

TABLE 3.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS	ACTION
1. CORE SPRAY SYSTEM			
a. Reactor Vessel Water Level - Low Low Low, Level 1	2(a)	1, 2, 3, 4 ^a , 5 ^a	30
b. Drywell Pressure - High	2(a)	1, 2, 3	30
c. Reactor Vessel Steam Dome Pressure - Low (Permissive)	2(a)	1, 2, 3, 4, 5	31 32
d. Manual Initiation	1/subsystem	1, 2, 3, 4 ^a , 5 ^a	33
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM			
a. Reactor Vessel Water Level - Low Low Low, Level 1	2(a)	1, 2, 3, 4 ^a , 5 ^a	30
b. Drywell Pressure - High	2(a)	1, 2, 3	30
c. Reactor Vessel Steam Dome Pressure - Low (Permissive)			
1) System Initiation	2(a)	1, 2, 3 4, 5	31 32
2) Recirculation Discharge Valve Closure	2(a)	1, 2, 3 4, 5	31 32
d. Manual Initiation	1/subsystem	1, 2, 3, 4 ^a , 5 ^a	33
3. HIGH PRESSURE COOLANT INJECTION SYSTEM^b			
a. Reactor Vessel Water Level - Low Low, Level 2	2(a)	1, 2, 3	30
b. Drywell Pressure - High	2(a)	1, 2, 3	30
c. Condensate Storage Tank Level - Low	2(a)(b)	1, 2, 3	34
d. Suppression Pool Water Level - High^{**}	2(a)	1, 2, 3	34
d. Reactor Vessel Water Level - High, Level 8	2(c)	1, 2, 3	31
e. Manual Initiation	1/system	1, 2, 3	33

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

- (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) One trip system. Provides signal to HPCI pump suction valves only.
- (c) Two out of two logic.
- (d) Either 4d or 4e must be satisfied. The ACTION is required to be taken only if neither is satisfied. A channel is not OPERABLE unless its associated pump is OPERABLE per Specification 3.5.1.
- (e) Within an ADS Trip System there are two logic subsystems, each of which contains an overall pump permissive. At least one channel associated with each of these overall pump permissives shall be OPERABLE.
- (f) A channel may be placed in an Inoperable status for up to 2 hours for required surveillance testing provided that all channels in the other trip system are OPERABLE.

• When the system is required to be OPERABLE per Specification 3.5.2

• Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 150 psig.

•• Required when ESF equipment is required to be OPERABLE.

•• Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 100 psig.

••• Required to be OPERABLE only when Diesel Generator E is either aligned to the Class 1E system or not aligned to the Class 1E system but operating on the Test Facility.

••• The automatic transfer of HPCI pump suction from the condensate storage tank to suppression pool on high suppression pool water level occurs only when HPCI injection valve is open.

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EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
1. CORE SPRAY SYSTEM		
a. Reactor Vessel Water Level - Low Low Low, Level 1	≥ -129 inches ^a	≥ -136 inches
b. Drywell Pressure - High	≤ 1.72 psig	≤ 1.88 psig
c. Reactor Vessel Steam Dome Pressure - Low	≥ 436 psig, decreasing	≥ 416 psig, decreasing
d. Manual Initiation	NA	NA
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM		
a. Reactor Vessel Water Level - Low Low Low, Level 1	≥ -129 inches ^a	≥ -136 inches
b. Drywell Pressure - High	≤ 1.72 psig	≤ 1.88 psig
c. Reactor Vessel Steam Dome Pressure - Low		
1) System Initiation	≥ 436 psig, decreasing	≥ 416 psig, decreasing
2) Recirculation Discharge Valve Closure	≥ 236 psig, decreasing	≥ 216 psig, decreasing
d. Manual Initiation	NA	NA
3. HIGH PRESSURE COOLANT INJECTION SYSTEM		
a. Reactor Vessel Water Level - Low Low, Level 2	≥ -38 inches ^a	≥ -45 inches
b. Drywell Pressure - High	≤ 1.72 psig	≤ 1.88 psig
c. Condensate Storage Tank Level - Low	≥ 36.0 inches above tank bottom	≥ 36.0 inches above tank bottom
d. Reactor Vessel Water Level - High, Level 8	≤ 54 inches	≤ 55.5 inches
e. Suppression Pool Water Level - High	≤ 23 feet 9 inches	≤ 24 feet
f. Manual Initiation	NA	NA

