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. Set points and interlocks are given in Table 2.2.1-1.

APPLICABILITY: As shown in Table 3.3.1-1.

ACTION: INSERT 1A

a. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel(s) and/or trip system in the tripped condition* within one hour.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, place at least one trip system** in the tripped condition within one hour and take the ACTION required by Table 3.3.1-1.

c. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.1.1 Each reactor protection system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.1-1.

4.3.1.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

4.3.1.3 The REACTOR PROTECTION SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one logic train such that both logic trains are tested at least once per 36 months and one channel per 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 reactor trip function.

INSERT 2A

* 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 3.3.1-1 for that Trip Function shall be taken.

** If more channels are inoperable in one trip system than in the other, place the trip system with more inoperable channels in the tripped condition, except when this would cause the Trip Function to occur.

' Neutron detectors are exempt from response time testing.

Insert 1A, page 3/4 3-1

a. With one channel less than the Minimum Number of OPERABLE Channels per Trip System required by Table 3.3.1-1 in one or more Functional Units, place the inoperable channel and/or that trip system in the tripped condition* within 12 hours.

b. With two or more channels less than the Minimum Number of OPERABLE Channels per Trip System required by Table 3.3.1-1 in one or more Functional Units:

1. Within one hour, verify sufficient channels remain OPERABLE or in the tripped condition* to maintain trip capability in the Functional Unit, and

2. Within 6 hours, place the inoperable channel(s) in one trip system and/or that trip system** in the tripped condition*, and

3. Within 12 hours, restore the inoperable channels in the other trip system to an OPERABLE status or place them in the tripped condition*.

Otherwise, take the ACTION required by Table 3.3.1-1 for the Functional Unit.

Insert 2A, page 3/4 3-1

* An inoperable channel or trip system need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, if the inoperable channel is not restored to OPERABLE status within the required time, the ACTION required by Table 3.3.1-1 for the Functional Unit shall be taken.

** This ACTION applies to that trip system with the most inoperable channels; if both trip systems have the same number of inoperable channels, the ACTION can be applied to either trip system.

TABLE 3.3.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	APPLICABLE OPERATIONAL CONDITIONS	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM (a)	ACTION	
1. Intermediate Range Monitors:				
a. Neutron Flux - High	2, 5(b)	3	1	
	3, 4	2	2	
b. Inoperative	2, 5	3	1	
	3, 4	2	2	
2. Average Power Range Monitor				
a. Neutron Flux - High, 15%	2, 5(b)	2	3	
b. Flow Biased ~~Neutron Flux~~ Simulated Thermal Power - High	1	2	4	
c. Fixed Neutron Flux - High, 120%	1	2	4	
d. Inoperative	1, 2, 5	2	5	
e. Downscale	1	2	4	
f. LPRM	1, 2, 5	(c)	NA	
3. Reactor Vessel Steam Dome Pressure - High	1, 2(d)	2	6	
4. Reactor Vessel Water Level - Low, Level 1	1, 2	2	6	
5. Main Steam Isolation Valve - Closure	1	4	4	
6. Main Steam Line Radiation - High	1, 2(d)	2	7	

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	APPLICABLE OPERATIONAL CONDITIONS	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM (a)	ACTION
7. Drywell Pressure - High	1, 2[e]	2	6
8. Scram Discharge Volume Water Level - High	1, 2, 5[f]	2	5
9. Turbine Stop Valve - Closure	1[g]	4	8
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low	1[g]	2	8
11. Reactor Mode Switch in Shutdown Position	1, 2, 3, 4, 5	1	9
12. Manual Scram	1, 2, 3, 4, 5	1	10
13. Automatic Scram Contactors	1, 2, 3, 4, 5	2	10

X

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

ACTION 10 - In OPERATIONAL CONDITION 1 or 2, be in at least HOT SHUTDOWN within 6 hours.

In OPERATIONAL CONDITION 3 or 4, lock the reactor mode switch in the Shutdown position within one hour.

In OPERATIONAL CONDITION 5, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and fully insert all insertable control rods within one hour.

INSERT 3A

NOTES

(a) A channel may be placed in an inoperable status for up to 2 hours for required surveillance without placing the trip system in the tripped condition provided at least one OPERABLE channel in the same trip system is monitoring that parameter.

(b) The "shorting links" shall be removed from the RPS circuitry prior to and during the time any control rod is withdrawn* and shutdown margin demonstrations.

(c) An APRM channel is inoperable if there are less than 2 LPRM inputs per level or less than eleven LPRM inputs to an APRM channel.

(d) These functions are not required to be OPERABLE when the reactor pressure vessel head is unbolted or removed.

(e) This function is not required to be OPERABLE when PRIMARY CONTAINMENT INTEGRITY is not required.

(f) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

(g) These functions are bypassed when THERMAL POWER is less than 30% of RATED THERMAL POWER.

*Not required for control rods removed per Specification 3.9.10.1 or 3.9.10.2.

Insert 3A, page 3/4 3-5

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed for up to 6 hours provided the Functional Unit maintains RPS trip capability.

TABLE 4.3.1-1

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	D	S/U(b)(c), W(d)	R	2	
	D	W	R	3, 4, 5	
b. Inoperative	NA	W(d)	NA	2, 3, 4, 5	
2. Average Power Range Monitor:					
a. Neutron Flux - High 15%	S	S/U(b)(m), W(d)	Q	2	
	S	W(n)	Q	5	
b. Flow-Biased ~~Neutron Flux~~ Simulated Thermal Power - High	S	S/U(b), ~~W~~ Q	W(e)(f), Q	1	X
c. Fixed Neutron Flux - High, 120%	S	S/U(b), ~~W~~ Q	W(e), Q	1	X
d. Inoperative	NA	~~W~~ Q (m)(n)	NA	1, 2, 5	X
e. Downscale	NA	~~W~~ Q	NA	1	X
f. LPRM	D	NA	(g)	1, 2, 5	
3. Reactor Vessel Steam Dome Pressure - High	NA(k)	NA	R(l)	1, 2	X
Transmitter:					
Trip Logic:	D	~~W~~ Q	~~W~~ Q	1, 2	
4. Reactor Vessel Water Level - Low, Level 1	NA(k)	NA	R(l)	1, 2	X
Transmitter:					
Trip Logic:	D	~~W~~ Q	~~W~~ Q	1, 2	

TABLE 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION[a]	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
5. Main Steam Line Isolation Valve - Closure	NA	~~M~~ Q	R[h]	1	X
6. Main Steam Line Radiation - High	S	~~M~~[i] Q	R[j]	1, 2	X
7. Drywell Pressure - High	NA[k]	NA	R[l]	1, 2	
Transmitter:	D	~~M~~ Q	~~M~~ Q	1, 2	X
Trip Logic:					
8. Scram Discharge Volume Water Level - High	NA	Q	R	1, 2, 5	
9. Turbine Stop Valve - Closure	NA	~~M~~ Q	R[h]	1[o]	X
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low	NA	~~M~~ Q	R	1[o]	X
11. Reactor Mode Switch in Shutdown Position	NA	R	NA	1, 2, 3, 4, 5	
12. Manual Scram	NA	Q	NA	1, 2, 3, 4, 5	
13, Automatic Scram Contactors	NA	W	NA	1, 2, 3, 4, 5	X

TABLE 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

NOTES

(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) The IRM channels shall be compared to the APRM channels and the SRM instruments for overlap during each startup, if not performed within the previous 7 days.

(d) When changing from OPERATIONAL CONDITION 1 to OPERATIONAL CONDITION 2, perform the required surveillance within 12 hours after entering OPERATIONAL CONDITION 2, if not performed within the previous 7 days.

(e) This calibration shall consist of the adjustment of the APRM readout to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER is greater than or equal to 25% of RATED THERMAL POWER.

(f) This calibration shall consist of the adjustment of the APRM flow-biased ~~setpoint~~ channel to conform to a calibrated flow signal.

(g) The LPRMs shall be calibrated at least once per effective full power month (EFPM) using the TIP system.

(h) This calibration shall consist of a physical inspection and actuation of these position switches.

(i) Instrument alignment using a standard current source.

(j) Calibration using a standard radiation source.

(k) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(l) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration.

(m) Placement of Reactor Mode Switch into the Startup/Hot Standby position is permitted for the purpose of performing the required surveillance prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

(n) Placement of Reactor Mode Switch into the Shutdown or Refuel position is permitted for the purpose of performing the required surveillance provided all control rods are fully inserted and the vessel head bolts are tensioned.

(o) Surveillance is not required when THERMAL POWER is less than 30% of RATED THERMAL POWER.

3/4 3 2 ISOLATION ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The isolation actuation instrumentation 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.

APPLICABILITY: As shown in Table 3.3.2-1.

ACTION:

a. With an isolation actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.2-2, declare the channel inoperable ~~and 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.

INSERT 1B

~~b. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel(s) and/or that trip system in the tripped condition* within one hour.~~

~~c. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, place at least one trip system** in the tripped condition within one hour and take the ACTION required by Table 3.3.2-1.~~

d. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each isolation actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.2-1.

4.3.2.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

~~* 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.~~

~~** If more channels are inoperable in one trip system than in the other, place the trip system with more inoperable channels in the tripped condition, except when this would cause the Trip Function to occur.~~

Insert 1B, page 3/4 3-10

b. For any isolation actuation Trip Function with less than the Minimum Number of OPERABLE Channels per Trip System required by Table 3.3.2-1:

1. Within one hour, verify sufficient channels remain OPERABLE or are placed in the tripped condition* to maintain automatic isolation actuation capability for the Trip Function, and

2. Place the inoperable channel(s) in the tripped condition* within:

   a) 12 hours for trip functions common to RPS Instrumentation, and

   b) 24 hours for trip functions not common to RPS Instrumentation

Otherwise, take the ACTION required by Table 3.3.2-1.

---

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

SURVEILLANCE REQUIREMENTS (Continued)

4.3.2.3 The ISOLATION SYSTEM RESPONSE TIME of each isolation function* shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one logic train such that both logic chains are tested at least once per 36 months and one channel per 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 isolation function.

trains

* Radiation monitors are exempt from response time testing.

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

NOTES

(a) When handling irradiated fuel in the secondary containment

(a) See Specification 3.6.3.1, Table 3.6.3-1 for valves in each valve group.

INSERT 2B

(b) ~~A channel may be placed in an inoperable status for up to 4 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.~~

X

(c) Deleted ~~With only one channel per trip system, 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.~~

X

(d) A channel is OPERABLE if 2 of 4 instruments in that channel are OPERABLE.

(e) With reactor steam pressure $\geq$ 500 psig.

(f) Closes only RWCU outlet isolation valve.

(g) Alarm only.

(h) Isolates containment purge and vent valves.

(i) Does not isolate E11-F015A,B.

(j) Does not isolate B32-F019 or B32-F020.

(k) Valve isolation depends upon low steam supply pressure coincident with high drywell pressure.

(l) Secondary containment isolation dampers as listed in Table 3.6.5.2-1.

Insert 2B, page 3/4 3-17a

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed as follows:

(a) for up to 2 hours for Trip Functions with a design that provides only one channel per trip system.

(b) for up to 6 hours for all Trip Functions, provided the Trip Function maintains isolation actuation capability.

