



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

WBL-20-067

January 4, 2021

10 CFR 50.73

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

Watts Bar Nuclear Plant, Units 1 and 2
Facility Operating License Nos. NPF-90 and NPF-96
NRC Docket Nos. 50-390 and 50-391

Subject: **Licensee Event Report 391/2020-005-00, Automatic Start of the Emergency Diesel Generators Due to an Equipment Failure During Transfer of Power Source for the 2A-A Shutdown Board**

This submittal provides Licensee Event Report (LER) 391/2020-005-00. This LER provides details of an automatic start of the Emergency Diesel Generators (EDGs) when the transfer of the 2A-A 6.9 kV Shutdown Board (SDBD) to the normal feed malfunctioned, resulting in the loss of power to the SDBD. This event is being reported as a safety system actuation of the EDGs in accordance with Title 10 of the Code of Federal Regulations (10 CFR) part 50.73(a)(2)(iv)(A).

There are no new regulatory commitments contained in this letter. Please direct any questions concerning this matter to Tony Brown, WBN Licensing Manager, at (423) 365-7720.

Respectfully,

A handwritten signature in black ink, appearing to read 'Anthony L. Williams IV', written over a large, light-colored oval scribble.

Anthony L. Williams IV
Site Vice President
Watts Bar Nuclear Plant

U.S. Nuclear Regulatory Commission
WBL-20-067
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January 4, 2021

Enclosure: LER 391-2020-005-00 "Automatic Start of the Emergency Diesel Generators
Due to an Equipment Failure During Transfer of Power Source for the 2A-A
Shutdown Board"

cc (w/o Enclosure):

NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Watts Bar Nuclear Plant
NRC Project Manager – Region II

ENCLOSURE
Tennessee Valley Authority
Watts Bar Nuclear Plant
Units 1 and 2

LER 391-2020-005-00 “Automatic Start of the Emergency Diesel Generators Due to an Equipment Failure During Transfer of Power Source for the 2A-A Shutdown Board”



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 <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk ail: ira_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 Watts Bar Nuclear Plant, Unit 2	2. Docket Number 05000391	3. Page 1 OF 5
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4. Title
Automatic Start of the Emergency Diesel Generators Due to an Equipment Failure During Transfer of Power Source for the 2A-A Shutdown Board

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	15	2020	2020	- 005 -	00	01	04	2021	Watts Bar Nuclear Plant, Unit 1	05000390
									NA	05000

9. Operating Mode Mode 5	10. Power Level 0
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

<input checked="" type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	10 CFR Part 73
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	10 CFR Part 21	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<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)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	

Other (Specify here, in Abstract, or in NRC 366A).

12. Licensee Contact for this LER

Licensee Contact Daniel Fox, Licensing Engineer	Phone Number (Include Area Code) (423) 368-0977
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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	EB	52	GE	Y					

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)		N/A	N/A	N/A

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

On November 15, 2020 at 0144 Eastern Standard Time (EST), with Watts Bar Nuclear Plant (WBN) Unit 1 in Mode 1 at 100 percent power and Unit 2 in Mode 5, an actuation of the Emergency Diesel Generator (EDG) System occurred due to a loss of power to the Unit 2, 2A-A Shutdown Board (SDBD).

During the performance of a surveillance instruction, the normal power supply breaker failed to close while transferring the 2A-A SDBD from its maintenance source. The cause of the normal feeder breaker not closing was determined to be a failure of the breaker's 52SM switch contacts. All safety systems responded as designed.

To prevent recurrence, the preventative maintenance strategy is being revised to include switch replacement during the performance of the 5 year inspection versus the current replacement strategy of 15 years with the overhaul.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Watts Bar Nuclear Plant, Unit 2	05000-391	2020	- 005	- 00

NARRATIVE

I. Plant Operating Conditions Before the Event

Unit 1 was in Mode 1 at 100 percent power and Unit 2 was in MODE 5 with the pressurizer bubble established.

II. Description of Event

A. Event Summary

On November 15, 2020 at 0144 Eastern Standard Time (EST), during performance of Surveillance Instruction (SI) 2-SI-211-1-A, "18 Month 6.9 KV Shutdown Board 2A-A Automatic and Manual Transfer Tests," Operations attempted to transfer the 2A-A Shutdown Board (SDBD) [EIIS:EB] from its maintenance supply to its normal power supply. The normal feeder breaker failed to close during the transfer, resulting in loss of power to the 2A-A SDBD. All four Emergency Diesel Generators (EDGs)[EIIS:EK] started, and the 2A-A SDBD was restored by its associated EDG. All safety systems responded as designed.

This event is being reported to the Nuclear Regulatory Commission (NRC) in accordance with 10 CFR 50.73(a)(2)(iv)(A) as a safety system actuation of the Emergency Diesel Generators (EDGs).

B. Status of structures, components, or systems that were inoperable at the start of the event and that contributed to the event

No inoperable structures, systems, or components contributed to this condition.

