ENCLOSURE 2

"Information Only" - Marked-up Technical Specification Pages

Current TS & BWR-STS

3.1 LIMITING CONDITIONS FOR OPERATION

STS 3.3.1
TSUP 3.1.A

REACTOR PROTECTION SYSTEM

Applicability:

Applies to the instrumentation and associated devices which initiates a reactor scram.

Objective:

To assure the operability of the reactor protection system.

Specification:

A. Reactor Protection System

1. The setpoints, minimum number of trip systems, and minimum number of instrument channels that must be operable for each position of the reactor mode switch shall be as given in Table 3.1.1.

STS 3.3.1
TSUP 3.1.A

TSUP 4.1.A.3

The system response times from the opening of the sensor contact up to and including the opening of the trip actuator contacts shall not exceed 50 milliseconds.

2. If during operation, the fuel design limiting ratio for centerline melt (FDLRC) for any fuel assembly exceeds 1.0 when operating above 25% rated thermal power, either:

TSUP 3.11.B

4.1 SURVEILLANCE REQUIREMENTS

REACTOR PROTECTION SYSTEM

Applicability:

Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram.

Objective:

To specify the type and frequency of surveillance to be applied to the protection instrumentation.

Specification:

A. Reactor Protection System

1. Instrumentation systems shall be functionally tested and calibrated as indicated in Tables 4.1.1 and 4.1.2, respectively.

STS 4.3.1
TSUP 4.1.A

TSUP 4.11 (POWER DISTRIBUTION LIMITS SECTION)

2. Daily during reactor power operation above 25% rated thermal power, the core power distribution shall be checked for:

3.1 LIMITING CONDITIONS FOR OPERATION
(Cont'd.)

a. The APRM scram and rod block settings shall be reduced to the values given by the equations in Specifications 2.1.A.1 and 2.1.B. This may be accomplished by increasing APRM gains as described therein.

Tsup 3.11.B

b. The power distribution shall be changed such that the fuel design limiting ratio for centerline melt (FDLRC) for any fuel assembly no longer exceeds 1.0.

3. Two RPS electric power monitoring channels for each inservice RPS MG set or alternate source shall be OPERABLE at all times.

Tsup 3.9.G

4.1 SURVEILLANCE REQUIREMENTS
(Cont'd.)

a. Maximum fuel design limiting ratio for centerline melt (FDLRC).

Tsup 4.11 (Power distribution limits section)

b. Deleted

3. The RPS power monitoring system instrumentation shall be determined OPERABLE:

a. By performance of a CHANNEL FUNCTIONAL TEST each time the unit is in COLD SHUTDOWN for a period of more than 24 hours, unless performed in the previous 6 months.

Tsup 4.9.G

3.1 LIMITING CONDITIONS FOR OPERATION (Cont'd.)

4.1 SURVEILLANCE REQUIREMENTS (Cont'd.)

TSup 4.9.G

b. At least once per operating cycle by demonstrating the OPERABILITY of overvoltage, undervoltage, and underfrequency protective instrumentation by performance of a CHANNEL CALIBRATION including simulated automatic actuation of the protective relays, tripping logic, and output circuit breakers, and verifying the following setpoints:

Surveillance Requirements:
Reactor Protection Buses

(1) Overvoltage
126.5V ± 2.5%
Min. 123.3V
Max. 129.6V

(2) Undervoltage
108V ± 2.5%
Min. 105.3V
Max. 110.7V

(3) Underfrequency
56.0 Hz ± 1% of 60 H
Min. 55.4 Hz
Max. 56.6 Hz

TSup 3.9.G

4. With one RPS electric power monitoring channel for an inservice RPS MG set or alternate power supply inoperable, restore the inoperable channel to OPERABLE

3.1 LIMITING CONDITIONS FOR OPERATION (Cont'd.)

4.1 SURVEILLANCE REQUIREMENTS (Cont'd.)

status within 72 hours or remove the associated RPS MG set or alternate power supply from service.

5. With both RPS electric power monitoring channels for an inservice RPS MG set or alternate power supply inoperable, restore at least one to OPERABLE status within 30 minutes or remove the associated RPS MG set or alternate power supply from service.

TSUP 3.9.G

FOR IMPLEMENTATION ONLY

TABLE 3.1.1

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION REQUIREMENTS

Minimum Number Operable Inst. Channels per Trip (1) System	Trip Function	Trip Level Setting	Modes in Which Function Must be Operable: Refuel (6)	Startup/Hot Standby	Run	Action*
1	Mode Switch in Shutdown		X	X	X	A
1	Manual Scram		X	X	X	A
3	IRM High Flux	(LT/E) 120/125 of Full Scale	X	X	N/A	A
3	Inoperative		X	X	N/A	A
2	APRM High Flux	Specification 2.1.A.1	X	X(8)	X	A or B
2	Inoperative***		X	X(8)	X	A or B
2	High Flux (15% Scram)	Specification 2.1.A.2	X	X	N/A	A
2	High Reactor Pressure	(LT/E) 1060 psig	X(10)	X	X	A
2	High Drywell Pressure	(LT/E) 2 psig	X(7), X(9)	X(7), (9)	X(9)	A
2	Reactor Low Water Level	(GT/E) 1 inch*** Deleted	X	X	X	A
2 (Per Bank)	High Water Level in Scram Discharge Volume (Thermal and dP Switch)	(LT/E) 40 inches above bottom of the Instrument Volume	X(2) TSUP 3.1.A-1 note (j)	X STS 3.3.1-1 note (b) TSUP 3.1.A-1 note (b)	X	A or D
2	Turbine Condenser Low Vacuum TSUP 3.1.A-1.13	(GT/E) 23 in. Hg Vacuum	X(3)	X(3)	X	A or C
2	Main Steam Line High Radiation	(LT/E) 3 X Normal Full Power Background	X	X	X(11)	A or C
4(5) Deleted	Main Steam Line Isolation Valve Closure	(LT/E) 10% Valve Closure	X(3)	X(3)	X	A or C
2	Generator Load Rejection, turbine control valve trip system oil pressure low	(GT/E) 460 psig*** Deleted	X(4) STS 3.3.1-1 note (j) TSUP 3.1.A-1 note (d)	X(4)	X(4)	A or C
2	Turbine Stop Valve Closure	(LT/E) 10% Valve Closure	X(4)	X(4)	X(4)	A or C
2	Turbine Control - Loss of Control Oil Pressure	(GT/E) 900 psig	X(4)	X(4)	X(4)	A or C

DELETED

Notes: (LT/E) = Less than or equal to.
(GT/E) = Greater than or equal to.
(Notes continue on next two pages)

TSUP 3.1.A-1 note (j)

Deleted, incorporated into TSUP 3.1.A Action a; STS 3.3.1 Action b.

NOTES: (For Table 3.1.1)

1. There shall be two operable or tripped trip systems for each function.
2. Permissible to bypass, with control rod block, for reactor protection system reset in refuel and shutdown positions of the reactor mode switch.

STS 3.3.1-1 note (b)
TSUP 3.1.A-1 note (a)

3. Permissible to bypass when reactor pressure less than 600 psig.

STS 3.3.1-1 note (j)
TSUP 3.1.A-1 note (i)

4. Permissible to bypass when first stage turbine pressure less than that which corresponds to 45% rated steam flow.
5. The design permits closure of any one valve without a scram being initiated.

