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NP-33-97-004-01

Docket No. 50-346

License No. NPF-3

March 26, 2004

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

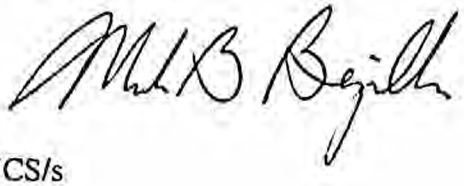
Ladies and Gentlemen:

LER 1997-004-01
Davis-Besse Nuclear Power Station, Unit No. 1
Date of Occurrence – February 3, 1997

Enclosed please find Revision 1 to Licensee Event Report 1997-004, which is being submitted to provide supplemental information concerning a condition that was initially reported as a condition considered outside the plant's design basis in accordance with 10CFR50.73(a)(2)(ii)(B). This revision corrects incomplete information in the original submittal. This discrepancy was discovered during a 10CFR50.9 review project as detailed in DBNPS letters dated August 15, 2003 (Serial 1-1325) and October 24, 2003 (Serial 1-1330).

This LER revision is limited to the information that corrects the discrepancy discovered during the 13RFO 10CFR50.9 review project. This additional information, as depicted by the revision bars, completes the LER description, corrective actions and failure data regarding a review of the Reactor Coolant Pump Oil Collection system for NRC Information Notice 94-058. Additionally, this revision provides an updated status of the corrective actions taken for this event. Commitments associated with this LER Revision are listed in the Attachment.

Very truly yours,



JCS/s

Attachment

Enclosure

IE22

cc: Regional Administrator, USNRC Region III
DB-1 Senior Project Manager, USNRC
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
A Standing Order was issued on February 20, 1997, to provide guidance to not start the oil lift pumps unless directed by procedure, and to prevent the use of the remote oil fill lines.	Complete
New enclosures were designed for the RCP lift oil system piping. The modification to the oil collection system for each Reactor Coolant Pump was completed.	Complete
The RCP lower bearing oil reservoir piping and the remote oil fill lines were evaluated and modified, as necessary, to ensure they are in compliance with 10CFR50, Appendix R requirements. The modification was completed.	Complete
The DBNPS modified the Information Notice review process to utilize the corrective action process. Currently, upon receipt of an NRC Information Notice, a Condition Report is initiated. The Condition Report process requires a review and approval of the Information Notice/CR evaluation that was not present in the Information Notice review process at the time Information Notice 94-058 was initially reviewed.	Complete

NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

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	2. DOCKET NUMBER	3. PAGE
Davis-Besse Unit Number 1	05000346	1 OF 6

4. TITLE

Reactor Coolant Pump Motor Oil Piping Not Protected From Leakage As Required Per 10CFR50, Appendix R

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
02	03	97	97	004	01	03	26	2004		05000
									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)(ii)	X 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)	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	TELEPHONE NUMBER (Include Area Code)
Gerald Wolf – Senior Licensing Engineer	419-321-8001

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 January 31, 1997, with the plant in Mode 1 operating at 100 percent power, it was discovered that a portion of the oil piping for each Reactor Coolant Pump (RCP) motor was outside the oil collection system that is required per 10CFR50, Appendix R. This piping is the source connection for three pressure switches and a pressure gauge for the lift oil pump system, which is only pressurized when the lift oil pump is operating. On February 19, 1997, after reviewing pictures of the RCP motors as part of the corrective actions for this issue, more piping was found outside the RCP oil collection system. This additional piping included lower bearing remote oil fill connections, which are not pressurized; and piping for lower bearing oil reservoir drains, which is exposed to only two feet static head pressure. The lift oil pumps were not operating, and the remote oil fill connections had not been used that operating cycle. This condition is considered outside the plant design basis and was reported in accordance with 10CFR50.73(a)(2)(ii)(B). Plant modifications were implemented to contain or modify the piping as necessary to ensure compliance with 10CFR50, Appendix R.

DESCRIPTION OF OCCURRENCE:

On October 20, 1996, the AC powered lift oil pump for Reactor Coolant Pump (RCP) 2-2 [AB-RO] was started in an attempt to reduce high motor up thrust bearing operating temperatures. On January 31, 1997, with the plant in Mode 1 operating at 100 percent power, low pressure alarms were received for RCP 2-2 lift oil system, and the AC powered lift oil pump was subsequently shutdown. In an attempt to discover the cause of the alarms, the spare RCP motors located in the turbine building were examined. Based on this examination, it was theorized that the coupling for the lift oil pump had failed. However, during this examination, it was discovered that a portion of each RCP motor oil piping was outside the enclosure designed to contain oil from potential leak sites in the oil system. This piping is the source of connection for three pressure switches and a pressure gauge for the lift oil pump system, and is only pressurized when a lift oil pump is operating. On February 3, 1997, after determination that this piping is not in compliance with 10CFR50, Appendix R, Section III.O, this condition was reported to the NRC via the Emergency Notification System in accordance with 10CFR50.72(b)(1)(ii)(B). This condition is reported in accordance with 10CFR50.73(a)(2)(ii)(B) as a condition outside the design basis of the plant.

