



# ENERGY NORTHWEST

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March 31, 2010  
GO2-10-052

10 CFR 50.90

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

**Subject: COLUMBIA GENERATING STATION, DOCKET NO. 50-397  
LICENSE AMENDMENT REQUEST FOR PROPOSED CHANGES TO  
COLUMBIA TECHNICAL SPECIFICATION 3.3.6.1; ADD CHANNEL  
CHECK SURVEILLANCE REQUIREMENT TO PRIMARY CONTAINMENT  
ISOLATION INSTRUMENTATION MAIN STEAM LINE ISOLATION -  
REACTOR VESSEL WATER LEVEL LOW FUNCTION**

**Reference:** Letter dated August 18, 2009, from NJ DiFrancesco (NRC) to JV Parrish (Energy Northwest), "Columbia Generating Station – Issuance of Amendment RE: Change in Group 1 Primary Isolation Valves Reactor Water Level Isolation Signal from Level 2 to Level 1 (TAC No. MD9598)" [ADAMS No ML091700146]

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Energy Northwest hereby requests an amendment to the Columbia Generating Station (Columbia) Technical Specifications (TS). The proposed change would revise the TS to add a channel check surveillance for the primary containment isolation valves' reactor pressure vessel (RPV) low water level isolation signal. The proposed change would affect TS 3.3.6.1, Primary Containment Isolation Instrumentation.

Addition of this surveillance provides increased assurance that the main steam line isolation due to low reactor water function is operable and able to perform its design function of limiting the release of radioactivity during a transient or accident. Through formal evaluation in accordance with 10 CFR 50.92, Energy Northwest has concluded there are no significant hazards associated with this change.

Energy Northwest requests approval of this change prior to April 11, 2011 so that the change can be implemented during Refueling Outage 20 (R-20). New instrumentation will be installed during R-20 as part of implementation of Amendment 214 (see reference) to change the low reactor water level isolation of the main steam lines from level 2 to level 1. The new instrumentation will support performance of a channel check and the new surveillance requirement should be added to ensure appropriate protections are in place for the revised system design.

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NRR

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Once approved, this amendment will be implemented prior to entry into Mode 2 during restart from R-20, in conjunction with implementation of Amendment 214.

The enclosure provides a technical and regulatory evaluation of the changes, including further discussion of the following precedents which adopted new surveillance requirements:

- Amendment No. 272 to Facility Operating License No. DPR-49 for Duane Arnold Energy Center (ADAMS No ML083190108)
- Amendment No. 128 to Facility Operating License No. DPR-33 for Browns Ferry Nuclear Plant (ADAMS No ML020070326)

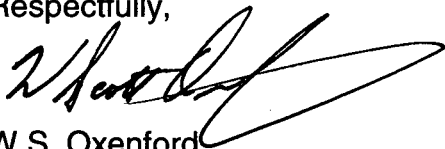
Proposed TS page markups against the current TS are included as an attachment to the enclosure. Retyped TS pages reflect incorporation of both Amendment 214 and the proposed change.

In accordance with 10 CFR 50.91, a copy of this application, with attachments is being provided to the designated Washington State Official.

There are no regulatory commitments contained within this submittal. Should you have any further questions please contact Mr. M.C. Humphreys, Licensing Supervisor, at (509)377-4025.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the date of this letter.

Respectfully,



W.S. Oxenford  
Vice President, Nuclear Generation and Chief Nuclear Officer

Enclosure: Description and Evaluation of the Proposed TS Change

Attachments to the Enclosure:

1. Technical Specification Page Markup
2. Retyped Technical Specification Pages

cc: NRC Region IV Administrator  
NRC NRR Project Manager  
NRC Senior Resident Inspector/988C  
R.R. Cowley - WDOH

R.N. Sherman – BPA/1399  
W.A. Horin – Winston & Strawn  
J.O. Luce – EFSEC

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**Description and Evaluation of the Proposed TS Change**

Subject: Add Channel Check to Main Steam Line Isolation Function 1.a.

