



Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

May 20, 2011

10 CFR 50.73

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

Browns Ferry Nuclear Plant, Unit 1  
Facility Operating License No. DPR-33  
NRC Docket No. 50-259

**Subject: Licensee Event Report 50-259/2010-002-01**

**Reference: Letter from TVA to NRC, "Licensee Event Report 50-259/2010-002-00," dated November 15, 2010.**

On November 15, 2010, the Tennessee Valley Authority (TVA) submitted Licensee Event Report (LER) 2010-002 (Reference) which provides details of plant operation with inoperable drywell pressure channels for longer than allowed by the Browns Ferry Nuclear Plant Technical Specifications. TVA is submitting this report in accordance with 10 CFR 50.73(a)(2)(i)(B), any operation or condition which was prohibited by the plant's Technical Specifications.

This revision to LER 50-259/2010-002 is administrative in nature, and primarily provides consistent nomenclature and corrected event dates.

There are no new regulatory commitments contained in this letter. Should you have any questions concerning this submittal, please contact J. E. Emens, Jr., Nuclear Site Licensing Manager, at (256) 729-2636.

Respectfully,

K. J. Polson  
Vice President

**Enclosure: Licensee Event Report - Unit 1, Drywell Pressure Instrument Channel Inoperability Due to Improper Instrument Tubing Slope**

*IE22  
MCA*

**U.S. Nuclear Regulatory Commission**  
**Page 2**  
**May 20, 2011**

**cc (w/ Enclosure):**

**NRC Regional Administrator - Region II**  
**NRC Senior Resident Inspector - Browns Ferry Nuclear Plant**

**Enclosure**

**Browns Ferry Nuclear Plant  
Unit 1**

**Licensee Event Report - Unit 1, Drywell Pressure Instrument Channel Inoperability  
Due to Improper Instrument Tubing Slope**

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**See Attached**

**LICENSEE EVENT REPORT (LER)**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

<b>1. FACILITY NAME</b> Browns Ferry Nuclear Plant Unit 1	<b>2. DOCKET NUMBER</b> 05000259	<b>3. PAGE</b> 1 of 8
--------------------------------------------------------------	-------------------------------------	--------------------------

**4. TITLE:** Drywell Pressure Instrument Channel Inoperability Due to Improper Instrument Tubing Slope

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	16	2010	2010	002	01	05	20	2011	N/A	05000
									FACILITY NAME	DOCKET NUMBER
									N/A	05000

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> <i>(Check all that apply)</i>									
<b>10. POWER LEVEL</b>  100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER						
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<small>Specify in Abstract below or in NRC Form 388A</small>						

**12. LICENSEE CONTACT FOR THIS LER**

FACILITY NAME Eric Bates, Licensing Engineer	TELEPHONE NUMBER <i>(Include Area Code)</i> 256-614-7180
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

<b>14. SUPPLEMENTAL REPORT EXPECTED</b>	<b>15. EXPECTED SUBMISSION DATE</b>	MONTH	DAY	YEAR
<input type="checkbox"/> YES <i>(If yes, complete 15. EXPECTED SUBMISSION DATE)</i> <input checked="" type="checkbox"/> NO	DATE	N/A	N/A	N/A

**ABSTRACT** *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On September 16, 2010, it was determined that a condition initially identified on December 8, 2008, reflected inoperability of a drywell pressure channel for longer than allowed by Technical Specifications. Subsequent review for extent of this condition identified that the inoperable condition existed from October 2, 2008, until corrected on December 9, 2008. Additionally, a subsequent occurrence of an inoperable drywell pressure channel between May 25, 2010, and October 6, 2010, was discovered. Corrective actions taken on December 9, 2008, and October 6, 2010, involved purging trapped water in the instrumentation sensing line. The immediate cause was improperly sloped instrument sensing lines that allowed water to condense and collect in the sensing lines, resulting in non-conservatively biased instrumentation output signals. The instrument sensing lines were modified during the Cycle 8 refueling outage (Fall 2010) to eliminate water traps and provide proper slope to assure no accumulation of condensed water. The condition resulted from modifications in 2005 which did not assure adherence to the design specifications for proper instrument sensing line slope. The cause for improper instrument slope is attributed to human error and unclear procedural guidance. The Browns Ferry procedures and processes have been revised to clearly require the verifications for proper slope.