On February 19, 1997, after reviewing pictures of the RCP motors via a surrogate tour program as part of the corrective actions for this issue, two more sections of piping were found for each RCP motor that are not in compliance with 10CFR50, Appendix R, Section III.O. The piping for the lower bearing oil reservoir drain appears to extend outside of the oil collection enclosure. This piping consists of a short section of line and a valve. Also, the lower bearing reservoir remote oil fill lines do not appear to be adequately protected against leakage. These conditions were reported to the NRC via the Emergency Notification System in accordance with 10CFR50.72(b)(1)(ii)(B), and are also being reported in accordance with 10CFR50.73(a)(2)(ii)(B) as a condition outside the design basis of the plant.

In 1975, while Davis-Besse was under construction, Toledo Edison integrated an oil leakage collection system into the RCP motor design. At the time of incorporation, the NRC had not yet imposed any criteria or regulations concerning the design or requiring the installation of a RCP oil collection system. The purpose of the oil collection system was to minimize any potential for oil leakage or high pressure oil spray from coming into contact with hot surfaces that could ignite the oil. In August 1976, Appendix "A" to Branch Technical Position 9.5-1 was issued requiring fire protection for primary and secondary containment areas including lubricating oil for the RCPs. Toledo Edison's response to Appendix "A" indicated that the oil collection system, in conjunction with the fire detection installed over each RCP motor, afforded equivalent protection to that of a fixed fire suppression system.

DESCRIPTION OF OCCURRENCE: (continued)

When Appendix R to 10CFR50 was issued in 1981, the contracted architect/ engineering firm for Davis-Besse reviewed the RCP oil collection system for the Davis-Besse Nuclear Power Station (DBNPS) and documented that the system met 10CFR50, Appendix R, Section III.O with the exception that the system was only capable of holding the oil volume from one RCP motor per Reactor Coolant System loop rather than two motors. An exemption request was submitted to the NRC and was approved on August 20, 1984.

Additionally, during review of Information Notice 94-058, "Reactor Coolant Pump Oil Fire", issued August 16, 1994, it was identified that the lift oil pump pressure switches and piping were not contained by the RCP oil collection system. However, no further actions were taken at that time based on the previous evaluations that the RCP oil collection system met the requirements of 10CFR50, Appendix R.

APPARENT CAUSE OF OCCURRENCE:

The intent of the RCP oil collection system is to collect oil from any leak or pipe break. No documentation could be found justifying the exclusion of the lift oil pump pressure switches, the lower bearing oil drain piping, or any other piping or component in the RCP oil system from being subjected to oil collection requirements. Drawings show the area where the lift oil pump pressure switches are located as an electrical panel. It is possible that the personnel reviewing the oil system did not realize that there was pressurized piping in this area. It is also possible that personnel felt that the probability of a leak or break at the lift oil pump pressure switches was very low since they did not provide discussion in their 10CFR50, Appendix R review that the lift oil system is normally only pressurized for approximately three minutes during startup.

The remote oil fill lines were added in 1990 to each RCP motor so that oil could be added to the lower oil reservoir of a RCP motor, if necessary, from a low-dose area during power operations. A temporary oil fill line was also installed on RCP 2-1 motor upper bearing in May 1995, due to a small leak that resulted in a low oil level alarm. This temporary oil fill line was removed during the tenth refueling outage in April 1996. All of the remote oil fill line installations were designed not to trap any oil after use. The remote oil fill lines were considered a means to facilitate maintenance and were not viewed as part of the RCP oil system, therefore they were not designed to meet the requirement that any potential oil leakage would be collected as specified by 10CFR50, Appendix R, Section III.O. These lines reduced the chance of spilling oil in an area of the RCP during oil addition while reducing dose received during power operations.

ANALYSIS OF OCCURRENCE:

The lift oil pumps are normally operated only a few minutes during each RCP startup, and during the prolonged coastdown of the last RCP during a plant shutdown. The lift oil pump piping would be depressurized at other times, therefore, there is minimal chance of oil spray when the lift oil pumps are not operating. Any leakage from the tubing mounted outside the existing enclosure when the lift oil pumps are not operating would be contained by the lip around the top of the motor. The lift oil pumps are not required during operation of the RCPs. With the lift oil pumps not in operation, the existing oil collection system is adequate for the lift oil pump piping that is outside the existing enclosure. With the lift oil pumps operating, if an oil leak developed, this leakage would result in a low oil level, which would be detected by the control room operators via computer alarms, and they would then secure the lift oil pumps. If this leakage resulted in a fire, either of the two heat detectors over each RCP motor would alert the operators in the control room to the situation. Additionally, a fire may be detected by an increase in the Containment Air Cooler inlet temperature, which is currently being monitored once per hour by a roving fire watch. Guidance has been provided to the operators not to start the lift oil pumps until this issue is resolved, unless directed by procedure in order to prevent equipment damage.