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TABLE 4.3.3.1-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED</u>
1. CORE SPRAY SYSTEM				
a. Reactor Vessel Water Level - Low Low Low, Level 1	S	H	R	1, 2, 3, 4*, 5*
b. Drywell Pressure - High	NA	H	Q	1, 2, 3
c. Reactor Vessel Steam Dome Pressure - Low	NA	H	Q	1, 2, 3, 4*, 5*
d. Manual Initiation	NA	R	NA	1, 2, 3, 4*, 5*
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM				
a. Reactor Vessel Water Level - Low Low Low, Level 1	S	H	R	1, 2, 3, 4*, 5*
b. Drywell Pressure - High	NA	H	Q	1, 2, 3
c. Reactor Vessel Steam Dome Pressure - Low				
1) System Initiation	NA	H	Q	1, 2, 3, 4*, 5*
2) Recirculation Discharge Valve Closure	NA	H	Q	1, 2, 3, 4*, 5*
d. Manual Initiation	NA	R	NA	1, 2, 3, 4*, 5*
3. HIGH PRESSURE COOLANT INJECTION SYSTEM				
a. Reactor Vessel Water Level - Low Low, Level 2	S	H	R	1, 2, 3
b. Drywell Pressure - High	NA	H	Q	1, 2, 3
c. Condensate Storage Tank Level - Low	NA	H	Q	1, 2, 3
d. Suppression Pool Water Level - High	NA	H	Q	1, 2, 3
d. e. Reactor Vessel Water Level - High, Level 8	NA	H	Q	1, 2, 3
e. Manual Initiation	NA	R	NA	1, 2, 3

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

2. For the HPCI system, verifying that the system develops a flow of at least 5000 gpm against a test line pressure of greater than or equal to 245 psig when steam is being supplied to the turbine at 150 ± 15 psig.
 3. Performing a CHANNEL CALIBRATION of the CSS header ΔP instrumentation and verifying the setpoint to be ≤ 1 psid.
 4. Verifying that the suction for the HPCI system is automatically transferred from the condensate storage tank to the suppression chamber either on a ~~suppression chamber water level-high signal when HPCI injection valve is open~~ or on a condensate storage tank water level -low signal.
 5. Performing a CHANNEL CALIBRATION of the condensate transfer pump discharge low pressure alarm instrumentation and verifying the low pressure alarm setpoint to be ≥ 113 psig.
- d. For the ADS:
1. At least once per 31 days, performing a CHANNEL FUNCTIONAL TEST of the accumulator backup compressed gas system low pressure alarm system.
 2. At least once per 18 months:
 - a) Performing a system functional test which includes simulated automatic actuation of the system throughout its emergency operating sequence, but excluding actual valve actuation.
 - b) Manually opening each ADS valve when the reactor steam dome pressure is greater than or equal to 100 psig and observing that either:
 - 1) The control valve or bypass valve position responds accordingly, or
 - 2) There is a corresponding change in the measured steam flow.
 - c) Performing a CHANNEL CALIBRATION of the accumulator backup compressed gas system low pressure alarm systems and verifying air alarm setpoint of 2070 ± 35 psig on decreasing pressure.
- e. At least every 18 months the following shall be accomplished by any series of sequential, overlapping or total channel steps such that the entire channel is tested:

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

- ADS solenoid energization shall be used alternating between ADS Division 1 and ADS Division 2.

