ENCLOSURE 4

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1 AND 2
NRC DOCKETS 50-325 & 50-324
OPERATING LICENSES DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENTS
RESPONSE TIME TABLE RELOCATION

MARKED-UP TECHNICAL SPECIFICATION PAGES - UNIT 1

TABLE 2.2.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. Intermediate Range Monitor, Neutron Flux - High[a]	≤ 120 divisions of full scale	≤ 120 divisions of full scale
2. Average Power Range Monitor		
a. Neutron Flux - High, 15%[b]	≤ 15% of RATED THERMAL POWER	≤ 15% of RATED THERMAL POWER
b. Flow-Biased Simulated Thermal Power - High[c][d]	≤ (0.66W + 64%) with a maximum ≤ 113.5% of RATED THERMAL POWER	≤ (0.66W + 67%) with a maximum ≤ 115.5% of RATED THERMAL POWER
c. Fixed Neutron Flux - High[d]	≤ 120% of RATED THERMAL POWER	≤ 120% of RATED THERMAL POWER
3. Reactor Vessel Steam Dome Pressure - High	≤ 1045 psig	≤ 1045 psig
4. Reactor Vessel Water Level - Low, Level 1	≥ +162.5 inches[g]	≥ +162.5 inches[g]
5. Main Steam Line Isolation Valve - Closure[e]	≤ 10% closed	≤ 10% closed
6. ~~Main Steam Line Radiation - High[h]~~ deleted	~~≤ 3 x full power background~~	~~≤ 3.5 x full power background~~
7. Drywell Pressure - High	≤ 2 psig	≤ 2 psig
8. Scram Discharge Volume Water Level - High	≤ 109 gallons	≤ 109 gallons
9. Turbine Stop Valve - Closure[f]	≤ 10% closed	≤ 10% closed
10. Turbine Control Valve Fast Closure, Control Oil Pressure-Low[f]	≥ 500 psig	≥ 500 psig

TABLE 2.2.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

NOTES

(a) The Intermediate Range Monitor scram functions are automatically bypassed when the reactor mode switch is placed in the Run position and the Average Power Range Monitors are on scale.

(b) This Average Power Range Monitor scram function is a fixed point and is increased when the reactor mode switch is placed in the Run position.

(c) The Average Power Range Monitor scram function is varied, Figure 2.2.1-1, as a function of the fraction of rated recirculation loop flow (W) in percent.

(d) The APRM flow-biased simulated thermal power signal is fed through a time constant circuit of approximately 6 seconds. The APRM fixed high neutron flux signal does not incorporate the time constant, but responds directly to instantaneous neutron flux.

(e) The Main Steam Line Isolation Valve-Closure scram function is automatically bypassed when the reactor mode switch is in other than the Run position.

(f) These scram functions are bypassed when THERMAL POWER is less than 30% of RATED THERMAL POWER as measured by turbine first stage pressure.

(g) Vessel water levels refer to REFERENCE LEVEL ZERO.

(h) The Hydrogen Water Chemistry (HWC) system shall not be placed in service until reactor power reaches 20% of RATED THERMAL POWER. After reaching 20% of RATED THERMAL POWER, the normal full power background radiation level and associated trip setpoints may be increased to compensate for increased radiation levels as a result of full power operation with hydrogen injection. Prior to decreasing power below 20% of RATED THERMAL POWER and after the HWC system has been shut off, the background level and associated setpoint shall be returned to the normal full power values. Control rod motion shall be suspended, when the reactor power is below 20% of RATED THERMAL POWER, until the necessary adjustment is made (except for scram or other emergency action).

deleted

BASES (Continued)

4. Reactor Vessel Water Level-Low, Level #1

The reactor water level trip point was chosen far enough below the normal operating level to avoid spurious scrams but high enough above the fuel to assure that there is adequate water to account for evaporation losses and displacement of cooling following the most severe transients. This setting was also used to develop the thermal-hydraulic limits of power versus flow.

5. Main Steam Line Isolation Valve-Closure

The low-pressure isolation of the main steamline trip was provided to give protection against rapid depressurization and resulting cooldown of the reactor vessel. Advantage was taken of the shutdown feature in the run mode which occurs when the main steam line isolation valves are closed, to provide for reactor shutdown so that high power operation at low pressures does not occur. Thus, the combination of the low-pressure isolation and isolation valve closure reactor trip with the mode switch in the Run position assures the availability of neutron flux protection over the entire range of the Safety Limits. In addition, the isolation valve closure trip with the mode switch in the Run position anticipates the pressure and flux transients which occur during normal or inadvertent isolation valve closure.