**LICENSEE EVENT REPORT (LER)**  
CONTINUATION SHEET

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Nuclear Plant Unit 1	05000259	2010	-- 002	-- 01	2 of 8

**NARRATIVE**

**I. PLANT CONDITION(S)**

At the time of discovery, Browns Ferry Nuclear Plant (BFN), Unit 1 was at approximately 100 percent power (3458 MWT).

**II. DESCRIPTION OF EVENT**

**A. Event**

Event No.1: 1-PT-064-56C (October - December 2008)

On December 8, 2008, at 1130 hours Central Standard Time (CST), during the performance of shift instrument checks, operations personnel noted that a drywell pressure transmitter, 1-PT-064-56C [JC], was reading 0.25 psig lower than redundant channels 1-PT-064-56A, 1-PT-064-56B, and 1-PT-064-56D. Troubleshooting was initiated on the drywell pressure transmitter loop. 1-PT-064-56C and 1-PT-064-58F [JE] share a common instrument line from the drywell penetration. Comparisons of meter readings (1-PT-064-56C = 0.8 psig and 1-PT-064-58F = 1.25 psig) indicated the potential for moisture in the sensing line leading to 1-PT-064-56C.

On December 9, 2008, at 1825 hours CST, troubleshooting personnel recorded as-found readings reflecting 1-PT-064-56C reading 0.5 psig lower than redundant channels 1-PT-064-56A, 1-PT-064-56B, and 1-PT-064-56D. Operations declared 1-PT-064-56C and 1-PT-064-58F inoperable. Operations entered Technical Specification (TS) Actions for the following Limiting Conditions for Operation (LCOs): LCO 3.3.1.1 Reactor Protection System (RPS) Instrumentation, LCO 3.3.6.1 Primary Containment Isolation System (PCIS) Instrumentation, LCO 3.3.6.2 Secondary Containment Isolation System (SCIS) Instrumentation, and LCO 3.3.7.1 Control Room Emergency Ventilation System (CREVS) Instrumentation. Each of these TS Actions requires placing the inoperable channel in trip within 12 hours.

While performing the troubleshooting, a "trap" was found where moisture or condensate could collect. The sensing line between 1-PT-064-56C and 1-PT-064-58F was blown down with nitrogen. Between 1/2 and 3/4 a cup of water was removed from the sensing line.

On December 9, 2008, at 2214 hours CST, 1-PT-064-56C and 1-PT-064-58F were unisolated and readings returned to normal; at that time operations personnel declared 1-PT-064-56C and 1-PT-064-58F operable and Actions for LCO 3.3.1.1, LCO 3.3.6.1, LCO 3.3.6.2, and LCO 3.3.7.1 were exited.

The functional evaluation for this condition was completed July 19, 2010, and concluded that the 0.5 psig bias resulted in a condition where 1-PT-064-56C and 1-PT-064-58F would not have performed its TS required function; the non-conservative bias would have resulted in the channel not reaching its trip setpoint until actual drywell pressure would exceed the TS allowable value as well as the analytical limit of the analyses. This evaluation, however, did not provide adequate basis to determine specifically when operability would not be maintained during the period when the bias was less than the peak of 0.5 psig.

Further analysis of the readings and uncertainties established a past operability criteria that allowed the determination that the water trap bias affecting 1-PT-064-56C had rendered the associated functions inoperable for longer than allowed by the TS. This conclusion was formally made on September 16, 2010. The period of inoperability without the channel being placed in trip within 12 hours is judged to have existed beginning October 2, 2008, until resolved on December 9, 2008. This period included a unit startup and associated Mode

**LICENSEE EVENT REPORT (LER)**  
CONTINUATION SHEET

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Nuclear Plant Unit 1	05000259	2010	-- 002	-- 01	3 of 8

**NARRATIVE**

changes, which would have required performance of a risk assessment addressing the inoperable components.

