NRC FORM 366 (08-2020) | U.S. NUCLEAR REGULATORY COMMISSION | APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)
(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name	2. Docket Number	3. Page
Calvert Cliffs Nuclear Power Plant, Unit 2	05000318	1 OF 5

4. Title
Unplanned Safety Injection Actuation Signal due to Human Error

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number 05000
09	14	2022	2022	002 -	00	11	11	2022	Facility Name	Docket Number 05000

9. Operating Mode	10. Power Level
5 – Cold Shutdown	000

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	☐ 50.36(c)(2)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(4)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(1)(i)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(iii)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.77(a)(2)(ii)
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	

☐ **OTHER** (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Michael Fick, Principal Regulatory Engineer	410-495-6714

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS		Cause	System	Component	Manufacturer	Reportable to IRIS
A	N/A	N/A	N/A	Y						

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☒ No	☐ Yes (If yes, complete 15. Expected Submission Date)				

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On September 14, 2022, with Unit 2 in Mode 5 (Cold Shutdown) during cooldown for a maintenance outage, Operations commenced performance of OI-34-2, Section 6.8 / Appendix J, Bypassing SIAS and SIAS Block Sensor Modules in Mode 5, 6, or Defueled, in support of OP-05-2, Plant Shutdown from Hot Standby to Cold Shutdown. During performance of the OI-34-2 evolution, an unplanned Safety Injection Actuation Signal (SIAS) occurred due to Operator failure to comply with station procedure use and adherence standards. The unplanned SIAS resulted in the automatic start of the site’s 2A Diesel Generator (DG) and 2B DG. The unplanned SIAS did not result in safety injection into the reactor coolant system nor did it adversely impact shutdown cooling operations.

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PLANT AND SYSTEM IDENTIFICATION

Calvert Cliffs Nuclear Power Plant, Unit 2 is a Combustion Engineering Pressurized Water Reactor with a licensed maximum power level of 2737 megawatts thermal. The Energy Industry Identification System code used in the text is identified as [XX].

A. PLANT OPERATING CONDITIONS PRIOR TO EVENT

Unit: 2
Event Date: September 14, 2022
Event Time: 1348
Power Level: 000
Mode: 5 – Cold Shutdown
Reactor Coolant System (RCS) Temperature: approximately 150 degrees F
RCS Pressure: approximately 135 psia
There were no systems, structures, or components out-of-service that contributed to this event.

B. DESCRIPTION OF EVENT

On September 14, 2022 at 0007, Operations commenced actions to shut down and cooldown and depressurize Unit 2 from 100% reactor power to Mode 5 (Cold Shutdown) with the reactor coolant system (RCS) opened to support a maintenance outage.

With Unit 2 in Mode 3 (Hot Standby) and the RCS temperature having been lowered to 325 degrees F, per OP-05-2, Plant Shutdown from Hot Standby to Cold Shutdown, Operations personnel implemented High Pressure Safety Injection (HPSI) Low Temperature Overpressure Protection (LTOP) controls. The HPSI LTOP controls include (1) two of the three HPSI Pumps have their breakers racked out and caution tagged, (2) the third HPSI Pump has its Control Room handswitch placed in the Pull-to-Lock position and caution tagged, (3) all eight Main and Auxiliary HPSI Loop Isolation valves have their Control Room handswitches placed in the Pull-to-Override position and caution tagged, and (4) the Safety Injection to Charging Header Motor Operated Valve (MOV) is shut and caution tagged.

At 1124, Unit 2 entered Mode 5 when the average RCS temperature was lowered to less than 200 degrees F. Upon entry into Mode 5, the Unit 2 Engineered Safety Features Actuation System [JE] (ESFAS), including the Safety Injection Actuation Signal (SIAS) and the Steam Generator Isolation Signal (SGIS), were no longer required to be Operable per Technical Specification 3.3.5.

Two licensed Operators were dispatched from the Control Room to the Unit 2 Cable Spreading Room to perform OI-34-2, Engineered Safety Features Actuation System, Section 6.6 / Appendix H, Bypassing SGIS and SGIS Block Sensor Modules in Mode 5, 6, or Defueled and Section 6.8 / Appendix J, Bypassing SIAS and SIAS Block Sensor Modules in Mode 5, 6, or Defueled. During the performance of Section 6.8 / Appendix J to bypass the SIAS and SIAS Block sensor

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modules, the licensed Operators failed to satisfactorily comply with the procedure use and adherence standards per HU-AA-104-101, Procedure Use and Adherence, which resulted in an unplanned SIAS A and SIAS B. Specifically, the procedure use and adherence error allowed two out of four (2oo4) SIAS sensor modules to sense an actual pressurizer pressure (approximately 135 psia) below the nominal setpoint value for a SIAS condition due to low pressurizer pressure (less than or equal to 1740 psia). After confirming that the SIAS was an unplanned actuation, the Operations Control Room staff successfully reset the SIAS A and SIAS B.

Based on the alignment of Unit 2 systems and components in Mode 5, notably the earlier implementation of the HPSI LTOP controls and both LPSI Pumps being in service for Shutdown Cooling (SDC), the major equipment change of state from the unplanned SIAS was the automatic start of the 2A Diesel Generator (DG) and the 2B DG. Since Unit 2 did not experience under voltage conditions on its two safety related 4KV busses – 21 4KV Bus (backed by the 2A DG) and 24 4KV Bus (backed by the 2B DG) – the 2A and 2B DGs remained operating in no-load conditions. Operations monitored the satisfactory unloaded operation of the 2A DG and 2B DG until they were secured following the unplanned SIAS event. Unit 2 did not experience any high or low pressure safety injection into the RCS and SDC was not adversely impacted by the unplanned SIAS event.