6. ~~Main Steam Line Radiation - High~~ deleted

~~The Main Steam Line Radiation detectors are provided to detect a gross failure of the fuel cladding. When the high radiation is detected, a scram is initiated to reduce the continued failure of fuel cladding. At the same time, the Main Steam Line Isolation Valves are closed to limit the release of fission products. The trip setting is high enough above background radiation level to prevent spurious scrams, yet low enough to promptly detect gross failures in the fuel cladding.~~

~~The Main Steam Line Radiation detectors setpoints may be adjusted prior to placing the hydrogen water chemistry (HWC) system in service. If the setpoints are adjusted, the HWC system shall be placed in service or the setpoints shall be returned to the normal full power values within 24 hours. If the HWC system is not placed in service and the setpoints are not readjusted within 24 hours, control rod motion shall be suspended (except for scram or other emergency action) until the necessary adjustments are made. Hydrogen injection may cause the radiation levels in the main steam lines to increase. After shutting off the HWC system or decreasing power, the setpoints shall be returned to the normal full power values.~~

~~The Technical Specification wording was derived using the EPRI "Guidelines for Permanent BWR Hydrogen Water Chemistry Installations, 1987 Revision".~~

7. Drywell Pressure, High

High pressure in the drywell could indicate a break in the nuclear process systems. The reactor is tripped in order to minimize the possibility of fuel damage and reduce the amount of energy being added to the coolant. The trip setting was selected as low as possible without causing spurious trips.

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 - 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~~ deleted	~~1, 2(d)~~	~~2~~	~~7~~

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

ACTIONS

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

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

ACTION 2 - Lock the reactor mode switch in the Shutdown position within one hour.

ACTION 3 - In OPERATIONAL CONDITION 2, be in at least HOT SHUTDOWN within 6 hours.

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

ACTION 4 - Be in at least STARTUP within 2 hours.

ACTION 5 - In OPERATIONAL CONDITION 1 or 2, be in at least HOT SHUTDOWN within 6 hours.

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

ACTION 6 - Be in at least HOT SHUTDOWN within 6 hours.

ACTION 7 - ~~Be in STARTUP with the main steam line isolation valves closed within 2 hours or in at least HOT SHUTDOWN within 6 hours.~~ deleted

ACTION 8 - Initiate a reduction in THERMAL POWER within 15 minutes and be at less than 30% of RATED THERMAL POWER within 2 hours.

ACTION 9 - In OPERATIONAL CONDITION 1 or 2, be in at least HOT SHUTDOWN within 6 hours.

In OPERATIONAL CONDITION 3 or 4, immediately and at least once per 12 hours verify that all control rods are fully inserted.

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

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.

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~~ This function ~~are~~ is not required to be OPERABLE when the reactor pressure vessel head is unbolted or removed.

(e) ~~This~~ 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.

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	R[h]	1
6. ~~Main Steam Line Radiation - High~~ deleted	~~S~~	~~M[i]~~	~~R[j]~~	~~1, 2~~
7. Drywell Pressure - High				
Transmitter:	NA[k]	NA	R[l]	1, 2
Trip Logic:	D	M	M	1, 2
8. Scram Discharge Volume Water Level - High	NA	Q	R	1, 2, 5
9. Turbine Stop Valve - Closure	NA	M	R[h]	1[o]
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low	NA	M	R	1[o]
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

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 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.~~ deleted

~~(j) Calibration using a standard radiation source.~~ deleted

(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 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.