1.0 SUMMARY DESCRIPTION

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- 2.1 Change to Primary Containment Isolation Instrumentation (TS 3.3.6.1)
- 2.2 Reason for the Amendment

3.0 TECHNICAL EVALUATION

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- 3.2 Applicable FSAR Text and Figures
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- 4.3 Significant Hazards Consideration
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**ATTACHMENTS:**

- 1. Technical Specification Page Markup
- 2. Retyped Technical Specification Pages

# LICENSE AMENDMENT REQUEST FOR PROPOSED CHANGES TO COLUMBIA TECHNICAL SPECIFICATION 3.3.6.1; ADD CHANNEL CHECK SURVEILLANCE REQUIREMENT TO PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION MAIN STEAM LINE ISOLATION - REACTOR VESSEL WATER LEVEL LOW FUNCTION

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## 1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend the Technical Specifications for Columbia Generating Station (Columbia). The proposed change would revise the Technical Specifications (TS) to add a channel check surveillance for the primary containment isolation valves' reactor pressure vessel (RPV) low water level isolation signal. The proposed change would affect TS 3.3.6.1, Primary Containment Isolation Instrumentation by adding surveillance requirement (SR) 3.3.6.1.1 to the list of required surveillances. The added surveillance reflects new equipment capacities including new instrumentation added in support of Amendment 214 (Reference 1) which modified the low reactor water level main steam line isolation from level 2 to level 1.

## 2.0 DETAILED DESCRIPTION

### 2.1 Change to Primary Containment Isolation Instrumentation (TS 3.3.6.1)

This amendment revises Table 3.3.6.1-1, Primary Containment Isolation Instrumentation. Specifically, Item 1.a of Table 3.3.6.1-1 will be revised to add surveillance requirement 3.3.6.1.1 (Perform CHANNEL CHECK).

### 2.2 Reason for the Amendment

Currently no channel check is required for Primary Containment Isolation Instrumentation function 1.a since existing instrumentation does not support performing a channel check. As part of the implementation of Amendment 214, to be implemented in spring 2011 as part of Refueling Outage 20 (R-20), new reactor water level instrumentation will be installed. The new instrumentation will support performance of a channel check.

The decision to add the channel check surveillance was made in accordance with guidance provided in Information Notice 88-51, Failures of Main Steam Isolation Valves (MSIVs) (Reference 2), which states that licensees should carefully consider the adequacy of main steam line isolation surveillances supporting operability determinations of MSIVs. The benefit of adding this surveillance is increased assurance that the MSIV low reactor water level driven isolation function satisfies all design requirements, in particular limiting the release of radioactivity during a transient or accident.

## 3.0 TECHNICAL EVALUATION

### 3.1 System Description

The existing design of the Primary Containment and Reactor Vessel Isolation Control System for MSIV low reactor water level isolation control consists of four independent,

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redundant, differential pressure reactor water level switches. The switches provide signals to four independent logic channels. As part of implementation of Amendment 214, the existing switches will be replaced with safety-related, differential pressure level transmitters, dual trip units, and auxiliary relays. The four existing independent logic channels will be retained and no changes are being made to the existing trip logic scheme.

**3.2 Applicable FSAR Text and Figures**

Final Safety Analysis Report (FSAR) Section 7.3.1.1.2, Primary Containment and Reactor Vessel Isolation Control System (PCRVICES) (Reference 3a), and the referenced sections, tables, and figures describe the purpose, function, and design of the isolation and control systems. The MSIV low water level isolation closes inboard and outboard main steam isolation valves in response to indications that the ability to cool the core may be threatened due to the low water level. Isolation of the MSIVs supports actions to ensure that offsite dose limits are not exceeded for a design basis accident (DBA).

Low water level isolation of the main steam lines is considered in anticipated (moderate frequency) operational occurrences (AOOs) and postulated accidents of low or extremely low probability (DBA or limiting faults). Analysis of these events is included in Chapter 15 (Reference 3b) and Section 6.3 (Reference 3c) of the FSAR.

**3.3 Analytical Methods, Applicable Standards, Data and Results**

A reliability analysis performed in support of the new instrumentation design concluded that while more components are added to each instrument channel, the system is comparatively more reliable than the previous system. The reliability analysis included data from IEEE Standard 500, Guide to the Collection and Presentation of Electrical, Electronic, Sensing Component, and Mechanical Equipment Reliability Data for Nuclear-Power Generating Stations (Reference 4). Since no channel check was performed on the previous system, the use of a channel check with the new system is an enhancement to the overall design.