This unplanned SIAS event required an 8-hour notification to the NRC per 10CFR50.72(b)(3)(iv)(A) and was classified as a Configuration Control Level 2 event per OP-AA-108-112, Plant Status and Configuration.

C. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES

September 14, 2022:

0007 - Commenced Unit 2 power reduction from 100% to 25% reactor power per OP-03-2, Normal Power Operation, to support maintenance outage for 2RV200 and 2RV201 replacements.

0255 - Per OP-04-2, Plant Shutdown from Power Operation to Hot Standby, performed a simultaneous CEA insertion on Unit 2 and entered Mode 3.

0725 – High Pressure Safety injection (HPSI) Low Temperature Overpressure (LTOP) clearance order (2-052-0227) is active.

0743 – Unit 2 enters Mode 4 (Hot Shutdown).

0951 - Started 22 LPSI Pump to initiate Shutdown Cooling (SDC) per OI-03B-2, Shutdown Cooling.

1124 – Unit 2 enters Mode 5.

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1348 – Unit 2 experiences an unplanned SIAS A and B during the performance of OI-34-2, Engineered Safety Features Actuation System, Section 6.8 / Appendix J, Bypassing SIAS and SIAS Block Sensor Maintenance Modules in Mode 5, 6, or Defueled.

1348 – The 2A DG and 2B DGs automatically start as a result of the unplanned SIAS.

1359 – The Unit 2 SIAS A and B are successfully reset.

1604 – The 2B DG is secured per OI-21B-2, 2B Diesel Generator.

1611 – The 2A DG is secured per OI-21A-2, 2A Diesel Generator.

2220 – Operations successfully performs OI-34-2, Engineered Safety Features Actuation System, Section 6.8 / Appendix J, Bypassing SIAS and SIAS Block Sensor Maintenance Modules in Mode 5, 6, or Defueled.

D. CAUSE OF EVENT

The method of discovery for this event was self-revealing and is documented in the site's Corrective Action Program (CAP) under IR 4522477.

The cause was personal accountability to uphold human performance and place keeping standards due to the perceived low level of complexity of the task and Operators high level of familiarity with ESFAS operation.

E. SAFETY CONSEQUENCES

System Design

The ESFAS [JE] initiates the start of equipment which protects the public and plant personnel from the accidental release of radioactive fission products in the unlikely event of a loss-of-coolant, main steam line break (MSLB), or loss of feedwater incident. The safety features function to localize, control, mitigate, and terminate such incidents in order to minimize radiation exposure levels for the general public.

The SIAS is required by Technical Specification 3.3.5, ESFAS [JE] Logic and Manual Actuation, to be Operable in Modes 1 through 4. Any condition which causes a low pressurizer pressure (nominally less than or equal to 1740 psia) or high containment pressure (nominally greater than or equal to 2.8 psig) will result in a SIAS. This signal will start two HPSI pumps, both LPSI pumps, open twelve safety injection system isolation valves, and close the four check valve leak-off lines at the Safety Injection Tanks, along with sending actuation signals to various other systems and components.

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Safety Impact

The safety significance of this event was minimal. At the time of the event, Unit 2 was in Mode 5 and the HPSI LTOP tagout was in place, preventing the injection of high pressure makeup into the reactor coolant system while in a low temperature condition. Both LPSI Pumps were already in operation providing cooling flow via the SDC system. SDC operation was not adversely impacted by the unplanned SIAS. Although both Unit 2 diesel generators, the 2A DG and 2B DG, received automatic start signals from the unplanned SIAS A and B, since there was no loss of either the 21 4KV Bus (safety related ZA-train bus supported by the 2A DG) or the 24 4KV Bus (safety related ZB-train bus supported by the 2B DG), neither of the diesel generators loaded onto their respective bus. Following the automatic start of the 2A DG and 2B DG, both diesel generators operated satisfactorily until secured.

F. CORRECTIVE ACTIONS

The CAP product performed under IR 4522477 identified the following corrective actions that are planned to be taken to address cause and extent of condition from the event investigation:

(1) Performed a Corrective Action Program evaluation.
(2) Addressed personnel accountability actions in accordance with Human Resource policies.
(3) Revise applicable ESFAS / Auxiliary Feedwater Actuation System (AFAS) procedures to clearly delineate supervisory oversight while performing the tasks.

G. PREVIOUS OCCURRENCES

A review of Calvert Cliffs reportable events back to January 2012 was performed. There were no LERs that involved unplanned ESFAS actuations as the result of personnel errors.

LER 318-2021-004, Unit 2 Manual Reactor Trip Due to Lowering Steam Generator Levels, does document a Unit 2 manual reactor trip that was initiated by a personnel error when breaker stab covers were not removed prior to attempting to energize the 12 Spent Fuel Pool Cooling Pump (SFPCP). Upon attempting to energize the 12 SFPCP, an arc-flash event occurred that resulted in the loss of the 24A 480V Load Center that led ultimately to the need for Operations to manually trip the Unit 2 reactor.

H. COMPONENT FAILURE DATA

There were no component failures identified that contributed to this event or occurred as a result of this event.