Deleted

6. When the reactor is subcritical and the reactor water temperature is less than 212°F, only the following trip functions need to be operable:

   a. Mode Switch in Shutdown
   b. Manual Scram
   c. High Flux IRM
   d. Scram Discharge Volume High Level

Deleted

STS 3.3.1-1 note (h)
TSUP 3.1.A-1 note (h)

7. Not required to be operable when primary containment integrity is not required.
8. Not required while performing low power physics tests at atmospheric pressure during or after refueling at power levels not to exceed 5 MW(t).

Deleted

9. May be bypassed when necessary during purging for containment inerting or deinerting.

Deleted

10. Not required to be operable when the reactor pressure vessel head is not bolted to the vessel.
11. Due to addition of hydrogen to the primary coolant, the Main Steam Line Radiation monitor setting will be less than or equal to 3 times full power background without hydrogen addition for all conditions except for greater than 20% power with hydrogen being injected during which the Main Steam Line Radiatjon trip setting will be less than or equal to 3 times full power background with hydrogen addition.

STS 3.3.1-1 note (f)
TSUP 3.1.A-1 note (c)

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(Cont'd. next page)

NOTES: (For Table 3.1.1 Cont'd)

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Required changes in Main Steam Line Radiation Monitor trip setting will be made within 24 hrs. except during controlled power descensions at which time the setpoint change will be made prior to going below 20% power. If due to a recirculation pump trip or other unanticipated power reduction event the reactor is below 20% power without the setpoint change, control rod motion will be suspended until the necessary trip setpoint adjustment is made.

STS 3.3.1 Action a. TSUP 3.1.A Action 1

* If the first column cannot be met for one of the trip systems, that trip system shall be tripped.

STS 3.3.1 Action b. TSUP 3.1.A Action 2.

If the first column cannot be met for both trip systems, the appropriate actions listed below shall be taken:

STS 3.3.1-1 Action 2 TSUP 3.1.A-1 Action 12

a. Initiate insertion of operable rods and complete insertion of all operable rods within 4 hours.

TSUP 3.1.A-1 Action 14 STS 3.3.1-1 Action 4

b. Reduce power level to IRM range and place mode switch in the Startup/Hot Standby position within 8 hours.

c. Reduce turbine load and close main steam line isolation valves within 5 hours.

STS 3.3.1-1 Action 5 TSUP 3.1.A-1 Action 15

STS 3.3.1-1 Action 3 TSUP 3.1.A-1 Action 13

d. In the refuel mode, when any control rod is withdrawn, suspend all operations involving core alterations and insert all insertable control rods within one hour.

** An APRM will be considered inoperable if there are less than 2 LPRM inputs per level or there are less than 50% of the normal complement of LPRM's to an APRM.

*** 1 inch on the water level instrumentation is greater than or equal to 504" above vessel zero (see Bases 3.2). Deleted

**** Trip is indicative of turbine control valve fast closure (due to low EHC fluid pressure) as a result of fast acting solenoid valve actuation. Deleted

STS 3.3.1-1 note (e) TSUP 3.1.A-1 note (e)

TABLE 4.1.1

SCRAM INSTRUMENTATION FUNCTIONAL TESTS

MINIMUM FUNCTIONAL TEST FREQUENCIES FOR SAFETY INSTR. AND CONTROL CIRCUITS

Instrument Channel	Group (3)	Functional Test	Minimum Frequency (4)
Mode Switch in Shutdown	A	Place Mode Switch in Shutdown	Each Refueling Outage
Manual Scram	A	Trip Channel and Alarm	Every 3 Months
IRM			
* High Flux	C	Trip Channel and Alarm (5)	Before Each Startup (6)
* Inoperative	C	Trip Channel and Alarm	Before Each Startup (6)
APRM			
High Flux	B	Trip Output Relays (5)	Once Each Week
Inoperative	B	Trip Output Relays	Once Each Week
High Flux (15% scram)	B	Trip Output Relays	Before Each Startup
High Reactor Pressure	A	Trip Channel and Alarm	(1)
High Drywell Pressure	A	Trip Channel and Alarm	(1)
Reactor Low Water Level (2)	B	(8)	(1)
High Water Level in Scram Discharge Volumes (Thermal and dp Switch)	A	Trip Channel and Alarm (7)	Every 3 Months
Turbine Condenser Low Vacuum	A	Trip Channel and Alarm	(1)
Main Steam Line High Radiation (2)	B	Trip Channel and Alarm (5)	Once Each Week
Main Steam Line Isolation Valve Closure	A	Trip Channel and Alarm	(1)
Generator Load Rejection	A	Trip Channel and Alarm	(1)
Turbine Stop Valve Closure	A	Trip Channel and Alarm	(1)
Turbine Control - Loss of Control Oil Pressure	A	Trip Channel and Alarm	(1)

Notes: (See next page.)

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FOR INFORMATION ONLY

NOTES: (For Table 4.1.1)

1. Initially once per month until exposure hours (M as defined on Figure 4.1.1) is 2.0×10^5; thereafter, according to Figure 4.1.1 with an interval not less than one month nor more than three months. The compilation of instrument failure rate data may include data obtained from other Boiling Water Reactors for which the same design instrument operates in an environment similar to that of Dresden Unit 2.
2. An instrument check shall be performed on low reactor water level once per day and on high steam line radiation once per shift.
3. A description of the three groups is included in the Bases of this Specification.
4. Functional tests are not required when the systems are not required to be operable or are tripped. If tests are missed, they shall be performed prior to returning the systems to an operable status.
5. This instrumentation is exempted from the Instrument Functional Test Definition (1.0.G). This Instrument Function Test will consist of injecting a simulated electrical signal into the measurement channels.
6. If reactor start-ups occur more frequently than once per week, the functional test need not be performed; i.e., the maximum functional test frequency shall be once per week.
7. Only the electronics portion of the thermal switches will be tested using an electronic calibrator during the three month test. A water column or equivalent will be used to test the dp switches.
8. A functional test of the master and slave trip unit is required monthly (staggered one channel out of 4 every week). A calibration of the trip unit is to be performed concurrent with the functional testing.

STS 4.0.1
TSUP 4.0.A

TSUP 4.1.A-1
Item 4, note (h)

STS 4.3.1.1-1 column 2
ITEMS .4 & .6

TSUP 4.1.A-1 column 3
Items .4 & .6

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STS 4.3.1.1-1 col. 4
TSUP 4.1.A-1 col. 5

FOR INFORMATION ONLY

TABLE 4.1.2
SCRAM INSTRUMENTATION CALIBRATIONS
MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

Instrument Channel	Group (1)	Calibration Test	Minimum Frequency (2)
Deleted * High Flux IRM	C	Comparison to APRM after Heat Balance	Every Shutdown (4)
High Flux APRM Output Signal	B	Heat Balance	Once Every 7 Days
Flow Bias	B	~~Standard Pressure~~ and Voltage Source	Refueling Outage
High Reactor Pressure	A	Standard Pressure Source	Every 3 Months
High Drywell Pressure	A	Standard Pressure Source	Every 3 Months
Reactor Low Water Level	B	Water Level	(5) TSUP 4.1.A-1 note (h)
Turbine Condenser Low Vacuum	A	Standard Vacuum Source	Every 3 Months
Main Steam Line High Radiation	B	Standard Current Source (3)	Every 3 Months
Turbine Control - Loss of Control Oil Pressure	A	Pressure Source	Every 3 Months
High Water Level in Scram Discharge Volume (dp only)	A	Water Level	Once per Refueling Outage
Generator Load Rejection	A	Pressure Source	Once per Refueling Outage

STS 4.3.1.1-1.1.a
TSUP 4.1.A-1.1.a
STS -.2
TSUP -.2
STS -.2.b
TSUP -.2.b
see marked-up STS Table 4.1.1

Deleted
Delete

NOTES: (For Table 4.1.2)

1. A description of the three groups is included in the bases of this Specification.

STS 4.3.1.1-1 column 5
TSUP 4.1.A-1 column 2

2. Calibration tests are not required when the systems are not required to be operable or are tripped. If tests are missed, they shall be performed prior to returning the systems to an operable status.