The addition of a channel check surveillance is for purposes of detecting a gross channel failure. While channel failure is rare, inclusion of a formal surveillance to supplement less formal checks of the channels during normal operational use provides further assurance of system operability when the low water isolation function is required. The channel check also complements existing channel calibration and testing surveillances and verifies that the low water level isolation function continues to operate properly between the less frequent channel calibrations.

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**3.4 Technical Details in Support of Safety Analysis**

The proposed change adds the channel check surveillance at a 12 hour frequency. The frequency is based on operating experience indicating that failure of a channel is rare. The selected frequency is consistent with the Standard Technical Specifications presented in NUREG-1434, Rev. 3, Standard Technical Specifications (STS) (Reference 7). Existing reliability analyses take no credit for any surveillances other than the channel calibration (SR 3.3.6.1.4) and channel functional tests (SR 3.3.6.1.2), so addition of the channel check adds margin to calculated instrument reliability.

**3.5 Impact on FSAR Accident Analysis**

The addition of a surveillance for the MSIV low water level isolation function does not change system functionality. The change does not impact safety functions, contribute to failures or otherwise impact existing accident analyses assumptions.

**3.6 Relationship to Other Relevant Amendments and NRC Issues**

There are no technical aspects related to the identified precedents that pertain to this submittal.

**3.7 Summary**

This evaluation supports a request to revise Table 3.3.6.1-1, Primary Containment Isolation Instrumentation, to add a channel check surveillance requirement for the Function 1.a. (Main Steam Line Isolation – Reactor Vessel Water Level – Low, Low, Low Level 1). The RPV low water level isolation function provides progressive protection for the reactor for potential variation in RPV coolant inventory. The new surveillance requirement will enhance existing surveillances to provide greater assurance of operability of the MSIV low water level isolation function.

**4.0 REGULATORY EVALUATION**

**4.1 Applicable Regulatory Requirements/Criteria**

Requirements and criteria related to the proposed license amendment are contained in the 10 CFR 50, Appendix A - General Design Criteria (GDC) for Nuclear Power Plants (Reference 5) and 10 CFR 50.36(c)(3) (Reference 6). The added surveillance requirement will aid in assuring reactor water level is appropriately monitored and the function of initiating automatic main steam line isolation is reliable as necessary when reactor coolant inventory is low in support of the following:

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- GDC-13 insofar as it requires instrumentation to be provided to monitor variables and systems over anticipated ranges for normal operations, AOOs and accident conditions to assure safety;
- GDC-20 insofar as it requires that the protection system(s) shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure the specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and initiate the operation of systems and components important to safety;
- GDC-21 insofar as it requires the reactor protection system shall be designed for high functional reliability and testability;
- GDC-29 insofar as it requires high probability of accomplishing safety functions for AOOs;
- GDC-54 insofar as it requires that piping systems penetrating primary reactor containment shall be provided with leak detection, isolation, and containment capabilities having redundancy, reliability, and performance capabilities which reflect the importance to safety of isolating these piping systems; and
- 10 CFR 50.36(c)(3), insofar as it specifies that technical specifications shall include surveillance requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

As noted above, the proposed change is in accordance with NUREG-1434, Rev. 3, Standard Technical Specifications (STS) General Electric Plants, BWR/6. Columbia TS were upgraded in 1997 for alignment with STS based on NUREG-1434, Rev. 1. (Reference 8). The proposed change is consistent with the preface to the STS which states that licensees are encouraged to upgrade TS and adopt all related requirements as applicable to be consistent with, and to conform to the extent practical with the included content. Addition of the new surveillance requirement will result in greater consistency and standardization with industry.

#### **4.2 Precedent**

The proposed change is similar to Amendment No. 272 to Facility Operating License No. DPR-49 for Duane Arnold Energy Center (Reference 9). Both Amendment No. 272 to DPR-49 and the proposed change adopt new surveillance requirements without any other associated changes to the facility or design requiring NRC approval. It should be noted that the surveillances for the Duane Arnold amendment were in a different functional area than the one proposed in this amendment request.

The proposed change is similar to Amendment No. 128 to Facility Operating License No. DPR-33 for Browns Ferry Nuclear Plant (Reference 10). Amendment No. 128 to

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DPR-33 also adopted a new surveillance requirement. Again the specific SR was in a different functional area than the proposed change.

