b. Flow-Biased Simulated Thermal Power - High	S	S/U(c) 	W(d)(e), SA, R(f)	1
c. Neutron Flux - High	S	S/U(c) 	W(d)(e), SA	1
d. Inoperative	NA		NA	1, 2, 3, 4, 5
3. Reactor Vessel Steam Dome Pressure - High	S		R(g)	1, 2(f)
4. Reactor Vessel Water Level - Low, Level 3	S		R(g)	1, 2
5. Reactor Vessel Water Level - High, Level 8	S		R(g)	1
6. Main Steam Line Isolation Valve - Closure	NA		R	1
7. Main Steam Line Radiation - High	S		R	1, 2(j)
8. Drywell Pressure - High	S		R(g)	1, 2(i)

TABLE 4.3.1.1-1 (Continued)

## REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION (a)	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
9. Scram Discharge Volume Water Level - High				
a. Level Transmitter	S		R <sup>(g)</sup>	1, 2, 5 <sup>(k)</sup>
b. Float Switches	NA	Q	R	1, 2, 5 <sup>(k)</sup>
10. Turbine Stop Valve - Closure	NA		R <sup>(m)</sup>	1
11. Turbine Control Valve Fast Closure Valve Trip System Oil Pressure - Low	NA		R <sup>(m)</sup>	1
12. Reactor Mode Switch Shutdown Position	NA	R	NA	1, 2, 3, 4, 5
13. Manual Scram	NA		NA	1, 2, 3, 4, 5

CLINTON - UNIT 1

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TABLE 4.3.1.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TABLE NOTATIONS

- (a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (b) The IRM and SRM channels shall be determined to overlap for at least 1/2 decade during each startup after entering OPERATIONAL CONDITION 2 and the IRM and APRM channels shall be determined to overlap for at least 1 decade during each controlled shutdown, if not performed within the previous 7 days.
- (c) Within 24 hours prior to startup, if not performed within the previous 7 days.
- (d) This calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER > 25% of RATED THERMAL POWER. Adjust the APRM channel if the absolute difference is greater than 2% of RATED THERMAL POWER.
- (e) This calibration shall consist of a setpoint verification of the Neutron Flux-High and the Flow Biased Simulated Thermal Power-High trip functions. The Flow Biased Simulated Thermal-High trip function is verified using a calibrated flow signal.
- (f) The LPRMs shall be calibrated at least once per 1000 effective full power hours (EFPH) using the TIP system.
- (g) Calibrate the analog trip module at least once per <sup>92</sup> days.
- (h) Deleted.
- (i) This calibration shall consist of verifying the  $6 \pm 0.6$  second simulated thermal power time constant.
- (j) This function is not required to be OPERABLE when the reactor pressure vessel head is removed per Specification 3.10.1.
- (k) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
- (l) This function is not required to be OPERABLE when DRYWELL INTEGRITY is not required to be OPERABLE per Special Test Exception 3.10.1.
- (m) The CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION shall include the turbine first stage pressure instruments.



## INSTRUMENTATION

### 3/4.3.2 CONTAINMENT AND REACTOR VESSEL ISOLATION CONTROL SYSTEM

#### LIMITING CONDITION FOR OPERATION

3.3.2 The containment and reactor vessel isolation control system (CRVICS) channels shown in Table 3.3.2-1 shall be OPERABLE\* with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.2-2 and with ISOLATION SYSTEM RESPONSE TIME as shown in Table 3.3.2-3.

APPLICABILITY: As shown in Table 3.3.2-1.

#### ACTION:

- a. With a CRVICS channel trip setpoint less conservative than the value shown in the Allowable Value column of Table 3.3.2-2, declare the channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.
- b. For CRVICS Main Steam Line Isolation Trip Functions:
  1. With one of the four channels required for any Trip Function inoperable, operation may continue provided the inoperable channel is placed in the tripped condition within 48 hours. The provisions of Specification 3.0.4 are not applicable.
  2. With two of the four channels required for any Trip Function inoperable, place one channel in the tripped condition within ~~one hour~~ Six hours provided no tripped channel for that Trip Function already exists. The provisions of Specification 3.0.4 are not applicable.
  3. With three of the four channels required for any Trip Function inoperable, take the ACTION required by Table 3.3.2-1.
- c. For other CRVICS Isolation Trip Functions:
  1. With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system, place the inoperable channel(s) and/or that trip system in the tripped condition\*\* within ~~1 hour~~ 24 hours. The provisions of Specification 3.0.4 are not applicable.

\*For CRVICS Main Steam Line Isolation Trip Function, a channel may be placed in an inoperable status for up to 2 hours for required surveillance provided at least two OPERABLE channels are monitoring that parameter.

For other CRVICS Isolation Trip Function, a channel may be placed in an inoperable status for up to 2 hours for required surveillance provided the requirements of Table 3.3.2-1 are fulfilled.

\*\*An inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to OPERABLE status within 2 hours or the ACTION required by Table 3.3.2-1 for that Trip Function shall be taken.

## INSTRUMENTATION

### CONTAINMENT AND REACTOR VESSEL ISOLATION CONTROL SYSTEM

#### LIMITING CONDITION FOR OPERATION (Continued)

##### 3.3.2 ACTION (Continued):

2. With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement for both trip systems, place at least one trip system\* in the tripped condition within 1 hour and take the ACTION required by Table 3.3.2-1.

#### SURVEILLANCE REQUIREMENTS

4.3.2.1 Each CRVICS channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations for the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.2.1-1.

4.3.2.2 LOGIC SYSTEM FUNCTIONAL TESTS shall be performed at least once per 18 months. CRVICS main steam line isolation divisional logic and portions of the channel coincident logic shall be manually tested independent of the SELF TEST SYSTEM during each refueling outage. Each of the two trip systems or divisions of the CRVICS trip system logic shall be alternately and manually tested independent of the SELF TEST SYSTEM during every other refueling outage. All manual testing shall be completed such that all trip functions are tested at least once every four fuel cycles.

4.3.2.3 The CRVICS RESPONSE TIME of each CRVICS trip function shown in Table 3.3.2-3 shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one logic train tested at least once per 36 months, and one channel per trip function such that all channels are tested at least once every N times 18 months, where N is the total number of redundant channels in a specific CRVICS trip function.

\*The trip system need not be placed in the tripped condition if this would cause the Trip Function to occur. When a trip system can be placed in the tripped condition without causing the Trip Function to occur, place the trip system with the most inoperable channels in the tripped condition; if both systems have the same number of inoperable channels, place either trip system in the tripped condition.

