



FirstEnergy Nuclear Operating Company

5501 North State Route 2  
Oak Harbor, Ohio 43449

Barry S. Allen  
Vice President - Nuclear

419-321-7676  
Fax: 419-321-7582

July 23, 2012  
L-12-239

10 CFR 50.73

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

SUBJECT:  
Davis-Besse Nuclear Power Station  
Docket Number 50-346, License Number NPF-3  
Licensee Event Report 2012-001

Enclosed is Licensee Event Report (LER) 2012-001, "Direct Current Source for Diesel Generator Transferred to Inoperable Source During Fuel Movement." This LER is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(v)(D).

There are no regulatory commitments contained in this letter or its enclosure. The actions described represent intended or planned actions and are described for information only. If there are any questions or if additional information is required, please contact Mr. Patrick J. McCloskey, Manager, Site Regulatory Compliance, at (419) 321-7274.

Sincerely,

  
Barry S. Allen

GMW

Enclosure: LER 2012-001

cc: NRC Region III Administrator  
NRC Resident Inspector  
NRR Project Manager  
Utility Radiological Safety Board

IEZZ  
NRR

<b>NRC FORM 366</b> (10-2010)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		APPROVED BY OMB NO. 3150-0104 Estimated burden per response to comply with this mandatory collection request: 80 hrs. 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 <a href="mailto:infocollects.resource@nrc.gov">infocollects.resource@nrc.gov</a> , 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.		EXPIRES 10/31/2013																																					
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<b>9. OPERATING MODE</b> <div style="text-align: center; font-size: 1.2em;">6</div>		<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> (Check all that apply) <table style="width: 100%;"> <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 style="font-size: 0.8em;">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
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FACILITY NAME Gerald M. Wolf, Supervisor, Nuclear Compliance						TELEPHONE NUMBER (Include Area Code) (419) 321-8001																																					
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>																																											
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<b>ABSTRACT</b> <i>(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)</i> <p>On May 19, 2012, with the Davis-Besse Nuclear Power Station in Mode 6 and movement of irradiated fuel in progress, the Direct Current (DC) power source providing the loss of power start function for the one required Emergency Diesel Generator (EDG) was transferred from its alternate to normal source. While the normal source was functional and available, required surveillance testing had not shown the DC power source to be operable following replacement of a battery cell and completion of a performance discharge test. This deficiency was identified during preparations for reloading fuel into the reactor core on May 22, 2012.</p> <p>The cause of this event was determined to be less than adequate administrative controls for maintaining the DC System power source operability with the system cross-tied during shutdown conditions. Subsequent testing showed the equipment was operable, and procedures will be revised to add a prerequisite for ensuring operability of the motor control center being transferred to, or to ensure both EDGs are operable.</p> <p>This event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B) as operation of the plant in a condition prohibited by the Technical Specifications and 10 CFR 50.73(a)(2)(v)(D) as a condition that could have prevented fulfillment of a safety function for a system needed to mitigate the consequences of an accident.</p>																																											

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		2012	-- 001	-- 00	

**NARRATIVE**

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].

**System Description:**

The Davis-Besse Nuclear Power Station (DBNPS) onsite electric power system [EB] is powered by two separate and independent Emergency Diesel Generators (EDGs) [EK-DG]. These EDGs provide onsite standby electrical power sources to supply their respective 4160 Volt Alternating Current (AC) Essential Buses [EB-BU]. Additionally, one non-class 1E diesel generator can be aligned to power either 4160 Volt Essential Bus in the event of a station blackout.

The DBNPS Direct Current (DC) electrical power system [EI] provides a continuous power source to essential instruments, safety features systems, and necessary control systems regardless of the auxiliary electrical system conditions. The DC System is arranged in two completely independent load groups (trains). Each train consists of a power source consisting of two 125 VDC batteries [EJ-BTRY], one battery charger [EJ-BYC] for each battery along with a spare battery charger per train. Each train of distribution consists of a DC motor control center (DCMCC), two essential distribution panels, and two non-essential distribution panels.

