

ATTACHMENT 3 TO PLA-5039

TECHNICAL SPECIFICATION MARK-UP'S

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Table 3.3.5.1-1 (page 1 of 6)  
Emergency Core Cooling System Instrumentation

| FUNCTION  | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER FUNCTION | CONDITIONS REFERENCED FROM REQUIRED ACTION A.1 | SURVEILLANCE REQUIREMENTS                                    | ALLOWABLE VALUE                                 |
|---|--|--------------------------------|--|--|---|
| <b>1. Core Spray System</b>                                 |  |                                |  |  |   |
| a. Reactor Vessel Water Level - Low Low Low, Level 1        | 1,2,3,<br>4(a), 5(a)                           | 4(b)                           | B  | SR 3.3.5.1.1<br>SR 3.3.5.1.2<br>SR 3.3.5.1.4<br>SR 3.3.5.1.5 | ≥ -136 inches                                   |
| b. Drywell Pressure - High                                  | 1,2,3  | 4(b)                           | B  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5                 | ≤ 1.88 psig                                     |
| c. Reactor Steam Dome Pressure - Low (initiation)           | 1,2,3<br>4(a), 5(a)                            | 4                              | B  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5                 | 407<br>≥ 446 psig (lower)<br>≤ 433 psig (upper) |
| d. Reactor Steam Dome Pressure - Low (injection permissive) | 1,2,3<br>4(a), 5(a)                            | 4                              | C  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5                 | 407<br>≥ 446 psig (lower)<br>≤ 433 psig (upper) |
| e. Manual Initiation  | 1,2,3,<br>4(a), 5(a)                           | 2<br>1 per subsystem           | C  | SR 3.3.5.1.5   | HA  |
| <b>2. Low Pressure Coolant Injection (LPCI) System</b>      |  |                                |  |  |   |
| a. Reactor Vessel Water Level - Low Low Low, Level 1        | 1,2,3,<br>4(a), 5(a)                           | 4(c)                           | B  | SR 3.3.5.1.1<br>SR 3.3.5.1.2<br>SR 3.3.5.1.4<br>SR 3.3.5.1.5 | ≥ -136 inches                                   |

(continued)

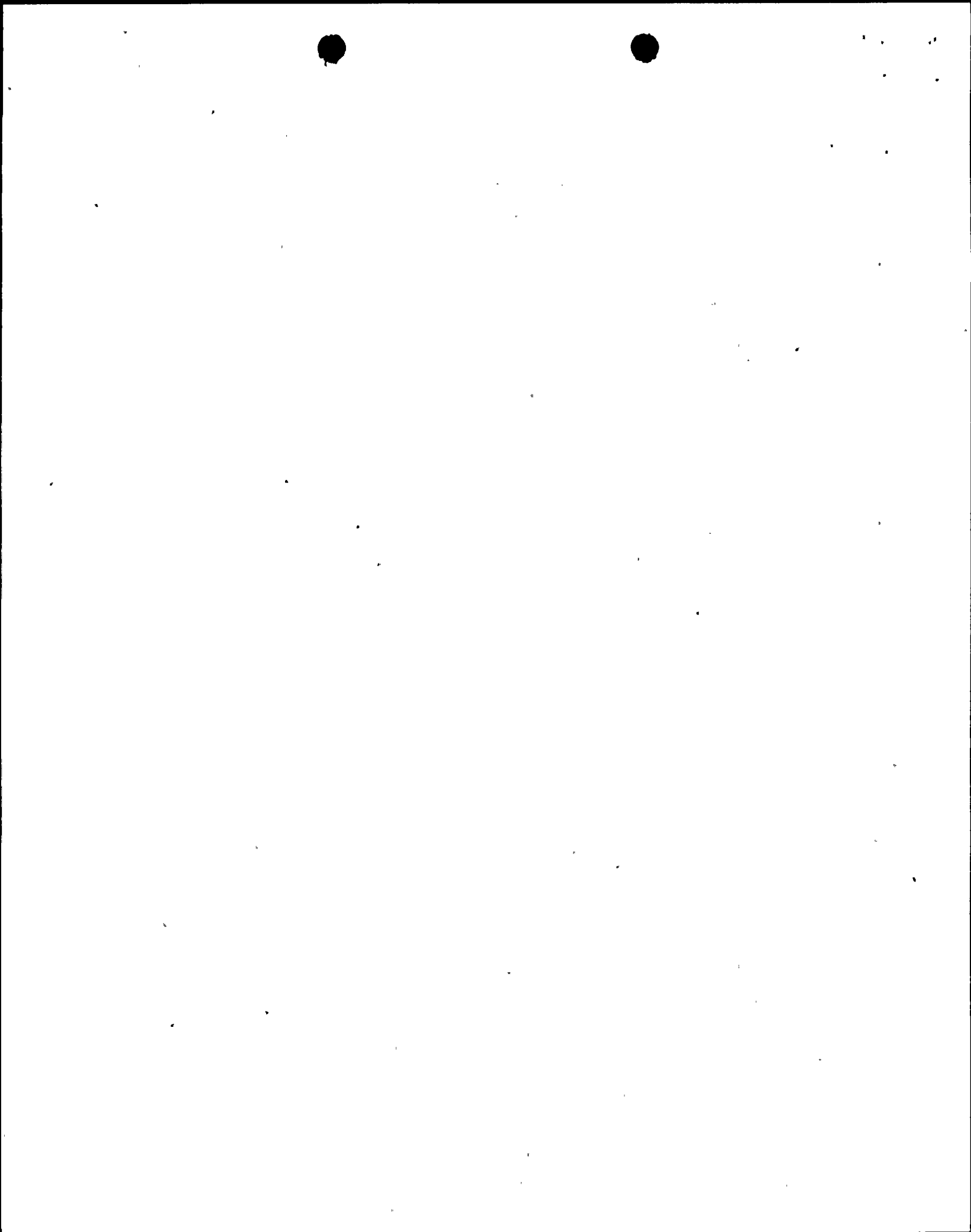
- (a) When associated subsystem(s) are required to be OPERABLE.
- (b) Also required to initiate the associated diesel generator (DG), initiate Drywell Cooling Equipment Trip, and Emergency Service Water (ESW) Pump timer reset.
- (c) Also required to initiate the associated DGs, ESW Pump timer reset and Turbine Building and Reactor Building Chillers trip.

