



Brunswick Nuclear Plant  
P.O. Box 10429  
Southport, NC 28461

OCT 22 2015

Serial: BSEP 15-0088

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

Subject: Brunswick Steam Electric Plant, Unit No. 1  
Renewed Facility Operating License No. DPR-71  
Docket No. 50-325  
Special Report - Technical Specification 5.6.6, Post Accident Monitoring (PAM)  
Instrumentation Report

In accordance with Technical Specification 5.6.6, "Post Accident Monitoring (PAM) Instrumentation Report," for the Brunswick Steam Electric Plant, Unit No. 1, Duke Energy Progress, Inc., is submitting the enclosed Special Report associated with the Unit 1 Reactor Water Clean-Up System Valve Position Indication.

This document contains no regulatory commitments.

Please refer any questions regarding this submittal to Mr. Lee Grzeck, Manager - Regulatory Affairs, at (910) 457-2487.

Sincerely,

A handwritten signature in cursive script that reads 'Annette H. Pope'.

Annette H. Pope  
Director - Organizational Effectiveness  
Brunswick Steam Electric Plant

IE22  
NRR

Enclosure:

Special Report - Technical Specification 5.6.6, Post Accident Monitoring (PAM)  
Instrumentation Report

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II  
ATTN: Regional Administrator  
245 Peachtree Center Ave, NE, Suite 1200  
Atlanta, GA 30303-1257

U. S. Nuclear Regulatory Commission  
ATTN: Ms. Michelle P. Catts, NRC Senior Resident Inspector  
8470 River Road  
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission  
ATTN: Mr. Andrew Hon (Mail Stop OWFN 8G9A) **(Electronic Copy Only)**  
11555 Rockville Pike  
Rockville, MD 20852-2738

Chair - North Carolina Utilities Commission  
P.O. Box 29510  
Raleigh, NC 27626-0510

**Enclosure**  
**Special Report -**  
**Technical Specification 5.6.6, Post Accident Monitoring (PAM)**  
**Instrumentation Report**

## Background

On September 9, 2015, at 2103 hours, with Brunswick Steam Electric Plant (BSEP) Unit 1 in MODE 1 at 100% power, Unit 1 experienced a loss of electrical power to Motor Control Center 1CB, resulting in a Reactor Water Clean-Up (RWCU) Group 3 containment isolation. During this isolation, Unit 1 RWCU Inlet Inboard Isolation Valve 1-G31-F001 went fully closed as required, but displayed dual "Open-Closed" valve position indication in the Control Room. Full closure of 1-G31-F001 was verified by stroking the valve open and closed and noting an acceptable full stroke time in both the open and closed directions. Subsequent investigation determined the 1-G31-F001 "Open" position indication in the Control Room was operable while the 1-G31-F001 "Closed" position indication in the Control Room was inoperable. Valve 1-G31-F004 is the Unit 1 RWCU Inlet Outboard Isolation Valve in the same containment penetration as 1-G31-F001. During the Group 3 containment isolation, 1-G31-F004 went fully closed as required and the valve's "Open" and "Closed" position indications in the Control Room were operable.

In MODE 1, BSEP Unit 1 Technical Specification (TS) Table 3.3.3.1-1, "Post Accident Monitoring Instrumentation," Function 8 PCIV Position, requires two channels of Primary Containment Isolation Valve (PCIV) position instrumentation in the Control Room be operable for an un-isolated containment penetration flow path with two containment isolation valves. For the un-isolated containment penetration flow path served by PCIVs 1-G31-F001 and 1-G31-F004, this requirement is satisfied by requiring one channel of position instrumentation in the Control Room be operable for each of these two PCIVs. With the 1-G31-F001 "Closed" position indication in the Control Room inoperable, the required 1-G31-F001 PCIV position instrumentation channel is inoperable. The Required Action and Completion Time for Condition A of TS 3.3.3.1, "Post Accident Monitoring (PAM) Instrumentation," requires the channel be restored to an operable status within 30 days. Given that BSEP Unit 1 is in MODE 1 and valve 1-G31-F001 and its limit switches are in the Unit 1 drywell, the valve and its limit switches cannot be accessed for repairs. Therefore, the required 1-G31-F001 PCIV position instrumentation channel was not restored to an operable status within 30 days. With the Required Action and Completion Time of Condition A not met, the Required Action and Completion Time of TS 3.3.3.1, Condition B, requires action be initiated immediately in accordance with TS 5.6.6. TS 5.6.6, "Post Accident Monitoring (PAM) Instrumentation Report," requires a report be submitted within the following 14 days outlining the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the 1-G31-F001 PCIV position instrumentation channel to an operable status. This Special Report is submitted in accordance with the TS 5.6.6 requirement.

## Cause of Inoperability

Initial investigation determined the cause of the inoperable 1-G31-F001 PCIV position instrumentation channel was a failure of a limit switch on the valve.

## Preplanned Alternate Monitoring Method

The TS Table 3.3.3.1 PAM instrumentation ensures there is sufficient information available on selected plant parameters to monitor and assess plant status and behavior following an accident. In the case of PCIV position, the important information is the isolation status of the associated containment penetration for verification of containment integrity. For the containment penetration flow path served by PCIVs 1-G31-F001 and 1-G31-F004, the two TS required operable channels ensure that no single failure prevents the operators from being

presented with the information necessary to determine the status of the containment penetration flow path. The two required channels is satisfied by requiring one channel of position instrumentation in the Control Room be operable for each of these two PCIVs.

Although the 1-G31-F001 PCIV position instrumentation channel is inoperable, there are alternate means for operators to verify the isolation status of the containment penetration flow path served by PCIVs 1-G31-F001 and 1-G31-F004. First, the 1-G31-F004 PCIV position instrumentation channel is fully operable. Also, the Control Room is equipped with RWCU inlet, RWCU return, RWCU reject, and RWCU differential flow indications. Isolation of the RWCU containment penetration flow path served by 1-G31-F001 and 1-G31-F004 can be quickly verified by monitoring these flow indications. These flow signals are continually monitored by the leak detection system which would annunciate and alert operators of flow imbalance levels arising from isolation of the containment penetration flow path. Individual RWCU filter flow indication is also available in the Control Room with associated low flow annunciation. Finally, the high energy line break and leak detection systems also monitor reactor building temperatures alerting operators of any significant RWCU system leakage.

#### Plans and Schedule for Restoring the Instrumentation to an Operable Status

Given that BSEP Unit 1 is in MODE 1 and valve 1-G31-F001 and its limit switches are in the Unit 1 drywell, the limit switches cannot be accessed for repairs. These repair activities will be completed during the next Unit 1 refueling outage, currently scheduled to begin on February 27, 2016. These repair activities will restore the required 1-G31-F001 PCIV position instrumentation channel to an operable status.