TABLE 4.3.2-1

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
1. PRIMARY CONTAINMENT ISOLATION					
a. Reactor Vessel Water Level -					
1. Low, Level 1					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	X
Trip Logic:	D	Q	Q	1, 2, 3	
2. Low, Level 3					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	X
Trip Logic:	D	Q	Q	1, 2, 3	
b. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	X
Trip Logic:	D	Q	Q	1, 2, 3	
c. Main Steam Line					
1. Radiation - High	D	Q	R[d]	1, 2, 3	X
2. Pressure - Low					
Transmitter:	NA[a]	NA	R[b]	1	X
Trip Logic:	D	Q	Q	1	
3. Flow - High					
Transmitter:	NA[a]	NA	R[b]	1	X
Trip Logic:	D	Q	Q	1	
d. Main Steam Line Tunnel Temperature - High	NA	Q	R	1, 2, 3	X
e. Condenser Vacuum - Low					
Transmitter:	NA[a]	NA	R[b]	1, 2[c]	X
Trip Logic:	D	Q	Q	1, 2[e]	
f. Turbine Building Area Temperature - High	NA	Q	R	1, 2, 3	X
g. Main Stack Radiation - High	NA	Q	R	1, 2, 3	
h. Reactor Building Exhaust Radiation - High	D	Q	R	1, 2, 3	X

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
2. SECONDARY CONTAINMENT ISOLATION					
a. Reactor Building Exhaust Radiation - High	D	~~M~~ Q	R	1.2.3.5. and[f]	X
b. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~ Q	~~M~~ Q	1, 2, 3	X
c. Reactor Vessel Water Level - Low, Level 2					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~ Q	~~M~~ Q	1, 2, 3	X
3. REACTOR WATER CLEANUP SYSTEM ISOLATION					
a. Δ Flow - High	NA	SA	R	1, 2, 3	
b. Area Temperature - High	NA	SA	R	1, 2, 3	
c. Area Ventilation Δ Temperature - High	NA	SA	R	1, 2, 3	
d. SLCS Initiation	NA	R	NA	1, 2	
e. Reactor Vessel Water Level - Low, Level 2					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~ Q	~~M~~ Q	1, 2, 3	X
f. Δ Flow - High - Time Delay	NA	SA	R	1, 2, 3	
g. Piping Outside RWCU Rooms Area Temperature - High	NA	SA	R	1, 2, 3	

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
4. CORE STANDBY COOLING SYSTEMS ISOLATION					
a. High Pressure Coolant Injection System Isolation					
1. HPCI Steam Line Flow - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~ → Q	~~M~~ → Q	1, 2, 3	X
2. HPCI Steam Line High Flow Time Delay Relay	NA	R	R	1, 2, 3	
3. HPCI Steam Supply Pressure - Low	NA	~~M~~ → Q	R	1, 2, 3	X
4. HPCI Steam Line Tunnel Temperature - High	NA	SA	R	1, 2, 3	
5. Bus Power Monitor	NA	R	NA	1, 2, 3	
6. HPCI Turbine Exhaust Diaphragm Pressure - High	NA	~~M~~ → Q	Q	1, 2, 3	X
7. HPCI Steam Line Ambient Temperature - High	NA	SA	R	1, 2, 3	
8. HPCI Steam Line Area Δ Temperature - High	NA	SA	R	1, 2, 3	
9. HPCI Equipment Area Temperature - High	NA	SA	R	1, 2, 3	
10. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~ → Q	~~M~~ → Q	1, 2, 3	X

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED		
4. CORE STANDBY COOLING SYSTEMS ISOLATION (Continued)						
b. Reactor Core Isolation Cooling System Isolation						
1. RCIC Steam Line Flow - High Transmitter: Trip Logic:	NA[a] D	NA ~~M~~ Q	R[b] ~~M~~ Q	1, 2, 3 1, 2, 3		X
2. RCIC Steam Line Flow - High Time Delay Relay	NA	R	R	1, 2, 3		
3. RCIC Steam Supply Pressure - Low	NA	~~M~~ Q	Q	1, 2, 3		X
4. RCIC Steam Line Tunnel Temperature High	NA	SA	R	1, 2, 3	|	
5. Bus Power Monitor	NA	R	NA	1, 2, 3		
6. RCIC Turbine Exhaust Diaphragm Pressure - High	NA	~~M~~ Q	R	1, 2, 3		X
7. RCIC Steam Line Ambient Temperature - High	NA	SA	R	1, 2, 3	|	
8. RCIC Steam Line Area Δ Temperature - High	NA	SA	R	1, 2, 3	|	
9. RCIC Equipment Room Ambient Temperature - High	NA	SA	R	1, 2, 3	|	
10. RCIC Equipment Room Δ Temperature - High	NA	SA	R	1, 2, 3	|	
11. RCIC Steam Line Tunnel Temperature - High Time Delay Relay	NA	SA	R	1, 2, 3	|	
12. Drywell Pressure - High Transmitter: Trip Logic:	NA[a] D	NA ~~M~~ Q	R[b] ~~M~~ Q	1, 2, 3 1, 2, 3		X

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
5. SHUTDOWN COOLING SYSTEM ISOLATION					
a. Reactor Vessel Water Level - Low, Level 1	NA[a]	NA	R[b]	1, 2, 3	
Transmitter:	D	Q	Q	1, 2, 3	X
Trip Logic:		S/U[c]	R	1, 2, 3	X
b. Reactor Steam Dome Pressure - High	NA				

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

NOTES

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration. X

(c) ~~If not performed within the previous 31 days.~~ Deleted X

(d) Testing shall verify that the mechanical vacuum pump trips and the mechanical vacuum pump line valve closes.

(e) When reactor steam pressure $\geq$ 500 psig.

(f) When handling irradiated fuel in the secondary containment.

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.

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 Values column of Table 3.3.3-2, declare the channel inoperable ~~and 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.

b. With one or more ECCS actuation instrumentation channels inoperable, take the ACTION required by Table 3.3.3-1.

c. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.3.1 Each ECCS actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.3-1.

4.3.3.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

4.3.3.3 The ECCS RESPONSE TIME of each ECCS function shall be demonstrated to be within the limit at least once per 18 months. Each test shall include at least one logic train such that both logic trains are tested at least once per 36 months and one channel per 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 ECCS function.

TABLE 3.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION	MINIMUM ~~NUMBER~~ OPERABLE CHANNELS PER TRIP ~~SYSTEM~~ FUNCTION	APPLICABLE OPERATIONAL CONDITIONS	ACTION	
1. CORE SPRAY SYSTEM				
a. Reactor Vessel Water Level - Low, Level 3	2 4	1, 2, 3, 4, 5	30	Y
b. Reactor Steam Dome Pressure - Low (Injection Permissive)	2 4	1, 2, 3, 4, 5	~~31~~ 30	Y
c. Drywell Pressure - High	2 4	1, 2, 3	30	Y
d. Time Delay Relay	1/pump	1, 2, 3, 4, 5	31	Y
e. Bus Power Monitor[a]	1/bus	1, 2, 3, 4, 5	32	
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM				
a. Drywell Pressure - High	2 4	1, 2, 3	30	X
b. Reactor Vessel Water Level - Low, Level 3	2 4	1, 2, 3, 4[b], 5[b]	30	Y
c. Reactor Vessel Shroud Level (Drywell Spray Permissive)	1/valve	1, 2, 3, 4[b], 5[b]	31	X
d. Reactor Steam Dome Pressure - Low (Injection Permissive)				
1. RHR Pump Start and LPCI Injection Valve Actuation	2 4	1, 2, 3, 4[b], 5[b]	~~31~~ 30	X
2. Recirculation Loop Pump Discharge Valve Actuation	2 4	1, 2, 3, 4[b], 5[b]	~~31~~ 30	X
e. RHR Pump Start - Time Delay Relay	1/pump	1, 2, 3, 4[b], 5[b]	31	X
f. Bus Power Monitor[a]	1/bus	1, 2, 3, 4[b], 5[b]	32	

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION	MINIMUM ~~NUMBER~~ OPERABLE CHANNELS PER TRIP ~~SYSTEM~~ FUNCTION[a]	APPLICABLE OPERATIONAL CONDITIONS	ACTION
3. HIGH PRESSURE COOLANT INJECTION SYSTEM			
a. Reactor Vessel Water Level - Low, Level 2	~~2~~ 4	1, 2, 3	30
b. Drywell Pressure - High	~~2~~ 4	1, 2, 3	30
c. Condensate Storage Tank Level - Low	2[c]	1, 2, 3	33
d. Suppression Chamber Water Level - High	2[c]	1, 2, 3	33
e. Bus Power Monitor[d]	1/bus	1, 2, 3	32
4. AUTOMATIC DEPRESSURIZATION SYSTEM			
a. ADS Inhibit Switch	~~2~~ 2	1, 2, 3	36
b. Reactor Vessel Water Level - Low, Level 3	~~2~~ 4	1, 2, 3	~~35~~ 36
c. Reactor Vessel Water Level - Low, Level 1	~~2~~ 2	1, 2, 3	~~35~~ 36
d. ADS Timer	~~2~~ 2	1, 2, 3	~~35~~ 36
e. Core Spray Pump Discharge Pressure - High (Permissive)	~~2~~ 4	1, 2, 3	~~35~~ 36
f. RHR (LPCI MODE) Pump Discharge Pressure - High (Permissive)	2/pump	1, 2, 3	~~35~~ 36
g. Bus Power Monitor[d]	1/bus	1, 2, 3	32

X 1)

Insert 3C, page 3/4 3-38

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed for up to 6 hours provided the Trip Function or the redundant Trip Function maintains ECCS actuation capability.

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

ACTIONS

Function

ACTION 30 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip ~~System~~ requirement:

INSERT 1C

a. For one trip system, place at least one inoperable ~~channel~~ in the ~~tripped~~ condition within one ~~hour~~ or declare the associated ECCS inoperable.

b. For ~~both~~ trip systems, declare the associated ECCS inoperable.

ACTION 31 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip ~~System~~ requirement, declare the associated ECCS inoperable.

Function

ACTION 32 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip ~~System~~ requirement, verify bus power availability at least once per 12 hours or declare the associated ECCS inoperable.

Function

ACTION 33 - 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 one hour or declare the ~~HPCS~~ system inoperable.

HPCI

ACTION 34 - 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 Specification 3.8.1.1 or 3.8.1.2, as appropriate.

ACTION 35 - 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 36 - 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 8 hours or declare the associated ECCS inoperable.~~

INSERT 2C

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

NOTES

INSERT 3C

(a) A channel may be placed in an inoperable status for up to two hours for required surveillance without placing the trip system in the tripped condition, provided at least one OPERABLE channel in the same trip system is monitoring the affected parameter.

(b) Not applicable when two core spray system subsystems are OPERABLE per Specification 3.5.3.1.

(c) Provides signal to HPCI pump suction valves only.

(d) Alarm only.

(e) Required when ESF equipment is required to be OPERABLE.

(f) On a one-time basis, prior to start-up from the outage that began on April 21, 1992, the Minimum Number OPERABLE Channels per Trip System for one reactor steam dome pressure - low (injection permissive) trip function may be reduced, for no longer than 7 days, from two (2) channels to one (1) channel without declaring the associated ECCS inoperable in accordance with ACTION 31. This will be done on one occasion for Unit 1 and two occasions for Unit 2. During these periods, the following actions shall be implemented:

(1) The inoperable channel shall be placed in the condition that will satisfy the logic for allowing injection by the associated ECCS with the reactor steam dome pressure below 410 psig ± 15 psig.

(2) Both channels in the other trip system shall be maintained OPERABLE.

(3) The reactor vessel head vent shall be maintained in the open position.