TABLE 3.3.2-1

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION	
1. PRIMARY CONTAINMENT ISOLATION					
a. Reactor Vessel Water Level -					
1. Low, Level 1	2, 6	2	1, 2, 3	20	
	8	2	1, 2, 3	27	
2. Low, Level 3	1	2	1, 2, 3	20	
b. Drywell Pressure - High	2, 6	2	1, 2, 3	20	
c. Main Steam Line					
1. ~~Radiation - High~~ deleted	~~1~~	~~2~~	~~1, 2, 3~~	~~21~~	
2. Pressure - Low	1(j)	2	1	22	
3. Flow - High	1(j)	2/line	1	22	
d. Main Steam Line Tunnel Temperature - High	1(j)	2(d)	1, 2, 3	21	
e. Condenser Vacuum - Low	1~~(j)~~	2	1, 2(e)	21	
f. Turbine Building Area Temperature - High	1(j)	4(d)	1, 2, 3	21	
g. Main Stack Radiation - High	(h)	1	1, 2, 3	28	
h. Reactor Building Exhaust Radiation - High	6	1	1, 2, 3	20	

TABLE 3.3.2-2

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
1. PRIMARY CONTAINMENT ISOLATION		
a. Reactor Vessel Water Level -		
1. Low, Level 1	$\geq$ + 162.5 inches(a)	$\geq$ + 162.5 inches(a)
2. Low, Level 3	$\geq$ + 2.5 inches(a)	$\geq$ + 2.5 inches(a)
b. Drywell Pressure - High	$\leq$ 2 psig	$\leq$ 2 psig
c. Main Steam Line		
1. ~~Radiation - High~~ deleted	~~$\leq$ 3 x full power background(c)~~	~~$\leq$ 3.5 x full power background(c)~~
2. Pressure - Low	$\geq$ 825 psig	$\geq$ 825 psig
3. Flow - High	$\leq$ 140% of rated flow	$\leq$ 140% of rated flow
d. Main Steam Line Tunnel Temperature - High	$\leq$ 200°F	$\leq$ 200°F
e. Condenser Vacuum - Low	$\geq$ 7 inches Hg vacuum	$\geq$ 7 inches Hg vacuum
f. Turbine Building Area Temperature - High	$\leq$ 200°F	$\leq$ 200°F
g. Main Stack Radiation - High	(b)	(b)
h. Reactor Building Exhaust Radiation - High	$\leq$ 11 mr/hr	$\leq$ 11 mr/hr

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
5. SHUTDOWN COOLING SYSTEM ISOLATION		
a. Reactor Vessel Water Level - Low Level 1	$\geq$ 162.5 inches[(a)]	$\geq$ 162.5 inches[(a)]
b. Reactor Steam Dome Pressure - High	$\leq$ 140 psig	$\leq$ 140 psig

(a) Vessel water levels refer to REFERENCE LEVEL ZERO.

(b) Establish alarm/trip setpoints per the methodology contained in the OFFSITE DOSE CALCULATION MANUAL (ODCM).

(c) The Hydrogen Water Chemistry (HWC) system shall not be placed in service until reactor power reaches 20% of RATED THERMAL POWER. After reaching 20% of RATED THERMAL POWER, the normal full power background radiation level and associated trip setpoints may be increased to compensate for increased radiation levels as a result of full power operation with hydrogen injection. Prior to decreasing power below 20% of RATED THERMAL POWER and after the HWC system has been shut off, the background level and associated setpoint shall be returned to the normal full power values. Control rod motion shall be suspended, when the reactor power is below 20% of RATED THERMAL POWER, until the necessary adjustment is made (except for scram or other emergency action).

deleted

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
Trip Logic:	D	M	M	1, 2, 3
2. Low, Level 3				
Transmitter:	NA[a]	NA	R[b]	1, 2, 3
Trip Logic:	D	M	M	1, 2, 3
b. Drywell Pressure - High				
Transmitter:	NA[a]	NA	R[b]	1, 2, 3
Trip Logic:	D	M	M	1, 2, 3
c. Main Steam Line				
1. ~~Radiation - High~~ deleted	~~D~~	~~W~~	~~R[(d)]~~	~~1, 2, 3~~
2. Pressure - Low				
Transmitter:	NA[a]	NA	R[b]	1
Trip Logic:	D	M	M	1
3. Flow - High				
Transmitter:	NA[a]	NA	R[b]	1
Trip Logic:	D	M	M	1
d. Main Steam Line Tunnel Temperature - High	NA	M	R	1, 2, 3
e. Condenser Vacuum - Low				
Transmitter:	NA[a]	NA	R[b]	1, 2[(e)]
Trip Logic:	D	M	M	1, 2[(e)]
f. Turbine Building Area Temperature - High	NA	M	R	1, 2, 3
g. Main Stack Radiation - High	NA	Q	R	1, 2, 3
h. Reactor Building Exhaust Radiation - High	D	M	R	1, 2, 3

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 channel calibration.

