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NP-33-02-010-00

Docket No. 50-346

License No. NPF-3

February 24, 2003

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

Ladies and Gentlemen:

LER 2002-010  
Davis-Besse Nuclear Power Station, Unit No. 1  
Date of Occurrence – December 20, 2002

Enclosed please find Licensee Event Report 2002-010, which is being submitted to provide written notification that the trolley on the Intake Structure Gantry Crane was not adequately restrained in the event of tornado-generated winds. This issue was identified as part of the Davis-Besse Return to Service Plan System Health Readiness Reviews. This LER is being submitted in accordance with 10CFR50.73(a)(2)(i)(B). Commitments associated with this LER are listed in the Attachment.

Very truly yours,

GMW/s

Enclosures

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

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Attachment  
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### 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 (419-321-8450) at Davis-Besse of any questions regarding this document or associated regulatory commitments.

#### COMMITMENTS

#### DUE DATE

Install restraints on the Intake Gantry Crane trolley to secure the trolley to the gantry in the event 360 mile per hour tornado-generated winds or a design basis earthquake potentially overturns the Intake Gantry Crane.

Completed on February 1, 2003

Estimated burden per response to comply with this mandatory information collection request. 50 hrs  
Reported lessons learned are incorporated into the licensing process and fed back to industry. Send  
comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear  
Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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 Davis-Besse Unit Number 1		2 DOCKET NUMBER 05000346	3 PAGE 1 OF 5
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4 TITLE  
Intake Gantry Crane Trolley Not Adequately Restrained for Tornado-Generated Winds

5 EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	25	2002	2002	-- 010 --	00	02	24	2003		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9 OPERATING MODE D	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
10 POWER LEVEL 000	20 2201(b)	20 2203(a)(3)(ii)	50 73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)						
	20 2201(d)	20 2203(a)(4)	50 73(a)(2)(iii)	50.73(a)(2)(x)						
	20 2203(a)(1)	50 36(c)(1)(i)(A)	50 73(a)(2)(iv)(A)	73 71(a)(4)						
	20 2203(a)(2)(i)	50 36(c)(1)(ii)(A)	50 73(a)(2)(v)(A)	73 71(a)(5)						
	20 2203(a)(2)(ii)	50 36(c)(2)	50 73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A						
	20 2203(a)(2)(iii)	50 46(a)(3)(ii)	50 73(a)(2)(v)(C)							
	20.2203(a)(2)(iv)	50 73(a)(2)(i)(A)	50.73(a)(2)(v)(D)							
	20 2203(a)(2)(v)	X 50 73(a)(2)(i)(B)	50.73(a)(2)(vii)							
	20 2203(a)(2)(vi)	50 73(a)(2)(i)(C)	50 73(a)(2)(viii)(A)							
	20 2203(a)(3)(i)	50 73(a)(2)(ii)(A)	50 73(a)(2)(viii)(B)							

12. LICENSEE CONTACT FOR THIS LER

NAME Gerald M. Wolf, Staff Engineer - Licensing	TELEPHONE NUMBER (Include Area Code) (419) 321-8114
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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

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

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

On December 25, 2002, with the reactor defueled, the Service Water System was declared inoperable due to the inability of the Intake Gantry Crane to withstand tornado-generated winds. The trolley of the crane was not adequately secured to the gantry, and in the event tornado-generated winds or a design basis earthquake potentially overturns the crane, the trolley could fall independent of the gantry and possibly impact the roof of the Service Water Pump Room. While the reinforced concrete roof of the Service Water Pump Room is designed to withstand tornado-generated missiles, it was not designed to withstand the approximately 52 foot drop of the nearly 5 ton trolley. New restraints have been installed on the Intake Gantry Crane trolley to ensure it remains with the gantry in the event the crane is overturned, and therefore the Service Water System will not be adversely affected. Since the restraint of the Intake Gantry Crane has apparently been inadequate since initial plant operation, the operation of the plant in this condition was prohibited by the Technical Specifications, and therefore this condition is being reported in accordance with 10CFR50.73 (a) (2) (i) (B).