~~\*\*Manual testing for the purpose of satisfying Specification 4.3.2.2 is not required until after shutdown during the first regularly scheduled refueling outage.~~

TABLE 3.3.2-1 (Continued)  
CRVICS INSTRUMENTATION

TABLE NOTATIONS

- # When handling irradiated fuel in the primary or secondary containment and during CORE ALTERATIONS and operations with a potential for draining the reactor vessel.
- ## When handling irradiated fuel in the primary containment (building) and during CORE ALTERATIONS and operations with a potential for draining the reactor vessel.
- \* With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
- \*\* When any turbine stop valve is greater than 95% open or the reactor mode switch is in the run position.
- † Main steam line isolation trip functions have 2-out-of-4 isolation logic except for the main steam line flow - high trip function which has 2-out-of-4 isolation logic for each main steam line.
- †† See Specification 3.6.4 Table 3.6.4-1 for valves which are actuated by these isolation signals.
- (a) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.
- (b) Also actuates the standby gas treatment system.
- (c) Deleted
- (d) Also trips and isolates the mechanical vacuum pumps.
- (e) Isolates RWCU valves 1G33-F001 and 1G33-F004 only.
- (f) Also actuates secondary containment ventilation isolation dampers per Table 3.6.6.2-1.
- (g) Manual Switch closes RWCU system inboard isolation valves F001, F028, F053, F040 and outboard isolation valves F004, F039, F034 and F054.
- (h) Vacuum breaker isolation valves require RCIC system steam supply pressure low coincident with drywell pressure high for isolation of vacuum breaker isolation valves.
- (i) A single manual isolation switch isolates outboard steam supply line isolation valve (F064) and the RCIC pump suction from suppression pool valve (F031) only following a manual or automatic (Reactor Vessel Water Level 2) RCIC system initiation.
- (j) Only actuates secondary containment ventilation isolation dampers per Table 3.6.6.2-1. Note †† is not applicable to this Trip Function.
- (k) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the trip condition provided that the redundant trip system is OPERABLE and monitoring that parameter.
- (l) Not required to be OPERABLE when valves 1VRO02A,B and 1VQ006A,B are sealed closed in accordance with Specification 3.6.4.

TABLE 4.3.2.1-1

## CRVICS INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. PRIMARY AND SECONDARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level - Low Low, Level 2	S	#Q	R <sup>(b)</sup>	1, 2, 3, #
b. Reactor Vessel Water Level - Low Low, Level 2 (ECCS Div. I and II)	S	#Q	R <sup>(b)</sup>	1, 2, 3
c. Reactor Vessel Water Level - Low Low, Level 2 (ECCS Div. III)	S	#Q	R <sup>(b)</sup>	1, 2, 3
d. Drywell Pressure - High	S	#Q	R <sup>(b)</sup>	1, 2, 3
e. Drywell Pressure - High (ECCS Div. I and II)	S	#Q	R <sup>(b)</sup>	1, 2, 3
f. Drywell Pressure - High (ECCS Div. III)	S	#Q	R <sup>(b)</sup>	1, 2, 3
g. Containment Building Fuel Transfer Pool Ventilation Plenum Radiation - High	S	#Q	R	##
h. Containment Building Exhaust Radiation - High	S	#Q	R	1, 2, 3, #
i. Containment Building Contin- uous Containment Purge (CCP) Exhaust Radiation - High	S	#Q	R	1, 2, 3, #

TABLE 4.3.2.1-1 (Continued)

## CRVICS INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. PRIMARY AND SECONDARY CONTAINMENT ISOLATION (Continued)				
j. Reactor Vessel Water Level - Low Low Low, Level 1	S	H-Q	R <sup>(b)</sup>	1, 2, 3, #
k. Containment Pressure - High	S	H-Q	R	1, 2, 3, #
l. Main Steam Line Radiation - High	S	H-Q	R	1, 2, 3
m. Fuel Building Exhaust Radiation - High	S	H-Q	R	1, 2, 3, #
n. Manual Initiation	NA	R	NA	1, 2, 3, #
2. MAIN STEAM LINE ISOLATION				
a. Reactor Vessel Water Level - Low Low Low, Level 1	S	H-Q	R <sup>(b)</sup>	1, 2, 3
b. Main Steam Line Radiation - High	S	H-Q	R	1, 2, 3
c. Main Steam Line Pressure - Low	S	H-Q	R <sup>(b)</sup>	1
d. Main Steam Line Flow - High	S	H-Q	R <sup>(b)</sup>	1, 2, 3
e. Condenser Vacuum - Low	S	H-Q	R <sup>(b)</sup>	1, 2**, 3**
f. Main Steam Line Tunnel Temp. - High	S	H-Q	R	1, 2, 3
g. Main Steam Line Tunnel Δ Temp. - High	S	H-Q	R	1, 2, 3
h. Main Steam Line Turbine Bldg. Temp. - High	S	H-Q	R	1, 2, 3
i. Manual Initiation	NA	R	NA	1, 2, 3

TABLE 4.3.2.1-1 (Continued)

## CRVICS INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
3. REACTOR WATER CLEANUP SYSTEM ISOLATION				
a. $\Delta$ Flow - High	S	Q #	R	1, 2, 3
b. $\Delta$ Flow Timer	NA	Q #	Q	1, 2, 3
c. Equipment Area Temp. - High				
1. Pump Rooms - A, B, C	S	Q #	R	1, 2, 3
2. Heat Exchanger Rooms - East, West	S	Q #	R	1, 2, 3
d. Equipment Area $\Delta$ Temp. - High				
1. Pump Rooms - A, B, C	S	Q #	R	1, 2, 3
2. Heat Exchanger Rooms - East, West	S	Q #	R	1, 2, 3
e. Reactor Vessel Water Level - Low Low, Level 2	S	Q #	R <sup>(b)</sup>	1, 2, 3, #
f. Main Steam Line Tunnel Ambient Temp. - High	S	Q #	R	1, 2, 3
g. Main Steam Line Tunnel $\Delta$ Temp. - High	S	Q #	R	1, 2, 3
h. SLCS Initiation	NA	Q # <sup>(a)</sup>	NA	1, 2, 5*
i. Manual Initiation	NA	R	NA	1, 2, 3, #
4. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION				
a. RCIC Steam Line Flow - High	S	Q #	R <sup>(b)</sup>	1, 2, 3
b. RCIC Steam Line Flow - High Timer	NA	Q #	R	1, 2, 3