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

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

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

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

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 AMENDMENTS
RESPONSE TIME TABLE RELOCATION

MARKED-UP TECHNICAL SPECIFICATION PAGES - UNIT 2

TABLE 2.2.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. Intermediate Range Monitor, Neutron Flux - High[a]	≤ 120 divisions of full scale	≤ 120 divisions of full scale
2. Average Power Range Monitor		
a. Neutron Flux - High, 15%[b]	≤ 15% of RATED THERMAL POWER	≤ 15% of RATED THERMAL POWER
b. Flow Biased Simulated Thermal Power - High[c][d]	≤ (0.66 W + 64%) with a maximum ≤ 113.5% of RATED THERMAL POWER	≤ (0.66 W + 67%) with a maximum ≤ 115% of RATED THERMAL POWER
c. Fixed Neutron Flux - High[d]	≤ 120% of RATED THERMAL POWER	≤ 120% of RATED THERMAL POWER
3. Reactor Vessel Steam Dome Pressure - High	≤ 1045 psig	≤ 1045 psig
4. Reactor Vessel Water Level - Low, Level 1	≥ +162.5 inches[g]	≥ +162.5 inches[g]
5. Main Steam Line Isolation Valve - Closure[e]	≤ 10% closed	≤ 10% closed
6. ~~Main Steam Line Radiation - High[h]~~ deleted	~~≤ 3 x full power background~~	~~≤ 3.5 x full power background~~
7. Drywell Pressure - High	≤ 2 psig	≤ 2 psig
8. Scram Discharge Volume Water Level - High	≤ 109 gallons	≤ 109 gallons
9. Turbine Stop Valve-Closure[f]	≤ 10% closed	≤ 10% closed
10. Turbine Control Valve Fast Closure, Control Oil Pressure-Low[f]	≥ 500 psig	≥ 500 psig

TABLE 2.2.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

NOTES

(a) The Intermediate Range Monitor scram functions are automatically bypassed when the reactor mode switch is placed in the Run position and the Average Power Range Monitors are on scale.

(b) This Average Power Range Monitor scram function is a fixed point and is increased when the reactor mode switch is placed in the Run position.

(c) The Average Power Range Monitor scram function is varied, Figure 2.2.1-1, as a function of the fraction of rated recirculation loop flow (W) in percent.

(d) The APRM flow-biased simulated thermal power signal is fed through a time constant circuit of approximately 6 seconds. The APRM fixed high neutron flux signal does not incorporate the time constant, but responds directly to instantaneous neutron flux.

(e) The Main Steam Line Isolation Valve-Closure scram function is automatically bypassed when the reactor mode switch is in other than the Run position.

(f) These scram functions are bypassed when THERMAL POWER is less than 30% of RATED THERMAL POWER as measured by turbine first stage pressure.

(g) Vessel water levels refer to REFERENCE LEVEL ZERO.

(h) ~~The Hydrogen Water Chemistry (HWC) system shall not be placed in service until reactor power reaches 20% of RATED THERMAL POWER. After reaching 20% of RATED THERMAL POWER, the normal full power background radiation level and associated trip setpoints may be increased to compensate for increased radiation levels as a result of full power operation with hydrogen injection. Prior to decreasing power below 20% of RATED THERMAL POWER and after the HWC system has been shut off, the background level and associated setpoint shall be returned to the normal full power values. Control rod motion shall be suspended, when the reactor power is below 20% of RATED THERMAL POWER, until the necessary adjustment is made (except for scram or other emergency action).~~

Deleted

4. Reactor Vessel Water Level-Low, Level #1

The reactor water level trip point was chosen far enough below the normal operating level to avoid spurious scrams but high enough above the fuel to assure that there is adequate water to account for evaporation losses and displacement of cooling following the most severe transients. This setting was also used to develop the thermal-hydraulic limits of power versus flow.

5. Main Steam Line Isolation Valve-Closure

The low-pressure isolation of the main steam line trip was provided to give protection against rapid depressurization and resulting cooldown of the reactor vessel. Advantage was taken of the shutdown feature in the run mode which occurs when the main steam line isolation valves are closed, to provide for reactor shutdown so that high power operation at low pressures does not occur. Thus, the combination of the low-pressure isolation and isolation valve closure reactor trip with the mode switch in the Run position assures the availability of neutron flux protection over the entire range of the Safety Limits. In addition, the isolation valve closure trip with the mode switch in the Run position anticipates the pressure and flux transients which occur during normal or inadvertent isolation valve closure.

