10 CFR 50.73

Progress Energy

Serial: RNP-RA/09-0052

JUN 18 2009

Attn: Document Control Desk
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

LICENSEE EVENT REPORT NO. 2009-001-00
EMERGENCY DIESEL GENERATOR INOPERABLE IN EXCESS
OF TECHNICAL SPECIFICATIONS ALLOWED COMPLETION TIME

Ladies and Gentlemen:

The attached Licensee Event Report is submitted in accordance with the requirements of 10 CFR 50.73. Should you have any questions regarding this matter, please contact Mr. C. A. Castell at (843) 857-1626.

Sincerely,

Kenneth B. Jones for

W. Scott Saunders
Plant General Manager
H. B. Robinson Steam Electric Plant, Unit No. 2

CAC/ahv

Attachment

c: L. A. Reyes, NRC, Region II
M. G. Vaaler, NRC, NRR
NRC Resident Inspector

Progress Energy Carolinas, Inc.
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IE22
NRR

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES 08/31/2010

LICENSEE EVENT REPORT (LER)

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

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4. TITLE

Emergency Diesel Generator Inoperable in Excess of Technical Specifications Allowed Completion Time

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
04	20	2009	2009	- 001	- 00	06	18	2009	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

100%

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)	
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)	
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)	
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)		

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Ashley Valone	843-857-1256

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
B	EB	BKR	Westinghouse	Y						

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO

15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

At 1250 hours EDT on April 20, 2009, with H. B. Robinson Steam Electric Plant, Unit No. 2, operating at approximately 100% power, breaker 52/27B, Emergency Diesel Generator (EDG) 'B' output breaker, failed to close during the performance of OST-409-2, "EDG 'B' Fast Speed Start." Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.8.1 Condition B, was entered due to EDG 'B' being inoperable. On April 21, 2009, EDG 'A' was tested satisfactorily to verify operability in accordance with OP-604, "Diesel Generators 'A' and 'B'," and TS LCO 3.8.1, Action B.3.1. Breaker 52/27B was replaced on April 21, 2009, and EDG 'B' was declared operable on April 23, 2009.

The investigation for the inoperability of EDG 'B' due to breaker 52/27B failure to close determined that the cotter pin used to retain the relay's mechanical lift linkage had rotated to a position that prevented complete return of the lift linkage to its normal position. Therefore, the lift linkage maintained the control relay trip pin engaged and maintained the control circuits open preventing the breaker from closing. The investigation concluded that EDG 'B' was inoperable from March 28, 2009 to April 23, 2009. This resulted in approximately 26 days of inoperability. Additionally, the investigation determined that EDG 'B' was unable to fulfill its safety related function from March, 28, 2009 to April 21, 2009. This condition resulted in a failure to meet the required actions associated with TS Action Statement 3.8.1.B.4 and Condition C, which is a condition prohibited by the plant's Technical Specifications. Therefore, it is reportable based on 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications."

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NARRATIVE

I. DESCRIPTION OF EVENT

At 1250 hours EDT on April 20, 2009, with H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, operating at approximately 100% power, breaker 52/27B [EB:BKR], Emergency Diesel Generator (EDG) 'B' output breaker, failed to close during the performance of OST-409-2, "EDG 'B' Fast Speed Start." The operator attempted to close the output breaker using the local control switch on EDG 'B' Generator Control Panel [EK:33], and the breaker failed to close. A visual inspection was performed on breaker 52/27B by operations personnel with no abnormalities identified. The control room operators proceeded to cycle breaker 52/27B Appendix R Isolation Switch [EB:33] to verify the switch was in the proper position. A second attempt to close breaker 52/27B from the EDG 'B' Generator Control Panel was unsuccessful.

Operations personnel declared EDG 'B' inoperable and entered Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.8.1 Condition B, "One DG inoperable." On April 21, 2009, a test was performed on EDG 'A' as required by TS Action Statement 3.8.1.B.3.1 and in accordance with OP-604, "Diesel Generators 'A' and 'B'." The test was completed satisfactorily and concluded EDG 'A' was operable. In addition, breaker 52/27B was replaced on April 21, 2009 with a spare breaker (DB-100) and OST-409-2 was completed satisfactorily. On April 23, 2009, EDG 'B' was declared operable. March 28, 2009 was the date breaker 52/27B was last successfully operated and as discussed below was the most likely time that EDG 'B' became inoperable. It was concluded that EDG 'B' was inoperable from March 28, 2009 to April 23, 2009. This event resulted in a failure to meet the required actions associated with TS Action Statement 3.8.1.B.4 and Condition C, which require a plant shutdown if an EDG is inoperable for seven days.

II. CAUSE OF EVENT

The cause of the event was determined to be a vendor design error resulting from a modification to the breaker's lifting link assembly. This modification used a cotter pin in place of a drive screw/rolled pin. The cotter pin that was used to retain the relay's mechanical lift linkage had rotated to a position that prevented complete return of the lift linkage to its normal position (see picture at the end of this report). Therefore, the lift linkage maintained the control relay trip pin engaged and maintained the control circuits open preventing the breaker from closing.

