

NP-33-00-001-00

Docket No. 50-346

License No. NPF-3

February 21, 2000

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Ladies and Gentlemen:

LER 2000-001  
Davis-Besse Nuclear Power Station, Unit No. 1  
Date of Occurrence - September 26, 1998

Enclosed please find Licensee Event Report 2000-001, which is being submitted to provide written notification of the subject occurrence. This LER is being submitted in accordance with 10CFR50.73(a)(2)(i)(B).

Very truly yours,



James H. Lash  
Plant Manager  
Davis-Besse Nuclear Power Station

GMW/s

Enclosure

cc: Mr. J. E. Dyer, Regional Administrator, USNRC Region III  
Mr. K. S. Zellers, DB-1 NRC Senior Resident Inspector  
Utility Radiological Safety Board

IE22

**COMMITMENT LIST**

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station in this document. Any other actions discussed in the submittal represent intended or planned actions by Davis-Besse. They are described only as information and are not regulatory commitments. Please notify the Manager - Regulatory Affairs (419-321-8466) at Davis-Besse of any questions regarding this document or associated regulatory commitments.

**COMMITMENTS**

**DUE DATE**

- |   |  |
|---|--|
| 1. Review operating procedures relating to switchyard operation and revise necessary procedures to include steps to alert operators of conditions that may require entry into Technical Specification 3.8.1.1 when opening switchyard breakers or removing transmission lines from service. | September 29, 2000                           |
| 2. Maintain Standing Order 00-001 in effect to provide the appropriate guidance to the operators.   | Until all procedure revisions are completed. |

### LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50.0 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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.

FACILITY NAME (1) Davis-Besse Unit Number 1		DOCKET NUMBER (2) 05000346	PAGE (3) 1 OF 6
--	--	-------------------------------	--------------------

TITLE (4)  
Failure To Perform Technical Specification Action With Switchyard Circuit Inoperable Due To Inadequate Procedure

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	26	1998	2000	-- 001 --	00	02	21	2000	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)										
POWER LEVEL (10) 100	20.2201(b)			20.2203(a)(2)(v)			X 50.73(a)(2)(i)			50.73(a)(2)(viii)	
	20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)			50.73(a)(2)(x)	
	20.2203(a)(2)(i)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)			73.71	
	20.2203(a)(2)(ii)			20.2203(a)(4)			50.73(a)(2)(iv)			OTHER	
	20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)			Specify in Abstract below or in NRC Form 366A	
20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)	
NAME Gerald M. Wolf, Engineer - Licensing	TELEPHONE NUMBER (Include Area Code) (419) 321-8114

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (if yes, complete EXPECTED SUBMISSION DATE)	X	NO					

**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On January 23, 2000, with the unit in Mode 1 at approximately 100 percent power, a past condition was identified and determined to be reportable in accordance with 10CFR50.73(a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications. This past condition occurred on September 26, 1998, when switchyard breakers were opened while synchronizing the main generator to the grid. In this switchyard configuration, only one qualified circuit exists, rather than two as required by the Technical Specifications. On September 26, 1998, the appropriate actions of the Technical Specifications with only one qualified circuit operable were not performed within the one hour time frame specified. The apparent cause of this event is that previous reviews of the switchyard configuration and fault relaying did not address that opening these breakers could result in only one qualified circuit remaining operable. This condition would not have prevented safe shutdown of the plant because onsite power sources were unaffected by this condition. Appropriate procedures relating to switchyard operation will be changed to include steps to alert operators of conditions that may require entry into Technical Specifications when opening switchyard breakers.

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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 6
		2000	-- 001 --	00	

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

DESCRIPTION OF OCCURRENCE:

On January 23, 2000, with the unit in Mode 1 at approximately 100 percent power, a condition was identified that could have resulted in a complete loss of offsite power. On January 17, 2000, a low air pressure alarm was received on switchyard breaker 34563 [FK-BRK]. If the air pressure were to drop too low, the breaker could not be opened if a fault should occur. Therefore breaker 34563 was opened before all air pressure was lost. Upon review of this condition, it was determined that Technical Specification Limiting Condition for Operation (LCO) 3.8.1.1.a should have been entered while breaker 34563 was open due to the potential for a single breaker fault that, should the fault occur, would result in a loss of all offsite power sources. The surveillance required by Technical Specification 3.8.1.1 was performed within one hour of opening the breaker on January 17 as a conservative measure due to the uncertainty of needing to enter the Technical Specification LCO.