TABLE 4.3.2.1-1 (Continued)  
CRVCS INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
4. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION (Continued)				
c. RCIC Steam Supply Pressure - Low	S	H-Q	R <sup>(b)</sup>	1, 2, 3
d. RCIC Turbine Exhaust Diaphragm Pressure - High	S	H-Q	R <sup>(b)</sup>	1, 2, 3
e. RCIC Equipment Room Ambient Temperature - High	S	H-Q	R	1, 2, 3
f. RCIC Equipment Room Δ Temp. - High	S	H-Q	R	1, 2, 3
g. Main Steam Line Tunnel Ambient Temp. - High	S	H-Q	R	1, 2, 3
h. Main Steam Line Tunnel Δ Temp. - High	S	H-Q	R	1, 2, 3
i. Main Steam Line Tunnel Temp. Timer	NA	H-Q	R	1, 2, 3
j. Drywell pressure - High	S	H-Q	R <sup>(b)</sup>	1, 2, 3
k. Manual Initiation	NA	H-Q	NA	1, 2, 3
l. RHR/RCIC Steam Line Flow - High	S	H-Q	R <sup>(b)</sup>	1, 2, 3
m. RHR Heat Exchanger A, B Ambient Temperature - High	S	H-Q	R	1, 2, 3
n. RHR Heat Exchanger A, B Δ Temp. - High	S	H-Q	R	1, 2, 3

TABLE 4.3.2.1-1 (Continued)  
CRVICS INSTRUMENTATION SURVEILLANCE REQUIREMENTS

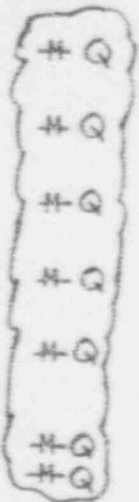
<u>TRIP FUNCTION</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
5. <u>RHR SYSTEM ISOLATION</u>				
a. RHR Heat Exchanger Rooms A, B Ambient Temp. - High	S		R	1, 2, 3
b. RHR Heat Exchanger Rooms A, B Δ Temp. - High	S		R	1, 2, 3
c. Reactor Vessel Water Level - Low, Level 3	S		R(b)	1, 2, 3
d. Reactor Vessel Water Level - Low Low Low, Level 1	S		R(b)	1, 2, 3
e. Reactor Vessel (RHR Cut-in Permissive) Pressure - High	S		R(b)	1, 2, 3
f. Drywell Pressure - High				
1) RHR Test Line	S		R(b)	1, 2, 3
2) Fuel Pool Cooling	S		R(b)	1, 2, 3
g. Manual Initiation	NA	R	NA	1, 2, 3



TABLE 4.3.2.1-1 (Continued)

CRVICS INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TABLE NOTATIONS

- # When handling irradiated fuel in either the secondary or the primary containment and during CORE ALTERATIONS and operations with a potential for draining the reactor vessel.
- ## When handling irradiated fuel in the primary containment (building) and during CORE ALTERATIONS and operations with a potential for draining the reactor vessel.
- \* With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
- \*\* When any turbine stop valve is greater than 95% open or the reactor mode switch is in the run position.
- (a) Each train or logic channel shall be tested at least every other <sup>92</sup>~~31~~ days.
- (b) Calibrate the analog trip modules at least once per <sup>92</sup>~~31~~ days.

## INSTRUMENTATION

### 3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

#### LIMITING CONDITION FOR OPERATION

3.3.3 The emergency core cooling system (ECCS) actuation instrumentation channels shown in Table 3.3.3-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.3-2 and with EMERGENCY CORE COOLING SYSTEM RESPONSE TIME as shown in Table 3.3.3-3.

APPLICABILITY: As shown in Table 3.3.3-1.

#### ACTION:

- a. With an ECCS actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Value column of Table 3.3.3-2, declare the channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.
- b. With one or more ECCS actuation instrumentation channels inoperable, take the ACTION required by Table 3.3.3-1.
- c. With either ADS trip system "1" or "2" inoperable, restore the inoperable trip system to OPERABLE status within:
  1. 7 days, provided that the HPCS and RCIC systems are OPERABLE, or
  2. 72 hours, provided either the HPCS or RCIC systems are inoperable.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to  $\leq 100$  psig within the following 24 hours.

#### SURVEILLANCE REQUIREMENTS

4.3.3.1 Each ECCS actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations for the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.3.1-1.

4.3.3.2 LOGIC SYSTEM FUNCTIONAL TESTS shall be performed at least once per 18 months. The actuation system logic associated with each of the ECCS divisions shall be manually tested independent of the SELF TEST SYSTEM during alternate refueling outages such that all divisions and all trip functions are tested at least once every four fuel cycles.

4.3.3.3 The ECCS RESPONSE TIME of each ECCS trip function shown in Table 3.3.3-3 shall be demonstrated to be within the limit at least once per 18 months. Each test shall include at least one channel per trip system such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific ECCS trip system.

~~\*Manual testing for the purpose of satisfying Specification 4.3.3.2 is not required until after shutdown during the first regularly scheduled refueling outage.~~

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TABLE NOTATIONS

- (a) A channel may be placed in an inoperable status for up to 6 hours during periods of required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.
- (b) Also actuates the associated division diesel generator.
- (c) Provides signal to close HPCS pump injection valve only.
- (d) Provides signal to HPCS pump suction valves only.
- (e) Four reactor vessel water level trip channels are logically combined in a one-out-of-two-twice configuration. For the purposes of the associated ACTION, each one-out-of-two logic is defined as a separate trip system.
- (f) Four drywell pressure trip channels are logically combined in a one-out-of-two-twice configuration. For the purposes of the associated ACTION, each one-out-of-two logic is defined as a separate trip system.
- (g) One half of these trip channels is associated with Nuclear Systems Protection System (NSPS) Division III; the other half is associated with NSPS Division IV.
- \* When the system is required to be OPERABLE per Specification 3.5.2 or 3.5.3.
- \*\* Required when ESF equipment is required to be OPERABLE.
- # Not required to be OPERABLE when reactor steam dome pressure is  $\leq$  100 psig.
- ## These Trip Functions are not required for ECCS actuation.
- † The HPCS initiation functions of the Drywell Pressure - High and Manual Initiation are not required to be OPERABLE with indicated reactor vessel water level on the wide range instrument greater than the Level-8 setpoint coincident with the reactor steam dome pressure less than 600 psig.
- †† One relay with three inputs in 3 out of 3 logic.