TABLE 3.3.3-1 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION			
TRIP FUNCTION	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS	ACTION
1. CORE SPRAY SYSTEM			
a. Reactor Vessel Water Level - Low Low Low, Level 1	2 nd	1,2,3,4*,5*	30
b. Drywell Pressure - High	2 nd	1,2,3	30
c. Reactor Vessel Steam Dome Pressure - Low (Permissive)	2 nd	1,2,3, 4*,5*	31 30
d. Manual Initiation	1/subsystem	1,2,3,4*,5*	31
2. LOW PRESSURE COOLANT INJECTION MODE OF RHB SYSTEM			
a. Reactor Vessel Water Level - Low Low Low, Level 1	2 nd	1,2,3,4*,5*	30
b. Drywell Pressure - High	2 nd	1,2,3	30
c. Reactor Vessel Steam Dome Pressure - Low (Permissive)			
1. System Initiation	2 nd	1,2,3, 4*,5*	31 30
2. Recirculation Discharge Valve Closure	2 nd	1,2,3, 4*,5*	31 30
d. Manual Initiation	1/subsystem	1,2,3,4*,5*	33
3. HIGH PRESSURE COOLANT INJECTION SYSTEM#			
a. Reactor Vessel Water Level - Low Low, Level 2	2 nd	1,2,3	30
b. Drywell Pressure - High	2 nd	1,2,3	30
c. Condensate Storage Tank Level - Low	2 ^{nd(12)}	1,2,3	34
d. Suppression Pool Water Level - High***	2nd	1,2,3	34
d. Reactor Vessel Water Level - High, Level B	2 nd	1,2,3	31
e. Manual Initiation	1/system	1,2,3	31

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TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

- (a) When a channel is placed in an inoperable status solely for performance of required Surveillances, initiation of ACTIONS may be delayed for up to 8 hours provided the associated Trip Function maintains trip capability.
- (b) One trip system. Provides signal to HPCI pump suction valves only.
- (c) Two out of two logic.
- (d) Either 4d or 4e must be satisfied. The ACTION is required to be taken only if neither is satisfied. A channel is not OPERABLE unless its associated pump is OPERABLE per Specification 3.5.1.
- (e) Within an ADS Trip System there are two logic subsystems, each of which contains an overall pump permissive. At least one channel associated with each of these overall pump permissives shall be OPERABLE.
- (f) When a channel is placed in an inoperable status solely for performance of required Surveillances, initiation of ACTIONS may be delayed for up to 8 hours.
- * When the system is required to be OPERABLE per Specification 3.5.2:
- # Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 150 psig.
- ** Required when ESF equipment is required to be OPERABLE.
- ## Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 100 psig.
- ### Required to be OPERABLE only when Diesel Generator E is either aligned to the Class 1E system or not aligned to the Class 1E system but operating on the Test Facility.
- *** The automatic transfer of HPCI pump suction from the condensate storage tank to suppression pool on high suppression pool water level occurs only when HPCI injection valve is open.



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EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

SUSQUEHANNA - UNIT 2

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<u>TRIP FUNCTION</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
1. CORE SPRAY SYSTEM		
a. Reactor Vessel Water Level - Low Low Low, Level 1	≥ -129 inches*	≥ -136 inches
b. Drywell Pressure - High	≤ 1.72 psig	≤ 1.88 psig
c. Reactor Vessel Steam Dome Pressure - Low	≥ 436 psig, decreasing	≥ 416 psig, decreasing
d. Manual Initiation	NA	NA
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM		
a. Reactor Vessel Water Level - Low Low Low, Level 1	≥ -129 inches*	≥ -136 inches
b. Drywell Pressure - High	≤ 1.72 psig	≤ 1.88 psig
c. Reactor Vessel Steam Dome Pressure - Low		
1) System Initiation	≥ 436 psig, decreasing	≥ 416 psig, decreasing
2) Recirculation Discharge Valve Closure	≥ 236 psig, decreasing	≥ 216 psig, decreasing
d. Manual Initiation	NA	NA
3. HIGH PRESSURE COOLANT INJECTION SYSTEM		
a. Reactor Vessel Water Level - Low Low, Level 2	≥ -38 inches*	≥ -45 inches
b. Drywell Pressure - High	≤ 1.72 psig	≤ 1.88 psig
c. Condensate Storage Tank Level - Low	≥ 36.0 inches above tank bottom	≥ 36.0 inches above tank bottom
d. Reactor Vessel Water Level - High, Level 8	≤ 54 inches	≤ 55.5 inches
e. Suppression Pool Water Level - High	≤ 23 feet 9 inches	≤ 24 feet
e.f. Manual Initiation	NA	NA

