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July 2, 2018

AEP-NRC-2018-44
10 CFR 50.73

Docket No.: 50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Donald C. Cook Nuclear Plant Unit 2
LICENSEE EVENT REPORT 316/2018-003-00
Unit 2 Manual Reactor Trip Due to High-High Moisture Separator Drain Tank Level

In accordance with 10 CFR 50.73, Licensee Event Report (LER) System, Indiana Michigan Power Company, the licensee for Donald C. Cook Nuclear Plant Unit 2, is submitting as an enclosure to this letter the following report:

LER 316/2018-003-00: Unit 2 Manual Reactor Trip Due to High-High Moisture Separator Drain Tank Level

There are no commitments contained in this submittal.

Should you have any questions, please contact Mr. Michael K. Scarpello, Regulatory Affairs Director, at (269) 466-2649.

Sincerely,

Q. Shane Lies
Site Vice President

SJM/mll

Enclosure: Licensee Event Report 316/2018-003-00: Unit 2 Manual Reactor Trip Due to High-High Moisture Separator Drain Tank Level

IE22
NRR

c: R. J. Ancona – MPSC
A.W. Dietrich – NRC Washington, DC
MDEQ – RMD/RPS
NRC Resident Inspector
K. S. West, NRC Region III
A. J. Williamson – AEP Ft. Wayne

Enclosure to AEP-NRC-2018-44

Licensee Event Report 316/2018-003-00
Unit 2 Manual Reactor Trip Due to High-High Moisture Separator Drain Tank Level

NRC FORM 366 (04-2018) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

# LICENSEE EVENT REPORT (LER)

(See Page 2 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 |
|---|---|---|
| Donald C. Cook Nuclear Plant Unit 2 | 05000316 | 1 OF 3 |

**4. TITLE**

Unit 2 Manual Reactor Trip Due to High-High Moisture Separator Drain Tank Level

| 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 **05000** |
| 05 | 07 | 2018 | 2018 | 003 | 00 | 07 | 02 | 2018 | FACILITY NAME | DOCKET NUMBER **05000** |

| 9. OPERATING MODE | 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)* | | | |
|---|---|---|---|---|
| 1 | ☐ 20.2201(b) | ☐ 20.2203(a)(3)(i) | ☐ 50.73(a)(2)(ii)(A) | ☐ 50.73(a)(2)(viii)(A) |
| | ☐ 20.2201(d) | ☐ 20.2203(a)(3)(ii) | ☐ 50.73(a)(2)(ii)(B) | ☐ 50.73(a)(2)(viii)(B) |
| | ☐ 20.2203(a)(1) | ☐ 20.2203(a)(4) | ☐ 50.73(a)(2)(iii) | ☐ 50.73(a)(2)(ix)(A) |
| | ☐ 20.2203(a)(2)(i) | ☐ 50.36(c)(1)(i)(A) | ☒ 50.73(a)(2)(iv)(A) | ☐ 50.73(a)(2)(x) |
| **10. POWER LEVEL** | ☐ 20.2203(a)(2)(ii) | ☐ 50.36(c)(1)(ii)(A) | ☐ 50.73(a)(2)(v)(A) | ☐ 73.71(a)(4) |
| | ☐ 20.2203(a)(2)(iii) | ☐ 50.36(c)(2) | ☐ 50.73(a)(2)(v)(B) | ☐ 73.71(a)(5) |
| 30 | ☐ 20.2203(a)(2)(iv) | ☐ 50.46(a)(3)(ii) | ☐ 50.73(a)(2)(v)(C) | ☐ 73.77(a)(1) |
| | ☐ 20.2203(a)(2)(v) | ☐ 50.73(a)(2)(i)(A) | ☐ 50.73(a)(2)(v)(D) | ☐ 73.77(a)(2)(i) |
| | ☐ 20.2203(a)(2)(vi) | ☐ 50.73(a)(2)(i)(B) | ☐ 50.73(a)(2)(vii) | ☐ 73.77(a)(2)(ii) |
| | | ☐ 50.73(a)(2)(i)(C) | ☐ OTHER Specify in Abstract below or in NRC Form 366A | |

**12. LICENSEE CONTACT FOR THIS LER**

| LICENSEE CONTACT | TELEPHONE NUMBER *(Include Area Code)* |
|---|---|
| Michael K. Scarpello, Regulatory Affairs Director | (269) 466-2649 |

**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 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| 14. SUPPLEMENTAL REPORT EXPECTED | 15. EXPECTED SUBMISSION DATE | MONTH | DAY | YEAR |
|---|---|---|---|---|
| ☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO | | | | |

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)*

On May 7, 2018, Unit 2 was operating at approximately thirty percent power following completion of a refueling outage. The control room staff received a high-high level alarm in a moisture separator drain tank (MSDT) and manually tripped the reactor in accordance with plant procedures. Plant systems responded as expected. The plant was stabilized in hot standby conditions.