**4.3 Significant Hazards Consideration**

Pursuant to 10 CFR 50.90, Energy Northwest hereby requests an amendment to the Columbia TS. The proposed change modifies Table 3.3.6.1-1, Primary Containment Isolation Instrumentation to add SR 3.3.6.1.1 (Perform CHANNEL CHECK).

Energy Northwest has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, Issuance of Amendment, as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

Adding a channel check surveillance for the main steam low water level isolation function does not increase the probability or consequences of a previously evaluated accident. The proposed change does not impact the logic or performance of the isolation function. The proposed change increases assurance that the isolation function will be operable by providing increased monitoring.

Therefore the proposed change does not increase probability or consequences for an evaluated accident.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

No modifications are being made under the proposed change that create the possibility of a new or different kind of accident. Overall system reliability is improved due to more frequent monitoring.

Therefore the proposed change does not create the possibility of new or different accidents.



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3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

The addition of a channel check surveillance provides increased assurance of operability of the MSIV low water level isolation function.

Therefore the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Columbia concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

#### **4.4 Conclusions**

In conclusion, based on the considerations above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

#### **5.0 ENVIRONMENTAL CONSIDERATION**

The proposed amendment does not involve: (1) a significant hazards consideration, (2) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (3) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9) (Reference 11). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need to be prepared in connection with the proposed amendment.

#### **6.0 REFERENCES**

1. Letter dated August 18, 2009 from NJ DiFrancesco (NRC) to JV Parrish (Energy Northwest), "Columbia Generating Station – Issuance of Amendment RE: Change in Group 1 Primary Isolation Valves Reactor Water Level Isolation Signal from Level 2 to Level 1 (TAC No. MD9598)" [ADAMS No ML091700146].
2. "Failures of Main Steam Isolation Valves", Information Notice 88-51, Office of Nuclear Reactor Regulation, July 21, 1988.

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3. Columbia Generating Station, Final Safety Analysis Report, as amended, December 2009:
  - a. Section 7.3.1.1.2.1, Primary Containment and Reactor Vessel Isolation Control System (PCRVICES) – Reactor Vessel Low Water Level
  - b. Chapter 15, Accident Analyses
  - c. Section 6.3, Engineering Safety Feature – Emergency Core Cooling Systems
4. "Guide to the Collection and Presentation of Electrical, Electronic, Sensing Component, and Mechanical Equipment Reliability Data for Nuclear-Power Generating Stations", IEEE Standards Board, IEEE Standard 500-1984, December 13, 1983.
5. "General Design Criteria for Nuclear Power Plants", Code of Federal Regulations Title 10, Chapter I, Part 50 - Appendix A, 2009.
6. "Technical Specifications – Surveillance Requirements", Code of Federal Regulations Title 10, Chapter I, Part 50, Section 36(c)(3), 2009.
7. "Standard Technical Specifications General Electric Plants, BWR/6", Office of Nuclear Reactor Regulation, NUREG-1434, Revision 3, Volumes 1 & 2, March 31, 2004.
8. "Standard Technical Specifications General Electric Plants, BWR/6", Office of Nuclear Reactor Regulation, NUREG-1434, Revision 1, Volume 1 & 2, April 1, 1995.
9. Letter dated December 3, 2008 from PS Tam (NRC) to RL Anderson, "Duane Arnold Energy Center – Issuance of Amendment to Change Surveillance Requirements of the Cedar River Depth to Assure Ultimate Heat Sink Operability (TAC NO. MD7542) [ADAMS No ML083190108].
10. Letter dated March 31, 1986 from RJ Clark (NRC) to SA White, "Browns Ferry, Unit 1, 2 and 3, Issuance of License Amendment correcting inconsistencies and typographical errors, and adding new surveillance requirements" [ADAMS No ML020070326].
11. "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review", Code of Federal Regulations Title 10, Chapter I, Part 51, Section 22, 2009.