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

ACTION

- ACTION 30 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:
- With one channel inoperable, place the inoperable channel in the tripped condition within ~~1 hour~~ 24 hours\* or declare the associated system inoperable.
  - With more than one channel inoperable, declare the associated system inoperable.
- ACTION 31 - Deleted.
- ACTION 32 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, within 24 hours, declare the associated ADS trip system or ECCS inoperable.
- ACTION 33 - With the number of OPERABLE channels less than the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel(s) in the tripped condition within ~~1 hour~~ 24 hours.
- ACTION 34 - Deleted.
- ACTION 35 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, restore the inoperable channel to OPERABLE status within ~~1 hour~~ 24 hours or declare the associated ADS valve or ECCS inoperable.
- ACTION 36 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:
- For one trip system, place that trip system in the tripped condition within ~~one hour~~ 24 hours\* or declare the HPCS system inoperable.
  - For both trip systems, declare the HPCS system inoperable.
- ACTION 37 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place 24 hours\* ~~at least one inoperable channel in the tripped condition within 1 hour\*~~ declare the HPCS system inoperable.
- ACTION 38 With the number of OPERABLE channels less than the Total Number of Channels, declare the associated emergency diesel generator inoperable and take the ACTION required by Specifications 3.8.1.1 or 3.8.1.2, as appropriate.
- ACTION 39 - With the number of OPERABLE channels one less than the Total Number of Channels, place the inoperable channel in the tripped condition within 1 hour\*; operation may then continue until performance of the next required CHANNEL FUNCTIONAL TEST.
- ACTION 40 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel in the tripped condition within ~~one hour~~ 24 hours. Restore the inoperable channel to OPERABLE status within 7 days or declare the associated system inoperable.

\*The provisions of Specification 3.0.4 are not applicable.

TABLE 4.3.3.1-1

## EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
A. DIVISION 1 TRIP SYSTEM				
1. RHR-A (LPCI MODE) AND LPCS SYSTEM				
a. Reactor Vessel Water Level - Low Low Low, Level 1	S	#Q	R(a)	1, 2, 3, 4*, 5*
b. Drywell Pressure - High	S	#Q	R(a)	1, 2, 3
c. Reactor Vessel Pressure-Low (LPCI and LPCS Injection Valve Permissive)	S	#Q	R(a)	1, 2, 3, 4*, 5*
d. LPCI Pump A Start Time Delay Logic Card	NA	#Q	R(a)	1, 2, 3, 4*, 5*
e.* LPCS Pump Discharge Flow-Low	S	#Q	R(a)	1, 2, 3, 4*, 5*
f. LPCI Pump (A) Discharge Flow -Low	S	#Q	R(a)	1, 2, 3, 4*, 5*
g. Manual Initiation	NA	R	NA	1, 2, 3, 4*, 5*
2. AUTOMATIC DEPRESSURIZATION SYSTEM				
TRIP SYSTEM "1" #				
ADS LOGIC "A" AND "E"				
a. Reactor Vessel Water Level - Low Low Low, Level 1	S	#Q	R(a)	1, 2, 3
b. Drywell Pressure-High	S	#Q	R(a)	1, 2, 3
c. ADS Timer	NA	#Q	R	1, 2, 3
d. Reactor Vessel Water Level - Low, Level 3	S	#Q	R(a)	1, 2, 3
e. LPCS Pump Discharge Pressure-High	S	#Q	R(a)	1, 2, 3
f. LPCI Pump A Discharge Pressure-High	S	#Q	R(a)	1, 2, 3
g. ADS Drywell Pressure Bypass Timer	NA	#Q	R	1, 2, 3
h. Manual Inhibit ADS Switch	NA	#Q	NA	1, 2, 3
i. Manual Initiation	NA	R	NA	1, 2, 3



TABLE 4.3.3.1-1 (Continued)

## EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

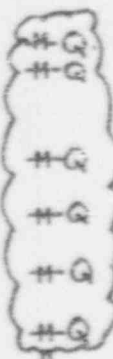
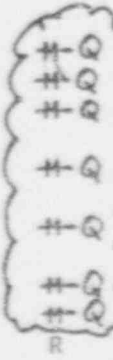
<u>TRIP FUNCTION</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED</u>	
<b>B. <u>DIVISION II TRIP SYSTEM</u></b>					
<b>1. <u>RHIR B AND C (LPCI MODE)</u></b>					
a. Reactor Vessel Water Level - Low Low Low, Level 1	S		R(a)	1, 2, 3, 4*, 5*	
b. Drywell Pressure - High	S		R(a)	1, 2, 3	
c. Reactor Vessel Pressure-Low (LPCI Injection Valve Permissive)	S		R(a)	1, 2, 3, 4*, 5*	
d. LPCI Pump B Start Time Delay Logic Card	NA		R	1, 2, 3, 4*, 5*	
e. LPCI Pump (B) Discharge Flow -Low	S		R(a)	1, 2, 3, 4*, 5*	
f. LPCI Pump (c) Discharge Flow -Low	S		R(a)	1, 2, 3, 4*, 5*	
g. Manual Initiation	NA		R	NA	1, 2, 3, 4*, 5*
<b>2. <u>AUTOMATIC DEPRESSURIZATION SYSTEM</u></b>					
<b><u>TRIP SYSTEM "2" #</u></b>					
<b><u>ADS LOGIC "B" AND "F"</u></b>					
a. Reactor Vessel Water Level - Low Low Low, Level 1	S		R(a)	1, 2, 3	
b. Drywell Pressure-High	S		R(a)	1, 2, 3	
c. ADS Timer	NA		R	1, 2, 3	
d. Reactor Vessel Water Level - Low, Level 3	S		R(a)	1, 2, 3	
e. LPCI Pump (B and C) Discharge Pressure-High	S		R(a)	1, 2, 3	
f. ADS Drywell Pressure Bypass Timer	NA		R	1, 2, 3	
g. Manual Inhibit ADS Switch	NA		R	NA	1, 2, 3
h. Manual Initiation	NA		R	NA	1, 2, 3

TABLE 4.3.3.1-1 (Continued)

## EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

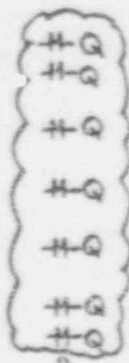
<u>TRIP FUNCTION</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED</u>
<u>C. DIVISION III TRIP SYSTEM</u>				
<u>1. HPCS SYSTEM</u>				
a. Reactor Vessel Water Level - Low Low, Level 2	S		R(a)	1, 2, 3, 4*, 5*
b. Drywell Pressure-High	S		R(a)	1, 2, 3
c. Reactor Vessel Water Level-High, Level 8	S		R(a)	1, 2, 3, 4*, 5*
d. RCIC Storage Tank Level - Low	S		R(a)	1, 2, 3, 4*, 5*
e. Suppression Pool Water Level - High	S		R(a)	1, 2, 3, 4*, 5*
f. HPCS Pump Discharge Pressure -High	S		R(a)	1, 2, 3, 4*, 5*
g. HPCS System Flow Rate-Low	S		R(a)	1, 2, 3, 4*, 5*
h. Manual Initiation	NA		R	NA
<u>D. LOSS OF POWER</u>				
1. 4.16 kV Emergency Bus Under-voltage (Loss of Voltage)	NA	NA	R	1, 2, 3, 4**, 5**
2. 4.16 kV Emergency Bus Under-voltage (Degraded Voltage)	S	M	R	1, 2, 3, 4**, 5**

TABLE 4.3.3.1-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TABLE NOTATIONS


- # Not required to be OPERABLE when reactor steam dome pressure is  $\leq 100$  psig.
- \* When the system is required to be OPERABLE per Specification 3.5.2.
- \*\* Required when ESF equipment is required to be OPERABLE.
- (a) Calibrate the analog trip module at least once per  days.



