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November 18, 2021

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

RE. Ginna Nuclear Power Plant
Renewed Facility Operating License No. DPR-18
NRC Docket No. 50-244

Subject: LER 2021-001, Service Water Pump "A" declared inoperable due to winding failure following replacement resulting in violation of Technical Specifications LCO 3.7.8.A (one Service Water pump inoperable greater than 14 days)

The attached Licensee Event Report (LER) 2021-001 is submitted under the provisions of NUREG-1022, Event Reporting Guidelines. There are no new commitments contained in this submittal. This submittal is for revision 0 of the LER.

Should you have any questions regarding this submittal, please contact Chris Bradshaw at (315) 791-3246.

Sincerely,

Paul Swift

Attachment: LER 2021-001

cc: NRC Regional Administrator, Region 1
NRC Project Manager, Ginna
NRC Resident Inspector, Ginna (e-mail)

# Attachment

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## LER 2021-001, Revision 0

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NRC FORM 366 (08-2020) U.S. NUCLEAR REGULATORY COMMISSION

# 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/)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

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 FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk ail: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

| 1. Facility Name | 2. Docket Number | 3. Page |
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| R.E. Ginna Nuclear Power Plant, Unit 1 | 05000 244 | 1 OF 4 |

**4. Title**
Service Water Pump "A" declared inoperable due to winding failure following replacement resulting in violation of Technical Specifications LCO 3.7.8.A (one Service Water pump inoperable greater than 14 days)

| 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 |
| 06 | 02 | 2021 | 2021 | - 001 - | 00 | 11 | 19 | 2021 | | 05000 |
| | | | | | | | | | Facility Name | Docket Number |
| | | | | | | | | | | 05000 |

| 9. Operating Mode | 10. Power Level |
|---|---|
| 1 | 100 |

**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) |
|---|---|
| Chris Bradshaw, Regulatory Assurance Manager | 3157913246 |

**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 |
|---|---|---|---|---|---|---|---|---|---|---|
| B | BI | MO | US Motors | 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 5/17/2021, the Service Water Pump "A" motor was removed from service for planned maintenance. Following maintenance, the pump was tested, declared operable, and secured. On 06/02/2021, the pump was placed into service. At 1825, after 11 hours of operation, the Control Room received alarms due to failure of the motor. The circuit breaker had tripped on instantaneous overcurrent. A standby Service Water Pump was started at 1826 to restore full flow. Locally there was evidence of motor overheating. The primary plant remained stable throughout the event. The motor was replaced, and Service Water Pump "A" was restored to operable on 06/05/2021.

It was later determined that the stator had experienced a turn-to-turn short that eventually shorted the coil to ground through the stator core and to an adjacent phase causing a phase-to-phase short circuit and subsequent breaker trip. The most likely cause of the turn-to-turn short was a defect in the magnet wire insulation used in the coils during a motor rewind in 2006. The exact type of latent defect could not be determined; therefore, reasonable assurance of operability of Service Water Pump "A" could not be established. As a result, the Service Water Pump was inoperable for a duration longer than allowed by Technical Specifications Limiting Condition for Operation 3.7.8 Condition (A) - 14 days. This condition is reportable under 10 CFR 50.73(a)(2)(i)(B) for a condition prohibited by Technical Specifications.

# LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(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. LER NUMBER | | |
|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. |
| R.E. Ginna Nuclear Power Plant, Unit 1 | 05000- 244 | 2021 | - 001 | - 00 |

**NARRATIVE**

I. PRE-EVENT PLANT CONDITIONS

At the time the condition was identified, the plant was in MODE 1 at approximately 100% rated thermal power.

II. DESCRIPTION OF EVENT

A. EVENT

On 5/17/2021, the Service Water Pump "A" motor was removed from service for planned maintenance. Following maintenance, the pump passed its surveillance test, was declared operable, and was secured. On 06/02/2021, the pump was placed into service. At 1825, after 11 hours of operation, the Control Room received alarms due to failure of the Service Water Pump "A" motor. Operators responded to the alarms and, based on Control Room indication of a tripped pump and lowered pressure in the Service Water loop, started a standby Service Water Pump at 1826, restoring the loop to normal conditions. It was subsequently determined that the feeder breaker had tripped on instantaneous overcurrent. Locally, Operators found no active fire but evidence of motor overheating. The primary plant remained stable throughout the event. The motor was replaced, and Service Water Pump "A" was restored to operable on 06/05/2021.