3. The current source provides an instrument channel alignment. Calibration using a radiation source shall be made during each refueling outage.

*4. If reactor startups occur more frequently than once per week, the functional test need not be performed; i.e., the maximum functional test frequency shall be once per week.

5. Trip units are calibrated monthly concurrently with functional testing (staggered one channel out of 4 every week). Transmitters are calibrated once per operating cycle.

TSUP 4.1.A-1 Item 4 note (h)

STS 4.3.1.1-1 note (c)
TSUP 4.1.A-1 note (c)

TSUP Table 4.1.A-1 item 6.
STS Table 4.3.1.1-1 item 6

Deleted

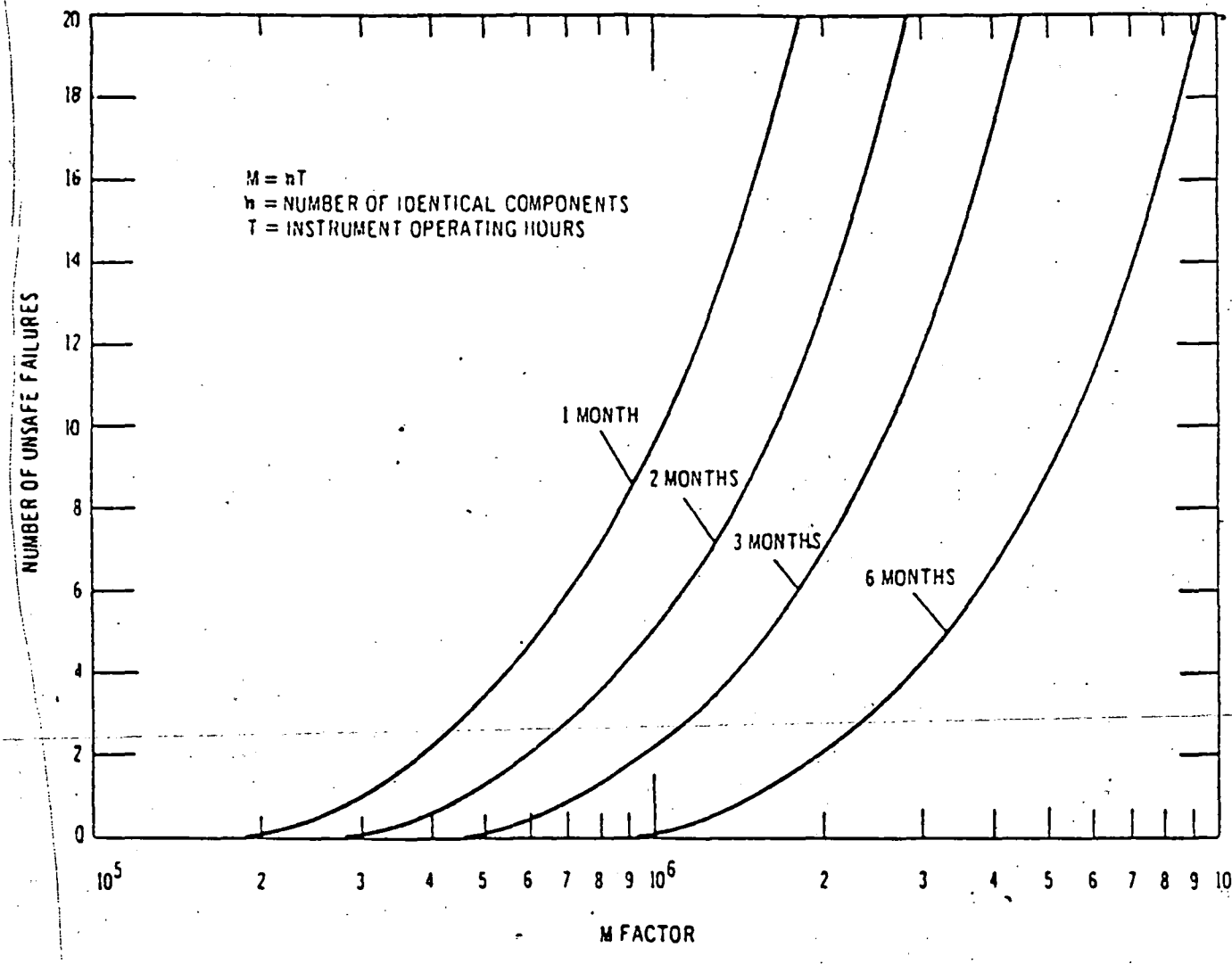

Figure 4.1.1
Graphical Aid in the Selection of an Adequate Interval Between Tests

STS 3.3.1
TSUP 3.1.A

3.1/4.1 REACTOR PROTECTION SYSTEM

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
Applicability: Applies to instrumentation and associated devices which initiate a reactor scram.	Applicability: Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram.
Objective: To assure the operability of the reactor protection system.	Objective: To specify the type and frequency of surveillance to be applied to the protection instrumentation.

STS 3.3.1
TSUP 3.1.A

STS 4.3.1
TSUP 4.1.A

SPECIFICATIONS	
A. The setpoints, minimum number of trip systems, and minimum number of instrument channels that must be operable for each position of the reactor mode switch shall be as given in Tables 3.1-1 through 3.1-4.	A. Instrumentation systems shall be functionally tested and calibrated as indicated in Tables 4.1-1 and 4.1-2 respectively.
TSUP 4.1.A.3 → The system response times from the opening of the sensor contact up to and including the opening of the trip actuator contacts shall not exceed 50 milliseconds.	
B. If, during operation, the maximum fraction of limiting power density exceeds the fraction of rated power when operating above 25% rated thermal power, either:	B. Daily during reactor power operation, the core power distribution shall be checked for maximum fraction of limiting power density (MFLPD) and compared with the fraction of rated power (FRP) when operating above 25% rated thermal power.
TSUP 3.11.B → 1. The APRM scram and rod block settings shall be reduced to the values given by the equations in Specification 2.1.A.1 and 2.1.B. This may also be accomplished by increasing the APRM gain as described therein.	TSUP 4.11 (Power Distribution Limits Section)

TSUP 3.11.B

2. The power distribution shall be changed such that the maximum fraction of limiting power density no longer exceeds the fraction of rated power.

STS 3.3.1 ACTION 1
TSUP 3.1.A ACTION 1

C. When it is determined that a channel is failed in the unsafe condition and Column 1 of Tables 3.1-1 through 3.1-3 cannot be met, that trip system must be put in the tripped condition immediately. ~~All other RPS channels that monitor the same variable shall be functionally tested within 8 hours.~~ The trip system with the failed channel may be untripped for a period of time not to exceed 1 hour to conduct this testing. As long as the trip system with the failed channel contains at least one operable channel monitoring that same variable, that trip system may be placed in the untripped position for short periods of time to allow functional testing of all RPS instrument channels as specified by Table 4.1-1. The trip system may be in the untripped position for no more than 8 hours per functional test period for this testing.