TABLE 3.3.4.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

<u>TRIP FUNCTION</u>	<u>MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM (a)</u>
1. Reactor Vessel Water Level - Low Low, Level 2	2
2. Reactor Vessel Pressure - High	2

- (a) One channel may be placed in an inoperable status for up to <sup>6</sup>2 hours for required surveillance provided the redundant trip system is OPERABLE and monitoring that parameter.

TABLE 4.3.4.1-1

ATWS RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>
1. Reactor Vessel Water Level - Low Low, Level 2	S		R*
2. Reactor Vessel Pressure - High	S		R*

\*Calibrate trip unit at least once per <sup>92</sup>~~31~~ days.

## INSTRUMENTATION

### END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

#### LIMITING CONDITION FOR OPERATION

3.3.4.2 The end-of-cycle recirculation pump trip (EOC-RPT) system instrumentation channels shown in Table 3.3.4.2-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.4.2-2 and with the END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM RESPONSE TIME as shown in Table 3.3.4.2-3.

APPLICABILITY: OPERATIONAL CONDITION 1, when THERMAL POWER is  $\geq$  to 40% of RATED THERMAL POWER.

#### ACTION:

- a. With an end-of-cycle recirculation pump trip function instrumentation channel trip setpoint less conservative than the value shown in the Allowable Value column of Table 3.3.4.2-2, declare the channel inoperable until the channel is restored to OPERABLE status with the channel setpoint adjusted consistent with the Trip Setpoint value.
- b. With one of the four channels required for any Trip Function inoperable, operation may continue provided the inoperable channel is placed in the tripped condition within 48 hours. The provisions of Specification 3.0.4 are not applicable.
- c. With two of the four channels required for any Trip Function inoperable, place one channel in the tripped condition within Six hours ~~one hour~~ provided no tripped channel for that Trip Function already exists. The provisions of Specification 3.0.4 are not applicable.
- d. With three of the four channels required for any Trip Function inoperable, reduce THERMAL POWER to less than 40% of RATED THERMAL POWER within 6 hours.

#### SURVEILLANCE REQUIREMENTS

4.3.4.2.1 Each end-of-cycle recirculation pump trip system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.4.2-1.

4.3.4.2.2 LOGIC SYSTEM FUNCTIONAL TESTS shall be performed at least once per 18 months. Divisional logic and portions of the channel coincident logic shall be manually tested independent of the SELF TEST SYSTEM during each refueling outage such that all trip functions are tested at least once every four fuel cycles.

~~\* Manual testing for the purpose of satisfying Specification 4.3.4.2.2 is not required until after shutdown during the first regularly scheduled refueling outage.~~

TABLE 3.3.4.2-1

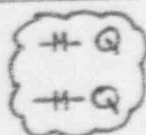
## END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION	TOTAL NUMBER OF CHANNELS	CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS PER TRIP FUNCTION (a)
1. Turbine Stop Valve - Closure	4	2	4 <sup>(b)</sup>
2. Turbine Control Valve-Fast Closure	4	2	4 <sup>(b)</sup>

- (a) A channel may be placed in an inoperable status for up to <sup>6</sup>2 hours for required surveillance provided at least two OPERABLE channels are monitoring that parameter.
- (b) This function shall be automatically bypassed when turbine first stage pressure is less than the value of turbine first stage pressure corresponding to 40% of RATED THERMAL POWER.

TABLE 4.3.4.2-1

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>
1. Turbine Stop Valve-Closure		R
2. Turbine Control Valve-Fast Closure		R



## INSTRUMENTATION

### 3/4.3.5 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

#### LIMITING CONDITION FOR OPERATION

3.3.5 The reactor core isolation cooling (RCIC) system actuation instrumentation channels shown in Table 3.3.5-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.5-2.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3 with reactor steam dome pressure greater than 150 psig.

#### ACTION:

- a. With an RCIC system actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Value column of Table 3.3.5-2, declare the channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.
- b. With one or more RCIC system actuation instrumentation channels inoperable, take the ACTION required by Table 3.3.5-1.

#### SURVEILLANCE REQUIREMENTS

4.3.5.1 Each RCIC system actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.5.1-1.

4.3.5.2 LOGIC SYSTEM FUNCTIONAL TESTS shall be performed at least once per 18 months. All RCIC actuation system logic shall be manually tested independent of the SELF TEST SYSTEM such that all trip functions are tested at least once every four fuel cycles.

~~Manual testing for the purpose of satisfying Specification 4.3.5.2 is not required until after shutdown during the first regularly scheduled refueling outage.~~

## INSTRUMENTATION

### 3/4.3.5 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

#### LIMITING CONDITION FOR OPERATION

3.3.5 The reactor core isolation cooling (RCIC) system actuation instrumentation channels shown in Table 3.3.5-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.5-2.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3 with reactor steam dome pressure greater than 150 psig.

#### ACTION:

- a. With an RCIC system actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Value column of Table 3.3.5-2, declare the channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.
- b. With one or more RCIC system actuation instrumentation channels inoperable, take the ACTION required by Table 3.3.5-1.

#### SURVEILLANCE REQUIREMENTS

4.3.5.1 Each RCIC system actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.5.1-1.

4.3.5.2 LOGIC SYSTEM FUNCTIONAL TESTS shall be performed at least once per 18 months. All RCIC actuation system logic shall be manually tested independent of the SELF TEST SYSTEM such that all trip functions are tested at least once every four fuel cycles.

~~Manual testing for the purpose of satisfying Specification 4.3.5.2 is not required until after shutdown during the first regularly scheduled refueling outage.~~

TABLE 3.3.5-1 (Continued)

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

TABLE NOTATIONS

- (a) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.
- (b) Two trip systems with two channels per trip system.
- (c) One trip system with two-out-of-two logic.
- (d) One trip system with one-out-of-two logic.
- (e) One trip system with one channel.

