



Entergy Nuclear South

Entergy Operations, Inc.
17265 River Road
Killona, LA 70057-3093
Tel 504 739 6685
Fax 504 739 6698
wsteelm@entergy.com

William J. Steelman

Licensing Manager
Waterford 3

W3F1-2011-0055

June 29, 2011

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

Subject: Licensee Event Report 2011-003-00
Waterford Steam Electric Station, Unit 3 (Waterford 3)
Docket No. 50-382
License No. NPF-38

Dear Sir or Madam:

Entergy is hereby submitting Licensee Event Report (LER) 2011-003-00 for Waterford Steam Electric Station Unit 3. This report provides details associated with the "A" Emergency Diesel Generator output breaker failing to automatically close during a Technical Specification surveillance test.

Based on this failure, it was determined that this condition is reportable under 10 CFR 50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(v)(D) requirements.

This report contains no new commitments. Please contact William J. Steelman at (504) 739-6685 if you have questions regarding this information.

Sincerely,

A handwritten signature in black ink, appearing to read "William J. Steelman", written over a horizontal line.

WJS/RJP

Attachment: Licensee Event Report 2011-003-00

cc: Mr. Elmo E. Collins, Jr.
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011-4125

NRC Senior Resident Inspector
Waterford Steam Electric Station Unit 3
P.O. Box 822
Killona, LA 70066-0751

U. S. Nuclear Regulatory Commission
Attn: Mr. N. Kalyanam
Mail Stop O-8 E9
Rockville, MD 20852
Kaly.Kalyanam@nrc.gov

Attachment 1

W3F1-2011-0055

Licensee Event Report 2011-003-00

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (10-2010)				APPROVED BY OMB NO. 3150-0104 EXPIRES 10/31/2013 Estimated burden per response to comply with this mandatory information 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/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.																																										
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)																																														
1. FACILITY NAME Waterford 3 Steam Electric Station				2. DOCKET NUMBER 05000 382		3. PAGE 1 OF 8																																								
4. TITLE Emergency Diesel Generator Output Breaker Failed to Automatically Close During Surveillance Testing																																														
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																																				
04	30	2011	2011 - 003 - 00			06	29	2011	FACILITY NAME	DOCKET NUMBER																																				
										05000																																				
										05000																																				
9. OPERATING MODE <div style="text-align: center; font-size: 24pt;">5</div>			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> 20.2201(b)</td> <td><input type="checkbox"/> 20.2203(a)(3)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(C)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)</td> </tr> <tr> <td><input type="checkbox"/> 20.2201(d)</td> <td><input type="checkbox"/> 20.2203(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(1)</td> <td><input type="checkbox"/> 20.2203(a)(4)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(ii)</td> <td><input type="checkbox"/> 50.36(c)(1)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(A)</td> <td><input type="checkbox"/> 73.71(a)(4)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iv)</td> <td><input type="checkbox"/> 50.46(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(B)</td> <td><input type="checkbox"/> 73.71(a)(5)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(C)</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(vi)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)</td> <td>Specify in Abstract below or in NRC Form 366A</td> </tr> </table>								<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<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)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)																																											
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)																																											
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<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)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)																																											
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)																																											
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)																																											
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)																																											
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER																																											
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A																																											
10. POWER LEVEL <div style="text-align: center; font-size: 24pt;">00</div>																																														
12. LICENSEE CONTACT FOR THIS LER																																														
FACILITY NAME Waterford 3 Steam Electric Station William Steelman								TELEPHONE NUMBER (Include Area Code) (504) 739-6685																																						
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																																					
A	EK	RLY	A348	YES																																										
14. SUPPLEMENTAL REPORT EXPECTED								15. EXPECTED SUBMISSION DATE																																						
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO								MONTH	DAY	YEAR																																				
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)																																														
<p>On April 30, 2011, the Emergency Diesel Generator (EDG) A output breaker failed to automatically close during Technical Specification (TS) surveillance testing. This was caused by a human performance error on November 2, 2010 when an electrical lead was reconnected to the wrong terminal on a timing relay following maintenance. With this incorrect configuration, EDG A was not able to automatically energize the Train A electrical safety bus. Operator action would have been required to energize the bus by locally closing the EDG A output breaker.</p> <p>Waterford 3 was in mode 5 at the time of discovery, and was in compliance with TS requirements with EDG B operable. Due to EDG A being inoperable from November 2, 2010 to after the time of discovery, the TS 3.8.1.1 Limiting Conditions for Operation (LCO) requirements were not met. Additionally, Train B equipment had been inoperable during this period which presented a condition that could have prevented the fulfillment of a safety function.</p> <p>The wiring error was corrected on May 1, 2011 and EDG A was restored to service on May 2, 2011. Planned corrective actions include procedure changes that will require the use of plant design documents to verify as left conditions and strengthening post maintenance testing.</p>																																														