TABLE 4.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
1. CORE SPRAY SYSTEM					
a. Reactor Vessel Water Level - Low, Level 3					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3, 4, 5	X
Trip Logic:	D	Q	Q	1, 2, 3, 4, 5	
b. Reactor Steam Dome Pressure - Low					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3, 4, 5	X
Trip Logic:	D	Q	Q	1, 2, 3, 4, 5	
c. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	X
Trip Logic:	D	Q	Q	1, 2, 3	
d. Time Delay Relay	NA	R	R	1, 2, 3, 4, 5	
e. Bus Power Monitor	NA	R	NA	1, 2, 3, 4, 5	
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM					
a. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	X
Trip Logic:	D	Q	Q	1, 2, 3	
b. Reactor Vessel Water Level - Low, Level 3					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3, 4[d], 5[d]	X
Trip Logic:	D	Q	Q	1, 2, 3, 4[d], 5[d]	
c. Reactor Vessel Shroud Level					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3, 4[d], 5[d]	X
Trip Logic:	D	Q	Q	1, 2, 3, 4[d], 5[d]	

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM (Continued)					
d. Reactor Steam Dome Pressure - Low	NA[a]	NA	R[b]	1, 2, 3, 4[d], 5[d]	
1. RHR Pump Start and LPCI Injection Valve Actuation	D	Q	Q	1, 2, 3, 4[d], 5[d]	X
2. Recirculation Loop Pump Discharge Valve Actuation	D	Q	Q	1, 2, 3, 4[d], 5[d]	X
e. RHR Pump Start - Time Delay Relay	NA	R	R	1, 2, 3, 4[d], 5[d]	
f. Bus Power Monitor	NA	R	NA	1, 2, 3, 4[d], 5[d]	
3. HIGH PRESSURE COOLANT INJECTION SYSTEM					
a. Reactor Vessel Water Level - Low, Level 2	NA[a]	NA	R[b]	1, 2, 3	X
Transmitter:	D	Q	Q	1, 2, 3	
Trip Logic:					
b. Drywell Pressure - High	NA[a]	NA	R[b]	1, 2, 3	X
Transmitter:	D	Q	Q	1, 2, 3	
Trip Logic:					
c. Condensate Storage Tank Level - Low	NA	Q	Q	1, 2, 3	X
d. Suppression Chamber Water Level - High	NA	Q	Q	1, 2, 3	X
e. Bus Power Monitor	NA	R	NA	1, 2, 3	

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
4. AUTOMATIC DEPRESSURIZATION SYSTEM					
a. ADS Inhibit Switch	D(c)	R	NA	1, 2, 3	
b. Reactor Vessel Water Level - Low, Level 3					
Transmitter:	NA(a)	NA	R(b)	1, 2, 3	
Trip Logic:	D	M→Q	M→Q	1, 2, 3	X
c. Reactor Vessel Water Level - Low, Level 1					
Transmitter:	NA(a)	NA	R(b)	1, 2, 3	
Trip Logic:	D	M→Q	M→Q	1, 2, 3	X
d. ADS Timer	NA	R	R	1, 2, 3	
e. Core Spray Pump Discharge Pressure - High	NA	M→Q	Q	1, 2, 3	X
f. RHR (LPCI MODE) Pump Discharge Pressure - High	NA	M→Q	Q	1, 2, 3	X
g. Bus Power Monitor	NA	R	NA	1, 2, 3	

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
5. LOSS OF POWER				
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	NA	NA	R	1, 2, 3, 4(d), 5(d)
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	NA	M	R	1, 2, 3, 4(d), 5(d)

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.
(b) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration.
(c) The ADS Inhibit Switches shall be maintained in the Automatic position.
(d) Required when ESF equipment is required to be OPERABLE.

TABLE 3.3.4-1 (Continued)

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

INSERT 1D

NOTES

(a) The minimum number of OPERABLE CHANNELS may be reduced by one for up to 2 hours in one of the trip systems for maintenance and/or testing except for Rod Block Monitor function.

(b) This function is bypassed if detector is reading >100 cps or the IRM channels are on range 3 or higher.

(c) This function is bypassed when the associated IRM channels are on range 8 or higher.

(d) A total of 6 IRM instruments must by OPERABLE.

(e) This function is bypassed when the IRM channels are on range 1.

(f) When (1) THERMAL POWER is greater than or equal to 30% of RATED THERMAL POWER and less than 90% of RATED THERMAL POWER and the MCPR is less than 1.70, or (2) THERMAL POWER is greater than or equal to 90% of RATED THERMAL POWER and the MCPR is less than 1.40.

(g) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

(h) This signal is contained in the Channel A logic only.

Insert 1D, page 3/4 3-49

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed for up to 6 hours provided the Trip Function maintains control rod block capability.

TABLE 4.3.4-1

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
1. APRM					
a. Upscale (Flow Biased)	NA	S/U(c) ~~,M~~ → Q	R(b)(a)	1	X
b. Inoperative	NA	S/U(c)(e) ,Q(f)	NA	1, 2, 5	
c. Downscale	NA	S/U(c) ~~,M~~ → Q	NA	1	X
d. Upscale (Fixed)	NA	S/U(c)(e) ,Q(i)(f)	R(a)	2, 5	
2. ROD BLOCK MONITOR					
a. Upscale	NA	S/U(c) ~~,M~~ → Q	R(a)	1(g)	X
b. Inoperative	NA	S/U(c) ,Q	NA	1(g)	
c. Downscale	NA	S/U(c) ~~,M~~ → Q	R(a)	1(g)	X
3. SOURCE RANGE MONITORS					
a. Detector not full in	NA	S/U(c) ,W(d)	NA	2, 5	
b. Upscale	NA	S/U(c) ,W(d)	NA	2, 5	
c. Inoperative	NA	S/U(c) ,W(d)	NA	2, 5	
d. Downscale	NA	S/U(c) ,W(d)	NA	2, 5	
4. INTERMEDIATE RANGE MONITORS					
a. Detector not full in	NA	S/U(c)(e) ,W(d)	NA	2	
	NA	W(f)	NA	5	
b. Upscale	NA	S/U(c) ,W(d)	NA	2	
	NA	W	NA	5	
c. Inoperative	NA	S/U(c) ,W(d)	NA	2	
	NA	W	NA	5	
d. Downscale	NA	S/U(c) ,W(d)	NA	2	
	NA	W	NA	5	
5. SCRAM DISCHARGE VOLUME					
a. Water Level - High	NA	Q	R	1, 2, 5(h)	

TABLE 4.3.5.5-1

CONTROL ROOM EMERGENCY VENTILATION SYSTEM
INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
CHLORINE ISOLATION:			
1. Local Detection Trip System	NA	M	A
2. Remote Detection Trip System	NA	M	A
RADIATION PROTECTION:			
1. Control Building Air Intake	D	~~M~~ → Q	R
CONTROL ROOM ENVELOPE SMOKE PROTECTION:			
1. Zone 4	NA	6 months	(a)
2. Zone 5	NA	6 months	(a)

(a) See Surveillance Requirement 4.7.2.d.2

3/4.3.6 ATWS RECIRCULATION PUMP TRIP (RPT) SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.1 The ATWS-RPT system instrumentation ~~trip systems~~ channels shown in Table 3.3.6.1-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.6.1-2.

APPLICABILITY: OPERATIONAL CONDITION 1.

ACTION:

a. With an ATWS-RPT system instrumentation trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.6.1-2, declare the instrument channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

INSERT 1E

b. With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement for one or both trip systems, place the inoperable channel(s) in the tripped condition within one hour.

c. With the total number of OPERABLE channels less than 3 as required by the Minimum OPERABLE Channels per Trip System requirement for one trip system and:

   1. If the inoperable channels consist of one reactor vessel water level channel and one reactor vessel pressure channel, place both inoperable channels in the tripped condition within one hour.

   2. If the inoperable channels include two reactor vessel water level channels or two reactor vessel pressure channels, declare the trip system inoperable.

d. With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 14 days or be in at least STARTUP within the next 8 hours.

e. With both trip systems inoperable, restore at least one trip system to OPERABLE status within one hour or be in at least STARTUP within the next 8 hours.

SURVEILLANCE REQUIREMENTS

4.3.6.1.1 Each ATWS-RPT system 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 4.3.6.1.1-1.

4.3.6.1.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

Insert 1E, page 3/4 3-88

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

   1. Verify that a sufficient number of channels remain OPERABLE or are in the tripped condition to maintain ATWS-RPT trip capability for both Trip Functions within one hour, and

   2. Restore the inoperable channel(s) to OPERABLE status or place the inoperable channel(s) in the tripped condition within 14 days.

c. With trip capability for one ATWS-RPT Trip Function not maintained, restore trip capability within 72 hours.

d. With trip capability for both ATWS-RPT Trip Functions not maintained, restore trip capability for one Trip Function within one hour.

Otherwise, be in at least STARTUP within the next six hours.

TABLE 3.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION	MINIMUM ~~NUMBER~~ OPERABLE TRIP SYSTEM ~~PER OPERATING PUMP~~ (a) CHANNELS PER
1. Reactor Vessel Water Level - Low, Level 2	2
2. Reactor Vessel Pressure - High	2

INSERT 2E

(a) One trip ~~system~~ may be placed in an ~~inoperable status for up to 2 hours for~~ required ~~surveillance provided that the other trip system is~~ OPERABLE.

Insert 2E, page 3/4 3-89 (Unit 1) and 3/4 3-90 (Unit 2)

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed for up to 6 hours provided the Trip Function maintains ATWS-RPT capability.

TABLE 4.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
1. Reactor Vessel Water Level - Low, Level 2			
Transmitter:	NA[a]	~~M~~ NA	~~M~~ R[b]
Trip Logic:	D	Q	Q
2. Reactor Vessel Pressure - High			
Transmitter	NA[a]	~~M~~ NA	~~M~~ R[b]
Trip Logic:	D	Q	Q

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration.

INSTRUMENTATION

3/4.3.7 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.7 The reactor core isolation cooling (RCIC) system actuation their ~~those~~ instrumentation channels shown in Table 3.3.7-1 shall be OPERABLE with trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.7-2.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3 with reactor steam dome pressure greater than 113 psig.

ACTION:

a. With a RCIC system actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.7-2, 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 3.3.7-1.

SURVEILLANCE REQUIREMENTS

4.3.7.1 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 4.3.7.1-1.

4.3.7.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months.

TABLE 3.3.7-1

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

FUNCTIONAL UNIT	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM(a)	ACTION
1. Reactor Vessel Water Level - Low, Level 2	2	50
2. Reactor Vessel Water Level - High	2(b)	51
3. Condensate Storage Tank Water Level - Low(d)	2(c)	52

INSERT 1G

(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) One trip system with two-out-of-two logic.

(c) One trip system with one-out-of-two logic.

(d) Provides signal to RCIC pump suction valves only.

Insert 1G, page 3/4 3-93 (Unit 1) and 3/4 3-100 (Unit 2)

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed as follows:

(a) for up to 6 hours for Functional Unit 2.

(b) for up to 6 hours for Functional Units 1 and 3, provided the Functional Unit maintains RCIC actuation capability.

TABLE 3.3.7-1 (Continued)

REACTOR CORE ISOLATION COOLING SYSTEM

ACTUATION INSTRUMENTATION

ACTIONS

ACTION 50 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement:

a. For one trip system place the inoperable channel(s) and/or that trip system in the tripped condition within ~~one~~ 24 hours or declare the RCIC system inoperable. X

INSERT 2G 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 Channel per Trip System requirement, declare the RCIC system inoperable.~~ X

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 ~~one~~ 24 hours or declare the RCIC system inoperable. X X

Insert 2G, page 3/4 3-94 (Unit 1) and 3/4 3-101 (Unit 2)

With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement, restore the inoperable channel(s) to OPERABLE status within 24 hours. Otherwise, declare the RCIC system inoperable.

TABLE 4.3.7.1-1

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
1. Reactor Vessel Water Level - Low, Level 2			
Transmitter:	NA[a]	NA → Q	R[b] → Q
Trip Logic:	D		
2. Reactor Vessel Water Level - High			
Transmitter:	NA[a]	NA → Q	R[b] → Q
Trip Logic:	D		
3. Condensate Storage Tank Level - Low	NA	→ Q	Q

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration.

UNIT 1

BASES FOR

SECTIONS 3.0 AND 4.0

LIMITING CONDITIONS FOR OPERATIONS

AND

SURVEILLANCE REQUIREMENTS

RETYPED TECH. SPECS.
Updated Thru. Amend. 53

NOTE

The Summary statements contained in this section provide the bases for the specifications in Sections 3.0 and 4.0 and are not considered a part of these technical specifications as provided in 10 CFR 50.36.