Table 3.3.5.1-1 (page 2 of 6)  
Emergency Core Cooling System Instrumentation

| FUNCTION  | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER FUNCTION | CONDITIONS REFERENCED FROM REQUIRED ACTION A.1 | SURVEILLANCE REQUIREMENTS                    | ALLOWABLE VALUE                                 |
|---|--|--------------------------------|--|--|---|
| 2. LPCI System (continued)  |  |                                |  |  |   |
| b. Drywell Pressure - High  | 1,2,3  | 4(c)                           | B  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5 | ≤ 1.88 psig                                     |
| c. Reactor Steam Dome Pressure - Low (initiation)                               | 1,2,3<br>4(a), 5(a)                            | 4                              | B  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5 | 407<br>≥ 416 psig (lower)<br>≤ 433 psig (upper) |
| d. Reactor Steam Dome Pressure - Low (injection permissive)                     | 1,2,3<br>4(a), 5(a)                            | 4                              | C  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5 | 407<br>≥ 416 psig (lower)<br>≤ 433 psig (upper) |
| e. Reactor Steam Dome Pressure - Low (Recirculation Discharge Valve Permissive) | 1(d), 2(d),<br>3(d)                            | 4                              | B  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5 | 407<br>≥ 416 psig (lower)<br>≤ 433 psig (upper) |
|   |  |                                | C  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5 | ≥ 216 psig                                      |

(continued)

- (a) When associated subsystem(s) are required to be OPERABLE.
- (c) Also required to initiate the associated DGs, ESW pump timer reset and Turbine Building and Reactor Building Chiller trip.
- (d) With either associated recirculation pump discharge or bypass valves open.



ATTACHMENT 4 TO PLA-5039

**SUPPLEMENTAL INFORMATION**

**QUESTION 1:**

*Your submittal stated that the current installed reactor pressure instruments need replacement in order to better control for a more restrictive allowable value range. Please discuss the instruments (that) will be installed during next refueling outage. What are the major differences between the existing instruments and the new instruments?*

**RESPONSE 1:**

The existing instruments used to sense Reactor Steam Dome Pressure for the Division 1 Core Spray RHR/LPCI injection permissive are Barksdale pressure switches. Because of the magnitude of the Barksdale's inaccuracies and drift, they may not actuate within the required range of operation bounded by the upper and lower analytical limits for the permissive function. Therefore, the Barksdale's will be replaced with Barton pressure switches. The Barton's have improved accuracy and drift specifications that allow them to trip within the new lower and upper allowable values. It should be noted that the replacement Barton switches are the same models as are currently used for the Division 2 switches.