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Davis-Besse Unit Number 1	05000346	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		2002	-- 010 --	00	

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

## DESCRIPTION OF OCCURRENCE:

In accordance with the Davis-Besse Nuclear Power Station (DBNPS) Return to Service Plan, detailed system health walkdowns have been conducted. As part of these walkdowns, problems were found with the exhaust piping of the Emergency Diesel Generators [EK-SC] and an exterior door to a Main Steam Line Room that were not adequately protected from tornado-generated missiles as documented in DBNPS LER 02-006. On October 14, 2002, during field verifications to support the analysis of tornado-generated missiles, an issue was raised regarding the adequacy of the Intake Structure Gantry Crane to withstand tornado wind loads. As part of the evaluation of this issue, a walkdown of the crane was performed, and on December 20, 2002, with the DBNPS shutdown and the reactor defueled, it was discovered that a trolley locking device for the Intake Gantry Crane was not installed. The missing trolley locking device is required to secure the crane trolley in the event of an earthquake (0.05 g) or high winds (90 miles per hour).

The Service Water System pumps water from Lake Erie to supply cooling water to plant equipment during normal operation, and supplies cooling water to the engineered safety features equipment during an emergency. The reinforced concrete Intake Structure and enclosures for the Service Water pumps are designed to withstand a Class I seismic event as well as tornado-generated missiles. The Intake Structure Gantry Crane is used for servicing various pumps and motors at the intake structure, including the Service Water Pumps, Cooling Tower Water Makeup Pumps, and Traveling Screens. This 15 ton (30,000 pound) capacity crane is an overhead gantry type traveling crane that was designed and fabricated by Mecco-Matic, Brookfield, Ohio. The largest load normally expected to be lifted with the crane is the 8,600 pound Service Water Pump Motors. The crane was originally designed with a single locking device to secure the crane trolley to the crane gantry in the event of an earthquake (0.05 g) or high winds (90 miles per hour).

The Intake Gantry Crane was designed to withstand 90 mile per hour winds as well as horizontal earthquake loads of 0.05 g. Evaluations were performed to determine the potential of the crane trolley to become displaced in the event tornado-generated winds that potentially reach 360 mile per hour overturn the 60-foot tall crane. With the crane trolley secured to the gantry, the crane would fall as one piece and not impact the Intake Structure due to its size/height. However, with the crane trolley not secured to the gantry, there is a potential that the trolley would fall independent of the overturning gantry, and could possibly impact the roof of the Service Water Pump Room. It was concluded that even if the single locking device on the crane trolley had been installed, it would not have been sufficient to ensure the trolley remained secured to the gantry should the gantry be overturned.

While the reinforced concrete roof of the Service Water Pump Room is designed to withstand tornado-generated missiles, it was not designed to withstand the approximately 52 foot drop of the 9,900 pound crane trolley. Therefore, on December 25, 2002, the Service Water System was declared inoperable in

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

DESCRIPTION OF OCCURRENCE: (Continued)

accordance with Technical Specification Limiting Condition for Operation 3.7.4.1 which requires two independent service water loops be operable in Modes 1, 2, 3 and 4.

At the time of discovery there were no Technical Specification operability requirements for the Service Water System with the reactor defueled. However, since the plant operated in this condition when the Service Water Loops were required to be operable per DBNPS Technical Specifications, this issue represents a condition prohibited by the Technical Specifications, and is therefore reportable in accordance with 10CFR50.73 (a) (2) (i) (B).

APPARENT CAUSE OF OCCURRENCE:

The single locking device for the crane trolley was provided as part of the original design of the Intake Gantry Crane. However, this single locking device was not sufficient to ensure the trolley would remain secured to the gantry should the gantry be overturned. Therefore, the locking device would not have prevented the trolley from potentially impacting the roof of the Service Water Pump Room in the event of a design-basis tornado or earthquake. The preliminary apparent cause of the inadequate locking device is that the original design of the crane, which included the locking device, was inadequate. The Intake Gantry Crane was apparently only designed to withstand the 90 mile per hour wind that is projected to occur once every one hundred years in accordance with the guidance of the American Society of Civil Engineers. The crane was not designed to withstand tornado wind loads of up to 360 miles per hour or the design basis earthquake as specified in the DBNPS Updated Safety Analysis Report and Design Criteria Manual.

The Intake Gantry Crane is an outdoor crane, and is exposed to the elements. This requires frequent maintenance to keep the crane in a useable condition, even though the maintenance that requires use of the crane (major equipment overhauls) is performed infrequently. In the 1995-1996 timeframe, it was decided to abandon and scrap the Intake Gantry Crane, and use a mobile crane instead when needed for maintenance. Some actions were taken in the abandonment of the crane before it was realized that it would be difficult to qualify a mobile crane to the requirements of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants" as previously committed by the DBNPS.