**Event No.2: 1-PT-064-56B (May - October 2010)**

On October 5, 2010, at 1630 hours Central Daylight Time (CDT), operations personnel declared 1-PT-064-56B [JC], 1-PT-064-50 [IP], and 1-PT-064-58G [JE] (all associated with a common sensing line) inoperable. This resulted in entering Actions for LCO 3.3.1.1, RPS Instrumentation; LCO 3.3.6.1, PCIS Instrumentation; LCO 3.3.6.2, SCIS Instrumentation; and LCO 3.3.7.1 CREVS Instrumentation. Each of these TS Actions requires placing the inoperable channel in trip within 12 hours. The condition also resulted in entering Actions for LCO 3.3.3.1, Post Accident Monitoring (PAM) Instrumentation, and LCO 3.3.3.2, Backup Control System; each of these actions requiring restoration within 30 days.

This declaration was a result of engineering notifying the Operations Shift Manager that based on a similar potential for a water trap and an ongoing non-conservative bias in the reading, 1-PT-064-56B had been determined to be not capable of tripping within its TS required Allowable Value. The monitoring instrumentation requirements associated with PAM and Backup Control System were conservatively considered inoperable for the indication function.

On October 6, 2010, at 0348 hours CDT, the issue was corrected by purging trapped water in the common sensing line back into the drywell, at which time operations personnel declared 1-PT-064-56B, 1-PT-064-50, and 1-PT-064-58G operable and Actions for LCO 3.3.1.1, LCO 3.3.3.1, LCO 3.3.3.2, LCO 3.3.6.1, LCO 3.3.6.2, and LCO 3.3.7.1 were exited.

Utilizing the established past operability criteria for the evaluation of the 2008 event, it was determined that the water trap bias affecting 1-PT-064-56B, 1-PT-064-50, and 1-PT-064-58G rendered the associated functions inoperable for longer than allowed by the TS. The period of inoperability is judged to have existed beginning May 25, 2010, until resolved on October 6, 2010. This period also included an instance where 1-PT-064-56D was removed from service (on August 17, 2010, at 2347 hours to August 18, 2010, at 0116 hours) for surveillance testing. With both 1-PT-064-56B and 1-PT-064-56D inoperable, the associated automatic RPS [JC], PCIS [JE], SCIS [JE], and CREVS [JE] functions would have been incapable of actuating within the analytical limit; however, since the instrumentation continued to track normal variations in drywell pressure, the 1-PT-064-56B channel would have tripped on increasing drywell pressure such that the actual impact would have been to the response time and not a complete failure to actuate.

The Tennessee Valley Authority (TVA) is submitting this report in accordance with 10 CFR 50.73(a)(2)(i)(B), any operation or condition which was prohibited by the plant's Technical Specifications.

**B. Inoperable Structures, Components, or Systems that Contributed to the Event**

During the Event No.1 period of inoperability, there were no inoperable structures, components, or systems that contributed to the event. During the Event No.2 period of inoperability, normally scheduled surveillance testing rendered redundant instrument channels inoperable for a brief period such that the safety function was not capable of being actuated as assumed in the safety analysis.

**LICENSEE EVENT REPORT (LER)**  
CONTINUATION SHEET

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Nuclear Plant Unit 1	05000259	2010	-- 002	-- 01	4 of 8