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Waterford 3 Steam Electric Station	05000382	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 8
		2011	- 003	- 00	

NARRATIVE

REPORTABLE OCCURRENCE

On April 30, 2011 at 23:32 hours, the Emergency Diesel Generator (EDG) A [EK] output breaker [BKR] did not automatically close during Technical Specification (TS) Surveillance testing. This failure was caused by a human error that occurred on November 2, 2010 when an electrical lead was re-landed on an incorrect terminal on the associated timing relay [RLY] during maintenance. Following the maintenance, EDG A was declared operable on November 6, 2010 at 12:22 hours.

Reporting criteria 10CFR50.73(a)(2)(i)(B), operation prohibited by Waterford 3's Technical Specification

TS 3.8.1.1 requires, with one diesel generator inoperable, to demonstrate the OPERABILITY of the remaining A.C. circuits by performing Surveillance Requirements (separately for each offsite A.C. circuit) within 1 hour and at least once per 8 hours thereafter. With one diesel generator inoperable, verify that: (1) All required systems, subsystems, trains, components, and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE, and (2) When in MODE 1, 2, or 3, the steam-driven emergency feed pump is OPERABLE. If these conditions are not satisfied within 2 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The mis-landed wire existed in plant modes of operation in which EDG A was required to be operable and the TS allowed action times were exceeded. There were additional occurrences of operation prohibited by Technical Specifications during this time period. Each specific example is not listed due to this reporting criteria already being met by the listed TS 3.8.1.1 condition.

Reporting criteria 10CFR50.73(a)(2)(v)(D), a condition that alone could have prevented the fulfillment of a safety function needed to mitigate the consequences of an accident.

While EDG A was inoperable between the period November 6, 2010 and April 30, 2011, there were occurrences where EDG B was made inoperable. Additionally, Train B safety related components were made inoperable while their redundant components on Train A were inoperable due to an inoperable EDG A. During the above occurrences, where components in both Trains were inoperable, a condition existed that could have prevented the fulfillment of a safety function needed to mitigate the consequences of an accident with a loss of off-site power.

INITIAL CONDITIONS

Waterford 3 has two EDGs supplied by Cooper-Bessemer. Each diesel provides emergency AC power needed to supply its associated train's safety loads following an accident coincident with a loss of off-site power. This function is satisfied by the automatic starting of the EDGs and automatically re-energizing the safety busses through an output breaker. There is a relay contact in the automatic close circuit for EDG A output breaker that must be closed to provide a permissive for the output breaker to close. The relay must be dropped out to allow automatic closure of the "A" EDG output breaker. This relay drops out after a time delay when the safety bus tie breaker to non-safety bus opens, allowing the EDG A output breaker closure. This relay is model number E7022PB supplied by Amerace Corporation (now Tyco).

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Waterford 3 Steam Electric Station	05000382	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 8
		2011	- 003	- 00	

NARRATIVE

On April 30, 2011, the plant was in cold shutdown (Mode 5) conducting planned refueling outage 17. With EDG B operable, compliance was being maintained with the TS which required one EDG to be operable in mode 5. Compliance was also being maintained with the TSs which required two shutdown cooling loops to be operable and at least one shutdown cooling (SDC) loop in operation in mode 5 with the reactor coolant loops not filled. The safety busses were energized from off-site power through the normal distribution system.

There were no plant structures, systems, or components inoperable at the start of the event that contributed to the event.

EVENT DESCRIPTION

During each refueling outage, operations personnel perform procedure OP-903-115, "Integrated Train 'A' Integrated Emergency Diesel Generator/Engineering Safety Features Test" to satisfy Technical Specification 4.8.1.1.2.3 requirements. On April 30, 2011 during the performance of OP-903-115, EDG A auto-started but did not energize safety busses 3A and 31A because the EDG A output breaker did not close as expected.

