

INDEX

LIST OF TABLES

<u>TABLE</u>	<u>TITLE</u>	<u>PAGE</u>
1.1	Surveillance Frequency Notation.....	1-10
1.2	Operational Conditions.....	1-11
2.2.1-1	Reactor Protection System Instrumentation Setpoints.	2-4
3.3.1-1	Reactor Protection System Instrumentation.....	3/4 3-2
3.3.1-2	DELETED Reactor Protection System Response Times.....	3/4 3-6
4.3.1.1-1	Reactor Protection System Instrumentation Surveillance Requirements.....	3/4 3-7
3.3.2-1	Isolation Actuation Instrumentation.....	3/4 3-12
3.3.2-2	Isolation Actuation Instrumentation Setpoints.....	3/4 3-19
3.3.2-3	DELETED Isolation System Instrumentation Response Time.....	3/4 3-24
4.3.2 1-1	Isolation Actuation Instrumentation Surveillance Requirements.....	3/4 3-26
3.3.3-1	Emergency Core Cooling System Actuation Instrumentation.....	3/4 3-31
3.3.3-2	Emergency Core Cooling System Actuation Instrumentation Setpoints.....	3/4 3-36
3.3.3-3	DELETED Emergency Core Cooling System Response Times.....	3/4 3-40
4.3.3.1-1	Emergency Core Cooling System Actuation Instrumentation Surveillance Requirements.....	3/4 3-41
3.3.4.1-1	ATWS Recirculation Pump Trip System Instrumentation.	3/4 3-45
3.3.4.1-2	ATWS Recirculation Pump Trip System Instrumentation Setpoints.....	3/4 3-46

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.
- 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.

required
Neutron detectors are exempt from response time testing.

*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.

**The trip system need not be placed in the tripped condition if this would cause the Trip Function to occur. When a trip system can be placed in the tripped condition without causing the Trip Function to occur, place the trip system with the most inoperable channels in the tripped condition; if both systems have the same number of inoperable channels, place either trip system in the tripped condition. The requirement to place a trip system in the tripped condition does not apply to Functional Units 6 and 10 of Table 3.3.1-1.

***Logic System Functional Test period may be extended as identified by note 'p' on Table 4.3.1.1-1.

TABLE 3.3.1-2

REACTOR PROTECTION SYSTEM RESPONSE TIMES

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME (Seconds)</u>
1. Intermediate Range Monitors:	
a. Neutron Flux - High	NA
b. Inoperative	NA
2. Average Power Range Monitor ^a :	
a. Neutron Flux - High, Setdown	NA
b. Flow Biased Simulated Thermal Power - High	<0.09**
c. Neutron Flux - High	<0.09
d. Inoperative	NA
3. Reactor Vessel Steam Dome Pressure - High	<0.35
4. Reactor Vessel Water Level - Low, Level 3	<1.05
5. Reactor Vessel Water Level - High, Level 8	<1.05
6. Main Steam Line Isolation Valve - Closure	<0.09
7. Main Steam Line Radiation - High	NA
8. Drywell Pressure - High	NA
9. Scram Discharge Volume Water Level - High	
a. Level Transmitter	NA
b. Float Switches	NA
10. Turbine Stop Valve - Closure	<0.06
11. Turbine Control Valve Fast Closure, Valve Trip System	
Oil Pressure - Low	<0.07#
12. Reactor Mode Switch Shutdown Position	NA
13. Manual Scram	NA

^aNeutron 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.

^{**}Not including simulated thermal power time constant specified in the COLR.

[#]Measured from start of turbine control valve fast closure.

Table 3.3.1-2 has been deleted.

RIVER BEND - UNIT 1

3/4 3-6

Amendment No. 42

INSTRUMENTATION

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, and with ISOLATION SYSTEM RESPONSE TIME as shown in Table 3.3.2-3.

APPLICABILITY: As shown in Table 3.3.2-1.

ACTION:

- a. With 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 until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.
- b. 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.
- c. 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 3.3.2-1.

*An inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, 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.

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

INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

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

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

4.3.2.3 The ISOLATION SYSTEM RESPONSE TIME of each ^{required} isolation trip function ~~shown in Table 3.3.2-3~~ shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one 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 isolation trip system.

*Logic System Functional Testing period may be extended as identified by notes C and D on Table 4.3.2.1-1.

Table 3.3.2-3 has been deleted.