**NARRATIVE**

**C. Dates and Approximate Times of Major Occurrences**

- |                                      |                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| October 2, 2008                      | The beginning of greater than or equal to 3 consecutive days with a non-conservative deviation on a 1-PT-064-56C instrument channel greater than or equal to 0.10 psig                                                                                                                                                                                                                                     |
| November 30, 2008, at 1755 hours CST | Unit startup commenced by entering MODE 2 (STARTUP).                                                                                                                                                                                                                                                                                                                                                       |
| December 1, 2008, at 1433 hours CST  | Unit entered MODE 1 (RUN).                                                                                                                                                                                                                                                                                                                                                                                 |
| December 8, 2008, at 1130 hours CST  | Operations noted that 1-PT-064-56C was reading 0.25 psig lower than channels 56A, 56B, and 56D.                                                                                                                                                                                                                                                                                                            |
| December 9, 2008, at 1825 hours CST  | Troubleshooting activities resulted in isolating 1-PT-064-56C and 1-PT-064-58F. Operations personnel declared 1-PT-064-56C and 1-PT-064-58F inoperable and entered TS Actions for LCO 3.3.1.1, LCO 3.3.6.1, LCO 3.3.6.2, and LCO 3.3.7.1 that require placing the inoperable channel in trip in 12 hours.                                                                                                  |
| December 9, 2008, at 2214 hours CST  | Water was purged from sensing line for 1-PT-064-56C. Operations declared 1-PT-064-56C and 1-PT-064-58F operable and exited Actions for LCO 3.3.1.1, LCO 3.3.6.1, LCO 3.3.6.2, and LCO 3.3.7.1.                                                                                                                                                                                                             |
| May 25, 2010                         | The beginning of greater than or equal to 3 consecutive days with a non-conservative deviation on a 1-PT-064-56B instrument channel greater than or equal to 0.10 psig                                                                                                                                                                                                                                     |
| October 5, 2010, at 1630 hours CDT   | Engineering notified Operations Shift Manager that 1-PT-064-56B has been determined to be not capable of tripping at its TS required Allowable Value. 1-PT-064-56B, 1-PT-064-50, and 1-PT-064-58G are declared inoperable and TS Actions for LCO 3.3.1.1, LCO 3.3.3.1, LCO 3.3.3.2, LCO 3.3.6.1, LCO 3.3.6.2, and LCO 3.3.7.1 are entered that require placing the inoperable channel in trip in 12 hours. |
| October 6, 2010, at 0348 hours CDT   | Water was purged from sensing line for 1-PT-064-56B. Operations declared 1-PT-064-56B, 1-PT-064-50, and 1-PT-064-58G operable and exited Actions for LCO 3.3.1.1, LCO 3.3.3.1, LCO 3.3.3.2, LCO 3.3.6.1, LCO 3.3.6.2, and LCO 3.3.7.1.                                                                                                                                                                     |

**D. Other Systems or Secondary Functions Affected**

None

**LICENSEE EVENT REPORT (LER)**  
CONTINUATION SHEET

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Nuclear Plant Unit 1	05000259	2010	-- 002	-- 01	5 of 8

**NARRATIVE**

**E. Method of Discovery**

Engineering evaluation of the impact of drywell pressure reading deviations greater than 0.2 psig determined the non-conservative bias resulted in affected instruments not meeting TS operability criteria.

**F. Operator Actions**

None

**G. Safety System Responses**

None

**III. CAUSE OF THE EVENT**

**A. Immediate Cause**

The immediate cause for the non-conservative bias affecting operability of the drywell pressure transmitters was improperly sloped instrument sensing lines. The improperly sloped sensing lines allowed water to condense and collect in the sensing lines, which resulted in non-conservatively biased instrumentation output signals.

**B. Root Cause**

The cause of the improperly sloped instrument sensing lines is attributed to human error and unclear procedural guidance to assure modification installation meets engineering design specifications.

**C. Contributing Factors**

None

**IV. ANALYSIS OF THE EVENT**

During 2005, as part of BFN Unit 1 restart, there were various design change notices (DCN) that included refurbishment of the instrument panels affecting 1-PT-064-56A, 1-PT-064-56B, 1-PT-064-56C, and 1-PT-064-56D. One DCN provided a design information package for the refurbishment of components and cabling to the affected panels. A second DCN replaced various valves and fittings on the affected panels, and a third provided sensing line installation and modification in accordance with sensing line support drawings for small bore piping.

Adherence to TVA Engineering Specifications for instrument and instrument line installation criteria for most of the routing of the sensing lines was evident. Specifically, the routing of piping, going from the instrument panels through the floor penetrations (adjacent to the local panels) to the primary containment wall penetration, was detailed in isometric drawings and does not exhibit instances of "water trap" routing. However, the piping sensing lines from the floor penetration to the local panels did not adhere to the applicable specification and thus did not preclude the presence of water traps. The Unit 1 piping configurations were duplicated from the Unit 3 design (Panel 3-25-5B and Panel 3-25-6B), which have also been found to not adhere to the design specifications to preclude water traps. (Note that no instances of actual trapped water and related instrument bias impact have been identified during Unit 3 operation.) Unit 2 sensing line configurations conform to the applicable instrument slope design specifications.