In 1998, Maintenance personnel requested Engineering evaluate the need to maintain the trolley locking device and the two gantry tie-down pins because they were difficult to install after each use of the crane. This request was approved by engineering based on an evaluation that showed the device/pins were not needed for the trolley to remain in-place in the 90 mile per hour winds or the (0.05 g) earthquake the crane was designed to withstand. However, the engineering evaluation was deficient in that it did not fully consider all design inputs for this equipment, namely, that the crane was required to withstand 360 mile per hour winds and the design basis earthquake in order to not adversely affect the Service Water System.

ANALYSIS OF OCCURRENCE:

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

While tornadoes are rather common in Ohio, the probability of a tornado striking at a point within the one-degree square in which the site is located is 6.3 E-4 per year. The associated recurrence interval is one in approximately 1,590 years. The tornado that struck the DBNPS on June 24, 1998, was classified by the National Weather Service as an F2 (Fujita Scale) with winds ranging from 113 to 157 miles per hour. While the 1998 tornado resulted in a complete loss of offsite power, there was no effect on the Intake Gantry Crane or Intake Structure (Refer to DBNPS LER 98-006 for further information on the 1998 tornado).

The Intake Gantry Crane is 60 foot tall, and travels on rails 60 feet apart that are oriented in a north-south direction on the top of the Service Water Pump Room and foundation of the Intake Structure. The entire crane weighs a total of 125,900 pounds (almost 63 tons), and the wheels of the gantry are 30 feet apart between the wheel axles. The crane trolley rides on rails 11 feet apart that are oriented in an east-west direction. In the unlikely event that a tornado could generate sufficient winds to overturn the Intake Gantry Crane, it is most probable that the trolley would fall with the gantry, and fall a safe distance from any safety-related equipment. However, should the trolley fall separate from the gantry, it could impact the Service Water Pump Room roof directly below the western end of the gantry. The roof of the Service Water Pump Room contains 3 equipment access ports that are each closed with four removable concrete plugs 7 feet 4 inches by 5 feet 10 inches and 21 inches thick. While this roof and removable plugs are designed to withstand tornado-generated missiles, they are not designed for the potential impact load the 9,900 pound crane trolley would represent falling from a height of approximately 52 feet.

The three Service Water Pumps are arranged in the Service Water Pump Room in a straight line in a north-south orientation, with a Cooling Tower Makeup Pump located between each Service Water Pump. Each of these five pumps also has a strainer located to the west of its respective pump. The room has no physical barriers separating these pumps, but Service Water Pump 1 is located 28 feet from Service Water Pump 2, with Service Water Pump 3 (which can be aligned as either pump 1 or pump 2) located midway between the other 2 pumps. Because of this separation, it is unlikely that a fall of the 11-foot wide trolley could damage more than one Service Water Pump to the extent that it was rendered incapable of performing its designated safety function. Only if the fall of the trolley resulted in a large rupture of the safety-related Service Water piping would the resultant room flooding have the potential of adversely affecting more than one Service Water Pump. Each Cooling Tower Makeup Pump has a pressure switch installed to sense a pipe rupture and shutdown the Cooling Tower Makeup Pump in order to protect the Service Water Pumps. Therefore, this event has low safety significance.

CORRECTIVE ACTIONS:

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

An Engineering Change Request (ECR 03-0058) was performed to evaluate and install the necessary restraints for the Intake Gantry Crane Trolley. This action was completed on February 1, 2003 with the installation of four trolley locking devices, one at each corner of the trolley. These four locking devices are designed to secure the trolley to the gantry in the event 360 mile per hour tornado-generated winds or a design basis earthquake potentially overturns the Intake Gantry Crane.

Evaluations are ongoing to more thoroughly evaluate the potential for the Intake Gantry Crane trolley to fall onto the roof of the Service Water Pump Room and the potential damage that would result in such an impact. If these evaluations determine the consequences of a potential overturning of the Intake Gantry Crane are significantly different than those described above, a revision to this LER will be submitted.

FAILURE DATA:

DBNPS LER 02-006 documents an issue where the Emergency Diesel Generator exhaust piping and a door to a Main Steam Line Room were not adequately protected from potential tornado-generated missiles. It was through the review and walkdowns performed as corrective actions for LER 02-006 that the issue with the Intake Gantry Crane was discovered. There have been no other LERs in the previous two years involving deficiencies with tornado-generated winds or missile protection.

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

NP-33-02-010-00

CRs 2002-07981, 2002-10425