C. Dates and approximate times of occurrences

<u>Date</u>	<u>Time (EST)</u>	<u>Event</u>
11/15/20	0144	Loss of power to 2A-A SDBD and actuation of all four EDGs. Operators entered 0-AOI-43.03, "Loss of Unit 2 Train A Shutdown Boards."
11/15/20	0208	1A EDG is shutdown
11/15/20	0215	1B EDG is shutdown
11/15/20	0217	2B EDG is shutdown
11/15/20	0330	Restored 2A-A 6.9 kV SDBD to offsite power.
11/15/20	0350	Completed Standby Line up on all 4 EDGs

D. Manufacturer and model number of each component that failed during the event

The component that failed is a General Electric (GE) CR2940 Contact Block for Type AM Magne-Blast Breaker [EIIS:52]



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E. Other systems or secondary functions affected

No other systems or secondary functions were affected.

F. Method of discovery of each component or system failure or procedural error

Following the event, a troubleshooting team assembled to determine the reason for the 2A-A 6.9 kV SDBD failing to transfer to the normal power supply. The team determined that the cause of the normal feeder breaker not closing was due to a failure of the breaker's 52SM switch contacts 5 to 6.

G. Failure mode, mechanism, and effect of each failed component

Investigation found that a high resistance was measured through the 52SM contacts 5 to 6. Based on localized measurements at the terminal strips for the breakers internal circuitry, the 52SM contacts 5 to 6 were found to be OPEN. Thus, the 2A-A SDBD's failure to transfer from its maintenance feed breaker to its normal feed breaker was isolated to the normal feeder breakers internal contacts.

H. Operator actions

Operations entered 0-AOI-43.03, "Loss of Unit 2 Train A Shutdown Boards," restored to offsite power and secured the EDGs.

I. Automatically and manually initiated safety system responses

When the 2A-A SDBD lost power, the EDGs automatically started. The 2A-A SDBD loaded onto the 2A-A EDG as designed. All other 6.9kV SDBDs remained powered from offsite power.

III. Cause of the Event

A. Cause of each component or system failure or personnel error

The cause of the 2A-A SDBD normal feeder breaker not closing was determined to be a failure of the breaker's 52SM switch contacts 5 to 6.

B. Cause(s) and circumstances for each human performance related root cause

A human performance root cause was not identified for this event.



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IV. Analysis of the Event

When this event occurred, the operators were performing 2-SI-211-1-A, "18 Month 6.9 KV Shutdown Board 2A-A Automatic and Manual Transfer Tests." This SI provided detailed steps to verify manual and automatic transfer operability of two offsite circuits (Normal and Maintenance) supplying the 6.9 kV SDBD 2A-A. While performing steps to transfer the 2A-A SDBD from the maintenance to the normal power supply, the normal power supply breaker failed to close. This resulted in a loss of power signal causing an actuation of all four EDGs, and restoration of power to the 2A-A SDBD by its associated EDG. Operations personnel were able to respond to the event without incident and restored offsite power to the 2A-A SDBD.

V. Assessment of Safety Consequences

When this event occurred, Unit 1 was operating at 100 percent power and Unit 2 was stable in Mode 5, restoring from a Refuel Outage (U2R3). The EDGs operated within their design basis requirements and therefore, there was no impact to the safety analysis or consequences due to this event. This event was not considered to be risk significant since actuation did not impact the ability of any safety systems to perform their design basis function during the event. This condition is fully bounded by a loss of offsite power described in the Updated Final Safety Analysis Report Chapter 15.

- A. Availability of systems or components that could have performed the same function as the components and systems that failed during the event

Not applicable.

- B. For events that occurred when the reactor was shut down, availability of systems or components needed to shutdown the reactor and maintain safe shutdown conditions, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident

Not applicable

- C. For failure that rendered a train of a safety system inoperable, an estimate of the elapsed time from the discovery of the failure until the train was returned to service

Not applicable



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VI. Corrective Actions

This event was entered into the Tennessee Valley Authority's (TVA) Corrective Action Program and is being tracked under Condition Report (CR) 1652116.

A. Immediate Corrective Actions

A substitute breaker was obtained, tested, and installed to replace the 2A-A normal feeder breaker. The suspect normal feeder breaker was quarantined until a troubleshooting support-refute matrix was completed and repairs performed. The 2A-A SDBD was powered from the 2A EDG, and transferred back to offsite power approximately two hours later.

B. Corrective Actions to Prevent Recurrence or to reduce probability of similar events occurring in the future

To prevent recurrence, the preventative maintenance strategy is being revised to include switch replacement during the performance of the 5 year inspection versus the current replacement strategy of 15 years with the overhaul.

VII. Previous Similar Events at the Same Site

LER 390/2020-002-00, "Automatic Start of the Emergency Diesel Generators due to an Equipment Failure During Transfer of Power Source for the 1B-B Shutdown Board," submitted on July 14, 2020.

The cause of the May 2020 event was different, in that the fast transfer switch associated with control circuitry for the normal supply breaker was not properly aligned, preventing the closure of the maintenance supply breaker and subsequent de-energization of the 1B-B SDBD.

VIII. Additional Information

There is no additional information.

IX. Commitments

There are no new commitments.