

Dominion Energy Nuclear Connecticut, Inc.
Millstone Power Station
314 Rope Ferry Road, Waterford, CT 06385
DominionEnergy.com



U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Serial No.: 21-274
MPS Lic/LD R0
Docket No.: 50-336
License No.: DPR-65

SEP 23 2021

DOMINION ENERGY NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
LICENSEE EVENT REPORT 2021-001-00
INCORRECTLY PLACED SPENT FUEL ASSEMBLIES IN UNIT 2 SPENT FUEL POOL

This letter forwards Licensee Event Report (LER) 2021-001-00, documenting a condition that was discovered at Millstone Power Station Unit 2, on July 27, 2021. This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications.

There are no regulatory commitments contained in this letter or its enclosure.
Should you have any questions, please contact Mr. Jeffry A. Langan at (860) 444-5544.

Sincerely,

A handwritten signature in blue ink that reads "John R. Daugherty".

John R. Daugherty
Site Vice President – Millstone

Enclosure: LER 336/2021-001-00

cc: U.S. Nuclear Regulatory Commission
Region I
2100 Renaissance Blvd.
Suite 100
King of Prussia, PA 19406-2713

R.V. Guzman
NRC Senior Project Manager Millstone Units 2 and 3
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 08 C-2
Rockville, MD 20852-2738

NRC Senior Resident Inspector
Millstone Power Station

Serial No. 21-274
Docket No. 50-336
Licensee Event Report 2021-001-00

ATTACHMENT

LICENSEE EVENT REPORT 2021-001-00
INCORRECTLY PLACED SPENT FUEL ASSEMBLIES IN UNIT 2 SPENT FUEL POOL

MILLSTONE POWER STATION UNIT 2
DOMINION ENERGY NUCLEAR CONNECTICUT, INC.



LICENSEE EVENT REPORT (LER)

(See Page 3 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/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollcts.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk all: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name Millstone Power Station Unit 2	2. Docket Number 05000 336	3. Page 1 OF 3
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4. Title
INCORRECTLY PLACED SPENT FUEL ASSEMBLIES IN UNIT 2 SPENT FUEL POOL

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
07	15	2021	2021	001	00	09	23	2021		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)

<input type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	10 CFR Part 73
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	10 CFR Part 21	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<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)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
<input type="checkbox"/> OTHER (Specify here, in abstract, or NRC 366A).				

12. Licensee Contact for this LER

Licensee Contact Jeffrey A. Langan, Manager Nuclear Station Licensing	Phone Number (Include area code) (860) 444-5544
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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

14. Supplemental Report Expected 15. Expected Submission Date

<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)	Month	Day	Year

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On July 27, 2021, with Millstone Power Station Unit 2 (MPS2) in operational Mode 1, 100 percent reactor power, it was discovered that four spent fuel assemblies were placed in a region of the MPS2 Spent Fuel Pool (SFP) on July 15, 2021, for which they were not qualified by measured burnup. The configuration violated Technical Specifications, resulting in Technical Specification 3.9.18 Action Statement being entered on July 27, 2021, at 15:18. The direct cause of this condition was the incorrectly calculated projected burnup values for all fuel assemblies resident in the MPS2 Cycle 26 core which impacted fuel assemblies BB-65, BB-66, BB-67, and BB-68. The root cause was lack of specific guidance in the engineering standard used to calculate projected burnup values.

The non-complying spent fuel assemblies were immediately moved to an acceptable location in Region 1 of the MPS2 SFP, and the TS 3.9.18 Action Statement was exited on July 27, 2021, at 17:29. The engineering standard used to perform the calculations to qualify spent fuel for storage in the SFP is being revised to include specific guidance to use measured assembly burnup values for MPS2 SFP qualification and to prohibit projection of assembly burnup. Additional corrective actions are being taken in accordance with the Corrective Action Program.