Deleted

STS TABLE 3.3.1-1 NOTE (a)
TSUP TABLE 3.1.A-1 NOTE (a)

Deleted; incorporated into: STS 3.3.1 Action b, TSUP 3.1.A Action a

STS 3.3.1-1 column 2
TSUP 3.1.A-1 column 2

QUAD-CITIES
DPR-29

TABLE 3.1-1

STS 3.3.1 Action a.
TSUP 3.1.A Action 1

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION REQUIREMENTS REFUEL MODE

STS TABLE 3.3.1-1 ITEM 11
TSUP TABLE 3.1.A-1 Item 13

STS 3.3.1 Action b
STS 3.3.1-1 Action 3
TSUP 3.1.A Action 2
TSUP 3.1.A-1 Action 13

Minimum Number of Operable or Tripped Instrument Channels per Trip System [1]	Trip Function	Trip Level Setting	Action [2]
1	Mode switch in shutdown		A
1	Manual scram		A
3	IRM High Flux	≤ 120/125 of full scale	A
3	Inoperative		A
2	APRM [3] High Flux (15% scram)	Specification 2.1.A.2	A
2	Inoperative		A
2 (per bank)	High water level in scram discharge volume [4]	≤ 40 gallons per bank	A
2	High reactor pressure	≤ 1060 psig	A
2	High drywell pressure [5]	≤ 2.5 psig	A
2	Reactor low water level	≥ 8 inches [8] deleted	A
2	Turbine condenser low vacuum [7]	≥ 21 inches Hg vacuum	A
2	Main steamline high radiation [12]	≤ 15 X normal full power background (without hydrogen addition)	A
4	Main steamline isolation valve closure [7]	≤ 10% valve closure	A

STS TABLE 3.3.1-1.12
TSUP TABLE 3.1.A-1.14

STS TABLE 3.3.1-1.1.a
TSUP TABLE 3.1.A-1.1.a

STS TABLE 3.3.1-1.1.b
TSUP TABLE 3.1.A-1.1.b

STS 3.3.1-1 note (e)
TSUP 3.1.A-1 note (e)

STS TABLE 3.3.1-1.2.a
TSUP TABLE 3.1.A-1.2.a

STS TABLE 3.3.1-1.2.d
TSUP TABLE 3.1.A-1.2.d

STS TABLE 3.3.1-1.8
TSUP TABLE 3.1.A-1.8

STS 3.3.1-1 note (b)
TSUP 3.1.A-1 note (b)

STS TABLE 3.3.1-1.3
TSUP TABLE 3.1.A-1.3

STS 3.3.1-1.7
TSUP 3.1.A-1.7

STS 3.3.1-1 note (h)
TSUP 3.1.A-1 note (h)

STS 3.3.1-1.4
TSUP 3.1.A-1.4

TSUP 3.1.A-1.12

TSUP 3.1.A-1 note (j)

STS 3.3.1-1.6
TSUP 3.1.A-1.6

DELETED

STS 3.3.1-1.5
TSUP 3.1.A-1.5

TSUP TABLE 2.2.A-1

STS TABLE 2.2.1-1

NOTE; DELETED FOR Refuel MODE

FOR INFORMATION ONLY

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DPR-29

STS 3.3.1-1 column 2
TSUP 3.1.A-1 column 2

TABLE 3.1-2

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION REQUIREMENTS STARTUP/HOT STANDBY MODE

Minimum Number of Operable or Tripped Instrument Channels per Trip System[1]	Trip Function	Trip Level Setting	Action[2]
1	Mode switch in shutdown		A
1	Manual scram		A
	IRM		
3	High Flux	≤ 120/125 of full scale	A
3	Inoperative		A
	APRM[3]		
2	High Flux (15% scram)	Specification 2.1.A.2	A
2	Inoperative		A
2	High-reactor pressure	≤ 1060 psig	A
2	High drywell pressure [5]	≤ 2.5 psig	A
2	Reactor low water level	≥ 8 inches[8] delered	A
2 (per bank)	High water level in scram discharge volume[4]	≤ 40 gallons per bank	A
2	Turbine condenser low vacuum [7]	≥ 21 inches Hg vacuum	A
2	Main steamline high radiation [12]	≤ 15 X normal full power background (without hydrogen addition)	A
4	Main steamline isolation valve closure [7]	≤ 10% valve closure	A

SEE MARKED-UP: CTS TABLE 3.1-1
Deviations from marked-up CTS Table 3.1-1 noted where applicable

TSUP TABLE 2.2.A-1
STS TABLE 2.2.1-1

STS 3.3.1-1 column 2
TSUP 3.1.A-1 column 2

TABLE 3.1-3

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION REQUIREMENTS RUN MODE

STS 3.3.1-1 ACTION 4
TSUP 3.1.A-1 ACTION 14

Minimum Number of Operable or Tripped Instrument Channels per Trip System [1]	Trip Function	Trip Level Setting	Action [2]
1	Mode switch in shutdown		A
1	Manual scram		A
	APRM[3]		
2	High Flux (flow biased)	Specification 2.1.A.1	A or B
2	Inoperative		A or B
2	Downscale [11] (DELETED)	≥ 3/125 of full scale	A or B
2	High-reactor pressure	≤ 1060 psig	A
2	High drywell pressure	≤ 2.5 psig	A
2	Reactor low water level	≥ 8 inches [8] deleted	A
2 (per bank)	High-water level in scram discharge volume	≤ 40 gallons per bank	A
2	Turbine condenser low vacuum	≥ 21 inches Hg vacuum	A or C
2	Main Steamline high radiation [12]	≤ 15 X normal full power power background (without hydrogen addition)	A or C
	STS 3.3.1-1 note (j) TSUP 3.1.A-1 note (d) deleted		
4	Main steamline isolation valve closure [6]	≤ 10% valve closure	A or C
2	Turbine control valve fast closure, valve trip system oil pressure low [9]	≥ 460 psig [10] deleted	A or C
2	Turbine stop valve closure [9]	≤ 10% valve closure	A or C
2	Turbine EHC control fluid low pressure [9]	≥ 900 psig	A or C

STS 3.3.1-1, 2.b
TSUP 3.1.A-1.2.b

TSUP 3.1.A-1.11

TSUP 3.1.A-1.9
STS 3.3.1-1.9

TSUP 3.1.A-1.10
STS 3.3.1-1.10

SEE MARKED-UP: CTS TABLE 3.1-1; deviations from marked-up 3.1-1 noted where applicable.

STS TABLE 2.2.1-1
TSUP TABLE 2.2.A-1

STS 3.3.1-1 ACTION 5
TSUP 3.1.A ACTION 15

Deleted; incorporated into: STS 3.3.1 Action b; TSUP 3.1.A. Action 2

TABLE 3.1-4

NOTES FOR TABLES 3.1-1, 3.1-2, AND 3.1-3

[1] There shall be two operable trip systems or one operable and one tripped system for each function.

STS 3.3.1 Action a. TSUP 3.1.A Action 1

[2] If the first column cannot be met for one of the trip systems, that trip system shall be tripped. If the first column cannot be met for both trip systems, the appropriate actions listed below shall be taken:

STS 3.3.1, Action b; STS TABLE 3.3.1-1 Action 2; TSUP 3.1.A, Action 2; TSUP Table 3.1.A-1 Action 12

A. Initiate insertion of operable rods and complete insertion of all operable rods within 4 hours.

B. Reduce power level to IRM range and place mode switch in the Startup/Hot Standby position within 8 hours. STS Action 4; TSUP Action 14

STS Action 5 TSUP Action 15

C. Reduce turbine load and close main steamline isolation valves within 8 hours.

[3] An APRM will be considered inoperable if there are fewer than 2 LPRM inputs per level or there are less than 50% of the normal complement of LPRM's to an APRM. STS TABLE 3.3.1-1 note(e); TSUP TABLE 3.1.A-1 note (e)

[4] Permissible to bypass, with control rod block for reactor protection system reset in refuel and shutdown positions of the reactor mode switch. STS 3.3.1-1 Note (b); TSUP 3.1.A-1 note (b).