Based on further investigation, it was later determined that the stator had experienced a turn-to-turn short that eventually shorted the coil to ground through the stator core and to an adjacent phase causing a phase-to-phase short circuit and subsequent breaker trip. The most likely cause of the turn-to-turn short was a defect in the magnet wire insulation used in the coils during a motor rewind in 2006; however, due to the destruction in the fault area, the exact type of latent defect could not be determined. Numerous possible contributing causes were evaluated. The original manufacturing defect likely occurred during rewind and could later have been exacerbated during refurbishment, storage, or testing, as evidenced by satisfactory service following rewind but a short service life following refurbishment.

Reasonable assurance of operability of Service Water Pump "A" could not be established for the period from 05/17/2021 to 06/02/2021. As a result, the Service Water Pump was inoperable for a period of 19 days, a duration longer than allowed by Technical Specifications Limiting Condition for Operation 3.7.8 Condition (A) - 14 days plus the allowed Technical Specification Completion Time of 0.25 days, or 14.25 days in total. This duration meets the definition of "Any operation or condition which was prohibited by the plant's Technical Specifications" and is reportable under 10 CFR 50.73(a)(2)(i)(B).

Actions to prevent recurrence include improving motor repair specifications, evaluating refurbishment frequency, managing cold/hot starts, and use of motor heaters during storage.

B. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

None

# LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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**NARRATIVE**

C. DATES AND APPROXIMATE TIMES OF MAJOR OCCURENCES:

For the motor that failed:

02/2006 – last rewind

12/2019 – refurbishment by vendor, then in storage in Ginna Warehouse until installation.

Two (2) weeks prior to installation – surge testing of the motor stator in Ginna Warehouse.

05/17/2021 – Service Water Pump "A" removed from service due to planned maintenance.

05/19/2021 – Service Water Pump "A" returned to service, then secured.

06/02/2021 – Service Water Pump "A" failed during steady state operation after running approximately 11 hours.

D. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

None

E. METHOD OF DISCOVERY:

Self-revealing: at 1825 on 06/02/2021, Main Control Board alarm L-8 (480V Ground) was received. While dispatching Equipment Operators to investigate the L-8 alarm, Main Control Board alarms J-9 (Safeguard Breaker Trip) and H-31 (Vacuum Priming System) were received. These Main Control Board alarms were coincident with a Z26 Fire Alarm (Screenhouse Bus 17, Bus 18, Service Water Pump Area) and the Service Water Pump "A" circuit breaker tripping. The Fire Brigade dispatched to investigate the Z26 fire alarm found no active fire around the Service Water Pump "A" but evidence of motor overheating.

F. SAFETY SYSTEM RESPONSES:

No safety systems actuated, which was expected response.

III. CAUSE OF EVENT:

The most likely cause of the stator turn-to-turn short (that eventually shorted the coil to ground through the stator core and then to an adjacent phase to cause a phase-to-phase short circuit) was a defect in the magnet wire insulation used in the coils during the motor rewind in 2006. There were possible contributing causes associated with the motor refurbishment and replacement processes, as noted in Section II.A above.

# LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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**NARRATIVE**

IV. ASSESSMENT OF THE SAFETY CONSEQUENCES OF THE EVENT:

At 1825, the motor failure caused a loss of one of the two running Service Water Pumps. Flow was restored by manually starting the Service Water Pump "B" at 1826 per the appropriate response procedure which restored SW header pressure to pre-event pressure (70 psig). Service Water loops are normally cross-tied, and the one (1) running Service Water Pump maintained flow through both loops.

Based on the above considerations and the rapid response by Operations to start and restore normal service water flow to both loops, this event is not considered to have had any significant effect on the health and safety of the public.

V. CORRECTIVE ACTIONS

The failed motor was removed and replaced to restore operability of Service Water Pump "A" on 06/05/2021.

Procurement and repair strategies will be evaluated for both site processes and vendor oversight of refurbishment. For the windings, enamel thickness and resin application methods will be optimized to increase motor lifespans. The current rewind schedule will also be evaluated, and changes made as required. Cold/Hot start strategies will be added to maintenance and operations procedures, and training enhancements will be made based on learnings from the event. Lastly, motor heater energization will be added to the storage strategy for Service Water Pump motors and other similarly stored motors.

VI. ADDITIONAL INFORMATION:

None

A. FAILED COMPONENTS:

Motor for Service Water Pump “A”

B. PREVIOUS LERs ON SIMILAR EVENTS:

A search of all Ginna LERs submitted to the NRC determined there have been no prior LERs reporting similar motor failure.

C. THE ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) COMPONENT FUNCTION IDENTIFIER AND SYSTEM NAME OF EACH COMPONENT OR SYSTEM REFERRED TO IN THIS LER:

COMPONENT – Motor

IEEE 803 FUNCTION NUMBER - MO

IEEE 805 SYSTEM IDENTIFICATION - BI