**QUESTION 2:**

*Please provide setpoint calculation documents for the "Reactor Steam Dome Pressure-Low" trip setpoint and allowable values (AV). Is the Susquehanna setpoint calculation using the GE NEDC-31336, "General Electric Instrument Setpoint Methodology?" If the answer is yes, please include NEDC-31336 as reference in your submittal.*

**RESPONSE 2.:**

The setpoint and Allowable Values are determined based on guidance in GE NEDC-31336 "General Electric Instrument Setpoint Methodology" and documented in PP&L calculation. The calculation results are as follows:

| Parameter               | Value | Remarks   |
|-------------------------|-------|---|
| Upper Analytical Limit  | 440   | FSAR Section 6.3.2 and NEDC-31336, page 3-107 (piping design limit minus head of water in piping) |
| Upper Allowable Value   | 433   | UAL - (Instrument Accuracy + Calibration Accuracy)  |
| Upper NTSP <sup>1</sup> | 427   | UAL - (Instrument Accuracy + Calibration Accuracy + Drift)  |
| Setpoint                | 420   | Setting that is farthest from both the UAV and LAV  |
| Lower NTSP <sup>1</sup> | 413   | LAL + (Instrument Accuracy + Calibration Accuracy + Drift)  |
| Lower Allowable Value   | 407   | LAL + (Instrument Accuracy + Calibration Accuracy)  |
| Lower Analytical Limit  | 400   | FSAR Table 6.3-2 (based on peak cladding temperature limit)                                       |

<sup>1</sup>Nominal Trip Setpoint

**NOTE:** The Upper and Lower Allowable Values previously submitted in reference 1 were 437 psig (upper) and 403 psig (lower). It has since been determined that the new values of 433 psig (upper) and 407 psig (lower) should be used since they provide additional margin to the analytical limits.

**QUESTION 3:**

*For the proposed AV's that gives the appearance of a range, please confirm that the upper and lower limits are unique AV's with each AV associated with one unique analytical limit per function. Provide reference to the FSAR accident analysis sections for these analytical limits. Indicate the actual setpoint chosen for these functions.*

**RESPONSE 3:**

The SSES Technical Specifications only specify a lower allowable value. This value is based on the analytical limit in FSAR Table 6.3-2 (400 psig) that protects against exceeding the peak cladding temperature. SSES Technical Specifications do not specify an upper allowable value. However, there are piping overpressurization protection design limits specified in FSAR Section 6.3.2 for the Core Spray and RHR Systems. These piping design limits form the basis for the upper analytical limit (440 psig). Currently the upper allowable value is controlled procedurally by surveillance procedures.

Establishing the new setpoint for the Barton pressure switches at 420 psig ensures that the required switch actuation occurs within the lower analytical limit (400 psig) and upper analytical limit (440 psig).

**QUESTION 4:**

*Please verify that the trip setpoint associated with each proposed upper AV and Lower AV have been analyzed for potential interactions between the setpoint and each AV. Describe the method to verify the instrument operability during the instrument surveillance test to demonstrate that all the setpoint calculation uncertainty assumptions are being satisfied.*

**RESPONSE 4:**

I&C Surveillance procedures verify that the switch actuates on decreasing test pressure within the required tolerance bands specified by the setpoint calculation. These tolerance bands are specified in the procedure as part of the acceptance criteria for the operation of the switches and the relay logic. Control room annunciation and actuation of the appropriate relays in the relay room are also monitored as part of the surveillance. The surveillance procedures will be updated appropriately to incorporate the new setpoint and allowable values provided by the setpoint calculation.





**QUESTION 5:**

*Referring to Table 3.3.5.1-1, will 1c alone initiate core spray, or is 1b concurrent with 1c needed for core spray initiation? Since initiation (1c) and injection permissive (1d) are the same value, why are they two separate functions? Most reactors and the ISTS have a single injection permissive value. How did the conversion to the ISTS lead to the conclusion that the functions should be separated into initiation and injection permissive and the allowable values changed?*

**RESPONSE 5:**

Function 1c alone cannot initiate Core Spray. Core Spray function 1c concurrent with function 1d can (among other ways) initiate Core Spray. SSES FSAR Section 7.3.1.1a.1.5.3 and FSAR Figure 7.3-5-1 explains in detail the how the initiation logic initiates the Core Spray system.

Function's 1c and 1d are two separate functions because there are two different Functions being performed and required in the Technical Specifications; an ECCS initiation Function (SSES ITS Table 3.3.5.1-1 Function 1.d and 2.d) and a discharge valve injection permissive Function (SSES ITS 3.3.5.1-1 Function 1.e and 2.e). The separate Function's ensure that the proper Actions are taken for each Function.