The piping "water traps" in Unit 3 were not previously reported as a non-conformance. These non-conformances can be attributed to human error and inadequate procedural guidance, which included not properly reviewing the completed work. The duplication during the Unit 1 Restart



**LICENSEE EVENT REPORT (LER)**  
CONTINUATION SHEET

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Nuclear Plant Unit 1	05000259	2010	-- 002	-- 01	6 of 8

**NARRATIVE**

effort can also be attributed to human error and inadequate procedural guidance, which included not properly reviewing the completed work. The as-implemented design should be verified to preclude "water traps" per the design specification criteria.

Furthermore, the Unit 1 panel instrument tubing also presented routing that did not adhere to the applicable specification and thus did not preclude the presence of water traps. The Unit 1 panel tubing is field routed (not routed in accordance with isometrics) and therefore, while Unit 3 tubing does conform to the design specifications, Unit 1 tubing routing exhibited additional human error and inadequate procedural guidance, which included not properly reviewing the completed work.

With the presence of improperly sloped sensing lines, natural condensation within the lines would allow the formation of trapped water.

The only available data to review for past operability are the twice-daily remote readings on 1-PT-064-56A, 1-PT-064-56B, 1-PT-064-56C, and 1-PT-064-56D recorded on operator rounds. The remote readings are displayed on analog meters with 0.1 psig scaling divisions and some potential for parallax inaccuracies that engineering judgment suggests could approach 0.05 psig. The manufacturer stated accuracy for these indicators is +/- 0.5% (= 0.02 psig). As such, based on engineering judgment, a maximum-to-minimum deviation between the four readings that occasionally reaches 0.10 psig would be within the overall combined accuracy of a single instance of readings. Historical trending shows the majority of the time that maximum-to-minimum deviation of 0.10 psig is reported, subsequent readings return to differences less than 0.10 psig. The random nature of these occurrences also tends to coincide with differing instruments or more than one instrument reflecting the minimum value. These random occurrences are judged not to reflect evidence of a water trap bias.

On two occasions, extended periods of a maximum-to-minimum deviation at or above 0.10 psig occurred, where one instrument was consistently reading the minimum value. In each of these occurrences a maintenance activity to purge a potential water trap in the sensing line of that instrument resulted in a return to normal and continual reading differences less than 0.10 psig. As such, it is reasonable to conclude that continued periods of maximum-to-minimum differences of 0.10 psig and greater (with occasional drops below 0.10 psig for similar uncertainty reasoning) where a single reading was consistently the minimum value, reflect a basis for identifying a historical non-conservative water-trap-induced bias. A period of 3 consecutive days with the majority of maximum-to-minimum deviations greater than or equal to 0.10 psig is selected. This criterion is consistent with both the limitations of the accuracy of these readings, and the historical data associated with positive finding of trapped water.

Since an actual water-trap bias creates a non-conservative instrument reading, and a non-conservative bias of 0.05 psig exceeds the difference between setpoint calculation determination of the nominal trip and allowable value, it is assumed, based on engineering judgment, that any past extended period (3 or more days) where a majority of the maximum-to-minimum deviations are greater than or equal to 0.10 psig and where a single reading was consistently the minimum value, also reflected inoperability of that instrument channel.

There were no adverse indications, due to water entrapment, observed on the Unit 1 drywell pressure transmitters from the time period subsequent to the immediate corrective action of purging the water out of the sensing line, until the implementation of the DCN which reconfigured the sensing lines to eliminate any water traps. Additionally, there have been no adverse indications, due to water entrapment, observed on the Unit 3 drywell pressure transmitters.

**LICENSEE EVENT REPORT (LER)**  
CONTINUATION SHEET

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Nuclear Plant Unit 1	05000259	2010	-- 002	-- 01	7 of 8

**NARRATIVE**

**V. ASSESSMENT OF SAFETY CONSEQUENCES**

The affected drywell pressure instrumentation provides a drywell high pressure input for automatic functions in RPS, PCIS, SCIS, Standby Gas Treatment [JE] (SBGT), and CREVS. The Event No.2 affected instrumentation also provides indication-only for the PAM and Backup Control System. Since the negative bias that resulted in the automatic initiation being inoperable caused less than a 0.25 psig error in the indication-only functions, there is judged to be no appreciable safety consequence for the PAM or Backup Control System function.