STS 3.3.1-1 Note (h); TSUP 3.1.A-1 note (h)

[5] Not required to be operable when primary containment integrity is not required.

[6] The design permits closure of any one line without a scram being initiated. DELETED

[7] Automatically bypassed when reactor pressure is < 1060 psig. ENCORP TSUP 3.1.A-1, 12

[8] The +8-inch trip point is the water level as measured by the instrumentation outside the shroud. The water level inside the shroud will decrease as power is increased to 100% in comparison to the level outside the shroud to a maximum of 7 inches. This is due to the pressure drop across the steam dryer. Therefore, at 100% power, an indication of +8 inch water level will actually be +1 inch inside the shroud. 1 inch on the water level instrumentation is ≥ 504" above vessel zero. (See Bases 3.2).

DELETED

STS Table 3.3.1-1 Note (j) TSUP Table 3.1.A-1 Note(d)

[9] Permissible to bypass when first stage turbine pressure is less than that which corresponds to 45% rated steam flow. (< 400 psi)

[10] Trip is indicative of turbine control valve fast closure (due to low EHC fluid pressure) as a result of fast acting valve actuation. Deleted

[11] The APRM downscale trip function is automatically bypassed when the IRM instrumentation is operable and not high. DELETED

[12] Channel shared by the reactor protection and containment isolation system

TSUP 4.1.A.2
STS 4.3.1.2

STS 4.3.1.1-1 column 3
TSUP 4.1.A-1 column 4

TABLE 4.1-1
SCRAM INSTRUMENTATION AND LOGIC SYSTEMS FUNCTIONAL TESTS
MINIMUM FUNCTIONAL TEST FREQUENCIES FOR SAFETY INSTRUMENTATION, LOGIC SYSTEMS, AND CONTROL CIRCUITS

STS 4.3.1.1-1.11
TSUP 4.1.A-1.13

deleted [4]

Instrument Channel	Group [3]	Functional Test [7]	Minimum Frequency
Mode switch in shutdown	A	Place mode switch in shutdown	Each refueling outage
Manual scram (STS 4.3.1.1-1.12, TSUP 4.1.A-1.14)	A	Trip channel and alarm	Every 3 months
IRM			
High flux (STS 4.3.1.1-1.1.a, TSUP 4.1.A-1.1.a)	C	Trip channel and alarm [5]	Before each startup and weekly during refueling [6] Deleted
Inoperative (STS 4.3.1.1-1.1.b, TSUP 4.1.A-1.1.b)	C	Trip channel and alarm	Before each startup and weekly during refueling [6]
APRM (STS 4.3.1.1-1.2.a, TSUP 4.1.A-1.2.a)			
High flux	B	Trip output relays [5]	Once each week
Inoperative (STS .2.d, TSUP .2.d)	B	Trip output relays	Once each week
Deleted → Downscale	B	Trip output relays [5]	Once each week
High flux 15% (STS .2.a, TSUP .2.a)	C	Trip output relays [5]	Before each startup and weekly during refueling [6]
STS 4.3.1.1-1.3, TSUP 4.1.A-1.3 → High reactor pressure	A	Trip channel and alarm	[1]
STS .7, TSUP .7 → High drywell pressure	A	Trip channel and alarm	[1]
STS .4, TSUP .4 → Reactor low water level [2] (STS 4.3.1.1-1 Col 3,4/6, TSUP 4.1.A-1 Col 3.4/6)	B	[8]	[1] Deleted
STS .8, TSUP .8 → High water level in scram [9] discharge volume (thermal and dp switches) Deleted	A	Trip channel and alarm	Every 3 months
TSUP .12 → Turbine condenser low vacuum	A	Trip channel and alarm	[1]
STS .6, TSUP .6 → Main steamline high radiation [2]	B	Trip channel and alarm [5]	Once each week
STS .5, TSUP .5 → Main steamline isolation valve closure	A	Trip channel and alarm	[1]
TSUP .11 → Turbine control valve fast closure	A	Trip channel and alarm	[1]
STS .9, TSUP .9 → Turbine stop valve closure	A	Trip channel and alarm	[1]
Turbine EHC control fluid low pressure (STS .10, TSUP .10)	A	Trip channel and alarm	[1]

Deleted

Deleted

STS 4.3.1.1-1 column 3
TSUP 4.1.A-1 column 4

FOR INFORMATION ONLY.

TABLE 4.1-1 (Cont'd)

Notes:

Deleted

[1] Initially once per month until exposure hours (M as defined on Figure 4.1-1) are 2.0 X $10^{}$, thereafter, according to Figure 4.1-1 with an interval not less than 1 month nor more than 3 months. The compilation of instrument failure rate data may include data obtained from other boiling water reactors for which the same design instrument operates in an environment similar to that of Quad-Cities Units 1 and 2.

[2] An instrument check shall be performed on low reactor water level once per day and on high steamline radiation once per shift.

DELETED

[3] A description of the three groups is included in the bases of this specification.

[4] Functional tests are not required when the systems are not required to be operable or are tripped. If tests are missed, they shall be performed prior to returning the systems to an operable status.

STS 4.0.1 TSUP 4.0.A

[5] This instrumentation is exempted from the instrument functional test definition (1.0 Definition F). This instrument functional test will consist of injecting a simulated electrical signal into the measurement channels.

[6] Frequency need not exceed weekly.

[7] A functional test of the logic of each channel is performed as indicated. This coupled with placing the mode switch in shutdown each refueling outage constitutes a logic system functional test of the scram system.

Deleted

[8] A functional test of the master and slave trip units is required monthly. A calibration of the trip unit is to be performed concurrent with the functional testing.

[9] Only the electronics portion of the thermal switches will be tested using an electronic calibrator during the three month test. A water column or equivalent will be used to test the dp switches.

Deleted

STS 4.3.1.1-1 column 2 items .4 and .6
TSUP 4.1.A-1 column 3 Items .4 and .6

TSUP 4.1.A-1 Item 4 note (h)

STS 4.3.1.1-1 column 4
TSUP 4.1.A-1 column 5

TABLE 4.1-2

SCRAM INSTRUMENT CALIBRATION

MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

Instrument Channel	Group [1]	Calibration Standard [5]	Minimum Frequency [2]
High flux IRM (STS 4.3.1.1-1.1.a TSUP 4.1.A-1.1.a)	C	Comparison to APRM after heat balance	Every controlled shutdown [4] e (Deleted)
High flux APRM Output signal (STS -.2.c TSUP -.1.c)	B	Heat balance	Once every 7 days
Flow bias (STS -.2.b TSUP -.2.b)	B	Standard pressure and voltage source	Refueling outage
LPRM (STS 4.3.1.1-1 note(F) TSUP 4.1.A-1 note (f))	B[6]	Using TIP system	Every 1000 equivalent full power hours
High reactor pressure	A	Standard pressure source	Every 3 months
High drywell pressure	A	Standard pressure source	Every 3 months
Reactor low water level	B	Water level	[7] (TSUP 4.1.A-1 note h)
Turbine condenser low vacuum	A	Standard vacuum source	Every 3 months
Main steamline high radiation (See MARKED-UP CTS TABLE 4.1-1)	B	Appropriate radiation source [3]	Refueling outage
Turbine EHC control fluid low pressure	A	Pressure source	Every 3 months
Turbine control valve fast closure	A	Pressure source	Refueling outage
Highwater level in scram discharge volume (dp only)	A	Water level e (Deleted)	Refueling outage

(Deleted)

Notes:

[1] A description of the three groups is included in the bases of this specification.