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

The reactor protection system automatically initiates a reactor scram to:

a. Preserve the integrity of the fuel cladding.

b. Preserve the integrity of the reactor coolant system.

c. Minimize the energy which must be absorbed following a loss-of-coolant accident, and prevent inadvertent criticality.

This specification provides the limiting conditions for operation necessary to preserve the ability the system to perform its intended function even during periods when instrument channels may be out of service because of maintenance. When necessary, one channel may be made inoperable for brief intervals to conduct the required surveillance tests.

The reactor protection system is made up of two independent trip systems. There are usually four channels to monitor each parameter, with two in each trip system. The outputs of the channels in a trip system are combined in a logic so that either channel will trip that trip system. The tripping of both trip systems will produce a reactor scram. The system meets the intent of IEEE-279 for nuclear power plant protection systems. The bases for the trip settings of the RPS are discussed in the bases for Specification 2.2.

The measurement of response time at the specified frequencies provides assurance that the protective, isolation, and emergency core cooling functions associated with each channel are completed within the time limit assumed in the accident analysis. No credit was taken for those channels with response times indicated as not applicable.

Response time may be demonstrated by any series of sequential, overlapping, or total channel test measurements, provided such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either; 1) inplace, onsite or offsite test measurements, or 2) utilizing replacement sensors with certified response times.

The Bases for the trip setpoint is given in the Bases for Section 2.0.

INSERT 1H

RETYPED TECH. SPECS.
Updated Thru. Amend. 53

Insert 1H, page B 3/4 3-1

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE reports NEDC-30851P-A, "Technical Specification Improvement Analyses for BWR Reactor Protection System," March 1988 and MDE-81-0485, Rev. 1, "Technical Specification Improvement Analysis for the Reactor Protection System for Brunswick Steam Electric Plant, Units 1 and 2", August 1994, as modified by BWROG-92102, Letter from C. L. Tully (BWROG) to B. K. Grimes (NRC), "BWR Owners' Group (BWROG) Topical Reports on Technical Specification Improvement Analysis for BWR Reactor Protection Systems - Use for Relay and Solid State Plants (NEDC-30844 and NEDC-30851P)," November 4, 1992.

3/4.3.2 ISOLATION ACTUATION INSTRUMENTATION

This specification ensures the effectiveness of the instrumentation used to mitigate the consequences of accidents by prescribing the trip settings for isolation of the reactor systems. When necessary, one channel may be inoperable for brief intervals to conduct required surveillance. Some of the trip settings have tolerances explicitly stated where both the high and low values are critical and may have a substantial effect on safety. The setpoints of other instrumentation, where only the high or low end of the setting has a direct bearing on the safety, are established at a level away from the normal operating range to prevent inadvertent actuation of the systems involved.

INSERT 2H

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

The emergency core cooling system actuation instrumentation is provided to initiate actions to mitigate the consequences of accidents that are beyond the operator's ability to control. This specification provides the trip point settings that will ensure effectiveness of the systems to provide the design protection. Although the instruments are listed by system, in some cases the same instrument is used to send the start signal to several systems at the same time. The out-of-service times for the instruments are consistent with the requirements of the specifications in Section 3/4.5.

INSERT 3H

3/4.3.4 CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

The control rod block functions are provided consistent with the requirements of the specifications in Section 3/4.1.4, Rod Program Controls, and Section 3/4.2, Power Distribution Limits. The trip logic is arranged so that a trip in any one of the inputs will result in a rod block.

INSERT 4H

3/4.3.5 MONITORING INSTRUMENTATION

3/4.3.5.1 SEISMIC MONITORING INSTRUMENTATION

The OPERABILITY of the seismic monitoring instrumentation ensures that sufficient capability is available to promptly determine the magnitude of a seismic event and evaluate the response of those features important to safety. This capability is required to permit comparison of the measured response to that used in the design basis for the facility.

Insert 2H, page B 3/4 3-2

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE reports NEDC-30851P-A, Supplement 2, "Technical Specification Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989 and NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990, as modified by OG90-579-32A, Letter to Millard L. Wohl (NRC) from W. P. Sullivan and J. F. Klapproth (GE), "Implementation Enhancements to Technical Specification Changes Given in Isolation Actuation Instrumentation Analysis," June 25, 1990 and supplemented by GE letter report GENE-A31-00001-02, "Assessment of Brunswick Nuclear Plant Isolation Actuation Instrumentation Against NEDC-31677P-A Bounding Analyses," August 1994.

Insert 3H, page B 3/4 3-2

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE reports NEDC-30936P-A, Parts 1 and 2, "BWR Owners' Group Technical Specification Improvement Methodology (With Demonstration for BWR ECCS Actuation Instrumentation)," December 1988 and RE-011, Rev. 1, "Technical Specification Improvement Analysis for the Emergency Core Cooling System Actuation Instrumentation for Brunswick Steam Electric Plant, Units 1 & 2," August 1994, as modified by 0G90-319-32D, letter from W. P. Sullivan and J. F. Klapproth (GE) to Millard L. Wohl (NRC), "Clarification of Technical Specification Changes Given in ECCS Actuation Instrumentation Analysis", March 22, 1990.

Insert 4H, page B 3/4 3-2

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE report NEDC-30851P-A, Supplement 1, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988.

3/4.3.5.5 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

Surveillances (Continued)

instrumentation continues to operate properly between each CHANNEL CALIBRATION. The CHANNEL CHECK frequency is consistent with that performed for other radiation monitors with isolation functions.

The CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. The Control Building HVAC DBD (Reference 6) defines the specific actions to be satisfied by the radiation actuation instrumentation. The ~~monthly~~ frequency of the CHANNEL FUNCTIONAL TEST is consistent ~~with that performed for other radiation~~ monitors with isolation functions.

The CHANNEL CALIBRATION verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to ensure consistency with the system assumptions (Reference 5). The frequency of the calibration is consistent with the frequency of calibration of other radiation monitors with isolation functions.

Chlorine Protection

The CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. The Control Building HVAC DBD (Reference 6) defines the specific actions to be satisfied by the chlorine isolation instrumentation. The monthly frequency of the CHANNEL FUNCTIONAL TEST is consistent with the testing frequencies performed by other utilities with this type of instrumentation.

The CHANNEL CALIBRATION of the trip units provides a check of the instrument loop and the sensor when the sensor is replaced. The test verifies the calibration of the existing sensor prior to removal and performs an installation calibration of the new sensor, including a complete channel calibration with the new sensor installed, to verify the channel responds to the measured parameter within the necessary range and accuracy. The CHANNEL CALIBRATION leaves the channel adjusted to ensure consistency with the system assumptions (Reference 6).

The chlorine detectors use an amperometric sensor consisting of a platinum cathode and silver anode joined by an electrolytic salt bridge, all enclosed in a permeable membrane. This design eliminates the majority of the maintenance required on previous detectors. The detectors have been in service at other facilities and have provided reliable service. The annual replacement and calibration are based on a manufacturer recommendation. The adequacy of the replacement interval has been confirmed through discussions with other utilities.

Smoke Protection

The CHANNEL FUNCTIONAL TEST for the Smoke Protection instrumentation is consistent with the testing performed in accordance with the existing Fire Detection Instrumentation requirements. CHANNEL CALIBRATION is performed in accordance with the requirements of the CREVS specification (4.7.2).

3/4.3.5.5 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

References

1. 10 CFR 50, Appendix A, General Design Criterion 19, Control Room.

2. Regulatory Guide 1.95, Revision 1, Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release.

3. Updated FSAR, Brunswick Steam Electric Plant, Units 1 & 2.

4. NUS-3697, Revision 2, February 1983, Control Building Habitability Analysis.

5. CP&L Calculation 01534A-248, Control Room Radiation Monitor Setpoint Evaluation.

6. BNP Design Basis Document (DBD)-37, Control Building Heating, Ventilation, and Air Conditioning System.

7. GENE-770-06-1-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

3/4.3.6 ATWS RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

The ATWS recirculation pump trip system has been added at the suggestion of ACRS as a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. The response of the plant to this postulated event falls within the envelope of study events given in General Electric Company Topical Report NEDO-10349, dated March, 1971.

3/4.3.7 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

The reactor core isolation cooling system actuation instrumentation is provided to initiate actions to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without providing actuation of any of the emergency core cooling equipment.

INSERT 5H

INSERT 6H

Insert 5H, page B 3/4 3-6

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE report GENE-770-06-1-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

Insert 6H, page B 3/4 3-6 (Unit 1) and B 3/4 3-7 (Unit 2)

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE report GENE-770-06-2P-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

ENCLOSURE 5

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1 AND 2
NRC DOCKETS 50-325 & 50-324
OPERATING LICENSES DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
INCREASED INSTRUMENT SURVEILLANCE TEST INTERVALS AND
ALLOWABLE OUT-OF-SERVICE TIMES

MARKED-UP TECHNICAL SPECIFICATIONS PAGES - UNIT 2

The following pages have been revised and an 'X' has been placed in the margin to indicate where changes occur.

Technical Specifications

3/4 3-1, 2, 3, 5, 7, 8, 9	(RPS Instrumentation)
3/4 3-10, 11, 17a, 27 through 32	(Isolation Actuation Instrumentation)
3/4 3-33 through 35, 37, 38, 43 through 46	(ECCS Actuation Instrumentation)
3/4 3-49, 51	(Control Rod Withdrawal Block Instrumentation)
3/4 3-64c	(Control Room Emergency Ventilation Instrumentation)
3/4 3-88, 90, 92	(ATWS-RPT Instrumentation)
3/4 3-93, 95, 98	(EOC-RPT Instrumentation)
3/4 3-99, 100, 101, 103	(RCIC Actuation Instrumentation)

Bases

B 3/4 3-1
B 3/4 3-2
B 3/4 3-3d
B 3/4 3-3e
B 3/4 3-6
B 3/4 3-7

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. Set points and interlocks are given in Table 2.2.1-1.

APPLICABILITY: As shown in Table 3.3.1-1.

ACTION: INSERT 1A

a. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel(s) and/or trip system in the tripped condition* within one hour.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, place at least one trip system** in the tripped condition within one hour and take the ACTION required by Table 3.3.1-1.

c. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.1.1 Each reactor protection system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.1-1.

4.3.1.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

4.3.1.3 The REACTOR PROTECTION SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one logic train such that both logic trains are tested at least once per 36 months and one channel per 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 reactor trip function.

INSERT 2A

* 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 3.3.1-1 for that Trip Function shall be taken.

** If more channels are inoperable in one trip system than in the other, place the trip system with more inoperable channels in the tripped condition, except when this would cause the Trip Function to occur.

Neutron detectors are exempt from response time testing.

Insert 1A, page 3/4 3-1

a. With one channel less than the Minimum Number of OPERABLE Channels per Trip System required by Table 3.3.1-1 in one or more Functional Units, place the inoperable channel and/or that trip system in the tripped condition* within 12 hours.

b. With two or more channels less than the Minimum Number of OPERABLE Channels per Trip System required by Table 3.3.1-1 in one or more Functional Units:

1. Within one hour, verify sufficient channels remain OPERABLE or in the tripped condition* to maintain trip capability in the Functional Unit, and

2. Within 6 hours, place the inoperable channel(s) in one trip system and/or that trip system** in the tripped condition*, and

3. Within 12 hours, restore the inoperable channels in the other trip system to an OPERABLE status or place them in the tripped condition*.

Otherwise, take the ACTION required by Table 3.3.1-1 for the Functional Unit.

Insert 2A, page 3/4 3-1

* An inoperable channel or trip system need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, if the inoperable channel is not restored to OPERABLE status within the required time, the ACTION required by Table 3.3.1-1 for the Functional Unit shall be taken.