The high drywell nominal setpoint is 2.45 psig. With the analytical limit of 2.6 psig and TS Allowable Value of less than or equal to 2.5 psig, there is a very small margin between the setpoint and these limits. A non-conservative bias on the order of 0.05 psig would result in a channel tripping at drywell pressures above the TS required Allowable Value. A non-conservative bias on the order of 0.15 psig would result in a channel tripping at drywell pressures above the Analytical Limit. The majority of the indicated negative bias for both Event No.1 and Event No.2 ranged between 0.15 psig and 0.20 psig. It is conservatively assumed that the affected channels would not have tripped within the analytically assumed drywell pressure value. However, since the instrumentation continued to track normal variations in drywell pressure, these channels would have tripped on increasing drywell pressure such that the actual impact would have been to the response time and not to a complete failure to actuate.

Note that the drywell high pressure input for automatic functions in RPS and SCIS (including SBGT) are not credited in the accident analysis. While the PCIS and CREVS automatic functions do take credit for being actuated on high drywell pressure, the response time for the protection afforded is not immediate in nature. The primary containment isolation total response time includes signal delay, diesel generator startup (for loss of offsite power), and isolation valve stroke times. The CREVS initiation on drywell pressure is performed as a precursor to a potential radiation release and subsequent radiation exposure to control room personnel. As such, the delayed channel trip is judged to not have a significant impact on the credited safety functions.

The logic for each function described above is arranged in a one-out-of-two, taken-twice logic, such that the failure of one pressure transmitter (1-PT-064-56A, 1-PT-064-56B, 1-PT-064-56C, or 1-PT-064-56D) would not prevent the associated reactor trip, primary or secondary containment isolation, SBGT, and CREVS initiation functions. However, for brief periods on August 12, 2010 and August 17, 2010, both channels of one division of logic (one of the "taken-twice" logics) were inoperable; one channel (1-PT-064-56B) inoperable for the negative bias, and one channel (1-PT-064-56D) inoperable for scheduled surveillance testing. The scheduled surveillance testing periods were 5 hours and 15 minutes (August 12, 2010) and 1 hour and 29 minutes (August 17, 2010). While these brief periods reflect an inoperable condition that potentially impacted the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material (PCIS inoperable), and mitigate the consequences of an accident (CREVS initiation inoperable), as discussed above the actual impact was to the response time of the negative bias channel (1-PT-064-56B). This condition would have still provided the function delayed by the time for increasing drywell pressure to exceed the small negative bias.

As such, TVA concludes that there was no significant reduction in the protection of the public by this event.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 1	05000259	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	8 of 8
		2010	-- 002	-- 01	

**NARRATIVE**

**VI. CORRECTIVE ACTIONS**

The corrective actions are being managed within TVA's Corrective Action Program.

**A. Immediate Corrective Actions**

Instrument sensing lines were purged of water to restore operability.

**B. Corrective Actions to Prevent Recurrence**

1. Implement Unit 1 and Unit 3 design changes that reconfigure sensing lines to eliminate water traps. Unit 1 modifications were made during the Cycle 8 refueling outage (Fall 2010). Unit 3 modifications will be scheduled within the corrective action program.
2. Revised the general requirements for modifications procedure to specifically address implementation requirements to assure the design specification standards for instrument sensing line slopes are met.
3. Engineering design specifications were revised to require Quality Control inspection of sensing lines associated with instruments which perform a primary safety function. This change was completed subsequent to Unit 1 Restart modifications.

**VII. ADDITIONAL INFORMATION**

**A. Failed Components**

None

**B. Previous Similar Events**

None

**C. Additional Information**

The corrective action documents for this report are PER 159710, PER 219150, PER 242068, and PER 279760. The BFN corrective action program is also addressing issues associated with untimely evaluations of the condition and operability determination, as documented in PER 285603. PER 333024 documents typographical errors that were found in the original issue of LER 50-259/2010-002.

**D. Safety System Functional Failure Consideration**

This event is not classified as a safety system functional failure according to NEI 99-02.

**E. Scram With Complications Consideration**

This event did not include a reactor scram.

**VIII. COMMITMENTS**

None