Each essential distribution panel is normally supplied from one DCMCC, with a manually transferred alternate supply available from the opposite DCMCC for maintenance purposes when the plant is in cold shutdown. The manual switches and related fuses for transferring the essential distribution panel between the normal and alternate DCMCC supply are classified as administratively controlled circuits. These administratively controlled circuits enable transferring the essential distribution panel between normal and alternate supply, thus allowing the battery charger and battery power sources from one train to be cross-connected to the essential distribution panels for both trains.

**Technical Specification(s):**

Technical Specification (TS) Limiting Condition for Operation (LCO) 3.8.2 requires one EDG be operable to supply one train of the onsite Class 1E AC electrical power distribution subsystems while the plant is in Modes 5 and 6 and during movement of irradiated fuel assemblies. TS LCO 3.8.5 requires one train 1 or train 2 DC electrical power source be operable to support one train of the DC electrical power distribution system while the plant is in Modes 5 and 6 and during movement of irradiated fuel assemblies. TS LCO 3.8.10 requires the necessary portions of AC, DC, and AC vital bus electrical power distribution subsystems be operable to support equipment required to be operable while the plant is in Modes 5 and 6 and during movement of irradiated fuel assemblies. With any of this required equipment inoperable, the applicable TS LCO Conditions require movement of irradiated fuel assemblies be suspended immediately, any operations involving positive reactivity additions that could result in loss of shutdown margin or boron concentration be suspended immediately, and actions be immediately initiated to restore the required equipment to operable status.

**DESCRIPTION OF EVENT:**

On May 6, 2012, the DBNPS shutdown for refueling and maintenance activities. On May 7, 2012, the station entered Mode 5, and EDG 1 was declared inoperable for maintenance activities, including replacement of its exhaust piping. EDG 2 remained operable to meet the requirements of TS LCO 3.8.2 in Modes 5 and 6. On May 10, 2012, train 1 of the DC System was removed from service for maintenance activities, including replacement of cell 13 of Battery 1P. Train 2 of the DC System

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 5
		2012	-- 001	-- 00	

**NARRATIVE****DESCRIPTION OF EVENT: (continued)**

remained operable to meet the requirements of TS LCO 3.8.5 in Modes 5 and 6. On May 11, 2012, after replacement of the battery cell was complete, Battery 1P was placed on an equalizing charge. A performance discharge test was conducted on Battery 1P on May 14, 2012, followed by recharging of the battery.

On May 17, 2012, after EDG 1 had been returned to service, EDG 2 was removed from service at 0206 hours for replacement of its exhaust piping along with other maintenance activities. On May 19, following completion of Battery 1P charging at 0445 hours, DC System Train 1 loads were returned to their normal lineups. This included a live transfer of essential DC distribution panel D1P at 2231 hours. Surveillance Testing was then conducted for Train 1 of the DC System.

In parallel with these activities, fuel handling activities commenced on May 18, 2012, with the core offload to the Spent Fuel Pool being completed on May 20, 2012, at 1548 hours. On May 22, 2012, while making preparations for reloading the fuel into the reactor core, it was discovered that monthly surveillance tests for batteries 1N and 1P were overdue, potentially rendering Train 1 of the DC System inoperable. Subsequent reviews determined that DC System distribution panel D1P had been transferred from alternate to normal alignment prior to completion of required testing to demonstrate the power source was operable following maintenance. Following the transfer of panel D1P at 2231 hours on May 19, 2012, Battery 1P was functioning as part of the DC electrical power source for EDG 1 to provide the loss of power start function for EDG 1 while EDG 2 was inoperable for exhaust piping replacement. While Battery 1P was available and in service at this time, it was inoperable with the station in Mode 6 with fuel handling activities in progress, resulting in no operable EDG as required per TS LCO 3.8.2.

**CAUSE OF EVENT:**

On May 19, 2012, personnel in the Outage Control Center (OCC) heard reports that battery testing was field complete and that the battery met the test acceptance criteria; however, there was still paperwork to review. The mindset of station personnel was that the DC train 1 power source was functional, and that the transfer from alternate to normal alignment was part of restoration of the power source to a functional state after maintenance. Personnel knew the DC distribution trains were cross-tied to one power source, but did not realize that during fuel handling activities the cross-tie provided the Loss of Power Start function for the Operable EDG 1.

The cause of this event was determined to be less than adequate administrative controls for maintaining the DC System power source operability with the system cross-tied during shutdown conditions.