When a fault is detected on a switchyard breaker, protective relays open the breaker in an attempt to clear the fault. Protective relaying also exists for detecting when a breaker has failed to properly isolate a circuit. This relaying initiates a lockout of the circuits adjacent to the failed breaker, which opens all breakers associated with those circuits. Refer to Figure 1 for a diagram of the Davis-Besse Nuclear Power Station (DBNPS) Switchyard. If this lockout relaying fails and initiates a lockout of breaker 34562, breakers 34561 and 34564 would open, as well as the breakers on the Bayshore and Ohio Edison lines. A similar condition can occur if breaker 34564 experiences a lockout. The lockout of breakers 34562 and 34564 is discussed in the DBNPS Updated Safety Analysis Report (USAR) Section 8.2.1.1, Offsite Power System Reliability Considerations, but the configuration of the switchyard during maintenance is not discussed. With breaker 34563 open because of the low air pressure condition, a lockout of breaker 34562 would result in a loss of offsite power. Station operating procedures identified that Technical Specification LCO 3.8.1.1 should be entered when either the Bayshore or Lemoyne 345 kV transmission lines were removed from service as a result of the potential for this lockout fault, but did not identify entry into the LCO when opening other switchyard breakers.

Technical Specification LCO 3.8.1.1 requires two qualified circuits between the offsite transmission network and the onsite Class 1E A.C. electrical power distribution system shall be OPERABLE. Technical Specification 3.8.1.1 Action a. allows only one circuit operable for up to 72 hours. The Bases for Technical Specification 3/4.8 states that qualified offsite to onsite circuits are those that are described in the USAR and are part of the licensing basis for the plant.

USAR Section 3D.1.13, which references 10 CFR 50 Appendix A, Criterion 17, states "Electric power from the transmission network to the onsite electric distribution system is supplied by two physically independent circuits designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A switch yard common to both circuits is acceptable." Therefore the system must minimize simultaneous failure of the offsite circuits due to a single event. This is repeated in USAR Section 8.2.1.1 which states that the possibility of power failure due to faults in the network interconnections and

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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 6
		2000	-- 001 --	00	

**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)

DESCRIPTION OF OCCURRENCE (continued):

the associated switching is minimized by the arrangement of the switchyard. USAR Section 8.3.1.2.2 states: "Three independent circuits are provided to supply power to the onsite electrical distribution system, and with any two circuits in service the requirements of NRC General Design Criterion 17 are fulfilled."

General Design Criterion 17 further states "Each of these circuits [i.e., the two qualified circuits] is designed to be available in sufficient time following a loss of all onsite alternating current power supplies and the other offsite electric power circuit, to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits is designed to be available within a few seconds following a loss-of-coolant accident to assure that core cooling, containment integrity, and other vital safety functions are maintained." One circuit was available within a few seconds to respond to a LOCA. However, if a lockout occurs as described above, it will take approximately one hour to restore offsite power.

The Standard Review Plan (NUREG-0800), Section 8.2, Offsite Power System, Paragraph III.1 (d), (Revision 2, July 1981) states "At least one of the two required circuits can, within a few seconds, provide power to safety-related equipment following a loss-of-coolant accident. GDC 17 does not require these circuits in themselves to be single-failure-proof for this accident." Paragraph IV.2 also states "The switchyard is arranged such that single events will not cause simultaneous failure of all offsite circuits to the switchyard." These statements further clarify that although the single failure criteria does not apply within the circuit itself, the condition described previously is not in compliance with General Design Criterion 17 requirements.

Independence is defined in IEEE 308-1971, Criteria for Class 1E Electric Systems for Nuclear Power Generating Stations definition 3.14, as "No common failure mode for any design basis event." Definition 3.12 states that a common mode failure is a mechanism by which a single design basis event can cause redundant equipment to be inoperable. By maintaining two circuits with operable components which would be available in sufficient time to address a design basis event with no resulting common failure mode, the required "qualified" circuits for LCO 3.8.1.1 are maintained.

