energy harbor

Davis-Besse Nuclear Power Station
5501 N. State Route 2
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Terry J. Brown
Site Vice President, Davis-Besse Nuclear

419-321-7676

August 23, 2021

L-21-185

10 CFR 50.73

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

Subject:
Davis-Besse Nuclear Power Station, Unit 1
Docket Number 50-346, License Number NPF-3
Licensee Event Report 2021-002-00

Enclosed is Licensee Event Report (LER) 2021-002-00, "Failure of Auxiliary Feedwater Rooms Interconnecting Door to Latch Due to Worn Interlock." This event is being reported pursuant to 10 CFR 50.73(a)(2)(ii)(B).

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. Robert W. Oesterle, Manager, Site Regulatory Compliance and Emergency Response, at (419) 321-7462.

Sincerely,

Terry J. Brown

GMW

Enclosure: LER 2021-002-00

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

NRC FORM 366 (08-2020) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/

1. Facility Name	2. Docket Number	3. Page
Davis-Besse Nuclear Power Station, Unit 1	05000 346	1 OF 4

4. Title:

Failure of Auxiliary Feedwater Rooms Interconnecting Door to Latch Due to Worn Interlock

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
06	22	2021	2021	- 002 -	00	08	23	2021		05000
									Facility Name	Docket Number
										05000

9. Operating Mode	10. Power Level
1	100

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(4)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(1)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(iii)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.77(a)(2)(ii)
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	

☐ **OTHER** (Specify here, in abstract, or in NRC Form 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Gerald M. Wolf, Supervisor – Regulatory Compliance	(419) 321-8001

13. Complete One Line for Each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS		Cause	System	Component	Manufacturer	Reportable to IRIS
O	NF	DR	X999	Y						

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☒ No	☐ Yes (If yes, complete 15. Expected Submission Date)				

16. Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On June 22, 2021, with the Davis-Besse Nuclear Power Station operating at approximately 100 percent power, the door separating the two Auxiliary Feedwater (AFW) Pump Rooms could not be latched following normal use. The watertight door, which serves as a Fire, Flood, Tornado, Security, and High-Energy Line Break (HELB) barrier, could not be latched due to a degraded interlock mechanism. After approximately seven minutes, the issue with the interlock was resolved and the door was closed and latched. With the door closed but not latched, a postulated HELB in AFW Room 1 could have pushed the door open to allow the high-energy fluid to enter Room 2, potentially rendering the AFW equipment in Room 2 unable to perform its required function. A postulated break in Room 2 would push the door against the door jamb, keeping the door closed to protect Train 1 equipment.

The door interlock mechanism malfunction was due to mechanical binding caused by normal operational wear, which was due to a lack of specific direction in the annual preventive maintenance instructions for the door. Corrective actions include adding detailed inspection instructions to the door annual preventive maintenance instructions. This event is being reported pursuant to 10 CFR 50.73(a)(2)(ii)(B) as an unanalyzed condition that significantly degraded plant safety.

NARRATIVE

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

System Description:

The Davis-Besse Nuclear Power Station (DBNPS) Emergency Feedwater (EFW) System [BA] consists of two Auxiliary Feedwater (AFW) trains and the Motor Driven Feedwater Pump (MDFP) [BA-P]. The AFW System provides a safety-related source of feedwater to the secondary side of the Steam Generators [AB-SG] in the event of a loss of normal feedwater flow to remove reactor decay heat. The AFW pumps [BA-P] take suction from the Condensate Storage Tanks (CST) [KA-TK] and pump to the Steam Generator secondary side through the AFW nozzles. The Steam Generators function as a heat sink for core decay heat. The heat load is dissipated by releasing steam to the atmosphere from the Steam Generators via the Main Steam Safety Valves (MSSVs) [SB-RV] or Atmospheric Vent Valves [SB-VTV].

The AFW System consists of two steam turbine driven AFW pumps, each of which provides a nominal 100% capacity. The steam turbine driven AFW pumps receive steam from either of the two main steam headers, upstream of the Main Steam Isolation Valves (MSIVs) [SB-ISV]. The AFW System supplies water via two headers, each capable of feeding either steam generator. The 100 percent capacity is sufficient to remove decay heat and cool the unit to Decay Heat Removal (DHR) System [BP] entry conditions. The AFW System normally receives a supply of water from the CSTs. A safety grade source of water is also supplied by the Service Water System (SWS) [BI].

The MDFP train provides feedwater to the steam generators during normal plant startup and shutdown. The non-safety related MDFP train is also designed to provide a backup supply of feedwater to the steam generators in the event of a total loss of both AFW and main feedwater (MFW) [SJ]. Additionally, a manually-initiated diesel engine-driven emergency feedwater pump [BA-P] ties into the AFW System to provide a water supply should the AFW System fail during a Beyond-Design Basis External Event.