[2] Calibration tests are not required when the systems are not required to be operable or are tripped. If tests are missed, they shall be performed prior to returning the systems to an operable status. (STS 4.3.1.1 NOTE(c) TSUP 4.1.A-1 NOTE c)

(TSUP TABLE 4.1.A-1, column 2 STS Table 4.3.1.1-1, column 5)

[3] A current source provides an instrument channel alignment every 3 months.

[4] Maximum calibration frequency need not exceed once per week. (TSUP TABLE 4.1.A-1 ITEM 6 STS TABLE 4.3.1.1-1 ITEM 6)

[5] Response time is not part of the routine instrument check and calibration but will be checked every refueling outage.

[6] ~~Does not provide scram function.~~ e (STS 4.3.1.3 TSUP 4.1.A.3)

[7] Trip units are calibrated monthly concurrently with functional testing. Transmitters are calibrated once per operating cycle. (TSUP 4.1.A-1 ITEM 1 NOTE h)

Deleted

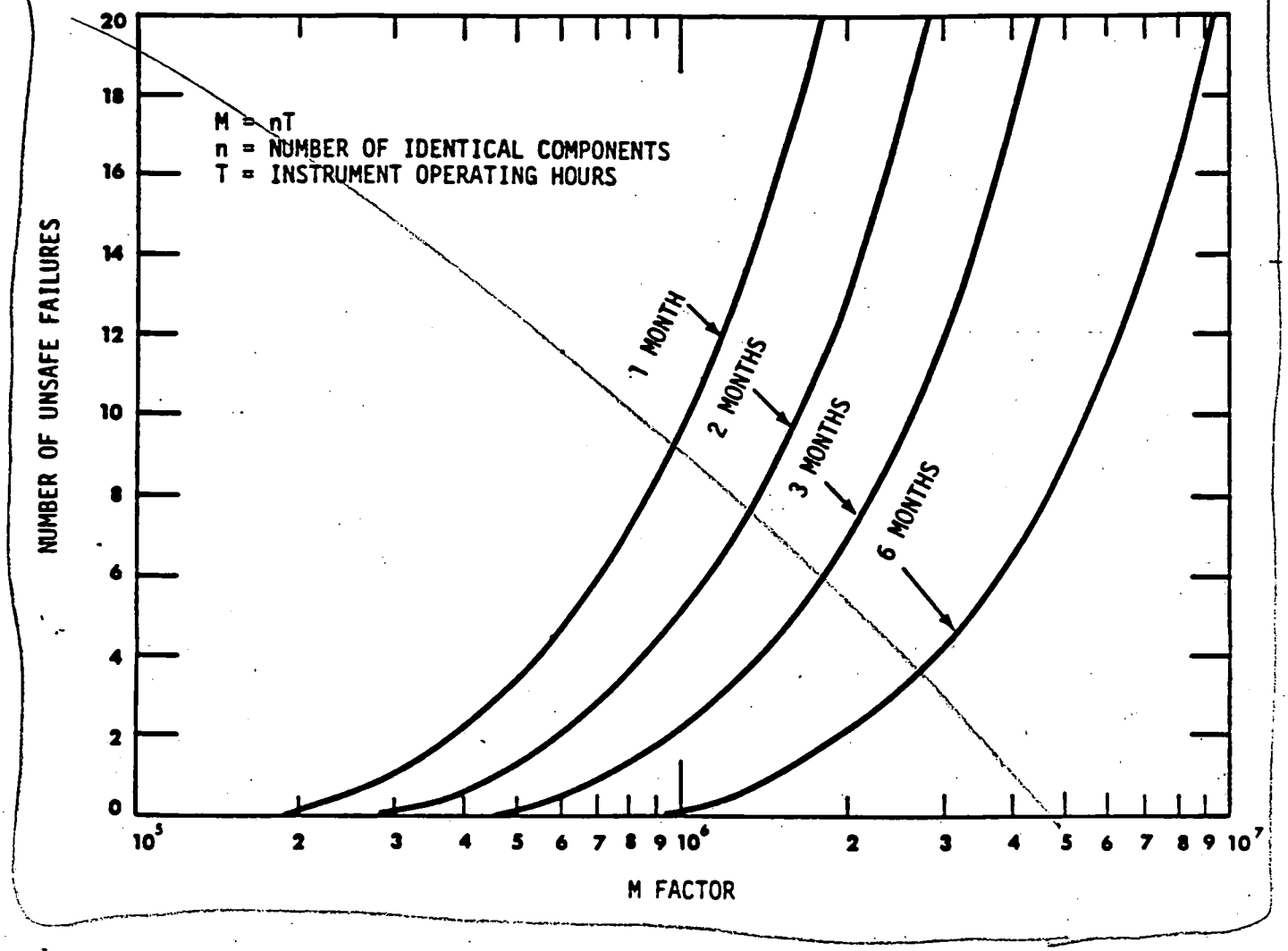

FIGURE 4.1-1

GRAPHICAL AID IN THE SELECTION OF AN ADEQUATE INTERVAL BETWEEN TESTS

Amendment No. 114

FOR INFORMATION ONLY

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

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

APPLICABILITY: As shown in Table 3.3.1-1.

ACTION:

a. With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system, place the inoperable channel(s) and/or that trip system in the tripped condition within one hour. The provisions of Specification 3.0.4 are not applicable.

b. With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement for both trip systems, place at least one trip system in the tripped condition within one hour and take the ACTION required by Table 3.3.1-1.

SURVEILLANCE REQUIREMENTS

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

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

4.3.1.3 The REACTOR PROTECTION SYSTEM RESPONSE TIME of each reactor trip functional unit shown in Table 3.3.1-2 shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one channel per trip system such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip system.

a. 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.

b. 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.

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

The system response time for each trip function from the opening of the sensor contact up to and including the opening of the trip actuator shall not exceed 50 milliseconds.

GE-STS (BWR/4)

3.1.A-1

TABLE 3.3.1-1

FOR INFORMATION ONLY

REACTOR PROTECTION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	APPLICABLE OPERATIONAL CONDITIONS (MODE(s))	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM (a)	ACTION
1. Intermediate Range Monitors (b):			
a. Neutron Flux - High	2	3	1, 11
	3, 4	2	2, 12
	5(c)	3(d)	3, 13
b. Inoperative	2	3	1, 11
	3, 4	2	2, 12
	5	3(d)	3, 13
2. Average Power Range Monitor (e):			
a. Neutron Flux - Upscale (High), Setdown	2	2	1, 11
	3	2	2, 12
	5(c)	2(d)	3, 13
b. Flow Biased Simulated Thermal Power - Upscale	1	2	4, 14
c. Fixed Neutron Flux - Upscale (High)	1	2	4
d. Inoperative	1, 2	2	1, 11
	3	2	2, 12
	5(c) (g)	2(d)	3, 13
(e. Downscale	1(g)	2	4)
3. Reactor Vessel Steam Dome Pressure - High	1, 2(f)	2	1, 11
4. Reactor Vessel Water Level - Low Level 3	1, 2	2	1, 11
5. Main Steam Line Isolation Valve - Closure	1(g), 2(j) Dresden only	4	4, 10 DRESDEN; 14 QUAD CITIES

3/4 3-2

Neutron Flux-High

a. [illegible] switch, and	1, 2 5 (b,i)	2 2	13
b. Thermal switch	1, 2 5 (b,i)	2 2	11 13