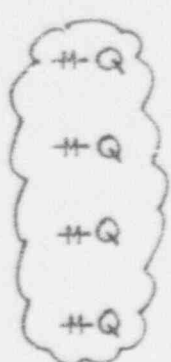
ACTION

- ACTION 50 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement:
- a. For 1 trip system, place the inoperable channel(s) and/or that trip system in the tripped condition within one hour or declare the RCIC system inoperable. 24
  - b. For both trip systems, declare the RCIC system inoperable.
- ACTION 51 - With the number of OPERABLE channels less than required by the Minimum OPERABLE channels per Trip System requirement, declare the RCIC system inoperable within 24 hours.
- ACTION 52 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement, place at least one inoperable channel in the tripped condition within 24 hours or declare the RCIC system inoperable.
- ACTION 53 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement, restore the inoperable channel to OPERABLE status within 6 hours or declare the RCIC system inoperable. 24



TABLE 4.3.5.1-1

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNITS</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>
a. Reactor Vessel Water Level - Low Low, Level 2	S		R(a)
b. Reactor Vessel Water Level - High, Level 8	S		R(a)
c. RCIC Storage Tank Level - Low	S		R(a)
d. Suppression Pool Water Level - High	S		R(a)
e. Manual Initiation	NA	R	NA

(a) Calibrate the analog trip module at least once per <sup>42</sup>31 days.

TABLE 3.3.6-1

## CONTROL ROD BLOCK INSTRUMENTATION

TRIP FUNCTION	MINIMUM OPERABLE CHANNELS PER TRIP FUNCTION <sup>(e)</sup>	APPLICABLE OPERATIONAL CONDITIONS	ACTION
1. <u>ROD PATTERN CONTROL SYSTEM</u>			
a. Low Power Setpoint	2	1, 2	60
b. RWL High Power Setpoint	2	1	60
2. <u>APRM</u>			
a. Flow Biased Neutron Flux - Upscale	3	1	61
b. Inoperative	3	1, 2, 5	61
c. Downscale	3	1	61
d. Neutron Flux - Upscale, Startup	3	2, 5	61
3. <u>SOURCE RANGE MONITORS</u>			
a. Detector not full in <sup>(a)</sup>	3	2	61
	2**	5	62
b. Upscale <sup>(b)</sup>	3	2	61
	2**	5	62
c. Inoperative <sup>(b)</sup>	3	2	61
	2**	5	62
d. Downscale <sup>(c)</sup>	3	2	61
	2**	5	62
4. <u>INTERMEDIATE RANGE MONITORS</u>			
a. Detector not full in	6	2, 5	61
b. Upscale	6	2, 5	61
c. Inoperative	6	2, 5	61
d. Downscale <sup>(d)</sup>	6	2, 5	61
5. <u>SCRAM DISCHARGE VOLUME</u>			
a. Water Level-High	2	1, 2, 5*	62 64
6. <u>REACTOR COOLANT SYSTEM RECIRCULATION FLOW</u>			
a. Upscale	3	1	62 64
7. <u>REACTOR MODE SWITCH</u>			
a. Shutdown Mode	2	3, 4	63
b. Refuel Mode	2	5	63

ACTION 64 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel in the tripped condition within 24 hours.

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TABLE 3.3.6-1 (Continued)

CONTROL ROD BLOCK INSTRUMENTATION

TABLE NOTATIONS

- \* With more than one control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
- \*\* OPERABLE channels must be associated with SRMs required OPERABLE per Specification 3.9.2.
- (a) This function shall be automatically bypassed if detector count rate is > 100 cps or the IRM channels are on range 3 or higher.
- (b) This function shall be automatically bypassed when the associated IRM channels are on range 8 or higher.
- (c) This function shall be automatically bypassed when the IRM channels are on range 3 or higher.
- (d) This function shall be automatically bypassed when the IRM channels are on range 1.
- (e) A channel may be placed in an inoperable status for up to <sup>6</sup>/<sub>2</sub> hours for required surveillance provided at least one other OPERABLE channel in the same trip function is monitoring that parameter.

ACTION

- ACTION 60 - Declare the RPCS inoperable and take the ACTION required by Specification 3.1.4.2.
- ACTION 61 - With the number of OPERABLE Channels:
- a. One less than required by the Minimum OPERABLE Channels per Trip Function requirement, restore the inoperable channel to OPERABLE status within 7 days or place the inoperable channel in the tripped condition within the next hour.
  - b. Two or more less than required by the Minimum OPERABLE Channels per Trip Function requirement, place at least one inoperable channel in the tripped condition within 1 hour.
- ACTION 62 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel in the tripped condition within 1 hour.
- ACTION 63 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, initiate a rod block.

TABLE 4.3.6-1

## CONTROL ROD BLOCK INSTRUMENTATION SURVEILLANCE REQUIREMENTS

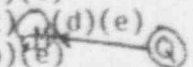
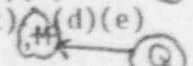
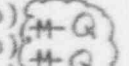
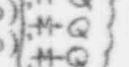
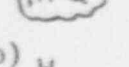
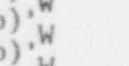
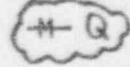
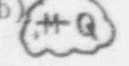
TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION (a)	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. ROD PATTERN CONTROL SYSTEM				
a. Low Power Setpoint	NA	S/U (b)(e) D (c) (d)(e) 	R (f)	1, 2
b. RWL High Power Setpoint	NA	S/U (b)(e) D (c) (d)(e) 	R (f)	1
2. APRM				
a. Flow Biased Neutron Flux - Upscale	NA	S/U (b) 	SA	1
b. Inoperative	NA	S/U (b) 	NA	1, 2, 5
c. Downscale	NA	S/U (b) 	SA	1
d. Neutron Flux - Upscale, Startup	NA	S/U (b) 	SA	2, 5
3. SOURCE RANGE MONITORS				
a. Detector not full in	NA	S/U (b), W	NA	2, 5
b. Upscale	NA	S/U (b), W	SA	2, 5
c. Inoperative	NA	S/U (b), W	NA	2, 5
d. Downscale	NA	S/U (b), W	SA	2, 5
4. INTERMEDIATE RANGE MONITORS				
a. Detector not full in	NA	S/U (b), W	NA	2, 5
b. Upscale	NA	S/U (b), W	SA	2, 5
c. Inoperative	NA	S/U (b), W	NA	2, 5
d. Downscale	NA	S/U (b), W	SA	2, 5
5. SCRAM DISCHARGE VOLUME				
a. Water Level-High	S		R (f)	1, 2, 5*
6. REACTOR COOLANT SYSTEM RECIRCULATION FLOW				
a. Upscale	NA	S/U (b) 	SA	1
7. REACTOR MODE SWITCH				
a. Shutdown Mode	NA	R	NA	3, 4
b. Refuel Mode	NA	R	NA	5