6. ~~Main Steam Line Radiation - High~~

~~The Main Steam Line Radiation detectors are provided to detect a gross failure of the fuel cladding. When the high radiation is detected, a scram is initiated to reduce the continued failure of fuel cladding. At the same time, the Main Steam Line Isolation Valves are closed to limit the release of fission products. The trip setting is high enough above background radiation levels to prevent spurious scrams, yet low enough to promptly detect gross failures in the fuel cladding.~~

~~The Main Steam Line Radiation detectors setpoints may be adjusted prior to placing the hydrogen water chemistry (WHC) system in service. If the setpoints are adjusted, the HWC system shall be placed in service or the setpoints shall be returned to the normal full power values within 24 hours. If the HWC system is not placed in service and the setpoints are not readjusted within 24 hours, control rod motion shall be suspended (except for scram or other emergency action) until the necessary adjustments are made. Hydrogen injection may cause the radiation levels in the main steam lines to increase. After shutting off the HWC system or decreasing power, the setpoints shall be returned to the normal full power values.~~

~~The Technical Specification wording was derived using the EPRI "Guidelines for Permanent BWR Hydrogen Water Chemistry Installations, 1987 Revision".~~

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, 4	3 2	1 2
b. Inoperative	2, 5 3, 4	3 2	1 2
2. Average Power Range Monitor			
a. Neutron Flux - High, 15%	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~~ deleted	~~1, 2(d)~~	~~2~~	~~7~~

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

ACTIONS

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

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

ACTION 2 - Lock the reactor mode switch in the Shutdown position within one hour.

ACTION 3 - In OPERATIONAL CONDITION 2, be in at least HOT SHUTDOWN within 6 hours.

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

ACTION 4 - Be in at least STARTUP within 2 hours.

ACTION 5 - In OPERATIONAL CONDITION 1 or 2, be in at least HOT SHUTDOWN within 6 hours.

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

ACTION 6 - Be in at least HOT SHUTDOWN within 6 hours.

ACTION 7 - ~~Be in STARTUP with the main steam line isolation valves closed within 2 hours or in at least HOT SHUTDOWN within 6 hours.~~ deleted

ACTION 8 - Initiate a reduction in THERMAL POWER within 15 minutes and be at less than 30% of RATED THERMAL POWER within 2 hours.

ACTION 9 - In OPERATIONAL CONDITION 1 or 2, be in at least HOT SHUTDOWN within 6 hours.

In OPERATIONAL CONDITION 3 or 4, immediately and at least once per 12 hours verify that all control rods are fully inserted.

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

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.

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~~ This function~~s~~ ~~are~~ is 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.

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	R[h]	1
6. ~~Main Steam Line Radiation - High~~ deleted	~~S~~	~~M[i]~~	~~R[j]~~	~~1, 2~~
7. Drywell Pressure - High				
Transmitter:	NA[k]	NA	R[l]	1, 2
Trip Logic:	D	M	M	1, 2
8. Scram Discharge Volume Water Level - High	NA	Q	R	1, 2, 5
9. Turbine Stop Valve - Closure	NA	M	R[h]	1[o]
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low	NA	M	R	1[o]
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

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 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~~. deleted

(j) ~~Calibration using a standard radiation source~~. deleted

(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 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.

TABLE 3.3.2-1

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
1. PRIMARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level -				
1. Low, Level 1	2, 6	2	1, 2, 3	20
	8	2	1, 2, 3	27
2. Low, Level 3	1	2	1, 2, 3	20
b. Drywell Pressure - High	2, 6	2	1, 2, 3	20
c. Main Steam Line				
1. ~~Radiation - High~~ deleted	~~1~~	~~2~~	~~1, 2, 3~~	~~21~~
2. Pressure - Low	1(j)	2	1	[illegible]
3. Flow - High	1(j)	2/line	1	22
4. Flow - High	1(j)	2	2, 3	21
d. Main Steam Line Tunnel Temperature - High	1(j)	2(d)	1, 2, 3	21
e. Condenser Vacuum - Low	1(j)	2	1, 2(e)	21
f. Turbine Building Area Temperature - High	1(j)	4(d)	1, 2, 3	21
g. Main Stack Radiation - High	(h)	1	1, 2, 3	28
h. Reactor Building Exhaust Radiation - High	6	1	1, 2, 3	20