This design flaw was reported by Westinghouse to the NRC in accordance with 10 CFR 21, "Reporting of Defects and Noncompliance," on May 28, 2009 (Event Number 45100). This notification identified circuit breakers DB-100 and DB-75 as being affected by this design flaw.

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III. ANALYSIS OF EVENT

The condition described in this Licensee Event Report is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by plant's Technical Specifications."

This event was investigated using the HBRSEP, Unit No. 2, Corrective Action Program (CAP) and documented in Significant Adverse Nuclear Condition Report 331663. This reportable event and the associated significant adverse condition investigation was reviewed by the Plant Nuclear Safety Committee on June 17, 2009. The investigation for the inoperability of EDG 'B' due to breaker 52/27B failure to close determined that the cotter pin used to retain the relay's mechanical lift linkage had rotated to a position that prevented complete return of the lift linkage to its normal position. Therefore, the lift linkage maintained the control relay trip pin engaged and maintained the control circuits open preventing the breaker from closing.

Additionally, the investigation determined that EDG 'B' was not able to fulfill its safety related function from March 28, 2009 to April 21, 2009. March 28, 2009 was the date breaker 52/27B was last successfully operated and the most likely time that the cotter pin rotated to the undesired position. Operations personnel did not declare the EDG 'B' operable until April 23, 2009. This resulted in approximately 26 days of inoperability and TS Required Actions and Completion Times not being met. It was subsequently determined that EDG 'B' was able to fulfill its safety related function on April 21, 2009 based on successful completion of OST-409-2. During this time period, EDG 'A' was declared inoperable for no more than two hours to complete testing in accordance with Required Action B.3.2.1. EDG 'A' remained capable of performing its safety related function and therefore there was no loss of safety function.

During the investigation, an extent of condition was performed. Fourteen circuit breakers were identified as DB-75 and DB-100 currently in service and one spare DB-100 breaker. Of those fourteen breakers, six breakers are safety related. These breakers have been identified by Westinghouse as being refurbished with a cotter pin. The eight non-safety related breakers have not been refurbished and contain the drive screw/rolled pin design. The six safety related breakers are 52/17B (EDG 'A' output breaker to Emergency Bus 1 [E1]), 52/18B (Station Service Transformer 2F to E1), 52/22B (E1 supply to SI Pump 'B'), 52/27B (EDG 'B' output breaker to Emergency Bus 2 [E2]), 52/28B (Station Service Transformer 2G to E2), and 52/29B (E2 supply to SI Pump 'B').

An inspection was performed on 52/22B and 52/29B to validate the lifting linkages were in the appropriate position to allow proper operation of the breakers. Breakers 52/18B and 52/28B are currently in the closed position. Caution tags are in place on 52/18B and 52/28B to verify correct lifting linkage position, in the event the breakers are cycled open.

It has been concluded that no loss of safety function existed from March 28, 2009 to April 23, 2009. This conclusion is based on evaluation provided in the Updated Final Safety Analysis

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Report that shows a single operable train is sufficient to achieve safe shutdown and accident mitigation. Additionally, scenarios were evaluated to consider "A Loss of Power Event." Immediately following a loss of normal offsite electrical AC power, the control room operators would enter PATH-1. PATH-1 requires the verification of either E1 and/or E2 energized. As previously stated, even if the EDG 'B' output breaker 52/27B failed to close, EDG 'A' would have been capable of providing power to the necessary equipment. If it is assumed that EDG 'A' had failed to operate, PATH-1 directs the start of End Path Procedure (EPP), EPP-1, "Loss of All AC Power." EPP-1 directs the control room to dispatch an operator to start and load the Dedicated Shutdown Diesel Generator (DSDG) to restore AC power. If the DSDG operates, sufficient equipment can be operated to safely shutdown the plant. The procedure then directs restoration of AC power to energize E1 and E2. Assuming EDG 'A,' EDG 'B,' and DSDG fail to operate, the control room would request assistance from Maintenance in restoring AC power. As a result of steps performed in EPP-1, it would be determined that 52/27B failed to close, and maintenance could use the following repair options:

1. Maintenance would perform a localized inspection of the 52/27B, EDG 'B' output breaker. This inspection would reveal that the relay's lift linkage is in an undesired location preventing the breaker from closing. Maintenance would then manually manipulate the breaker allowing the lift linkage to reset and the breaker to close. The estimated time of completion for this evolution is approximately one hour.

2. EDG 'B' output breaker 52/27B could be replaced with EDG 'A' output breaker 52/17B. The estimated time of completion for this evolution is approximately one hour.

3. Manual closure of 52/27B in accordance with EPP-22, "Energizing Plant Equipment Using Dedicated Shutdown Diesel Generator," Attachment 2. The estimated time of completion for this evolution is approximately two hours.

4. Retrieval of spare DB-100 breaker from stock and installing the spare breaker into the 52/27B cubicle. The estimated time of completion for this evolution is approximately four hours.

IV. CORRECTIVE ACTIONS

Completed Corrective Actions:

- The Appendix R isolation switch, EDG output breaker switch, generator synchronize switch, and control power fuses for breaker 52/27B were replaced.