TABLE 4.3.6-1 (Continued)

CONTROL ROD BLOCK INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TABLE NOTATIONS

- (a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (b) Within 24 hours prior to startup, if not performed within the previous 7 days.
- (c) Within one hour prior to control rod movement, unless performed within the previous 24 hours, and as each power range above the RPCS low power setpoint is entered for the first time during any 24 hour period during power increase or decrease.
- (d) At least once per 31 days while operation continues within a given power range above the RPCS low power setpoint.
- (e) Includes reactor manual control multiplexing system input.
- (f) Calibrate the analog trip module at least once per <sup>92</sup>~~31~~ days.
- \* With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

TABLE 3.3.7.1-1 (Continued)

RADIATION MONITORING INSTRUMENTATION


TABLE NOTATIONS

- \* When irradiated fuel is being handled in the secondary containment.
- \*\* Alarm only.
- # With fuel in the new fuel storage vault.
- ## With irradiated fuel in the spent fuel storage pool.
- (a) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.

ACTION

- \* ACTION 70 -
  - a. With one of the required monitors inoperable, place the inoperable channel in the tripped condition within 1 hour <sup>24 hours</sup> restore the inoperable channel to OPERABLE status within 7 days, or, within the next 6 hours, initiate and maintain operation of the control room emergency filtration system in the high radiation mode of operation.
  - b. With both of the required monitors inoperable, initiate and maintain operation of the control room emergency filtration system in the high radiation mode of operation within 1 hour.
- ACTION 71 - With the required monitor inoperable, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

TABLE 4.3.7.1-1  
RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENTATION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST 	CHANNEL CALIBRATION	APPLICABILITY
1. Main Control Room Air Intake Radiation Monitor	S		R	1, 2, 3, 5, and *
2. Area Monitors				
a. New Fuel Storage Vault	S	M	R	#
b. Spent Fuel Storage Pool	S	M	R	##
c. Control Room Direct Radiation Monitor	S	M	R	At all times



## INSTRUMENTATION

### 3/4.3.9 PLANT SYSTEMS ACTUATION INSTRUMENTATION

#### LIMITING CONDITION FOR OPERATION

3.3.9 The plant systems actuation instrumentation channels shown in Table 3.3.9-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.9-2.

APPLICABILITY: As shown in Table 3.3.9-1.

#### ACTION:

- a. With a plant system actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Value column of Table 3.3.9-2, declare the channel inoperable and either place the inoperable channel in the tripped condition until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value, or declare the associated system/loop inoperable.
- b. For the containment spray system:
  1. With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per containment spray loop requirement for one containment spray loop, place at least one inoperable channel in the tripped condition within 24 hours or declare the associated loop inoperable.
  2. With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per containment spray loop requirement for both loops, declare the associated loop inoperable.
- c. For the feedwater system/main turbine trip system:
  1. With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels requirement, restore the inoperable channel to OPERABLE status within 7 days or be in at least STARTUP within the next 6 hours.
  2. With the number of OPERABLE channels two less than required by the Minimum OPERABLE Channels requirement, restore at least one of the inoperable channels to OPERABLE status within 72 hours or be in at least STARTUP within the next 6 hours.
- d. For the suppression pool makeup system (SPMS) with the number of channels one less than the minimum OPERABLE Channels Requirement of Table 3.3.9-1 take the ACTION required by Table 3.3.9-1.



## INSTRUMENTATION

### PLANT SYSTEMS ACTUATION INSTRUMENTATION

#### SURVEILLANCE REQUIREMENTS

4.3.9.1 Each plant system actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations for the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.9.1-1.

4.3.9.2 LOGIC SYSTEM FUNCTIONAL TESTS shall be performed at least once per 18 months. Each trip system or division of the plant system actuation logic associated with the Nuclear System Protection System shall be manually tested independent of the SELF TEST SYSTEM during separate refueling outages such that all divisions and all trip functions are tested at least once every four fuel cycles.

~~Manual testing for the purpose of satisfying Specification 4.3.9.2 is not required until after shutdown during the first regularly scheduled refueling outage.~~

TABLE 3.3.9-1  
PLANT SYSTEMS ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION</u>	<u>MINIMUM OPERABLE CHANNELS PER CONTAINMENT SPRAY LOOP</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	
1. <u>CONTAINMENT SPRAY SYSTEM</u>			
a. Drywell Pressure-High	2*	1, 2, 3	
b. Containment Pressure-High	2*	1, 2, 3	
c. Reactor Vessel Water Level-Low Low Low, Level 1	2*	1, 2, 3	
d. Timers			
(1) Loop A, Loop B (10 minutes)	1	1, 2, 3	
(2) Loop B only (90 seconds)	1	1, 2, 3	
e. Manual Initiation	1	1, 2, 3	
	<u>MINIMUM OPERABLE CHANNELS</u>		
2. <u>FEEDWATER SYSTEM/MAIN TURBINE TRIP SYSTEM</u>			
a. Reactor Vessel Water Level-High, Level 8	3*	1	
	<u>MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM</u>	<u>ACTION</u>	
3. <u>SUPPRESSION POOL MAKEUP SYSTEM</u>			
a. Drywell Pressure-High	2*	1, 2, 3	50
b. Reactor Vessel Water Level-Low Low Low, Level 1	2*	1, 2, 3	50
c. Suppression Pool Water Level-Low Low	2*	1, 2, 3	51
d. Suppression Pool Makeup Timer	1	1, 2, 3	51
e. SPMS Manual Initiation	2	1, 2, 3	51
f. SPMS Mode Switch Permissive	1	1, 2, 3	51

\*A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.

TABLE 3.3.9-1 (Continued)

PLANT SYSTEMS ACTUATION INSTRUMENTATION

ACTION

ACTION 50 -

With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement:

- a. For 1 trip system, place the inoperable channel(s) and/or that trip system in the tripped condition within ~~one hour~~ 24 hours or declare the SPMS inoperable and take the action of Specification 3.6.3.4.
- b. For both trip systems, declare the SPMS inoperable and take the action of Specification 3.6.3.4.

ACTION 51 -

With the number of OPERABLE channels less than required by the Minimum OPERABLE channels per Trip System requirement, declare the SPMS system inoperable and take the action of Specification 3.6.3.4.