The remote oil fill lines consist of a fill pot located outside the 'D-Ring' and stainless steel tubing from the fill pot to the RCP motor lower oil reservoir. Except during use, the fill pots and lines contain no oil. These lines terminate inside of the existing oil enclosure for the lower oil reservoir above the normal oil level so there is no potential for oil leakage from these lines during normal plant operation. A temporary remote oil fill line, made of high temperature flexible hose, was installed on RCP 2-1 upper motor bearing during operating cycle 10. This temporary remote oil fill line was added during a plant downpower to add oil to the upper bearing oil reservoir. The remote oil fill lines are not pressurized, and are only used when a low oil level alarm is received on a RCP motor. A predetermined amount of oil is added via the remote oil fill lines to clear the alarm. To ensure that the oil went into the bearing reservoir, the low level alarm is verified to clear after adding the predetermined amount of oil. The remote oil fill lines have not been used this operating cycle, and guidance has been provided to prohibit the use of these lines until this issue is resolved.

The lower bearing oil reservoir drain piping is of substantial construction, and it is unlikely that they would leak. This piping is not pressurized, and is exposed to only the static head of approximately two feet of oil. A leak in the reservoir drain line that is outside of the enclosure, while extremely remote, would allow the oil in the lower reservoir to leak. This leak would be detected by a low oil level alarm that would actuate after approximately 2 to 3 pints of oil had leaked from the lower reservoir. Upon receiving this low oil level alarm, the operators would take appropriate actions to determine the cause and location of the leak. The type of oil used in the lower reservoir has a minimum flash point of approximately 400 degrees Fahrenheit. Any of the leakage would

ANALYSIS OF OCCURRENCE: (continued)

fall onto the top of the RCP insulation, into the RCP seal cavity, onto the Reactor Coolant System cold leg insulation, or the containment floor. The RCP and cold leg insulation is metal reflective type insulation with an expected surface temperature below 200 degrees Fahrenheit and, therefore, would not serve as an ignition source. The construction of the insulation is such that the oil would tend to be diverted away from hot surfaces, and would not be retained as in the case with fibrous insulation. The RCP seal cavity is also expected to be below 200 degrees Fahrenheit. There are no other credible ignition sources present during normal operation.

Assuming that significant quantities of oil leaked from any of the sources listed above, and that an ignition source was present, the effects of the resulting fire would be localized to within the one 'D-Ring.' The grading of the containment floor is such that any oil released would be channeled to the floor drains below each RCP. Consequently, an oil fire in one 'D-Ring' would not spread to the other "D-Ring.' The Appendix R safe shutdown analysis assumed an all-consuming fire within one 'D-Ring' and determined that adequate separation exists between redundant circuits to achieve safe shutdown. Any significant fire would be detected by the two heat detectors over each RCP motor that individually alarm in the control room, or possibly by an increase in the Containment Air Cooler inlet temperature that is currently being monitored once per hour by a roving fire watch. If an indication of a fire is received, the operators would take appropriate actions in accordance with the existing fire pre-plans for each of the RCPs to extinguish the fire and safely shut down the plant. Therefore, the condition described is considered to be of minimal safety significance.

CORRECTIVE ACTIONS:

A Standing Order was issued on February 20, 1997, to provide guidance to not start the oil lift pumps unless directed by procedure, and to prevent the use of the remote oil fill lines.

New enclosures were designed for the RCP lift oil system piping. The modification to the oil collection system for each Reactor Coolant Pump was completed in May of 1997.

The RCP lower bearing oil reservoir piping and the remote oil fill lines were evaluated and modified, as necessary, to ensure they are in compliance with 10CFR50, Appendix R requirements. The modification was completed in May 1997.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Davis-Besse Unit Number 1	05000346	1997	-- 004 --	01	6 OF 6

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

CORRECTIVE ACTIONS: (continued)

As documented in DBNPS letter Serial 1-1111, dated November 21, 1996, the DBNPS modified the Information Notice review process to utilize the corrective action process. Currently, upon receipt of an NRC Information Notice, a Condition Report is initiated. The Condition Report process requires a review and approval of the Information Notice/CR evaluation that was not present in the Information Notice review process at the time Information Notice 94-058 was initially reviewed.

FAILURE DATA:

LER 96-006 also documents a condition with the RCP oil collection system that was considered to be outside the design basis of the DBNPS. This condition involved a missing lip around the top of the motor, which was required by 10CFR50, Appendix R, that was overlooked during fabrication of the new motor. The corrective actions taken in responded to this previous event were to verify the lip around the top of each RCP motor was installed as originally designed. The current event deals with a deficiency in the original design of the RCP oil collection system. The previous corrective actions would not have been expected to have prevented the current event. However, as stated in the "Description of Occurrence" section above, the review of NRC Information Notice 94-058 could have discovered this event.

NP-33-97-004-01 PCAQR 97-0127