FOR INFORMATION ONLY

3.1.A-1

TABLE 3.3.1-1 (Continued) Table 3.3.1.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION

GE-STS (BWR/4)

FUNCTIONAL UNIT	APPLICABLE OPERATIONAL CONDITIONS	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM (a)	ACTION
6. Main Steam Line Radiation - High	1, 2 (1) 7	2 4	CONDITION F 5 15
7. (Primary Containment) (Drywell) Pressure - High	1, 2 (h) 7	2	G 1 11
8. Scram Discharge Volume Water Level - High	1, 2 5 (i) 8	2 2	G 1 H 3
9. Turbine Stop Valve - Closure	1 (j) 9	4 (k) 10	D 6 4 16
11 ~~10~~. Turbine Control Valve Fast Closure, Valve Trip System Oil Pressure - Low	d 1 (j) 1 d 6	2 (k) 10	D 6
13 11. Reactor Mode Switch Shutdown Position	1, 2 3, 4 5 3 8	1 1 1 2 2 2 26	G H 1 11 2 17 3 13
14 12. Manual Scram	1, 2 3, 4 5 3 8	1 1 1 2 2 2	G H 1 11 2 18 3 19

10. Turbine EHC control oil Pressure - Low 1 (d) 2 16

12. Turbine Condenser Vacuum Low 1, 2 (i) 2 10

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LCO

...P switch, and	1, 2 5 (b,d)	2 2	13
b. Thermal switch (unit 2), or Float switch (unit 3)	1, 2 5 (b,d)	2 2	11 13

DRESDEN

FOR INFORMATION ONLY

3.1.A-1

TABLE 3.3.1-1 (Continued) Table 3.3.1.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION

GE-STS (BWR/4)

FUNCTIONAL UNIT	APPLICABLE OPERATIONAL CONDITIONS	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM (a)	ACTION
6. Main Steam Line Radiation - High	1, 2	2	F
7. (Primary Containment) Drywell Pressure - High	1, 2	2	G
8. Scram Discharge Volume Water Level - High	1, 2 5	2 2	G H
9. Turbine Stop Valve - Closure	1	4	D
10. Turbine Control Valve Fast Closure, Valve Trip System Oil Pressure - Low	1	2	D
11. Reactor Mode Switch Shutdown Position	1, 2	2 2 2	G H
12. Manual Scram	1, 2 5	2 2	G H
10. Turbine EHC control oil Pressure - Low	1 (d)	2	16
12. Turbine Condenser Vacuum Low	1, 2 (c)	2	14

3/4 3-3

LCO

FOR INFORMATION ONLY

3.1.A-1

If SRM instrumentation is not OPERABLE per Specification 3.10.B, also suspend replacement of LPRMs.

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

ACTION

ACTION 1 - Be in at least HOT SHUTDOWN within 12 hours.

ACTION 2 - Verify all insertable control rods to be fully inserted in the core and lock the reactor mode switch in the Shutdown position within one hour.

ACTION 3 - Suspend all operations involving CORE ALTERATIONS* and insert all insertable control rods within one hour.

ACTION 4 - Be in at least STARTUP within 6 hours.

ACTION 5 - Be in STARTUP with the main steam line isolation valves closed within 6 hours or in at least HOT SHUTDOWN within 12 hours.

ACTION 6 - Initiate a reduction in THERMAL POWER within 15 minutes and reduce turbine first stage pressure to ≤ (250) psig, equivalent to THERMAL POWER less than (30)% (45%) of RATED THERMAL POWER, within 2 hours. (less than the automatic setpoint)

reactor power to

ACTION 7 - Verify all insertable control rods to be fully inserted within one hour.

ACTION 8 - Lock the reactor mode switch in the Shutdown position within one hour.

ACTION 9 - Suspend all operations involving CORE ALTERATIONS*, and fully insert all insertable control rods and lock the reactor mode switch in the SHUTDOWN position within one hour.

ACTION 10 Be in at least STARTUP with reactor pressure less than 600 psig within 8 hours.

*Except movement of IRM, SRM or special movable detectors, or replacement of LPRM strings provided SRM instrumentation is OPERABLE per Specification 3.9.2.

Unless adequate SHUTDOWN MARGIN has been demonstrated per specification 3/4.3.A and the "one-rod-out" Refuel mode switch interlock has been demonstrated OPERABLE per specification 3.10.A,

provided a control rod block is actuated, for reactor protection system logic reset in Refuel and Shutdown positions of the reactor mode switch

However, this is not required for control rods removed per Specification 3.10.I or 3.10.J.

3.1.A-1

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

TABLE NOTATIONS FOR INFORMATION ONLY

ALL CAPS

(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.

ALL CAPS

may be

(b) This function shall be automatically bypassed when the reactor mode switch is in the Run position.

(c) 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 are being performed per Specification 3.10.3.

(d) The non-coincident NMS reactor trip function logic is such that all channels go to both trip systems. Therefore, when the "shorting links" are removed, the Minimum OPERABLE Channels Per Trip System is 4 APRMS and 6 IRMS.

DELETED

ALL CAPS

fewer

(e) An APRM channel is inoperable if there are less than 2 LPRM inputs per level or less than (11) LPRM inputs to an APRM channel.

50% of the normal complement of

(f) This function is not required to be OPERABLE when the reactor pressure vessel head is removed per Specification 3.10.1. 3.12.A

unbolted or

(g) This function shall be automatically bypassed when the reactor mode switch is not in the Run position.

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

(i) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2. 3.10.I or 3.10.J

(d) (j) This function shall be automatically bypassed when turbine first stage pressure is < (250) psig, equivalent to THERMAL POWER less than (30)% of RATED THERMAL POWER.

15

46%

(k) Also actuates the EOC-RPT system.

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

(j) This function is not required to be OPERABLE when reactor pressure is less than 600 psig.

(g) Required to be OPERABLE only prior to and during required SHUTDOWN MARGIN demonstrations performed per Specification 3.12.B.

TABLE 3.3.1-2

REACTOR PROTECTION SYSTEM RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME (Seconds)
1. Intermediate Range Monitors:	
a. Neutron Flux - High	NA
b. Inoperative	NA
2. Average Power Range Monitor*:	
a. Neutron Flux - Upscale, Setdown	NA
b. Flow Biased Simulated Thermal Power - Upscale	≤ (0.09)(**)
c. Fixed Neutron Flux - Upscale	≤ (0.09)
d. Inoperative	NA
(e. Downscale	NA)
3. Reactor Vessel Steam Dome Pressure - High	≤ (0.55)
4. Reactor Vessel Water Level - Low, Level 3	≤ (1.05)
5. Main Steam Line Isolation Valve - Closure	≤ (0.06)
6. Main Steam Line Radiation - High	NA
7. (Primary Containment) (Drywell) Pressure - High	NA
8. Scram Discharge Volume Water Level - High	NA
9. Turbine Stop Valve - Closure	≤ (0.06)
10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	≤ (0.08)#
11. Reactor Mode Switch Shutdown Position	NA
12. Manual Scram	NA

*Neutron detectors are exempt from response time testing. Response time shall be measured from the detector output or from the input of the first electronic component in the channel. (This provision is not applicable to Construction Permits docketed after January 1, 1978. See Regulatory Guide 1.18, November 1977.)