** This ACTION applies to that trip system with the most inoperable channels; if both trip systems have the same number of inoperable channels, the ACTION can be applied to either trip system.

TABLE 3.3.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	APPLICABLE OPERATIONAL CONDITIONS	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM (a)	ACTION
1. Intermediate Range Monitors:			
a. Neutron Flux - High	2, 5(b)	3	1
	3, 4	2	2
b. Inoperative	2, 5	3	1
	3, 4	2	2
2. Average Power Range Monitor			
a. Neutron Flux - High, 15% Simulated Thermal Power	2, 5(b)	2	3
b. Flow Biased ~~Neutron Flux~~ - High	1	2	4
c. Fixed Neutron Flux - High, 120%	1	2	4
d. Inoperative	1, 2, 5	2	5
e. Downscale	1	2	4
f. LPRM	1, 2, 5	(c)	NA
3. Reactor Vessel Steam Dome Pressure - High	1, 2(d)	2	6
4. Reactor Vessel Water Level - Low, Level 1	1, 2	2	6
5. Main Steam Isolation Valve - Closure	1	4	4
6. Main Steam Line Radiation - High	1, 2(d)	2	7

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	APPLICABLE OPERATIONAL CONDITIONS	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM (a)	ACTION	
7. Drywell Pressure - High	1, 2(e)	2	6	
8. Scram Discharge Volume Water Level - High	1, 2, 5(f)	2	5	
9. Turbine Stop Valve - Closure	1(g)	4	8	
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low	1(g)	2	8	|
11. Reactor Mode Switch in Shutdown Position	1, 2, 3, 4, 5	1	9	
12. Manual Scram	1, 2, 3, 4, 5	1	10	
13. Automatic Scram Contactors	1, 2, 3, 4, 5	2	10	X

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

ACTION 10 - In OPERATIONAL CONDITION 1 or 2, be in at least HOT SHUTDOWN within 6 hours.

In OPERATIONAL CONDITION 3 or 4, lock the reactor mode switch in the Shutdown position within one hour.

In OPERATIONAL CONDITION 5, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and fully insert all insertable control rods within one hour.

INSERT 3A

NOTES

(a) A channel may be placed in an inoperable status for up to 2 hours for required surveillance without placing the trip system in the tripped condition, provided at least one OPERABLE channel in the same trip system is monitoring that parameter.

(b) The "shorting links" shall be removed from the RPS circuitry prior to and during the time any control rod is withdrawn* and during shutdown margin demonstrations.

(c) An APRM channel is inoperable if there are less than 2 LPRM inputs per level or less than eleven LPRM inputs to an APRM channel.

(d) These functions are not required to be OPERABLE when the reactor pressure vessel head is unbolted or removed.

(e) This function is not required to be OPERABLE when PRIMARY CONTAINMENT INTEGRITY is not required.

(f) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

(g) These functions are bypassed when THERMAL POWER is less than 30% of RATED THERMAL POWER.

*Not required for control rods removed per Specification 3.9.10.1 or 3.9.10.2.

Insert 3A, page 3/4 3-5

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed for up to 6 hours provided the Functional Unit maintains RPS trip capability.

TABLE 4.3.1-1

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	D	S/U[b][c], W[d]	R	2	
	D	W	R	3, 4, 5	
b. Inoperative	NA	W[d]	NA	2, 3, 4, 5	
2. Average Power Range Monitor:					
a. Neutron Flux - High 15%	S	S/U[b][m], W[d]	Q	2	
	S	W[n]	Q	5	
b. Flow-Biased ~~Neutron Flux~~ Simulated Thermal Power - High	S	S/U[b], ~~W~~ Q	W[e][f], Q	1	X
c. Fixed Neutron Flux - High, 120%	S	S/U[b], ~~W~~ Q	W[e], Q	1	X
d. Inoperative	NA	~~W~~ Q[m][n]	NA	1, 2, 5	X
e. Downscale	NA	~~W~~ Q	NA	1	X
f. LPRM	D	NA	(g)	1, 2, 5	
3. Reactor Vessel Steam Dome Pressure - High					
Transmitter:	NA[k]	NA	R[1]	1, 2	
Trip Logic:	D	~~W~~ Q	~~W~~ Q	1, 2	X
4. Reactor Vessel Water Level - Low, Level 1					
Transmitter:	NA[k]	NA	R[1]	1, 2	
Trip Logic:	D	~~W~~ Q	~~W~~ Q	1, 2	X

TABLE 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION[a]	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
5. Main Steam Line Isolation Valve - Closure	NA	~~M~~ → Q	R[h]	1	X
6. Main Steam Line Radiation - High	S	~~M~~[i] → Q	R[j]	1, 2	X
7. Drywell Pressure - High	NA[k]	NA	R[l]	1, 2	
Transmitter:	D	~~M~~ → Q	~~M~~ → Q	1, 2	X
8. Scram Discharge Volume Water Level - High	NA	Q	R	1, 2, 5	
9. Turbine Stop Valve - Closure	NA	~~M~~ → Q	R[h]	1[o]	X
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low	NA	~~M~~ → Q	R	1[o]	X
11. Reactor Mode Switch in Shutdown Position	NA	R	NA	1, 2, 3, 4, 5	
12. Manual Scram	NA	Q	NA	1, 2, 3, 4, 5	
13. Automatic Scram Contactors	NA	W	NA	1, 2, 3, 4, 5	/

TABLE 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

NOTES

(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) The IRM channels shall be compared to the APRM channels and the SRM instruments for overlap during each startup, if not performed within the previous 7 days.

(d) When changing from OPERATIONAL CONDITION 1 to OPERATIONAL CONDITION 2, perform the required surveillance within 12 hours after entering OPERATIONAL CONDITION 2, if not performed within the previous 7 days.

(e) This calibration shall consist of the adjustment of the APRM readout to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER greater than or equal to 25% of RATED THERMAL POWER.

(f) This calibration shall consist of the adjustment of the APRM flow-biased ~~setpoint~~ channel to conform to a calibrated flow signal.

(g) The LPRMs shall be calibrated at least once per effective full power month (EFPM) using the TIP system.

(h) This calibration shall consist of a physical inspection and actuation of these position switches.

(i) Instrument alignment using a standard current source.

(j) Calibration using a standard radiation source.

(k) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(l) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration.

(m) Placement of Reactor Mode Switch into the Startup/Hot Standby position is permitted for the purpose of performing the required surveillance prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

(n) Placement of Reactor Mode Switch into the Shutdown or Refuel position is permitted for the purpose of performing the required surveillance provided all control rods are fully inserted and the vessel head bolts are tensioned.

(o) Surveillance is not required when THERMAL POWER is less than 30% of RATED THERMAL POWER.

3/4.3.2 ISOLATION ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The isolation actuation instrumentation 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.

APPLICABILITY: As shown in Table 3.3.2-1.

ACTION:

a. With an isolation actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.2-2, declare the channel inoperable ~~and 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.

INSERT 1B

b. ~~With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel(s) and/or that trip system in the tripped condition* within one hour.~~

c. ~~With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, place at least one trip system** in the tripped condition within one hour and take the ACTION required by Table 3.3.2-1.~~

d. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each isolation actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.2-1.

4.3.2.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

---

* 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.

** If more channels are inoperable in one trip system than in the other, place the trip system with more inoperable channels in the tripped condition, except when this would cause the Trip Function to occur.

Insert 1B, page 3/4 3-10

b. For any isolation actuation Trip Function with less than the Minimum Number of OPERABLE Channels per Trip System required by Table 3.3.2-1:

1. Within one hour, verify sufficient channels remain OPERABLE or are placed in the tripped condition* to maintain automatic isolation actuation capability for the Trip Function, and

2. Place the inoperable channel(s) in the tripped condition* within:

   a) 12 hours for trip functions common to RPS Instrumentation, and

   b) 24 hours for trip functions not common to RPS Instrumentation

Otherwise, take the ACTION required by Table 3.3.2-1.

---

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

SURVEILLANCE REQUIREMENTS (Continued)

4.3.2.3 The ISOLATION SYSTEM RESPONSE TIME of each isolation function' shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one logic train such that both logic ~~chains~~ trains are tested at least once per 36 months and one channel per 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 isolation function.

X

' Radiation monitors are exempt from response time testing.

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

NOTES

* When handling irradiated fuel in the secondary containment.

(a) See Specification 3.6.3.1, Table 3.6.3-1 for valves in each valve group.

INSERT 2B

(b) ~~A channel may be placed in an inoperable status for up to 7 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.~~ X

(c) ~~With only one channel per trip system, 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.~~ X

Deleted

(d) A channel is OPERABLE if 2 of 4 instruments in that channel are OPERABLE.

(e) With reactor steam pressure $\geq$ 500 psig.

(f) Closes only RWCU outlet isolation valve.

(g) Alarm only.

(h) Isolates containment purge and vent valves.

(i) Does not isolate E11-F015A,B.

(j) Does not isolate B32-F019 or B32-F020.

(k) Valve isolation depends upon low steam supply pressure coincident with high drywell pressure.

(l) Secondary containment isolation dampers as listed in Table 3.6.5.2-1.

Insert 2B, page 3/4 3-17a

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed as follows:

(a) for up to 2 hours for Trip Functions with a design that provides only one channel per trip system.

(b) for up to 6 hours for all Trip Functions, provided the Trip Function maintains isolation actuation capability.

TABLE 4.3.2-1

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
1. PRIMARY CONTAINMENT ISOLATION					
a. Reactor Vessel Water Level -					
1. Low, Level 1					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	X
Trip Logic:	D	Q	Q	1, 2, 3	
2. Low, Level 3					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	X
Trip Logic	D	Q	Q	1, 2, 3	
b. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	X
Trip Logic:	D	Q	Q	1, 2, 3	X
c. Main Steam Line					
1. Radiation - High	D	Q	R[d]	1, 2, 3	X
2. Pressure - Low				1	
Transmitter:	NA[a]	NA	R[b]	1	X
Trip Logic:	D	Q	Q		
3. Flow - High				1	
Transmitter:	NA[a]	NA	R[b]	1	X
Trip Logic:	D	Q	Q	2, 3	X
4. Flow - High	D	Q	Q		X
d. Main Steam Line Tunnel Temperature - High	NA	Q	R	1, 2, 3	X
e. Condenser Vacuum - Low				1, 2[e]	
Transmitter:	NA[a]	NA	R[b]	1, 2[e]	X
Trip Logic:	D	Q	Q		
f. Turbine Building Area Temperature - High	NA	Q	R	1, 2, 3	X
g. Main Stack Radiation - High	NA	Q	R	1, 2, 3	X
h. Reactor Building Exhaust Radiation - High	D	Q	R	1, 2, 3	X

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
2. SECONDARY CONTAINMENT ISOLATION					
a. Reactor Building Exhaust Radiation - High	D	~~M~~→Q	R	1,2,3,5, and[f]	X
b. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~→Q	~~M~~→Q	1, 2, 3	X
c. Reactor Vessel Water Level - Low, Level 2					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~→Q	~~M~~→Q	1, 2, 3	X
3. REACTOR WATER CLEANUP SYSTEM ISOLATION					
a. Δ Flow - High	NA	SA	R	1, 2, 3	|
b. Area Temperature - High	NA	SA	R	1, 2, 3	|
c. Area Ventilation Δ Temperature - High	NA	SA	R	1, 2, 3	|
d. SLCS Initiation	NA	R	NA	1, 2	
e. Reactor Vessel Water Level - Low, Level 2					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~→Q	~~M~~→Q	1, 2, 3	X
f. Δ Flow - High - Time Delay	NA	SA	R	1, 2, 3	|
g. Piping Outside RWCU Rooms Area Temperature - High	NA	SA	R	1, 2, 3	|