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 5
		2012	-- 001	-- 00	

**NARRATIVE****ANALYSIS OF EVENT:**

For the time period when Battery 1P was functioning as part of the DC electrical power source for EDG 1 to provide the loss of power start function without the necessary surveillance testing being completed, the battery was in service and available. Testing completed approximately 1.5 hours after the transfer of panel D1P to its normal power source documented that Battery 1P had sufficient charge to perform all required functions. The battery had been on equalizing charge for over three days following the battery performance discharge test, and was removed from equalizing charge prior to the source transfer of panel D1P to Battery 1P. Completion of required surveillance testing on May 22, 2012, at 1144 hours confirmed all required equipment was operable. Additionally during this time, the Station Blackout Diesel Generator, which has its own DC system and does not rely on the station DC System for its loss of power start function, was available. Therefore this event was of very low safety significance.

**Reportability Discussion:**

From the time when panel D1P was transferred to its untested normal power source until completion of all required testing, it could not be confirmed that that Battery 1P was operable when D1P was transferred to the normal power supply. Therefore, EDG 1 was inoperable during this time period. Because EDG 2 was also inoperable at this time, no EDGs were Operable as required by the Technical Specifications. TS LCO 3.8.2 Action B requires that with the one required EDG inoperable, movement of irradiated fuel assemblies shall be suspended immediately (any Modes). Because fuel movement continued during this timeframe, the plant operated in a condition prohibited by the Technical Specifications, which is reportable per 10 CFR 50.73(a)(2)(i)(B).

Also, with no EDGs operable during this timeframe, this represents a condition that could have prevented fulfillment of a safety function for a system needed to mitigate the consequences of an accident (fuel handling accident). This is also reportable per 10 CFR 50.73(a)(2)(v)(D). Because this condition was discovered while the plant was defueled and no fuel movement in progress, no immediate reporting per 10 CFR 50.72(b)(3)(v)(D) was required because the EDGs provided no safety function at the time of discovery.

**CORRECTIVE ACTIONS:**

Required surveillance testing was completed on May 22, 2012, to confirm train 1 of the DC System and EDG 1 were operable as required for the existing plant conditions.

Procedure DB-OP-06321, "250/125 VDC Station DC Switching Procedure," will be revised for the live transfer of essential distribution panels to add a prerequisite for ensuring operability of the DCMCC being transferred to, or to ensure both EDGs are operable. Procedure DB-OP-06316, "Diesel Generator Operating Procedure," will be revised to include the affect of the operability of the DC distribution subsystem on the operability of the EDG.

Procedures regarding returning systems and components to service will be revised to be applicable at all times when systems or components are required to be functional or operable.

Existing pre-job briefs will be revised and additional pre-job briefs will be created for the live transfer of DC distribution panels to alternate/normal feed so that the impact on the DC System operability is addressed and this event is identified as operating experience.

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CONTINUATION SHEET**

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Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 5
		2012	-- 001	-- 00	

**NARRATIVE****CORRECTIVE ACTIONS:** (continued)

The outage schedule will be enhanced by including an activity to verify operability of power sources / loads between surveillance testing and transfer of DC system distribution panels between normal and alternate alignments.

A case study will be disseminated to licensed operators on the intended restoration of the DC system during outages that highlights the problem, causes, and corrective actions identified for this event. The key aspects of this case study will be reinforcement of the expected behaviors during outages with respect to return to service guidance, tracking alternate configurations of key shutdown safety defense in depth systems, and use of the questioning attitude human performance event-free tools.

**PREVIOUS SIMILAR EVENTS:**

DBNPS Licensee Event Report 2005-002 documented the inoperability of a DC System Battery during a plant shutdown that was not detected during surveillance testing. This resulted in the station starting up without the required operable batteries, which was a condition prohibited by the Technical Specifications. The corrective actions for the 2005 event focused on improving test procedures to ensure all battery cells met operability requirements, and would not be expected to have prevented the current event that involved the interface between the DC System and its effect on the operability of the EDGs. There have been no Licensee Event Reports submitted for the DBNPS in the past three years regarding similar issues where an electrical system alignment was transferred from alternate to normal supply prior to surveillance test completion.