Following the failure of the EDG A output breaker to automatically close once rated voltage and speed was achieved, an attempt was made to close the EDG A output breaker manually from the control room by taking the EDG A output breaker switch to the CLOSE position. The EDG A output breaker did not close. EDG A was manually secured. OP-901-310, Loss of A Train Safety Bus was entered, and off site power was restored to the 3A and 31A Safety Bus. The total time the safety busses were de-energized was approximately 15 minutes.

This condition was discovered while the EDG A and its supported systems were already declared inoperable in accordance with the test procedure. However, TS 3.4.1.5 requires two shutdown cooling (SDC) loops to be operable and at least one shutdown cooling loop shall be in operation in mode 5 with reactor coolant loops not filled. Since the safety bus was de-energized for 15 minutes and the Train A SDC loop was not operable, TS 3.4.1.5 was entered because there were less than two operable shutdown cooling loops. The TS goes on to require that with less than the above required loops operable, immediately initiate corrective action to return the required loops to operable status as soon as possible. As stated earlier, off site power was restored to the 3A and 31A Safety Bus. With the busses energized, SDC loop A was declared operable and TS 3.4.1.5 was exited.

When discovered, EDG B and its associated Train B safety equipment were operable and operating as required to support mode 5 operational requirements.

Trouble-shooting of this failure determined that an electrical lead had been connected to an incorrect terminal on a timing relay during a previous maintenance activity. This failure was caused by a human error that occurred on November 2, 2010 when an electrical lead was re-landed on an incorrect terminal on the associated timing relay. The wiring error was corrected on May 1, 2011, which restored the relay to its proper configuration. EDG A was tested and restored to service on May 2, 2011 at 20:28 hours.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Waterford 3 Steam Electric Station	05000382	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 8
		2011	- 003	- 00	

NARRATIVE

An investigation of this event was conducted under condition report CR-WF3-2011-03190 and it was determined that the wiring error occurred during a previous maintenance activity.

On November 1, 2010 at 0007, the scheduled six year maintenance on EDG A commenced which included a calibration of electrical relay EG EREL2327-C using Work Order 52230980-01. Two electricians were assigned the task of performing the calibration. The relay calibration is performed using the guidance contained in ME-007-005, "Time Delay Relay Setting Check, Adjustment, and Functional Test". Additional guidance for configuration control and completion of Lifted Lead Verification Forms was contained in Management Guideline MG-33, "Configuration Control Guidelines and Completing Lifted Lead & Switch Manipulation Forms."

The preventive maintenance involves disconnecting all electrical leads to the relay, removing the relay from the panel, performing a bench test in the shop and reinstalling the relay in the field. Prior to disconnecting the leads, the wire identification (ID) and its termination ID are recorded on the lifted lead sheet, ME-007-005 Attachment 12.2, "Lifted Leads Verification Form," to ensure the lead is re-landed on the same terminal from which it was removed.

Contrary to procedural requirements, the electricians did not follow procedure ME-007-005 and guideline MG-33 during the lead lifting process for relay EG EREL2327-C. The approved design document was not used to record the wiring information on the Lifted Lead Verification Form in accordance with MG-33. In addition, hand tracing the lead to the terminals could have identified the that the Lifted Lead Verification Form had incorrectly recorded the wire location

EDG A was declared operable on November 6, 2010 following completion of the scheduled six year maintenance.

CAUSAL FACTORS

There were two root causes and one notable contributing cause attributed to EDG A failing to meet surveillance requirements.

Root Cause 1: Inadequate Concurrent Verification execution during the Lifted Lead Process

The electricians did not follow procedure ME-007-005 when performing required "Concurrent Verification" and MG-33's Lifted Lead Verification Form Guidelines during the lifting leads process for relay EG EREL2327-C. An approved design document was not used to record the wiring information on the Lifted Lead Verification Form in accordance with MG-33.

Root Cause 2: Inadequate As Left Configuration Verification of the Lifted Lead Process

No procedural guidance exists that requires performing an As Left Verification (such as use of an approved design document, performance of a post maintenance test, or other augmented inspection).