- Cotter pins on breakers 52/17B and 52/27B were reconfigured in a manner to not interfere with the control relay mechanism.

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Planned Corrective Actions:

- The cotter pin in both EDG 'A' and EDG 'B' control relay lift link will be replaced with a spiral ring. This modification is currently listed for completion in Refueling Outage (RO)-26, scheduled to end on May 15, 2010.

- Procedure, CM-305, "Westinghouse 'DB' Type Circuit Breakers Maintenance," is scheduled to be revised by August 12, 2009, to require the use of a spiral ring instead of a cotter pin.

- The cotter pins for breakers 52/18B, 52/22B, 52/28B, and 52/29B control relay lift links will be replaced with a spiral ring. This modification is currently listed for completion in RO-26, scheduled to end on May 15, 2010.

V. ADDITIONAL INFORMATION

Previous Similar Events:

Licensee Event Reports (LERs) for HBRSEP, Unit No. 2, were reviewed from the past 20 years. The following events were identified as being similar to the events described in this LER:

- LER 2001-001-00, Reactor Protection System Low Reactor Coolant System Flow Channel Inoperable for Greater Than Technical Specifications Allowable Time. This event was attributed to human error and lack of procedural guidance. This event is not relatable to the event described in LER 2009-001-00.

- LER 2002-001-00, Four Main Steam Safety Valves Fail to Meet Acceptance Criteria During Lift Pressure Testing. This event was attributed to mechanical component failure/degradation due to slight binding of the spindle on the guide bearing. This is not applicable to the event described in LER 2009-001-00.

- LER 2003-001-00, Failure to Complete Technical Specifications Required Action within the Allowed Completion Time. This event was a failure to meet the required actions associated with TS LCO 3.1.7, "Rod Position Indication," due to operator error. This event is not relatable to the event described in LER 2009-001-00.

Previous Event Identified During Investigation:

On October 15, 2008, during RO-25, testing of a modification that was installed on an Appendix R Isolation Switch for the EDG 'B' output breaker 52/27B was being conducted. During the post modification testing that was being performed in accordance with Special Procedure (SP), SP-1534, breaker 52/27B failed to close twice when the local control switch was

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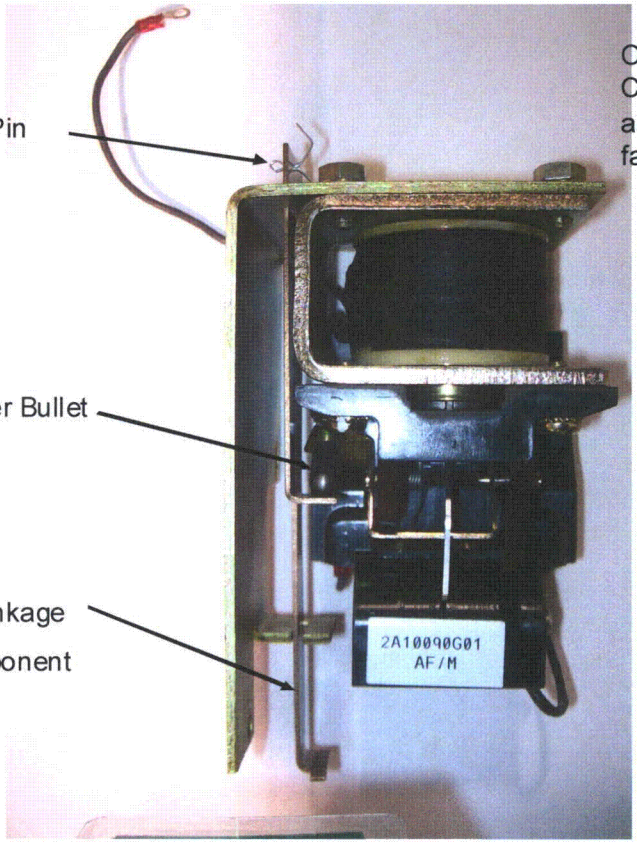
manipulated. The cause was determined by individuals in the field to be sticking of the control relay. The electrician manually corrected the condition by adjusting the linkage and 52/27B was retested. The breaker closed successfully. A work order was written due to the breaker failing to operate. The work order required that 52/27B be inspected and tested. The breaker was tested in accordance with Preventive Maintenance Procedure (PM), PM-163, "Inspection and Testing of Circuit Breakers for 480 Volt Bus E2." During this testing, the breaker cycled successfully seven times. Operations then performed post maintenance testing in the "Test" position and confirmed the breaker operated satisfactorily. DB-100 breakers have a history associated with the secondary disconnects having alignment problems and were known to be sensitive to being racked into the proper position. Therefore, based on historical evidence of DB-100 issues and the successful completion of PM-163, it was concluded that 52/27B failed to close due to misalignment of the secondary disconnects. Prior to start-up from RO-25, required tests were successfully performed on EDG 'B'. Therefore, based on the available information it is not possible to conclude that the failure during RO-25 was due to the same cause as the condition reported in this LER.



Overall view of Control relay assembly depicting failed position.