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
4. CORE STANDBY COOLING SYSTEMS ISOLATION					
a. High Pressure Coolant Injection System Isolation					
1. HPCI Steam Line Flow - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~ Q	~~M~~ Q	1, 2, 3	X
2. HPCI Steam Line Flow - High Time Delay Relay	NA	R	R	1, 2, 3	
3. HPCI Steam Supply Pressure - Low	NA	~~M~~ Q	R	1, 2, 3	X
4. HPCI Steam Line Tunnel Temperature - High	NA	SA	R	1, 2, 3	
5. Bus Power Monitor	NA	R	NA	1, 2, 3	
6. HPCI Turbine Exhaust Diaphragm Pressure - High	NA	~~M~~ Q	Q	1, 2, 3	X
7. HPCI Steam Line Ambient Temperature - High	NA	SA	R	1, 2, 3	
8. HPCI Steam Line Area Δ Temperature - High	NA	SA	R	1, 2, 3	
9. HPCI Equipment Area Temperature - High	NA	SA	R	1, 2, 3	
10. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~M~~ Q	~~M~~ Q	1, 2, 3	X

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
4. CORE STANDBY COOLING SYSTEMS ISOLATION (Continued)					
b. Reactor Core Isolation Cooling System Isolation					
1. RCIC Steam Line Flow - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~H~~→Q	~~H~~→Q	1, 2, 3	X
2. RCIC Steam Line High - Flow Time Delay Relay	NA	R	R	1, 2, 3	
3. RCIC Steam Supply Pressure - Low	NA	~~H~~→Q	Q	1, 2, 3	X
4. RCIC Steam Line Tunnel Temperature - High	NA	SA	R	1, 2, 3	
5. Bus Power Monitor	NA	R	NA	1, 2, 3	
6. RCIC Turbine Exhaust Diaphragm Pressure - High	NA	~~H~~→Q	R	1, 2, 3	X
7. RCIC Steam Line Ambient Temperature - High	NA	SA	R	1, 2, 3	|
8. RCIC Steam Line Area Δ Temperature - High	NA	SA	R	1, 2, 3	|
9. RCIC Equipment Room Ambient Temperature - High	NA	SA	R	1, 2, 3	|
10. RCIC Equipment Room Δ Temperature - High	NA	SA	R	1, 2, 3	|
11. RCIC Steam Line Tunnel Temperature - High Time Delay Relay	NA	SA	R	1, 2, 3	|
12. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	~~H~~→Q	~~H~~→Q	1, 2, 3	X

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
5. SHUTDOWN COOLING SYSTEM ISOLATION				
a. Reactor Vessel Water Level - Low, Level 1				
Transmitter:	NA[a]	NA	R[b]	1, 2, 3
Trip Logic:	D	M→Q	M→Q	1, 2, 3
b. Reactor Steam Dome Pressure - High	NA	S/U[c], M→Q	R	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

NOTES

(a) The transitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration.

(c) ~~If not performed within the previous 31 days.~~ Deleted

(d) Testing shall verify that the mechanical vacuum pump trips and the mechanical vacuum pump line valve closes.

(e) When reactor steam pressure $\geq$ 500 psig.

(f) When handling irradiated fuel in the secondary containment.

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.

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 Values column of Table 3.3.3-2, declare the channel inoperable ~~and 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.

b. With one or more ECCS actuation instrumentation channels inoperable, take the ACTION required by Table 3.3.3-1.

c. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.3.1 Each ECCS actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.3-1.

4.3.3.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

4.3.3.3 The ECCS RESPONSE TIME of each ECCS function shall be demonstrated to be within the limit at least once per 18 months. Each test shall include at least one logic train such that both logic trains are tested at least once per 36 months and one channel per 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 ECCS function.

TABLE 3.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION	MINIMUM ~~NUMBER~~ OPERABLE CHANNELS PER TRIP ~~SYSTEM~~ FUNCTION	APPLICABLE OPERATIONAL CONDITIONS	ACTION	X
1. CORE SPRAY SYSTEM				
a. Reactor Vessel Water Level - Low, Level 3	2/4	1, 2, 3, 4, 5	30	X
b. Reactor Steam Dome Pressure - Low (Injection Permissive)	1/4	1, 2, 3, 4, 5	~~31~~ 30	X
c. Drywell Pressure - High	2/4	1, 2, 3	30	X
d. Time Delay Relay	1/pump	1, 2, 3, 4, 5	31	X
e. Bus Power Monitor[a]	1/bus	1, 2, 3, 4, 5	32	
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM				
a. Drywell Pressure - High	2/4	1, 2, 3	30	X
b. Reactor Vessel Water Level - Low, Level 3	2/4	1, 2, 3, 4[b], 5[b]	30	X
c. Reactor Vessel Shroud Level (Drywell Spray Permissive)	1/valve	1, 2, 3, 4[b], 5[b]	31	X
d. Reactor Steam Dome Pressure - Low (Injection Permissive)				
1. RHR Pump Start and LPCI Injection Valve Actuation	1/4	1, 2, 3, 4[b], 5[b]	~~31~~ 30	X
2. Recirculation Loop Pump Discharge Valve Actuation	1/4	1, 2, 3, 4[b], 5[b]	~~31~~ 30	X
e. RHR Pump Start - Time Delay Relay	1/pump	1, 2, 3, 4[b], 5[b]	31	X
f. Bus Power Monitor[a]	1/bus	1, 2, 3, 4[b], 5[b]	32	

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION	MINIMUM ~~NUMBER~~ OPERABLE CHANNELS PER TRIP ~~SYSTEM~~ FUNCTION[a]	APPLICABLE OPERATIONAL CONDITIONS	ACTION	
3. HIGH PRESSURE COOLANT INJECTION SYSTEM				
a. Reactor Vessel Water Level - Low, Level 2	~~4~~	1, 2, 3	30	X
b. Drywell Pressure - High	~~4~~	1, 2, 3	30	X
c. Condensate Storage Tank Level - Low	2[c]	1, 2, 3	33	
d. Suppression Chamber Water Level - High	2[c]	1, 2, 3	33	
e. Bus Power Monitor[d]	1/bus	1, 2, 3	32	
4. AUTOMATIC DEPRESSURIZATION SYSTEM				
a. ADS Inhibit Switch	~~2~~	1, 2, 3	36	X
b. Reactor Vessel Water Level - Low, Level 3	~~4~~	1, 2, 3	~~36~~ 36	X
c. Reactor Vessel Water Level - Low, Level 1	~~2~~	1, 2, 3	~~36~~ 36	X
d. ADS Timer	~~2~~	1, 2, 3	~~36~~ 36	X
e. Core Spray Pump Discharge Pressure - High (Permissive)	~~4~~	1, 2, 3	~~36~~ 36	X
f. RHR (LPCI MODE) Pump Discharge Pressure - High (Permissive)	2/pump	1, 2, 3	~~36~~ 36	X
g. Bus Power Monitor[d]	1/bus	1, 2, 3	32	

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

ACTIONS

Function

ACTION 30 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip ~~System~~ requirement:

INSERT 1C

~~a. For one trip system, place at least one inoperable channel in the tripped condition within one hour or declare the associated ECCS inoperable.~~

~~b. For both trip systems, declare the associated ECCS inoperable.~~

ACTION 31 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip ~~System~~ requirement, declare the associated ECCS inoperable.

Function

ACTION 32 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip ~~System~~ requirement, verify bus power availability at least once per 12 hours or declare the associated ECCS inoperable.

Function

ACTION 33 - 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 one hour or declare the ~~HPCS~~ system inoperable.

HPCI

ACTION 34 - 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 Specification 3.8.1.1 or 3.8.1.2, as appropriate.

ACTION 35 - 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 36 - 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 8 hours or declare the associated ECCS inoperable.~~

INSERT 2C

Insert 1C, page 3/4 3-37

a. Within 1 hour, verify sufficient channels remain OPERABLE or are placed in the tripped condition to maintain automatic ECCS actuation capability for the Trip Function, and

b. Within 24 hours, place all inoperable channels that do not cause the Trip Function to occur in the tripped condition.

Otherwise, declare the associated ECCS inoperable.

Insert 2C, page 3/4 3-37

ACTION 36 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, verify within one hour that a sufficient number of channels remain OPERABLE to maintain actuation capability of either ADS Trip System A or ADS Trip System B and restore the inoperable channels to OPERABLE status within 24 hours. Otherwise, declare ADS inoperable.

Insert 1C, page 3/4 3-37

a. Within 1 hour, verify sufficient channels remain OPERABLE or are placed in the tripped condition to maintain automatic ECCS actuation capability for the Trip Function, and

b. Within 24 hours, place all inoperable channels that do not cause the Trip Function to occur in the tripped condition.

Otherwise, declare the associated ECCS inoperable.

Insert 2C, page 3/4 3-37

ACTION 36 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, verify within one hour that a sufficient number of channels remain OPERABLE to maintain actuation capability of either ADS Trip System A or ADS Trip System B and restore the inoperable channels to OPERABLE status within 24 hours. Otherwise, declare ADS inoperable.

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

INSERT 3C

NOTES

(a) A channel may be placed in an inoperable status for up to two hours for required surveillance without placing the trip system in the tripped condition, provided at least one OPERABLE channel in the same trip system is monitoring the affected parameter.

(b) Not applicable when two core spray system subsystems are OPERABLE per Specification 3.5.3.1.

(c) Provides signal to HPCI pump suction valves only.

(d) Alarm only.

(e) Required when ESF equipment is required to be OPERABLE.

(f) On a one-time basis, prior to start-up from the outage that began on April 21, 1992, the Minimum Number OPERABLE Channels per Trip System for one reactor steam dome pressure - low (injection permissive) trip function may be reduced, for no longer than 7 days, from two (2) channels to one (1) channel without declaring the associated ECCS inoperable in accordance with ACTION 31. This will be done on one occasion for Unit 1 and two occasions for Unit 2. During these periods, the following actions shall be implemented:

(1) The inoperable channel shall be placed in the condition that will satisfy the logic for allowing injection by the associated ECCS with the reactor steam dome pressure below 410 psig ± 15 psig.

(2) Both channels in the other trip system shall be maintained OPERABLE.

(3) The reactor vessel head vent shall be maintained in the open position.

Insert 3C, page 3/4 3-38

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed for up to 6 hours provided the Trip Function or the redundant Trip Function maintains ECCS actuation capability.