TABLE 3.3.2-2

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
1. PRIMARY CONTAINMENT ISOLATION		
a. Reactor Vessel Water Level -		
1. Low, Level 1	$\geq$ + 162.5 inches(a)	$\geq$ + 162.5 inches(a)
2. Low, Level 3	$\geq$ + 2.5 inches(a)	$\geq$ + 2.5 inches(a)
b. Drywell Pressure - High	$\leq$ 2 psig	$\leq$ 2 psig
c. Main Steam Line		
1. ~~Radiation - High~~ deleted	~~$\leq$ 3 x full power background(c)~~	~~$\leq$ 3.5 x full power background(c)~~
2. Pressure - Low	$\geq$ 825 psig	$\geq$ 825 psig
3. Flow - High	$\leq$ 140% of rated flow	$\leq$ 140% of rated flow
4. Flow - High	$\leq$ 40% of rated flow	$\leq$ 40% of rated flow
d. Main Steam Line Tunnel Temperature - High	$\leq$ 200°F	$\leq$ 200°F
e. Condenser Vacuum - Low	$\geq$ 7 inches Hg vacuum	$\geq$ 7 inches Hg vacuum
f. Turbine Building Area Temperature - High	$\leq$ 200°F	$\leq$ 200°F
g. Main Stack Radiation - High	(b)	(b)
h. Reactor Building Exhaust Radiation - High	$\leq$ 11 mr/hr	$\leq$ 11 mr/hr

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
5. SHUTDOWN COOLING SYSTEM ISOLATION		
a. Reactor Vessel Water Level - Low Level 1	$\geq$ 162.5 inches[(a)]	$\geq$ 162.5 inches[(a)]
b. Reactor Steam Dome Pressure - High	$\leq$ 140 psig	$\leq$ 140 psig

(a) Vessel water levels refer to REFERENCE LEVEL ZERO.

(b) Establish alarm/trip setpoints per the methodology contained in the OFFSITE DOSE CALCULATION MANUAL (ODCM).

(c) The Hydrogen Water Chemistry (HWC) system shall not be placed in service until reactor power reaches 20% of RATED THERMAL POWER. After reaching 20% of RATED THERMAL POWER, the normal full power background radiation level and associated trip setpoints may be increased to compensate for increased radiation levels as a result of full power operation with hydrogen injection. Prior to decreasing power below 20% of RATED THERMAL POWER and after the HWC system has been shut off, the background level and associated setpoint shall be returned to the normal full power values. Control rod motion shall be suspended, when the reactor power is below 20% of RATED THERMAL POWER, until the necessary adjustment is made (except for scram or other emergency action).

(deleted

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
Trip Logic:	D	M	M	1, 2, 3
2. Low, Level 3				
Transmitter:	NA[a]	NA	R[b]	1, 2, 3
Trip Logic	D	M	M	1, 2, 3
b. Drywell Pressure - High				
Transmitter:	NA[a]	NA	R[b]	1, 2, 3
Trip Logic:	D	M	M	1, 2, 3
c. Main Steam Line				
1. ~~Radiation - High~~ deleted	~~D~~	~~W~~	~~R[d]~~	~~1, 2, 3~~
2. Pressure - Low				
Transmitter:	NA[a]	NA	R[b]	1
Trip Logic:	D	M	M	1
3. Flow - High				
Transmitter:	NA[a]	NA	R[b]	1
Trip Logic:	D	M	M	1
4. Flow - High	D	M	M	2, 3
d. Main Steam Line Tunnel Temperature - High	NA	M	R	1, 2, 3
e. Condenser Vacuum - Low				
Transmitter:	NA[a]	NA	R[b]	1, 2[e]
Trip Logic:	D	M	M	1, 2[e]
f. Turbine Building Area Temperature - High	NA	M	R	1, 2, 3
g. Main Stack Radiation - High	NA	Q	R	1, 2, 3
h. Reactor Building Exhaust Radiation - High	D	M	R	1, 2, 3

TABLE 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 channel calibration.

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

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

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

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