**TABLE 4.3.3.1-1
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS**

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
1. CORE SPRAY SYSTEM				
a. Reactor Vessel Water Level - Low Low Low, Level 1	S	Q	R	1,2,3,4*,5*
b. Drywell Pressure - High	NA	Q	Q	1,2,3
c. Reactor Vessel Steam Dome Pressure - Low	NA	Q	Q	1,2,3,4*,5*
d. Manual Initiation	NA	R	NA	1,2,3,4*,5*
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM				
a. Reactor Vessel Water Level - Low Low Low, Level 1	S	Q	R	1,2,3,4*,5*
b. Drywell Pressure - High	NA	Q	Q	1,2,3
c. Reactor Vessel Steam Dome Pressure - Low				
1) System Initiation	NA	Q	Q	1,2,3,4*,5*
2) Recirculation Discharge Valve Closure	NA	Q	Q	1,2,3,4*,5*
d. Manual Initiation	NA	R	NA	1,2,3,4*,5*
3. HIGH PRESSURE COOLANT INJECTION SYSTEM				
a. Reactor Vessel Water Level - Low Low, Level 2	S	Q	R	1,2,3
b. Drywell Pressure - High	NA	Q	Q	1,2,3
c. Condensate Storage Tank Level - Low	NA	Q	Q	1,2,3
d. Suppression Pool Water Level - High	NA	Q	Q	1,2,3
d.g. Reactor Vessel Water Level - High, Level 8	NA	Q	Q	1,2,3
e.f. Manual Initiation	NA	R	NA	1,2,3



SURVEILLANCE REQUIREMENTS (Continued)

2. For the HPCI system, verifying that the system develops a flow of at least 5000 gpm against a test line pressure of greater than or equal to 245 psig when steam is being supplied to the turbine at 150 ± 15 psig.
 3. Performing a CHANNEL CALIBRATION of the CSS header ΔP instrumentation and verifying the setpoint to be ≤ 1 psid.
 4. Verifying that the suction for the HPCI system is automatically transferred from the condensate storage tank to the suppression chamber either on a ~~suppression chamber water level high signal when HPCI injection valve is open, or~~ on a condensate storage tank water level - low signal.
 5. Performing a CHANNEL CALIBRATION of the condensate transfer pump discharge low pressure alarm instrumentation and verifying the low pressure alarm setpoint to be ≥ 113 psig.
- d. For the ADS:
1. At least once per 31 days, performing a CHANNEL FUNCTIONAL TEST of the accumulator backup compressed gas system low pressure alarm system.
 2. At least once per 18 months:
 - a) Performing a system functional test which includes simulated automatic actuation of the system throughout its emergency operating sequence, but excluding actual valve actuation.
 - b) Manually opening each ADS valve when the reactor steam dome pressure is greater than or equal to 100 psig and observing that either:
 - 1) The control valve or bypass valve position responds accordingly, or
 - 2) There is a corresponding change in the measured steam flow.

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

ADS solenoid energization shall be used alternating between ADS Division 1 and ADS Division 2.

For the startup following the Third Refueling and Inspection Outage, this surveillance shall read as follows:

For the HPCI System, verifying that the system develops a flow of at least 4850 gpm against a test line pressure of 600 psig when steam is being supplied to the turbine at $150 \pm$ psig.