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Waterford 3 Steam Electric Station	05000382	YEAR	SEQUENTIAL NUMBER	REV NO.	5 OF 8
		2011	- 003	- 00	

NARRATIVE

Contributing Cause: Lack of Knowledge of Procedural Requirements

Procedure EN-WM-105, "Planning" requires every Work Order to have a PMT. No specific PMT was identified for this Work Order. Planning personnel and Operations personnel stated that the bench test and landing the leads using HU tools was the PMT for the job task. Interviews with 3 planning personnel revealed that they were unaware of the procedure requirements on the development of PMTs and the requirements that are to be followed if a PMT is not specified.

CORRECTIVE ACTIONS

The wiring was placed in its proper configuration as indicated on the design drawing, correcting the wiring error on 5/1/2011.

Human Performance Error Review (HPER) was performed and individual performance issues are being addressed in accordance with company policy.

Procedure ME-007-005, "Time Delay Relay Setting Check, Adjustment, and Functional Test" will be revised to require personnel to use approved plant design documents to verify the as left condition is in accordance with the approved plant design.

Waterford Maintenance will develop and implement a focused "Out of the Box" (specialized training) evaluation for all maintenance personnel with an emphasis on verification practices and behaviors applicable to lifting and landing leads.

Identify all maintenance procedures that govern lifting and landing leads. Issue additional actions to revise these procedures, as necessary, to ensure they are aligned with the changes made to ME-007-005 that will require verification of as-left-configuration using the approved design document.

Perform training needs analyses using the SAT process to determine training requirements related to this incident, such as EN-WM-105 and EN-WM-107 procedure requirements for post maintenance tests, including the guidance for the WO operations assessments performed by Operations personnel.

Identify safety systems with online maintenance which cannot be fully functionally tested using online procedures. Establish an augmented inspection for each component. If an augmented inspection cannot be developed determine if the maintenance should be moved to the outage scope.

Procedure MD-001-042, "Maintenance Component Status Control" (which has replaced MG-33, "Configuration Control Guidelines and Completing Lifted Lead & Switch Manipulation Forms") will be revised to require Concurrent Verification of the documentation that reflects the initial as found configuration and to provide prescriptive guidance that temporary labels are only to be used when existing conductor identification is not legible or not installed.

Procedure EN-WM-107, "Post Maintenance Testing" will be revised to establish guidance on development of post maintenance tests for relays.

Maintenance Management will reinforce to all maintenance supervisors the requirement that supervisors will participate in pre-job briefs performed for all critical work activities.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Waterford 3 Steam Electric Station	05000382	YEAR	SEQUENTIAL NUMBER	REV NO.	6 OF 8
		2011	- 003	- 00	

NARRATIVE

SAFETY SIGNIFICANCE

The Waterford 3 onsite power system, including the onsite electric distribution system, is designed to:

- Provide a reliable source of auxiliary power for safe shutdown of the reactor, assuming loss of offsite power and a single active failure in the onsite power system;
- Be capable of withstanding the effects of a design basis wind, tornado, flood and earthquake event without loss of power to safety-related components essential to safe shutdown; and
- Minimize the probability that the loss of one onsite power supply or its distribution system will cause loss of the other train or of the offsite power system.

Failure of the EDG A output breaker to automatically close was found during surveillance testing on April 30, 2011. This failure was due to an electrical lead that was reconnected to the wrong terminal on a timing relay on November 2, 2010. During the this period that EDG A was erroneously declared operable, EDG A was capable of being started and was available to provide power to its associated safety busses because the EDG A output breaker could have been closed locally by depressing the manual close pushbutton. The EDG A output breaker had not been called upon to perform its specified function for any transient or accident condition, thus this failure did not adversely affect the health and safety of the public.

The initial affect of the output breaker not closing was that the 3A and 31A Safety Busses were de-energized for approximately 15 minutes. There was no direct impact on plant operational parameters from this condition. Plant operational needs were being provided by train B equipment and Shutdown Cooling (SDC) Train A was not required to be in operation at the time of this event. Control Room personnel properly implemented procedure OP-901-310, "Loss of 'A' Train Safety Bus" and off site power was satisfactorily restored to safety busses 3A and 31A.

This was an equipment related condition and did not present any industrial safety or environmental concerns.

For the period of this event, Waterford 3 operated in Modes 1 through 4 from 12:22 hours on November 6, 2010 through April 6, 2011 at 11:27 hours; after which, Waterford 3 operated in Modes 5, 6 and defueled (No Mode) through April 30, 2011 at 23:32 hours.

