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10 CFR 50.73

SVPLTR # 09-0065

December 22, 2009

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

Dresden Nuclear Power Station, Unit 2
Renewed Facility Operating License No. DPR-19
NRC Docket No. 50-237

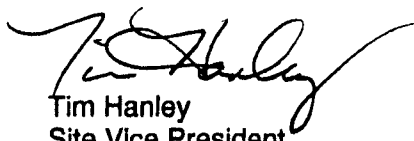
Subject: Licensee Event Report 237/2009-004-00, "Unit 2 Shutdown Cooling System Isolation during Cooldown due to Temperature Instrumentation Failure "

Enclosed is Licensee Event Report 237/2009-004-00, "Unit 2 Shutdown Cooling System Isolation during Cooldown due to Temperature Instrumentation Failure," for Dresden Nuclear Power Station, Unit 2. This event is being reported in accordance with 10 CFR 50.73(a)(2)(v)(B) "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat."

There are no regulatory commitments contained in this submittal.

Should you have any questions concerning this letter, please contact Ms. Marri Marchionda at (815) 416-2800.

Respectfully,


Tim Hanley
Site Vice President
Dresden Nuclear Power Station

Enclosure

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station

IE22
NRR

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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 the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollects@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.

1. FACILITY NAME Dresden Nuclear Power Station, Unit 2	2. DOCKET NUMBER 05000237	3. PAGE 1 OF 4
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4. TITLE
Unit 2 Shutdown Cooling System Isolation during Cooldown due to Temperature Instrumentation Failure

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
11	02	2009	2009	- 004	- 00	12	22	2009	N/A	N/A
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

9. OPERATING MODE 3	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
10. POWER LEVEL 000	<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 checked="" 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 type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Dresden Nuclear Power Station – Bob Rybak	TELEPHONE NUMBER (Include Area Code) (815) 416-2810
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	BO	TS	T106	Y	N/A				

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

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

On November 2, 2009, during shutdown for the Dresden Unit 2 Fall 2009 refueling outage, the Shutdown Cooling (SDC) System high temperature isolation logic actuated causing the SDC isolation valves to shut, resulting in a loss of cooling to the Reactor Vessel. Troubleshooting determined that Temperature Element 2-0261-8B, a thermocouple (TC), failed. The Resistance Temperature Detector (RTD), 2-0261-8F, housed in the same assembly, had previously failed and was out of service since December 2008. The presence of an open signal from both instruments in the same recirculation loop caused the isolation logic to activate, as designed.

The apparent cause was failure at the soldered TC junction and the RTD element-to-lead solder joint attributed to corrosion and oxidation at the solder connection. A replacement switch was installed during the refueling outage.

The safety significance of this event is minimal as cooling flow was restored to the vessel in approximately 40 minutes. Plant response and operator actions were consistent with plant procedures. The protection of public health and safety and personnel safety were not compromised at anytime during this event.

**LICENSEE EVENT REPORT
(I.E.R.)**

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NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

Dresden Nuclear Power Station (DNPS) Unit 2 is a General Electric Company Boiling Water Reactor with a licensed maximum power level of 2957 megawatts thermal. The Energy Industry Identification System codes used in the text are identified as [XX].

A. Plant Conditions Prior to Event:

Unit: 02	Event Date: 11-02-2009	Event Time: 0712 hours
Reactor Mode: 3	Mode Name: Hot Shutdown	Power Level: 0 Percent

B. Description of Event:

On November 2, 2009, at 0712, shutdown cooling (SDC)[BO] function was lost on DNPS Unit 2 during cooldown for its Fall 2009 refueling outage (D2R21). The SDC system high temperature isolation logic actuated causing the SDC isolation valves to shut, resulting in a loss of cooling to the Reactor Vessel. Reactor Recirculation (RR) system [AD] temperature was approximately 224 degrees F based on alternate indications. SDC was restarted at 0748 with Recirculation loop temperature at 260 degrees F. At approximately 0835, the reactor entered Mode 4 (i.e., Reactor Coolant temperature less than or equal to 212 degrees F and Mode Switch in Shutdown).

Troubleshooting determined that Temperature Element 2-0261-8B, a thermocouple (TC), had failed. The Resistance Temperature Detector (RTD), 2-0261-8F, housed in the same assembly, had previously failed and was out of service since December 2008. The presence of an open signal from both instruments in the same recirculation loop caused the isolation logic to activate, as designed.

The combined RTD/TC assembly is installed in the 2B RR System Pump suction line. Specifically, the RTD/TC probe is encased in a thermo-well located in the side of the RR suction piping in the first elbow off the reactor nozzle. The instrument is a model SRT-3375 RTD/TC assembly manufactured by Temp-Pro Inc. In this event, RTD 2-0621-8F had previously failed high meaning isolation logic already had one open contact in the logic. When TC 2-0261-8B failed, the isolation logic experienced two open contacts, one in each logic string, which generated an isolation signal as designed.

The isolation of the SDC system event is reportable in accordance with 10 CFR 50.73(a)(2)(v)(B) "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat."

C. Cause of Event:

The apparent cause was the failure at the soldered TC (2-0261-8B) junction and the RTD (2-0621-8F) element-to-lead solder joint attributed to corrosion and oxidation at the solder connection. Contributing causes included moisture intrusion aided by the hygroscopic (moisture absorbing) nature of the Aluminum Oxide (Al₂O₃) filler material and chlorine contamination, potentially due to residual flux material, in combination with high temperatures creating a corrosive environment.

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(T.E.R)

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These RTD/TC assemblies have a history of failure at DNPS with at least 27 individual TE failures since 1987. This RTD/TC assembly is a commercial grade instrument with a poor performance history. The equipment is located in the suction recirculation line but has no radiation design specification. Additionally, a review of the bill of materials indicates that the epoxy used to seal the assembly has a maximum service temperature rating of 446 degrees F. Since the assembly is located inside the insulation surrounding the recirculation system piping while online, it would be exposed to temperatures at the upper range of this service temperature or greater.

The extent of condition pertains to both Unit 2 and Unit 3 Recirculation Suction line temperature elements. Since the RTD/TC assembly is a unique part, custom made for DNPS, the extent of condition extending to other plants is unlikely. A replacement RR 2B temp instrument was installed during D2R21. Similar to the current Unit 2 configuration, logic to enhance reliability will be installed on Unit 3, which will require 2 instruments to fail in order to cause an inadvertent isolation on Unit 3.

D. Safety Analysis:

The safety significance of this event is minimal. The SDC was restored in 36 minutes, with reactor coolant temperatures rising approximately 36 degrees reaching 260 degrees F when SDC was restored. No other systems were affected and the system responded in a manner consistent with the plant design. The protection of public health and safety and personnel safety were not compromised at anytime during this event. Operator actions were appropriate and consistent with normal and emergency operating procedures.

E. Corrective Actions:

DNPS determined that the design of the existing temperature element assemblies would not ensure reliable performance, given the operational conditions (i.e., high temperature and radiation). Therefore, as the corrective action for this event, DNPS is in the process of identifying and procuring replacement temperature measurement assemblies suitable for installation in DNPS Units 2 and 3 RR suction lines.

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(LER)**

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F. Previous Occurrences:

A review of DNPS Licensee Event Reports (LERs) was performed and the following events were identified.

- Licensee Event Report 237/2000-005-01, "Recirculation Loop Temperature Failure Causes Shutdown Cooling Inoperability"

G. Component Failure Data:

Manufacturer	Component	Model
Temp-Pro Inc	Thermocouple	SRT-3375 RTD/TC