TABLE 3.3.2-3
ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
<u>1. PRIMARY CONTAINMENT ISOLATION</u>	
a. Reactor Vessel Water Level - Low Low Level 2	< 10 ^(a)
b. Drywell Pressure - High	< 10 ^(a)
c. Containment Purge Isolation Radiation - High ^(b)	NA
<u>2. MAIN STEAM LINE ISOLATION</u>	
a. Reactor Vessel Water Level - Low Low Low Level 1	< 1.0 * / < 10 ^{(a)**}
b. Main Steam Line Radiation - High ^(b)	< 1.0 * / < 10 ^{(a)**}
c. Main Steam Line Pressure - Low	< 1.0 * / < 10 ^{(a)**}
d. Main Steam Line Flow - High	< 0.5 * / < 10 ^{(a)**}
e. Condenser Vacuum - Low	NA
f. Main Steam Line Tunnel Temperature - High	NA
g. Main Steam Line Tunnel Δ Temperature - High	NA
h. Main Steam Line Area Temperature - High (Turbine Bldg)	NA
<u>3. SECONDARY CONTAINMENT ISOLATION</u>	
a. Reactor Vessel Water Level - Low Low Level 2	< 10 ^(a)
b. Drywell Pressure - High	< 10 ^(a)
c. Fuel Building Ventilation Exhaust Radiation - High ^(b)	NA
d. Reactor Building Annulus Ventilation Exhaust Radiation - High ^(b)	NA
<u>4. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>	
a. Δ Flow - High	< 10 ^{(a)##}
b. Δ Flow Timer	NA
c. Equipment Area Temperature - High	NA
d. Equipment Area Δ Temperature - High	NA
e. Reactor Vessel Water Level - Low Low Level 2	≤ 10 ^(a)
f. Main Steam Line Tunnel Ambient Temperature - High	NA
g. Main Steam Line Tunnel Δ Temperature - High	NA
h. SLCS Initiation	NA
<u>5. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION</u>	
a. RCIC Steam Line Flow - High	< 10 ^{(a)###}
b. RCIC Steam Line Flow-High Timer	NA
c. RCIC Steam Supply Pressure - Low	< 10 ^(a)
d. RCIC Turbine Exhaust Diaphragm Pressure - High	NA
e. RCIC Equipment Room Ambient Temperature - High	NA
f. RCIC Equipment Room Δ Temperature - High	NA
g. Main Steam Line Tunnel Ambient Temperature - High	NA
h. Main Steam Line Tunnel Δ Temperature - High	NA

Table 3.3.2-3 has been deleted.

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

<u>TRIP FUNCTION</u>	<u>RESPONSE TIME (Seconds)#</u>
i. Main Steam Line Tunnel Temperature Timer	NA
j. RHR Equipment Room Ambient Temperature - High	NA
k. RHR Equipment Room Δ Temperature - High	NA
RHR/RCIC Steam Line Flow - High	NA
Drywell Pressure - High	NA
n. Manual Initiation	NA
<u>6. RHR SYSTEM ISOLATION</u>	
a. RHR Equipment Area Ambient Temperature - High	NA
b. RHR Equipment Area Δ Temperature - High	NA
c. Reactor Vessel Water Level - Low Level 3	≤ 10 ^(a)
d. Reactor Vessel Water Level - Low Low Low Level 1	≤ 10 ^(a)
e. Reactor Vessel (RHR Cut-in Permissive) Pressure - High	NA
f. Drywell Pressure - High	NA
<u>7. MANUAL INITIATION</u>	NA

(a) Isolation system instrumentation response time specified includes the diesel generator starting and sequence loading delays.

Isolation detectors are exempt from response time testing. Response time will be measured from detector output or the input of the first electronic component in the channel.

*Isolation system instrumentation response time for MSIVs only. No diesel generator delays assumed.

**Isolation system instrumentation response time for associated valves except MSIVs.

#Isolation system instrumentation response time specified for the Trip Function actuating each valve group shall be added to isolation time shown in Tables 3.6.4-1 and 3.6.5.3-1 for valves in each valve group to obtain ISOLATION SYSTEM RESPONSE TIME for each valve.

##Time delay of 45-47 seconds.

###Time delay of 3-13 seconds.

INSTRUMENTATION

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

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

APPLICABILITY: As shown in Table 3.3.3-1.

ACTION:

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

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to less than or equal to 100 psig within the following 24 hours.

SURVEILLANCE REQUIREMENTS

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

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

^{##} Logic System Functional and ECCS Response time testing period may be extended as identified by note C on Table 4.3.3.1-1.

INSTRUMENTATION

3.4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

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

^{##} Logic System Functional and ECCS Response time testing period may be extended as identified by note C on Table 4.3.3.1-1.

TABLE 3.3.3-3

EMERGENCY CORE COOLING SYSTEM RESPONSE TIMES

<u>ECCS</u>	<u>RESPONSE TIME (Seconds)</u>
1. LOW PRESSURE CORE SPRAY SYSTEM	≤ 37
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM	
a. Pumps A and B	≤ 37
b. Pump C	≤ 37
3. AUTOMATIC DEPRESSURIZATION SYSTEM	NA
4. HIGH PRESSURE CORE SPRAY SYSTEM	≤ 27
5. LOSS OF POWER	NA

Table 3.3.3-3 has been deleted.