An investigation discovered condensate heater level column isolation valves were inadvertently left closed and not restored following system testing activities. This condition resulted in a loss of level control in the corresponding heater. Excess condensate could not drain from the heater and eventually backfilled through a steam supply line into the MSDT. This caused the drain flow capacity of the MSDT to be exceeded which resulted in corresponding high and high-high level alarms. The level column isolation valves were later returned to the open position which restored the condensate drain flow paths and cleared the alarms.

The manual reactor trip caused actuation of the Reactor Protection System and an automatic actuation of the Auxiliary Feedwater System. Therefore, the event is reportable as a Licensee Event Report in accordance with 10 CFR 50.73(a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)."

| 1. FACILITY NAME | 2. DOCKET NUMBER | 3. LER NUMBER | | |
|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. |
| Donald C. Cook Nuclear Plant Unit 2 | 05000316 | 2018 | 003 | 00 |

NARRATIVE

EVENT DESCRIPTION

On May 7, 2018, Unit 2 was operating at approximately thirty percent power following completion of a refueling outage. The control room staff received a high-high level alarm in the left moisture separator drain tank (MSDT)[SN][TK] and manually tripped the reactor [RCT] as required by plant annunciator response procedure. The plant trip was not complicated, as plant systems responded as expected. The plant was stabilized in hot standby conditions.

Event Notification 53387 was submitted to the Nuclear Regulatory Commission as required by 10 CFR 50.72(b)(2)(iv)(B) due to the Reactor Protection System [JC] actuation and 10 CFR 50.72(b)(3)(iv)(A) for the automatic actuation of the Auxiliary Feedwater System [BA] .

Analysis of the Event

On May 6, 2018, Unit 2 was at approximately eleven percent power and in the process of starting up from a refueling outage. Later in the shift following synchronization of the turbine generator [TG], and with the plant holding at approximately thirty percent power for chemistry analysis, a high-high level alarm activated on the MSDT. Actions were taken to lower the MSDT level to clear the alarm but were unsuccessful, which prompted staff to manually trip the reactor in accordance with procedures.

Following the plant trip, an investigation discovered condensate heater [SD][HX] level column isolation valves [V] were inadvertently left closed and not restored following system testing activities. The isolated level columns and associated sensors resulted in a loss of level control in the heater. Excess condensate could not drain from the heater due to a false normal level indicated in the isolated condensate heater level columns that prevented the alternate drain valve from opening. Condensate level increased, filled the heater, and backfilled through a steam supply line and eventually into the MSDT. This caused the drain flow capacity of the MSDT to be exceeded, which resulted in corresponding high and high-high level alarms. The condensate heater level column isolation valves were returned to the open position which restored the condensate drain flow paths and cleared the alarms.

ASSESSMENT OF SAFETY CONSEQUENCES

Nuclear Safety

The event is characterized as a plant trip following an alarm, with no safety mitigation equipment out of service. The Unit 2 plant response to the manual trip was not complicated. Manual actuation of the Reactor Protection System functioned as expected. Automatic actuation of the Auxiliary Feedwater System functioned as expected. Rapid transfer of the electrical busses from the Auxiliary Transformers [EL][XFMR] to Reserve Feed [EA] functioned as expected. Probabilistic Risk Assessment of the event determined it to have very low safety significance.

Industrial Safety

There was no actual or potential industrial safety hazard resulting from the Unit 2 manual reactor trip.

Radiological Safety

There was no actual or potential radiological safety hazard resulting from the Unit 2 manual reactor trip.

No radiological release resulted from this event.

CAUSE OF EVENT

The direct cause was due to condensate heater level column isolation valves that were inadvertently left closed and not restored following completion of system testing. A formal causal analysis of the human performance aspects contributing to the plant trip is in progress at the time of this report. A supplement to this report will be provided if the evaluation will significantly change the reader's perception of the course, significance, implications, or consequences of the event, or, if it results in substantial changes to planned corrective actions.

CORRECTIVE ACTIONS

Completed Corrective Actions

1. Human performance assessment and review of personnel and circumstances involved with the event.

2. Status control investigation of the valves that were out of expected position following testing activities.

Planned Corrective Actions

1. Revise plant project documents to include directions to validate systems are restored to desired conditions following completion of testing activities.

2. Create a case study training lesson plan on the MSDT high level trip event.

PREVIOUS SIMILAR EVENTS

LERs for CNP Unit 1 and Unit 2 were reviewed for the previous five years and found no similar events.