An evaluation was performed to evaluate the core damage risk associated with degradation of EDG A due to an incorrectly wired relay. This evaluation quantified risk based on two different conditions, at-power and shutdown.

As previous analyses have demonstrated that the increase in risk is insignificant for Train A equipment out of service along with EDG A, the maintenance periods where Train A equipment was unavailable during this condition were not evaluated as high risk configuration periods.

During the period that the relay was incorrectly wired, Waterford 3 did not experience any weather events that impacted the transmission grid or switchyard at the plant. Therefore, no increase in Core Damage Frequency (CDF) due to loss of off-site power frequency is necessary and the Equipment Out of Service (EOOS) risk evaluation utilizing the normal weather recovery rules is assumed to be conservative.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Waterford 3 Steam Electric Station	05000382	YEAR	SEQUENTIAL NUMBER	REV NO.	7 OF 8
		2011	- 003	- 00	

NARRATIVE

The risk associated with this condition was estimated using the Waterford 3 PRA model. The PRA includes a human error evaluation for manually closing the EDG A output breaker. A base risk was obtained by using the current at-power average maintenance model with no equipment out of service. The resulting base Core Damage Frequency (CDF) was compared to the calculated CDF with the relay removed from service. The risk evaluation with the at-power average maintenance model resulted in an incremental core damage probability (ICDP) of 7.007E-7 and an Incremental Large Early Release Probability (ILERP) of 7.007E-8.

In addition, an evaluation was also performed using the shutdown model. A base risk was obtained using the outage schedule. That risk was compared to the risk obtained when taking the relay out of service for the time period in question. There was no change in Conditional Core Damage Probability (CCDP) associated with the shutdown model because risk during shutdown was dominated by all three high pressure injection pumps being taken out of service for maintenance at the same time. As a result, the overall risk for the entire time period is all directly a result from the at-power conditions and the overall ICDP and ILERP remain the same as noted above.

SIMILAR EVENTS

A review identified 2 previous similar events that had been captured in the corrective action program, which are discussed below.

CR-WF3-2007-0123 identified that leads from HVRIT5250A and HVRIT5255A were discovered incorrectly terminated between two different cards in the same loop. The leads were a historical incorrect labeling of the leads contributed to the error, but there was a lack of rigor in the de-termination process which did not catch this historical error, leading to the incorrect termination of the leads.

The root cause of the event was that the procedure was not followed correctly. The procedure has separate sections for the calibration of each card. The leads for one card were supposed to have been lifted and then re-terminated prior to proceeding to the next card. The technicians interpreted the procedure to allow the lifting of the leads from both cards at the same time. The technicians did not verify the cable tag to the terminal before lifting the leads. A contributing cause was that planning personnel did not specify re-test requirements for the calibration activity. Operations did not specify any re-test requirements as part of the Equipment Out of Service entry. Corrective actions included: standard procedural guidance was implemented for lifting and landing of leads/wires including labeling and verification of labeling. The model work orders were updated for specific VLL cards. In addition, an extent of condition review of representative sample of mandatory preventative maintenance work orders was performed to determine if appropriate retests were specified in the Model Work Orders.

CR-WF3-2008-4822 Troubleshooting an alarm on Startup Transformer A discovered that wiring was terminated incorrectly. The affected wiring was required to be terminated to terminal #3 when it was found to be terminated to terminal #1. This relay is equipped with multiple contacts the only contact affected was for annunciation, contact for operation of the equipment was unaffected. Two experienced electricians disconnected a relay and reconnected the relay after testing it. A Human Performance Error Review concluded that the performer did not use adequate self-checking and the verifier did not use adequate verification techniques. Corrective actions were completed to raise the awareness of

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Waterford 3 Steam Electric Station	05000382	YEAR	SEQUENTIAL NUMBER	REV NO.	8 OF 8
		2011	- 003	- 00	

NARRATIVE

verification techniques, critical steps and accountability for these errors. An exercise on disconnecting and reconnecting leads was conducted with each electrical technician. This error only affected annunciator function, not affecting operability. Therefore, this condition did not require a root cause evaluation.

ADDITIONAL INFORMATION

Energy industry identification system (EIIIS) codes are identified in the text within brackets [].