Restore the inoperable channel(s) to OPERABLE status within 24 hours or

TABLE 4.3.9.1-1

## PLANT SYSTEMS ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	OPERATIONAL CHANNEL CALIBRATION	CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. <u>CONTAINMENT SPRAY SYSTEM</u>				
a. Drywell Pressure-High	S	⊕ Q	R <sup>(a)</sup>	1, 2, 3
b. Containment Pressure-High	S	⊕ Q	R <sup>(a)</sup>	1, 2, 3
c. Reactor Vessel Water Level-Low Low Low, Level 1	S	⊕ Q	R <sup>(a)</sup>	1, 2, 3
d. Timers	NA	⊕ Q	R	1, 2, 3
e. Manual Initiation	NA	R	NA	1, 2, 3
2. <u>FEEDWATER SYSTEM/MAIN TURBINE TRIP SYSTEM</u>				
a. Reactor Vessel Water Level-High, Level 8	S	⊕ Q	R	1
3. <u>SUPPRESSION POOL MAKEUP</u>				
a. Drywell Pressure-High	S	⊕ Q	R <sup>(a)</sup>	1, 2, 3
b. Reactor Vessel Water Level - Low Low Low, Level 1	S	⊕ Q	R <sup>(a)</sup>	1, 2, 3
c. Suppression Pool Water Level-Low Low S	S	⊕ Q	R <sup>(b)</sup>	1, 2, 3
d. Suppression Pool Makeup Timer	NA	⊕ Q	Q	1, 2, 3
e. SPMS Manual Initiation	NA	R	NA	1, 2, 3
f. SPMS Mode Switch Permissive	NA	R	NA	1, 2, 3

(a) Calibrate the analog trip module at least once every <sup>92</sup>~~31~~ days.

(b) Calibrate the analog <sup>a</sup>comparator unit at least once every <sup>92</sup>~~31~~ days.

# REACTOR COOLANT SYSTEM

## 3/4.4.2 SAFETY VALVES

### SAFETY/RELIEF VALVES

#### LIMITING CONDITION FOR OPERATION

3.4.2.1 The safety valve function of at least six of the following valves and the relief valve function of at least five additional valves, other than those satisfying the safety valve function requirement, shall be OPERABLE with the specified lift settings; and the acoustic monitor for each OPERABLE valve shall be OPERABLE.\*

<u>Number of Valves</u>	<u>Function</u>	<u>Setpoint** (psig)</u>
7	Safety	1165 ± 11.6 psi
5	Safety	1180 ± 11.8 psi
4	Safety	1190 ± 11.9 psi
1	Relief	1103 ± 15.0 psi
6	Relief	1113 ± 15.0 psi
7	Relief	1123 ± 15.0 psi

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

#### ACTION:

- With the safety and/or relief valve function of one or more of the above required safety/relief valves inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.
- With one or more safety/relief valves stuck open, provided that suppression pool average water temperature is less than 110°F, close the stuck open safety/relief valve(s); if suppression pool average water temperature is 110°F or greater, place the reactor mode switch in the Shutdown position.
- With one or more safety/relief valve acoustic monitor(s) inoperable, restore the inoperable monitor(s) to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- With either relief valve function pressure actuation trip system "A" or "B" inoperable, restore the inoperable trip system to OPERABLE status within 7 days; otherwise, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the following 24 hours.

\* One relief valve pressure actuation channel and/or one acoustic monitor channel may be placed in an inoperable status for up to 24 hours for the purpose of performing surveillance testing in accordance with Specifications 4.4.2.1.1 and 4.4.2.1.2.

\*\* The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures.



REACTOR COOLANT SYSTEM

SAFETY/RELIEF VALVES

SURVEILLANCE REQUIREMENTS

4.4.2.1.1 The acoustic monitor for each safety/relief valve shall be demonstrated OPERABLE by performance of a:

- a. CHANNEL FUNCTIONAL TEST at least once per 31 days, and a
- b. CHANNEL CALIBRATION at least once per 18 months.\*

4.4.2.1.2 The relief valve function pressure actuation instrumentation shall be demonstrated OPERABLE by performance of a:

- a. CHANNEL FUNCTIONAL TEST, including calibration of the trip unit, at least once per 31 days.
- b. CHANNEL CALIBRATION and LOGIC SYSTEM FUNCTIONAL TEST at least once per 18 months. Each of the two trip systems or divisions of the relief valve function actuation logic associated with the Nuclear System Protection System shall be manually tested independent of the SELF TEST SYSTEM during separate refueling outages such that both divisions and all channel trips are tested at least once every four fuel cycles.

\*The provisions of Specification 4.0.4 are not applicable provided the surveillance is performed within 12 hours after reactor steam pressure is adequate to perform the test.

~~Manual testing for the purpose of satisfying Specification 4.4.2.1.2.b is not required until after shutdown during the first regularly scheduled refueling outage.~~



# REACTOR COOLANT SYSTEM

## SAFETY/RELIEF VALVES LOW-LOW SET FUNCTION

### LIMITING CONDITION FOR OPERATION

3.4.2.2 The low-low set function of the following reactor coolant system safety/relief valves shall be OPERABLE with the following settings\*:

Valve No.	Low-Low Set Function Setpoint* (psig) $\pm$ 15 psi	
	Open	Close
F051D	1033	926
F051C	1073	936
F047F	1113	946
F051B	1113	946
F051G	1113	946

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

#### ACTION:

- With the low-low set function of one of the above required reactor coolant system safety/relief valves inoperable, restore the inoperable low-low set function to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- With the low-low set function of more than one of the above required reactor coolant system safety/relief valves inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.
- With either low-low set function pressure actuation trip system "A" or "B" inoperable, restore the inoperable trip system to OPERABLE status within 7 days; otherwise, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the following 24 hours.

### SURVEILLANCE REQUIREMENTS

4.4.2.2 The low-low set function pressure actuation instrumentation shall be demonstrated OPERABLE by performance of a:

- CHANNEL FUNCTIONAL TEST, including calibration of the trip unit, at least once per <sup>31</sup><sub>92</sub> days.
- CHANNEL CALIBRATION and LOGIC SYSTEM FUNCTIONAL TEST at least once per 18 months. Each of the two trip systems or divisions of the low-low set function actuation logic associated with the Nuclear System Protection System shall be manually tested independent of the SELF TEST SYSTEM during separate refueling outages such that both divisions and all channel trips are tested at least once every four fuel cycles <sup>6</sup><sub>4</sub>.

\*One channel may be placed in an inoperable status for up to <sup>6</sup><sub>2</sub> hours for the purpose of performing surveillance testing in accordance with Specification 4.4.2.2.

\*\*The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures.

~~#Manual testing for the purpose of satisfying Specification 4.4.2.2.b. is not required until after shutdown during the first regularly scheduled refueling outage~~