TABLE 4.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
1. CORE SPRAY SYSTEM					
a. Reactor Vessel Water Level - Low, Level 3					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3, 4, 5	
Trip Logic:	D	M→Q	M→Q	1, 2, 3, 4, 5	X
b. Reactor Steam Dome Pressure - Low					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3, 4, 5	
Trip Logic:	D	M→Q	M→Q	1, 2, 3, 4, 5	X
c. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	M→Q	M→Q	1, 2, 3	X
d. Time Delay Relay	NA	R	R	1, 2, 3, 4, 5	
e. Bus Power Monitor	NA	R	NA	1, 2, 3, 4, 5	
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM					
a. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	M→Q	M→Q	1, 2, 3	X
b. Reactor Vessel Water Level - Low, Level 3					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3, 4[d], 5[d]	
Trip Logic:	D	M→Q	M→Q	1, 2, 3, 4[d], 5[d]	X
c. Reactor Vessel Shroud Level					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3, 4[d], 5[d]	
Trip Logic:	D	M→Q	M→Q	1, 2, 3, 4[d], 5[d]	X

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM (Continued)					
d. Reactor Steam Dome Pressure - Low	NA[a]	NA	R[b]	1, 2, 3, 4[d], 5[d]	
1. RHR Pump Start and LPCI Injection Valve Actuation	D	→Q	→Q	1, 2, 3, 4[d], 5[d]	X
2. Recirculation Loop Pump Discharge Valve Actuation	D	→Q	→Q	1, 2, 3, 4[d], 5[d]	X
e. RHR Pump Start - Time Delay Relay	NA	R	R	1, 2, 3, 4[d], 5[d]	
f. Bus Power Monitor	NA	R	NA	1, 2, 3, 4[d], 5[d]	
3. HIGH PRESSURE COOLANT INJECTION SYSTEM					
a. Reactor Vessel Water Level - Low, Level 2					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	→Q	→Q	1, 2, 3	X
b. Drywell Pressure - High					
Transmitter:	NA[a]	NA	R[b]	1, 2, 3	
Trip Logic:	D	→Q	→Q	1, 2, 3	X
c. Condensate Storage Tank Level - Low	NA	→Q	Q	1, 2, 3	X
d. Suppression Chamber Water Level - High	NA	→Q	Q	1, 2, 3	X
e. Bus Power Monitor	NA	R	NA	1, 2, 3	

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
4. AUTOMATIC DEPRESSURIZATION SYSTEM					
a. ADS Inhibit Switch	D(c)	R	NA	1, 2, 3	
b. Reactor Vessel Water Level - Low, Level 3					
Transmitter:	NA(a)	NA	R(b)	1, 2, 3	
Trip Logic:	D	M→Q	M→Q	1, 2, 3	X
c. Reactor Vessel Water Level - Low, Level 1					
Transmitter:	NA(a)	NA	R(b)	1, 2, 3	
Trip Logic:	D	M→Q	M→Q	1, 2, 3	X
d. ADS Timer	NA	R	R	1, 2, 3	
e. Core Spray Pump Discharge Pressure - High	NA	M→Q	Q	1, 2, 3	X
f. RHR (LPCI MODE) Pump Discharge Pressure - High	NA	M→Q	Q	1, 2, 3	X
g. Bus Power Monitor	NA	R	NA	1, 2, 3	

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
5. LOSS OF POWER				
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	NA	NA	R	1, 2, 3, 4(d), 5(d)
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	NA	M	R	1, 2, 3, 4(d), 5(d)

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration.

(c) The ADS Inhibit Switches shall be maintained in the Automatic position.

(d) Required when ESF equipment is required to be OPERABLE.

TABLE 3.3.4-1 (Continued)

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

INSERT 1D

NOTES

(a) The minimum number of OPERABLE CHANNELS ~~may be reduced by one for up to~~ 8 hours in one of the ~~trip systems~~ for maintenance and/or testing ~~except~~ for Rod Block Monitor function.

(b) This function is bypassed if detector is reading >100 cps or the IRM channels are on range 3 or higher.

(c) This function is bypassed when the associated IRM channels are on range 8 or higher.

(d) A total of 6 IRM instruments must be OPERABLE.

(e) This function is bypassed when the IRM channels are on range 1.

(f) When (1) THERMAL POWER is greater than or equal to 30% of RATED THERMAL POWER and less than 90% of RATED THERMAL POWER and MCPR is less than 1.70, or (2) THERMAL POWER is greater than or equal to 90% of RATED THERMAL POWER and MCPR is less than 1.40.

(g) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

(h) This signal is contained in the Channel A logic only.

Insert 1D, page 3/4 3-49

When a channel is placed in a inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed for up to 6 hours provided the Trip Function maintains control rod block capability.

TABLE 4.3.4-1

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. APRM				
a. Upscale (Flow Biased)	NA	S/U(c) ~~M~~ Q	R(b)(a)	1
b. Inoperative	NA	S/U(c)(e) ~~M~~ Q(f)	NA	1, 2, 5
c. Downscale	NA	S/U(c) ~~M~~ Q	NA	1
d. Upscale (Fixed)	NA	S/U(c)(e) ~~M~~ Q(i)(f)	R(a)	2, 5
2. ROD BLOCK MONITOR				
a. Upscale	NA	S/U(c) ~~M~~ Q	R(a)	1(g)
b. Inoperative	NA	S/U(c) Q	NA	1(g)
c. Downscale	NA	S/U(c) ~~M~~ Q	R(a)	1(g)
3. SOURCE RANGE MONITORS				
a. Detector not full in	NA	S/U(c) W(d)	NA	2, 5
b. Upscale	NA	S/U(c) W(d)	NA	2, 5
c. Inoperative	NA	S/U(c) W(d)	NA	2, 5
d. Downscale	NA	S/U(c) W(d)	NA	2, 5
4. INTERMEDIATE RANGE MONITORS				
a. Detector not full in	NA	S/U(c)(e) W(d)	NA	2
	NA	W(f)	NA	5
b. Upscale	NA	S/U(c) W(d)	NA	2
	NA	W	NA	5
c. Inoperative	NA	S/U(c) W(d)	NA	2
	NA	W	NA	5
d. Downscale	NA	S/U(c) W(d)	NA	2
	NA	W	NA	5
5. SCRAM DISCHARGE VOLUME				
a. Water Level - High	NA	Q	R	1, 2, 5(h)

TABLE 4.3.5.5-1

CONTROL ROOM EMERGENCY VENTILATION SYSTEM
INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
CHLORINE ISOLATION:			
1. Local Detection Trip System	NA	M	A
2. Remote Detection Trip System	NA	M	A
RADIATION PROTECTION:			
1. Control Room Air Intake	D	~~M~~ Q	R
CONTROL ROOM ENVELOPE SMOKE PROTECTION:			
1. Zone 4	NA	6 months	(a)
2. Zone 5	NA	6 months	(a)

(a) See Surveillance Requirement 4.7.2.d.2

INSTRUMENTATION

3/4.3.6 RECIRCULATION PUMP TRIP (RPT) ACTUATION INSTRUMENTATION

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

channels

3.3.6.1 The ATWS-RPT system instrumentation ~~trip systems~~ shown in Table 3.3.6.1-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.6.1-2.

X

APPLICABILITY: OPERATIONAL CONDITION 1.

ACTION:

a. With an ATWS-RPT system instrumentation trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.6.1-2, declare the instrument channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

INSERT 1E

b. With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement for one or both trip systems, place the inoperable channel(s) in the tripped condition within one hour.

X

c. With the total number of OPERABLE channels less than 3 as required by the Minimum OPERABLE Channels per Trip System requirement for one trip system and:

1. If the inoperable channels consist of one reactor vessel water level channel and one reactor vessel pressure channel, place both inoperable channels in the tripped condition within one hour.

2. If the inoperable channels include two reactor vessel water level channels or two reactor vessel pressure channels, declare the trip system inoperable.

d. With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 14 days or be in at least STARTUP within the next 8 hours.

e. With both trip systems inoperable, restore at least one trip system to OPERABLE status within one hour or be in at least STARTUP within the next 8 hours.

Insert 1E, page 3/4 3-88

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

   1. Verify that a sufficient number of channels remain OPERABLE or are in the tripped condition to maintain ATWS-RPT trip capability for both Trip Functions within one hour, and

   2. Restore the inoperable channel(s) to OPERABLE status or place the inoperable channel(s) in the tripped condition within 14 days.

c. With trip capability for one ATWS-RPT Trip Function not maintained, restore trip capability within 72 hours.

d. With trip capability for both ATWS-RPT Trip Functions not maintained, restore trip capability for one Trip Function within one hour.

Otherwise, be in at least STARTUP within the next six hours.

TABLE 3.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION	MINIMUM ~~NUMBER~~ OPERABLE TRIP SYSTEMS ~~PER OPERATING PUMP~~ (a)
1. Reactor Vessel Water Level - Low, Level 2	2
2. Reactor Vessel Pressure - High	2

CHANNELS PER

INSERT 2E

(a) One trip ~~system~~ may be placed in an inoperable status for up to 2 hours for required surveillance ~~provided that the other trip system~~ is OPERABLE.

Insert 2E, page 3/4 3-89 (Unit 1) and 3/4 3-90 (Unit 2)

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed for up to 6 hours provided the Trip Function maintains ATWS-RPT capability.

TABLE 4.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
1. Reactor Vessel Water Level - Low, Level 2			
Transmitter:	NA[a]	NA	R[b]
Trip Logic:	D	~~M~~ → Q	~~M~~ → Q
2. Reactor Vessel Pressure - High			
Transmitter:	NA[a]	~~M~~ NA	R[b]
Trip Logic:	D	~~M~~ → Q	~~M~~ → Q

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration.

INSTRUMENTATION

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.2 The end-of-cycle recirculation pump trip (EOC-RPT) system instrumentation channels shown in Table 3.3.6.2-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.6.2-2 and with the END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM RESPONSE TIME as shown in Table 3.3.6.2-3.

APPLICABILITY: OPERATIONAL CONDITION 1, when THERMAL POWER is greater than or equal to 30% of RATED THERMAL POWER.*

ACTION:

a. With an end-of-cycle recirculation pump trip system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values Column of Table 3.3.6.2-2, 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 the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement for one or both trip systems, place the inoperable channel(s) in the tripped condition within ~~one hour~~ 12 hours. X

c. With the number of OPERABLE channels two or more less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system and:

   1. If the operable channels consist of one turbine control valve channel and one turbine stop valve channel, place both inoperable channels in the tripped condition within ~~one hour~~ 12 hours X

   2. If the inoperable channels include two turbine control valve channels or two turbine stop valve channels, declare the trip system operable.

d. With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 72 hours or take the ACTION required by Specification 3.2.3.

e. With both trip systems inoperable, restore at least one trip system to OPERABLE status within one hour or take the ACTION required by Specification 3.2.3.

* During the current cycle operation, the end-of-cycle recirculation pump trip (EOC-RPT) system will be inoperable (manually bypassed); therefore, Specification 3.3.6.2 above does not apply. The provisions of Specification 3.0.4 are not applicable.

TABLE 3.3.6.2-1

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM(a)
1. Turbine Stop Valve - Closure	2(b)
2. Turbine Control Valve - Fast Closure	2(b)

INSERT 1F

(a) ~~A trip system may be placed in an inoperable status~~ for up to 6 hours for required surveillance, ~~provided~~ that the other trip system is OPERABLE.

(b) These functions are bypassed when turbine first stage pressure is equivalent to THERMAL POWER less than 30% of RATED THERMAL POWER.

Insert 1F, page 3/4 3-95 (Unit 2 only)

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed for up to 6 hours provided the Trip Function maintains EOC-RPT capability.

TABLE 4.3.6.2.1-1

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
1. Turbine Stop Valve - Closure	~~N~~ Q(a)	R
2. Turbine Control Valve - Fast Closure	~~N~~ Q(a)	R

(a) Including trip system logic testing.

3/4.3.7 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.7 The reactor core isolation cooling (RCIC) system actuation instrumentation channels shown in Table 3.3.7-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.7-2.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3 with reactor steam dome pressure greater than 113 psig.

ACTION:

a. With a RCIC system actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.7-2, 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 3.3.7-1.

SURVEILLANCE REQUIREMENTS

4.3.7.1 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 4.3.7.1-1.

4.3.7.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months.

TABLE 3.3.7-1

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

FUNCTIONAL UNIT	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM (a)	ACTION
1. Reactor Vessel Water Level - Low, Level 2	2	50
2. Reactor Vessel Water Level - High	2(b)	51
3. Condensate Storage Tank Water Level - Low(d)	2(c)	52

INSERT 1G

(a) A channel may be placed in an ~~inoperable status for up to 2 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) One trip system with two-out-of-two logic.

(c) One trip system with one-out-of-two logic.

(d) Provides signal to RCIC pump suction valves only.

Insert 1G, page 3/4 3-93 (Unit 1) and 3/4 3-100 (Unit 2)

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated ACTIONs may be delayed as follows:

(a) for up to 6 hours for Functional Unit 2.

(b) for up to 6 hours for Functional Units 1 and 3, provided the Functional Unit maintains RCIC actuation capability.