Section 8.1 of the NRC's Safety Evaluation Report (NUREG-0136) which was issued in support of the Operating License (including the Appendix A Technical Specifications) states that General Design Criterion 17 and IEEE Standard 308-1971 were used as the primary basis for evaluating the adequacy of the electrical power systems. Therefore, for the electric power systems, the Technical Specifications were intended to reflect the minimum requirements of General Design Criterion 17 and IEEE 308-1971 as evaluated by the NRC and found acceptable. If a fault occurs as described above, this causes a loss of the "one" circuit that was OPERABLE. If the other circuit, which is out of service for maintenance, cannot be restored within a few seconds, then the LCO for Technical Specification 3.8.1.1 is not met, and the applicable actions should be taken. These actions include a check within one hour that the remaining offsite circuit breakers are correctly aligned and that power is indicated as available.

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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 6
		2000	-- 001 --	00	

**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)

DESCRIPTION OF OCCURRENCE (continued):

On January 17, 2000, when breaker 34563 was opened, the check required by Technical Specification 3.8.1.1 was performed within one hour of opening the breaker. This check was performed as a conservative measure due to the uncertainty of needing to enter the Technical Specification LCO. Upon review of this condition, it was discovered on January 23, 2000, that on September 26, 1998, with the unit in Mode 1 at approximately 20 percent power, breakers 34560 and 34561 were open for 1 hour and 23 minutes while synchronizing the unit to the grid without performing the necessary check of the remaining offsite circuit. Therefore, the LCO Action Statement time was not met, so this condition is reportable under 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications. The breakers were closed within the 72 hours allowed by the Technical Specification Action Statement for continued operation. This condition has also existed during previous similar evolutions of removing the unit from service, synchronizing the unit to the grid, or following a unit trip.

APPARENT CAUSE OF OCCURRENCE:

DBNPS Licensee Event Report (LER) 1996-008 identified the potential that if a switchyard circuit breaker should experience a lockout while an offsite transmission line is out of service, a loss of offsite power could occur. The investigation and subsequent corrective actions centered on the performance of maintenance activities causing one of the three offsite lines to be unavailable. The apparent cause of occurrence for this recent event is that the previous reviews of switchyard configuration for applicability of the TS action statements did not address the potential that opening a single switchyard breaker could result in a similar condition as having an offsite line unavailable.

ANALYSIS OF OCCURRENCE:

A review of the Unit Log was performed for the time period since the discovery date for DBNPS LER 1996-008. In addition to the event described above that occurred on September 26, 1998, six other similar events were discovered where only one circuit between the offsite transmission network and the onsite Class 1E A.C. electrical power distribution system was operable and the appropriate actions of the Technical Specifications were not performed in the allowed outage time. All of these events were shorter than the 72 hours allowed by the TS Action Statement for continued operation. Furthermore, all diesel generators remained operable during these events. Therefore there was sufficient capacity and capability to assure that core cooling, containment integrity, and other vital safety functions were maintained in accordance with General Design Criterion 17.

CORRECTIVE ACTIONS:

A Standing Order was issued on January 18, 2000, to provide guidance for entering Technical Specification 3.8.1.1 and performing the appropriate actions when operating switchyard breakers. Control Room Required Reading was issued on February 11, 2000, to remind the operating crews that a reactor or turbine trip

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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 6
		2000	-- 001 --	00	

**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)

CORRECTIVE ACTIONS (continued) :

will require entry into Technical Specification 3.8.1.1 due to the automatic opening of switchyard breakers 34560 and 34561.

Operating procedures relating to switchyard operation will be reviewed and the necessary procedures revised to include steps to alert operators of conditions that may require entry into Technical Specification 3.8.1.1 when opening switchyard breakers or removing transmission lines from service. These procedure revisions will be completed by September 29, 2000. Until these procedure revisions are completed, the Standing Order will remain in place to provide the appropriate guidance to the operators.

FAILURE DATA:

As discussed previously, DBNPS LER 1996-008 described a similar event involving the failure to comply with applicable Technical Specification requirements when operating the switchyard in an off-normal line-up. As discussed, the corrective actions taken in response to this LER did not prevent this occurrence due to the narrow scope of review.

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

NP-33-00-001-00

CR 2000-0096, 2000-0144

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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	6 OF 6
		2000	-- 001 --	00	

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

FIGURE 1

Davis-Besse Nuclear Power Station 345 kV Switchyard One-Line Diagram