For the ECCS initiation Function (1c and 2c), the Technical Specification applicable Condition is Condition B, which allows the channel to be placed in trip within 24 hours. This is appropriate for function 1c and 2c because placing this channel in trip will ensure the safety function is still available. For the injection valve permissive Functions 1d and 2d, the proper Technical Specification Condition is Condition C which does not require the channel to be placed in trip. It is not appropriate to place the channel in trip because placing the channel in trip with occurrence of a single failure would result in opening of the injection valve. This is an unsafe condition since not all of the piping downstream of the injection valve is designed for operating reactor pressures.

The designation of these as two separate functions in the SSES Technical Specifications was approved as part of the SSES conversion to the Improved Technical Specifications approved in Amendment 178 to the SSES Unit 1 Operating License.



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ATTACHMENT 5 TO PLA-5039

**TECHNICAL SPECIFICATIONS "CAMERA READY"**

Table 3.3.5.1-1 (page 1 of 6)  
Emergency Core Cooling System Instrumentation

| FUNCTION  | APPLICABLE<br>MODES<br>OR OTHER<br>SPECIFIED<br>CONDITIONS | REQUIRED<br>CHANNELS<br>PER<br>FUNCTION | CONDITIONS<br>REFERENCED<br>FROM<br>REQUIRED<br>ACTION A.1 | SURVEILLANCE<br>REQUIREMENTS                                 | ALLOWABLE<br>VALUE                       |
|---|--|---|--|--|--|
| <b>1. Core Spray System</b>                                 |  |   |  |  |  |
| a. Reactor Vessel Water Level - Low Low Low, Level 1        | 1,2,3,<br>4(a), 5(a)                                       | 4(b)                                    | B  | SR 3.3.5.1.1<br>SR 3.3.5.1.2<br>SR 3.3.5.1.4<br>SR 3.3.5.1.5 | ≥ -136 inches                            |
| b. Drywell Pressure - High                                  | 1,2,3  | 4(b)                                    | B  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5                 | ≤ 1.88 psig                              |
| c. Reactor Steam Dome Pressure - Low (initiation)           | 1,2,3<br>4(a), 5(a)  | 4                                       | B  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5                 | ≥ 407 psig (lower)<br>≤ 433 psig (upper) |
| d. Reactor Steam Dome Pressure - Low (injection permissive) | 1,2,3<br>4(a), 5(a)  | 4                                       | C  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5                 | ≥ 407 psig (lower)<br>≤ 433 psig (upper) |
| e. Manual Initiation  | 1,2,3,<br>4(a), 5(a)                                       | 2<br>1 per<br>subsystem                 | C  | SR 3.3.5.1.5   | NA                                       |
| <b>2. Low Pressure Coolant Injection (LPCI) System</b>      |  |   |  |  |  |
| a. Reactor Vessel Water Level - Low Low Low, Level 1        | 1,2,3,<br>4(a), 5(a)                                       | 4(c)                                    | B  | SR 3.3.5.1.1<br>SR 3.3.5.1.2<br>SR 3.3.5.1.4<br>SR 3.3.5.1.5 | ≥ -136 inches                            |

(continued)

- (a) When associated subsystem(s) are required to be OPERABLE.
- (b) Also required to initiate the associated diesel generator (DG), initiate Drywell Cooling Equipment Trip, and Emergency Service Water (ESW) Pump timer reset.
- (c) Also required to initiate the associated DGs, ESW Pump timer reset and Turbine Building and Reactor Building Chillers trip.