TABLE 3.3.7-1 (Continued)

REACTOR CORE ISOLATION COOLING SYSTEM

ACTUATION INSTRUMENTATION

ACTIONS

ACTION 50 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement:

a. For one trip system, place the inoperable channel(s) and/or that trip system in the tripped condition within ~~one~~ 24 hours or declare the RCIC system inoperable. X

INSERT 2G 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.~~ X

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 ~~one~~ 24 hours or declare the RCIC system inoperable. X X

Insert 2G, page 3/4 3-94 (Unit 1) and 3/4 3-101 (Unit 2)

With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement, restore the inoperable channel(s) to OPERABLE status within 24 hours. Otherwise, declare the RCIC system inoperable.

TABLE 4.3.7.1-1

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
1. Reactor Vessel Water Level - Low, Level 2			
Transmitter:	NA[a]	NA	R[b]
Trip Logic:	D	→ Q	→ Q
2. Reactor Vessel Water Level - High			
Transmitter:	NA[a]	NA	R[b]
Trip Logic:	D	→ Q	→ Q
3. Condensate Storage Tank Level - Low	NA	→ Q	Q

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the ~~monthly~~ quarterly channel calibration.

UNIT 2

BASES FOR

SECTIONS 3.0 AND 4.0

LIMITING CONDITIONS FOR OPERATION

AND

SURVEILLANCE REQUIREMENTS

RETYPED TECH. SPECS.
Updated Thru. Amend. 78

NOTE

The Summary statements contained in this section provide the bases for the specifications in Sections 3.0 and 4.0 and are not considered a part of these technical specifications as provided in 10 CFR 50.36.

BASES

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

The reactor protection system automatically initiates a reactor scram to:

a. Preserve the integrity of the fuel cladding.

b. Preserve the integrity of the reactor coolant system.

c. Minimize the energy which must be adsorbed following a loss-of-coolant accident, and prevent inadvertent criticality.

This specification provides the limiting conditions for operation necessary to preserve the ability of the system to perform its intended function even during periods when instrument channels may be out of service because of maintenance. When necessary, one channel may be made inoperable for brief intervals to conduct the required surveillance tests.

The reactor protection system is made up of two independent trip systems. There are usually four channels to monitor each parameter with two in each trip system. The outputs of the channels in a trip system are combined in a logic so that either channel will trip that trip system. The tripping of both trip systems will produce a reactor scram. The system meets the intent of IEEE-279 for nuclear power plant protection systems. The bases for the trip settings of the RPS are discussed in the bases for Specification 2.2.

The measurement of response time at the specified frequencies provides assurance that the protective, isolation, and emergency core cooling functions associated with each channel are completed within the time limit assumed in the accident analysis. No credit was taken for those channels with response times indicated as not applicable.

Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements, provided such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) inplace, onsite, or offsite test measurements; or 2) utilizing replacement sensors with certified response times.

~~The Bases for the trip setpoint are given in the Bases for Section 2.0.~~

INSERT 1H

Insert 1H, page B 3/4 3-1

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE reports NEDC-30851P-A, "Technical Specification Improvement Analyses for BWR Reactor Protection System," March 1988 and MDE-81-0485, Rev. 1, "Technical Specification Improvement Analysis for the Reactor Protection System for Brunswick Steam Electric Plant, Units 1 and 2", August 1994, as modified by BWROG-92102, Letter from C. L. Tully (BWROG) to B. K. Grimes (NRC), "BWR Owners' Group (BWROG) Topical Reports on Technical Specification Improvement Analysis for BWR Reactor Protection Systems - Use for Relay and Solid State Plants (NEDC-30844 and NEDC-30851P)," November 4, 1992.

3/4.3.2 ISOLATION ACTUATION INSTRUMENTATION

This specification ensures the effectiveness of the instrumentation used to mitigate the consequences of accidents by prescribing the trip settings for isolation of the reactor systems. When necessary, one channel may be inoperable for brief intervals to conduct required surveillance. Some of the trip settings have tolerances explicitly stated where both the high and low values are critical and may have a substantial effect on safety. The setpoints of other instrumentation where only the high or low end of the setting has a direct bearing on the safety, are established at a level away from the normal operating range to prevent inadvertent actuation of the systems involved.

INSERT 2H

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

The emergency core cooling system actuation instrumentation is provided to initiate actions to mitigate the consequences of accidents that are beyond the operator's ability to control. This specification provides the trip point settings that will ensure effectiveness of the systems to provide the design protection. Although the instruments are listed by system, in some cases the same instrument is used to send the start signal to several systems at the same time. The out-of-service times for the instruments are consistent with the requirements of the specifications in Section 3/4.5.

INSERT 3H

3/4.3.4 CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

The control rod block functions are provided consistent with the requirements of the specifications in Section 3/4.1.4, Rod Program Controls and Section 3/4.2, Power Distribution Limits. The trip logic is arranged so that a trip in any one of the inputs will result in a rod block.

INSERT 4H

3/4.3.5 MONITORING INSTRUMENTATION

3/4.3.5.1 SEISMIC MONITORING INSTRUMENTATION

The OPERABILITY of the seismic monitoring instrumention ensures that sufficient capability is available to promptly determine the magnitude of a seismic event and evaluate the response of those features important to safety. This capability is required to permit comparison of the measured response to that used in the design basis for the facility.

Insert 2H, page B 3/4 3-2

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE reports NEDC-30851P-A, Supplement 2, "Technical Specification Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989 and NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990, as modified by OG90-579-32A, Letter to Millard L. Wohl (NRC) from W. P. Sullivan and J. F. Klapproth (GE), "Implementation Enhancements to Technical Specification Changes Given in Isolation Actuation Instrumentation Analysis," June 25, 1990 and supplemented by GE letter report GENE-A31-00001-02, "Assessment of Brunswick Nuclear Plant Isolation Actuation Instrumentation Against NEDC-31677P-A Bounding Analyses," August 1994.

Insert 3H, page B 3/4 3-2

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE reports NEDC-30936P-A, Parts 1 and 2, "BWR Owners' Group Technical Specification Improvement Methodology (With Demonstration for BWR ECCS Actuation Instrumentation)," December 1988 and RE-011, Rev. 1, "Technical Specification Improvement Analysis for the Emergency Core Cooling System Actuation Instrumentation for Brunswick Steam Electric Plant Units 1 & 2," August 1994, as modified by 0G90-319-32D, letter from W. P. Sullivan and J. F. Klapproth (GE) to Millard L. Wohl (NRC), "Clarification of Technical Specification Changes Given in ECCS Actuation Instrumentation Analysis", March 22, 1990.

Insert 4H, page B 3/4 3-2

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE report NEDC-30851P-A, Supplement 1, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988.

3/4.3.5.5 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

Surveillances (Continued)

instrumentation continues to operate properly between each CHANNEL CALIBRATION. The CHANNEL CHECK frequency is consistent with that performed for other radiation monitors with isolation functions.

The CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. The Control Building HVAC DBD (Reference 6) defines the specific actions to be satisfied by the radiation actuation instrumentation. The ~~monthly~~ frequency of the CHANNEL FUNCTIONAL TEST is consistent with that performed for other radiation monitors with isolation functions.

The CHANNEL CALIBRATION verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to ensure consistency with the system assumptions (Reference 5). The frequency of the calibration is consistent with the frequency of calibration of other radiation monitors with isolation functions.

Chlorine Protection

The CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. The Control Building HVAC DBD (Reference 6) defines the specific actions to be satisfied by the chlorine isolation instrumentation. The monthly frequency of the CHANNEL FUNCTIONAL TEST is consistent with the testing frequencies performed by other utilities with this type of instrumentation.

The CHANNEL CALIBRATION of the trip units provides a check of the instrument loop and the sensor when the sensor is replaced. The test verifies the calibration of the existing sensor prior to removal and performs an installation calibration of the new sensor, including a complete channel calibration with the new sensor installed, to verify the channel responds to the measured parameter within the necessary range and accuracy. The CHANNEL CALIBRATION leaves the channel adjusted to ensure consistency with the system assumptions (Reference 6).

The chlorine detectors use an amperometric sensor consisting of a platinum cathode and silver anode joined by an electrolytic salt bridge, all enclosed in a permeable membrane. This design eliminates the majority of the maintenance required on previous detectors. The detectors have been in service at other facilities and have provided reliable service. The annual replacement and calibration are based on a manufacturer recommendation. The adequacy of the replacement interval has been confirmed through discussions with other utilities.

Smoke Protection

The CHANNEL FUNCTIONAL TEST for the Smoke Protection instrumentation is consistent with the testing performed in accordance with the existing Fire Detection Instrumentation requirements. CHANNEL CALIBRATION is performed in accordance with the requirements of the CREVS specification (4.7.2).

3/4.3.5.5 CONTROL Room EMERGENCY VENTILATION SYSTEM (Continued)

References

1. 10 CFR 50, Appendix A, General Design Criterion 19, Control Room.

2. Regulatory Guide 1.95, Revision 1, Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release.

3. Updated FSAR, Brunswick Steam Electric Plant, Units 1 & 2.

4. NUS-3697, Revision 2, February 1983, Control Room Habitability Analysis.

5. CP&L Calculation 01534A-248, Control Room Radiation Monitor Setpoint Evaluation.

6. BNP Design Basis Document (DBD)-37, Control Building Heating, Ventilation, and Air Conditioning System.

7. GENE-770-06-1-A, "Bases for Changes to Surveillance Test Intervals and Allowed-Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION (Continued)

The initial CHANNEL CALIBRATION for the instruments associated with footnote (b) to Table 4.3.5.9-1 shall be performed using National Bureau of Standards traceable sources which will verify that the detector operates properly over its intended energy range and measurement range. For instruments which were operational prior to this specification being implemented, previously established calibration procedures may be substituted for this requirement. Subsequent CHANNEL CALIBRATIONS will be performed using sources that have been related to the initial calibration in order to ensure that the detector is still operational, but the sources need not span the full ranges used in the initial CHANNEL CALIBRATION.

3/4.3.6 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

The anticipated transient without scram (ATWS) recirculation pump trip system provides a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. The response of the plant to this postulated event falls within an envelope of study events given in General Electric Company Topical Report NEDO-10349, dated March, 1971.

The end-of-cycle recirculation pump trip (EOC-RPT) system is a part of the Reactor Protection System and is a safety supplement to the reactor trip. The purpose of the EOC-RPT is to recover the loss of thermal margin which occurs at the end-of-cycle. The physical phenomenon involved is that the void reactivity feedback due to a pressurization transient can add positive reactivity to the reactor system at a faster rate than the control rods add negative scram reactivity. Each EOC-RPT system trips both recirculation pumps, reducing coolant flow in order to reduce the void collapse in the core during two of the most limiting pressurization events. The two events for which the EOC-RPT protective feature will function are closure of the turbine stop valves and fast closure of the turbine control valves.

A fast closure sensor from each of two turbine control valves provides input to one EOC-RPT system; a fast closure sensor from each of the other two turbine control valves provides input to the second EOC-RPT system. Similarly, a position switch for each of two turbine stop valves provides input to one EOC-RPT system; a position switch for each of the other two turbine stop valves provides input to the other EOC-RPT system. For each EOC-RPT system, the sensor relay contacts are arranged to form a 2-out-of-2 logic for closure of the turbine stop valves. The operation of either logic will actuate the EOC-RPT system and trip both recirculation pumps.

Each EOC-RPT system may be manually bypassed by use of a keyswitch which is administratively controlled. The manual bypasses and the automatic operating bypass at < 30% of RATED THERMAL POWER are annunciated in the control room.

→ INSERT 5H

Insert 5H, page B 3/4 3-6

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE report GENE-770-06-1-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

Insert 6H, page B 3/4 3-6 (Unit 1) and B 3/4 3-7 (Unit 2)

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE report GENE-770-06-2P-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

BASES

3/4.3.7 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

The reactor core isolation cooling system actuation instrumentation is provided to initiate actions to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without providing actuation of any of the emergency core cooling equipment.

→ INSERT 6H