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Attachment 1

Technical Specification Page Markup

Page 3.3.6.1-5

Primary Containment Isolation Instrumentation  
3.3.6.1

Table 3.3.6.1-1 (page 1 of 4)  
Primary Containment Isolation Instrumentation

*proposed change*

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Main Steam Line Isolation					
a. Reactor Vessel Water Level - Low	1,2,3	2	D	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6 SR 3.3.6.1.7	$\geq$ <del>38</del> inches
Low, Level X	Low				
b. Main Steam Line Pressure - Low	1	2	E	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6 SR 3.3.6.1.7	$\geq$ 804 psig
	1				142.3
<i>changes approved via Amendment 214</i>					
c. Main Steam Line Flow - High	1,2,3	2 per MSL	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6 SR 3.3.6.1.7	$\leq$ 124.4 psid
d. Condenser Vacuum - Low	1,2 <sup>(a)</sup> , 3 <sup>(a)</sup>	2	D	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	$\geq$ 7.2 inches Hg vacuum
e. Main Steam Tunnel Temperature - High	1,2,3	2	D	SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.6	$\leq$ 170°F
f. Main Steam Tunnel Differential Temperature - High	1,2,3	2	D	SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.6	$\leq$ 90°F
g. Manual Initiation	1,2,3	4	G	SR 3.3.6.1.6	NA
2. Primary Containment Isolation					
a. Reactor Vessel Water Level - Low, Level 3	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	$\geq$ 9.5 inches
b. Reactor Vessel Water Level - Low, Level 2	1,2,3	2 <sup>(e)</sup>	H	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	$\geq$ -58 inches
c. Drywell Pressure - High	1,2,3	2 <sup>(e)</sup>	H	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	$\leq$ 1.88 psig

(continued)

(a) With any turbine throttle valve not closed.

(e) Also required to initiate the associated LOCA Time Delay Relay Function pursuant to LCO 3.3.5.1.

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Attachment 2

Retyped Technical Specification Pages

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Page 3.3.6.1-6

Primary Containment Isolation Instrumentation  
3.3.6.1

Table 3.3.6.1-1 (page 1 of 4)  
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Main Steam Line Isolation					
a. Reactor Vessel Water Level - Low Low, Level 1	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6 SR 3.3.6.1.7	≥ -142.3 inches
b. Main Steam Line Pressure - Low	1	2	E	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6 SR 3.3.6.1.7	≥ 804 psig
c. Main Steam Line Flow - High	1,2,3	2 per MSL	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6 SR 3.3.6.1.7	≤ 124.4 psid
d. Condenser Vacuum - Low	1,2 <sup>(a)</sup> , 3 <sup>(a)</sup>	2	D	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≥ 7.2 inches Hg vacuum
e. Main Steam Tunnel Temperature - High	1,2,3	2	D	SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 170°F
f. Main Steam Tunnel Differential Temperature - High	1,2,3	2	D	SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 90°F
g. Manual Initiation	1,2,3	4	G	SR 3.3.6.1.6	NA
2. Primary Containment Isolation					
a. Reactor Vessel Water Level - Low, Level 3	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≥ 9.5 inches
b. Reactor Vessel Water Level - Low Low, Level 2	1,2,3	2 <sup>(e)</sup>	H	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≥ -58 inches
c. Drywell Pressure - High	1,2,3	2 <sup>(e)</sup>	H	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 1.88 psig

(continued)

(a) With any turbine throttle valve not closed.

(e) Also required to initiate the associated LOCA Time Delay Relay Function pursuant to LCO 3.3.5.1.

Primary Containment Isolation Instrumentation  
3.3.6.1

Table 3.3.6.1-1 (page 2 of 4)  
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Primary Containment Isolation (continued)					
d. Reactor Building Vent Exhaust Plenum Radiation - High	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 16.0 mR/hr
e. Manual Initiation	1,2,3	4	G	SR 3.3.6.1.6	NA
3. Reactor Core Isolation Cooling (RCIC) System Isolation					
a. RCIC Steam Line Flow - High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 250 inches wg
b. RCIC Steam Line Flow - Time Delay	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 3.00 seconds
c. RCIC Steam Supply Pressure - Low	1,2,3	2	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≥ 61 psig
d. RCIC Turbine Exhaust Diaphragm Pressure - High	1,2,3	2	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 20 psig
e. RCIC Equipment Room Area Temperature - High	1,2,3	1	F	SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 180°F
f. RCIC Equipment Room Area Differential Temperature - High	1,2,3	1	F	SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 60°F
g. RWCU/RCIC Steam Line Routing Area Temperature - High	1,2,3	1	F	SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 180°F
h. Manual Initiation	1,2,3	1 <sup>(b)</sup>	G	SR 3.3.6.1.6	NA
4. RWCU System Isolation					
a. Differential Flow - High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 67.4 gpm

(continued)

(b) RCIC Manual Initiation only inputs into one of the two trip systems.