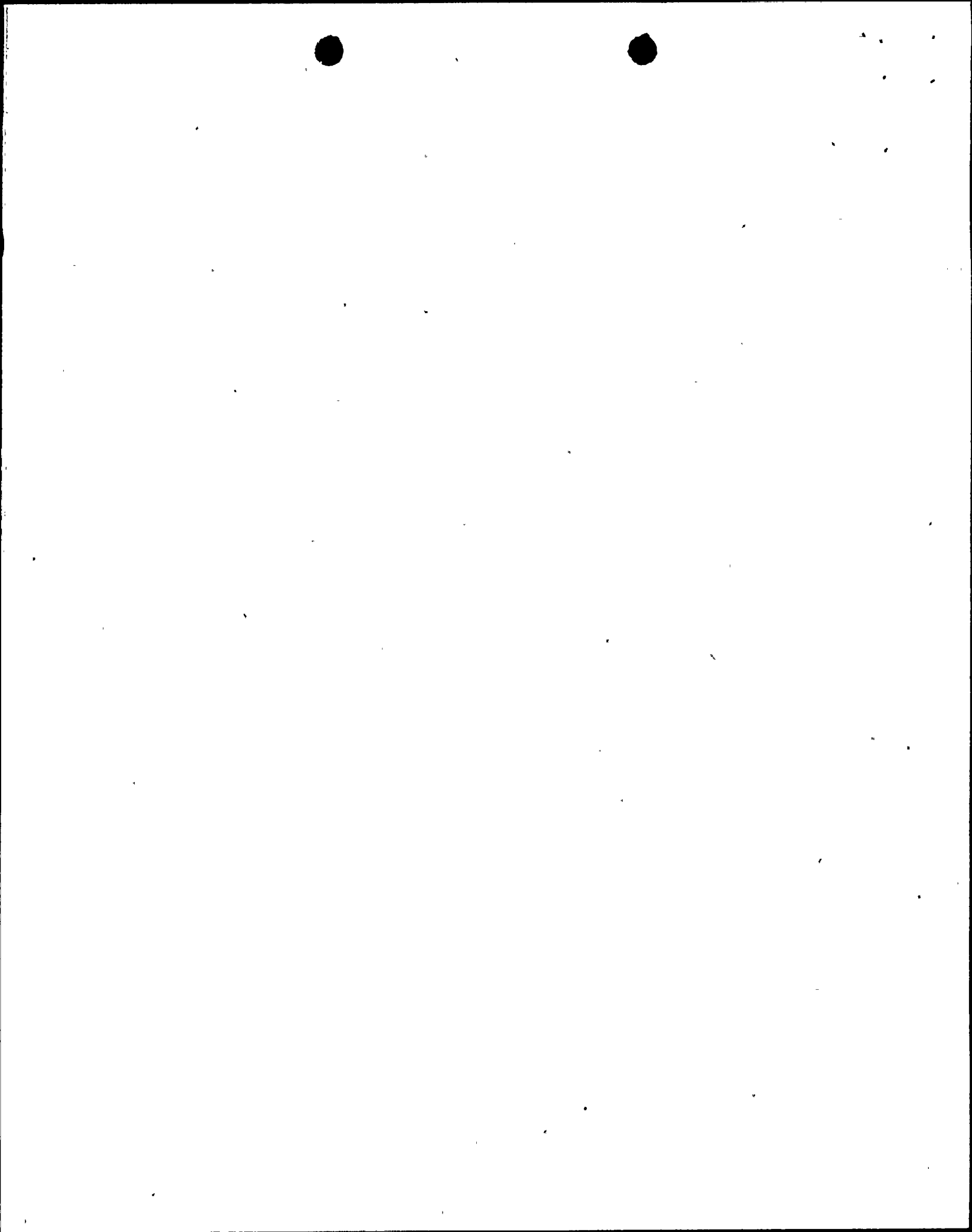


Table 3.3.5.1-1 (page 2 of 6)  
Emergency Core Cooling System Instrumentation

| FUNCTION  | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER FUNCTION | CONDITIONS REFERENCED FROM REQUIRED ACTION A.1 | SURVEILLANCE REQUIREMENTS                    | ALLOWABLE VALUE                          |
|---|--|--------------------------------|--|--|--|
| 2. LPCI System (continued)  |  |                                |  |  |  |
| b. Drywell Pressure - High  | 1,2,3  | 4(c)                           | B  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5 | ≤ 1.88 psig                              |
| c. Reactor Steam Dome Pressure - Low (initiation)                               | 1,2,3<br>4(a), 5(a)                            | 4                              | B  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5 | ≥ 407 psig (lower)<br>≤ 433 psig (upper) |
| d. Reactor Steam Dome Pressure - Low (injection permissive)                     | 1,2,3<br>4(a), 5(a)                            | 4                              | C  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5 | ≥ 407 psig (lower)<br>≤ 433 psig (upper) |
| e. Reactor Steam Dome Pressure - Low (Recirculation Discharge Valve Permissive) | 1(d), 2(d),<br>3(d)                            | 4                              | C  | SR 3.3.5.1.2<br>SR 3.3.5.1.3<br>SR 3.3.5.1.5 | ≥ 216 psig                               |

(continued)

(a) When associated subsystem(s) are required to be OPERABLE.

(c) Also required to initiate the associated DGs, ESW pump timer reset and Turbine Building and Reactor Building Chiller trip.

(d) With either associated recirculation pump discharge or bypass valves open.