Technical Specifications:

Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.5 requires three EFW trains, consisting of two AFW trains and the Motor Driven Feedwater Pump (MDFP) train, be Operable while in Modes 1, 2, or 3, and in Mode 4 when a Steam Generator is relied upon for heat removal. In Mode 1 with one EFW train inoperable, Condition B requires the inoperable EFW train be restored to Operable status within 72 hours. If these actions and associated completion times cannot be met, or if two EFW trains are inoperable, LCO 3.7.5 Condition D requires the plant be placed in Mode 3 within 6 hours and Mode 4 within 12 hours.

DESCRIPTION OF EVENT:

On June 22, 2021, the DBNPS was operating in Mode 1 at approximately 100 percent power, and no equipment was inoperable that contributed to the event. While performing a scheduled tour a Site Protection officer identified that Door 215 [NF-DR] separating the two AFW Pump Rooms could not be latched following use. Door 215 is a watertight door which serves as a Fire, Flood, Tornado, Security, and High Energy Line Break (HELB) barrier that provides normal access to AFW Pump 1 Room from Pump 2 Room but is otherwise closed for train separation. The officer remained at the door and notified the Control Room operators of the issue, who then dispatched personnel to the door for repairs. A degraded interlock mechanism was identified that prevented the door latching

NARRATIVE

DESCRIPTION OF EVENT: (continued)

mechanism from being extended to secure the door closed. After approximately seven minutes, the issue with the interlock was resolved and the door was closed and latched.

CAUSE OF EVENT:

The cause for Door 215 being unable to be latched was mechanical binding of the interlock mechanism due to normal operational wear. The interlock is installed to prevent the door latching mechanism from being extended unless the door is fully closed in order to protect the latching mechanism from damage that would result if the door were closed while the mechanism was extended. The mechanical binding prevented the latching mechanism from being extended even when the door was closed. Contributing to the cause of the mechanical binding of the door interlock mechanism was a lack of specific direction in the annual preventive maintenance instructions for the door. The annual preventive maintenance activity inspected the door for broken hardware and other possible failed components but did not specifically direct the performer to inspect the door interlock mechanism for proper function.

ANALYSIS OF EVENT:

The two Auxiliary Feedwater Trains are separated by Door 215, which serves as a Fire, Flood, Tornado, Security, and HELB barrier. As a HELB Barrier, the door protects each AFW Train from a break in the opposite train. With the door closed but not latched, a high-energy line break in AFW Train Room 1 is assumed to push the door open, allowing the high-energy fluid to enter Room 2, potentially rendering the AFW equipment in Room 2 unable to perform its required function. Therefore, AFW Train 2 was considered inoperable in accordance with TS LCO 3.7.5 during the seven minutes the door was unable to be latched closed. A similar postulated break in Room 2 with Door 215 closed but not latched would push the door against the door jamb, keeping the door closed to protect Train 1 equipment. Therefore, Train 1 equipment remained capable of performing its required functions in the event of a high-energy line break in Room 2 and Door 215 closed but not latched, and no loss of safety function occurred.

During the event, the non-safety grade MDFP was Operable and the beyond-design basis diesel-driven EFW Pump was available. Additionally, AFW Train 2 remained functional to respond to all other events besides high-energy line break or flood scenarios. Based upon a qualitative assessment of the event, considering the short duration of the event (seven minutes) and the low probability of a high-energy line break occurring in AFW Train 1 during that time, this event is considered to be of very low safety significance.

Reportability Discussion:

The DBNPS Updated Final Safety Analysis Report (UFSAR) describes a break of the Main Steam lines supplying the AFW Pump Turbines within the AFW Rooms and concludes the pressurization transient is assumed to not affect the adjacent AFW Train due to the wall and interconnecting door separating the rooms. With Door 215 closed but not latched as described above, a high-energy line break in Train 1 equipment could adversely affect both Train 1 and Train 2 as it is assumed the high-energy fluid would push the door open and thus affect Train 2 equipment. Therefore, while the door was unable to be latched, this represented an unanalyzed condition that significantly degrades plant safety in accordance with NRC reporting guidance and is reportable per 10 CFR 50.73(a)(2)(ii)(B). This event was reported in accordance with 10 CFR 50.72(b)(3)(ii)(B) at 1655 hours on June 22, 2021 (Event Number 55321).

NARRATIVE

CORRECTIVE ACTIONS:

Completed Actions:

Door 215 was closed and latched at 1215 hours on June 22, 2021, to restore operability of AFW Train 2. The interlock mechanism for Door 215 was repaired on June 23, 2021.

The annual preventive maintenance activity for the door was revised on July 28, 2021, to add a detailed inspection step to include checking the door striker/striker plate alignment to ensure appropriate interlock clearance and door operation. This annual preventive maintenance activity is scheduled to be next performed in September 2021.

Scheduled Actions:

No further actions are planned.

PREVIOUS SIMILAR EVENTS:

DBNPS LER 2019-002 documented an event on August 19, 2019, where the AFW Room Interconnecting Door was left open and unattended for approximately 75 minutes due to worker inattention to door signage, resulting in non-adherence to door usage requirements. The corrective actions taken in response to this event were related to the human performance errors that caused the event and would not have prevented the 2021 event caused by a failure of the door interlock.