**(Not) Including simulated thermal power time constant, 6 ± 1 seconds.

#Measured from start of turbine control valve fast closure.

a. Flow Check

b. Level Transmitter

4.1.A-1

FOR INFORMATION ONLY

TABLE 4.3.1.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION[a]	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
1. Intermediate Range Monitors:				
a. Neutron Flux - High	S/U,S,(b) S	S/U[c], W W	R, E R, E	2 3, 4, 5
b. Inoperative	NA	W	NA	2, 3, 4, 5
2. Average Power Range Monitor[f]:				
a. Neutron Flux - High Upscale, Setdown	S/U,S,(b) S	S/U[c], W W	SA SA	2 3, 5
b. Flow Biased Simulated Thermal Power - Upscale	S,D[(g)]	S/U[c], W	W[d][e], SA, (R[h])	1
c. Fixed Neutron Flux - High Upscale	S	S/U[c], W	W[d], SA	1
d. Inoperative	NA	W	NA	1, 2, 3, 5
(e. Downscale	S	W	SA	1)
3. Reactor Vessel Steam Dome Pressure - High	NA (S)	M	Q (R)	1, 2
4. Reactor Vessel Water Level - Low, Level 3	D (S)	M	(R), E[h]	1, 2
5. Main Steam Line Isolation Valve - Closure	NA	M	R, E	1
6. Main Steam Line Radiation - High	S	M	R	1, 2[i]
7. (Primary Containment) (Drywell) Pressure - High	(S) NA	M	(R), Q	1, 2

QUAD CITIES

4.1.A-1

a. ΔP switch, and N/A Q E 4, 5 (j,k)

b. Thermal Switch N/A Q N/A 1, 2, 5 (j,k)

TABLE 4.3.1.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FOR INFORMATION ONLY

INFORMATION ONLY

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
8. Scram Discharge Volume Water Level - High	(S)	M	(R)	1, 2, 5(j)
9. Turbine Stop Valve - Closure	(S) NA	M	(R) E	1 (1)
10. Turbine (EHC) Control Valve Fast Closure Valve Trip System Oil Pressure - Low	(S) NA	M	(R) Q	1
13 → 11. Reactor Mode Switch Shutdown Position	NA	R E	NA	1, 2, 3, 4, 5
14 → 12. Manual Scram	NA	M	NA	1, 2, 3, 4, 5

The weekly CHANNEL FUNCTIONAL TEST may be used to fulfill this requirement

3/4 3-8

(a) Neutron detectors may be excluded from CHANNEL CALIBRATION.

(b) The IRM and SRM channels shall be determined to overlap for at least (½) decades during each startup after entering OPERATIONAL CONDITION 2 and the IRM and APRM channels shall be determined to overlap for at least (½) decades during each controlled shutdown, if not performed within the previous 7 days.

(c) Within 24 hours prior to startup, if not performed within the previous 7 days.

(d) This calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER > 25% of RATED THERMAL POWER. Adjust the APRM channel if the absolute difference is greater than 2% of RATED THERMAL POWER. Any APRM channel gain adjustment made in compliance with Specification 3.2.2 shall not be included in determining the absolute difference.

(e) This calibration shall consist of the adjustment of the APRM flow biased channel to conform to a calibrated flow signal.

(f) The LPRMs shall be calibrated at least once per 1000 effective full power hours (EFPH) using the TIP system.

(g) Verify measured core flow to be greater than or equal to established core flow at the existing pump speed.

(h) This calibration shall consist of (the adjustment, as required, of) (verifying) the 6 ± 1 second simulated thermal power time constant.

(i) This function is not required to be OPERABLE when the reactor pressure vessel head is unbolted or removed per Specification 3.10.1.

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

11. Turbine Control Valve Fast Closure N/A M E 1 (1)

12. Turbine Condenser Vacuum-Low N/A M Q 1, 2 (f)

MODE

All CAPS

INSERT 1

All CAPS

INSERT 2

3.11.B

, within 2% of RATED THERMAL POWER,

recirculation LOOP flow

unbolted or

3.12.A.1

3.10.I or 3.10.J.

INSERT 3

INSERT 4

Dresden

GE-STS (BWR/4)

TABLE 4.3.1.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FOR INFORMATION ONLY

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
8. Scram Discharge Volume Water Level - High	(S)	M	(R)	1, 2, 5(j)
9. Turbine Stop Valve - Closure	(S) NA	M	(R) E	1 (1)
10. Turbine Control Valve Fast Closure Valve Trip System Oil Pressure - Low	(S) NA	M	(R) Q	1
11. Reactor Mode Switch Shutdown Position	NA	R E	NA	1, 2, 3, 4, 5
12. Manual Scram	NA	M	NA	1, 2, 3, 4, 5

a. SP switch, and N/A Q E 1, 2, 5 (k)

b. Thermal Switch (UNIT 2), or Float Switch (UNIT 3) N/A Q N/A 1, 2, 5 (j)

The weekly CHANNEL FUNCTIONAL TEST may be used to fulfill this requirement

(a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
(b) The IRM and SRM channels shall be determined to overlap for at least (½) decades during each startup after entering OPERATIONAL CONDITION 2 and the IRM and APRM channels shall be determined to overlap for at least (½) decades during each controlled shutdown, if not performed within the previous 7 days.
(c) Within 24 hours prior to startup, if not performed within the previous 7 days.
(d) This calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER > 25% of RATED THERMAL POWER. Adjust the APRM channel if the absolute difference is greater than 2% of RATED THERMAL POWER. Any APRM channel gain adjustment made in compliance with Specification 3.2.2 shall not be included in determining the absolute difference.
(e) This calibration shall consist of the adjustment of the APRM flow biased channel to conform to a calibrated flow signal.
(f) The LPRMs shall be calibrated at least once per 1000 effective full power hours (EFPH) using the TIP system.
(g) Verify measured core flow to be greater than or equal to established core flow at the existing pump speed.
(h) This calibration shall consist of (the adjustment, as required, of) (verifying) the 6 ± 1 second simulated thermal power time constant.
(i) This function is not required to be OPERABLE when the reactor pressure vessel head is unbolted or removed per Specification 3.10.I or 3.12.A.
(j) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2

11. Turbine Control Valve Fast Closure N/A M E 1 (1)
12. Turbine Condenser Vacuum-Low N/A M Q 1, 2 (p)

3/4 3-8

INSERT 1 · INSERT 2 · INSERT 3 · INSERT 4

MODE · ALL CAPS · 3.11.B · 3.10.I or 3.10.J. · , within 2% of RATED THERMAL POWER,

INSERT 1

This adjustment must be accomplished: a) within 2 hours if the APRM CHANNEL is indicating lower power values than the heat balance, or b) within 12 hours if the APRM CHANNEL is indicating higher power values than the heat balance, until any required APRM adjustment has been accomplished, notification shall be posted on the reactor control panel.

INSERT 2

This calibration is not required when THERMAL POWER is < 25% of RATED THERMAL POWER, The provisions of Specification 4.0.D are not applicable.

INSERT 3

(h) Trip units are calibrated at least once per 31 days and transmitters are calibrated at the frequency identified in the table.

SERT 4

(k) This function may be bypassed, provided a control rod block is actuated, for reactor protection system reset in Refuel and Shutdown positions of the reactor mode switch.

(l) This function not required to be OPERABLE when THERMAL POWER is less than 45% of RATED THERMAL POWER.

(m) Required to be OPERABLE only prior to and during required SHUTDOWN MARGIN demonstrations performed per Specification 3.12.B.

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

(o) The provisions of Specification 4.0.D are not applicable to the CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION surveillances for entry into their OPERATIONAL MODE(s) from OPERATIONAL MODE 1 provided the surveillances are performed within 12 hours after such entry.

(p) This function is not required to be OPERABLE when reactor pressure is less than 600 psig.

DRESDEN ONLY