The spent fuel assemblies placed in the incorrect location in MPS2 SFP is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by technical specifications.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME Millstone Power Station Unit 2	2. DOCKET NUMBER 05000- 336	3. LER NUMBER		
		YEAR 2021	SEQUENTIAL NUMBER 001	REV NO. 00

NARRATIVE

1. EVENT DESCRIPTION

On July 27, 2021, with Millstone Power Station Unit 2 (MPS2) in operational Mode 1, 100 percent reactor power, it was discovered that four spent fuel assemblies were placed in a region of the MPS2 Spent Fuel Pool (SFP), on July 15, 2021, for which they were not qualified by measured burnup. The four MPS2 fuel assemblies BB-65, BB-66, BB-67, and BB-68, were determined to have a lower measured burnup than the minimum burnup requirement for the MPS2 SFP Region 3 storage with borated stainless-steel poison rodlets. The configuration violated Technical Specifications, resulting in Technical Specification 3.9.18 Action Statement being entered on July 27, 2021, at 15:18.

In January 2020, approximately 4 months before the end of operating cycle 26, a calculation was performed to qualify cycle 26 fuel assemblies for SFP storage by SFP Region. The calculation was initially conducted using the current Cycle 26 measured cycle burnup at the time of the calculation. Using measured burnup, a larger than expected number of fuel assemblies were not cleared to be placed in Region 3 of the Millstone Unit 2 Spent Fuel Pool. To account for approximately 4 months of cycle operation remaining, a burnup augmentation factor was generated to project the burnup of the fuel assemblies currently in the core to a near end-of-cycle core burnup. This burnup augmentation factor was incorrectly applied to the burnup of the fuel assemblies over their entire operating history as opposed to just applying the augmentation factor to the current cycle burnup. This incorrect burnup augmentation factor increased the projected calculated burnup greater than these four fuel assemblies physically achieved when they were discharged from the core in May 2020. The error was not caught during the preparation, review, or approval of the calculation.

Spent fuel assemblies BB-65, BB-66, BB-67, and BB-68 were discharged from the MPS2 Cycle 26 Core to MPS2 SFP Region 2 in May 2020. These four spent fuel assemblies remained in Region 2 of MPS2 SFP until July 2021. On July 15, 2021, the spent fuel assemblies were placed into Region 3 following the July 2021 Independent Spent Fuel Storage Installation (ISFSI) Campaign. On July 27, 2021, the failure of these four fuel assemblies to meet the burnup requirements for storage in Region 3 was identified when their calculated burnup was updated to actual Cycle 26 burnup.

The spent fuel assemblies placed in the incorrect location in the MPS2 SFP is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by technical specifications.

2. CAUSE

The direct cause of this condition was the incorrectly calculated projected burnup values for all fuel assemblies resident in the MPS2 Cycle 26 core which impacted fuel assemblies BB-65, BB-66, BB-67, and BB-68. The root cause was the lack of specific guidance in the engineering standard used to calculate projected burnup values for compliance with Technical Specifications. As a result, the calculation preparer developed an incorrect calculation methodology.

With no detailed instructions provided, the preparer developed an alternate method for calculating projected assembly burnup based on a correction factor. The preparer made an error in applying the correction factor, which resulted in projected burnup values for the four fuel assemblies being higher (non-conservative) than their actual values.



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CONTINUATION SHEET**

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		YEAR 2021	SEQUENTIAL NUMBER 001	REV NO. 00

NARRATIVE

3. ASSESSMENT OF SAFETY CONSEQUENCES

There were no safety consequences related to this condition.

The MPS2 criticality safety analysis considered multiple potential failures, including analyzing 90 fuel assemblies with burnup significantly lower than the four fuel assemblies had. The results of this analysis concluded that with a 2100 ppm soluble boron in the SFP, the regulatory requirements for keff remained met even with the four fuel assemblies loaded in the incorrect location. Therefore, the current MPS2 SFP never entered an unanalyzed condition and did not exceed any safety limits.

No safety functions were challenged, and this condition did not challenge the health and safety of the public or the environment.

4. CORRECTIVE ACTION

The four non-complying spent fuel assemblies were immediately moved to an acceptable location in Region 1 of the MPS2 SFP, and the TS 3.9.18 Action Statement was exited on July 27, 2021, at 17:29. The engineering standard used to perform the calculations to qualify spent fuel for storage in the SFP is being revised to include specific guidance to use measured assembly burnup values for MPS2 SFP qualification and to prohibit projection of assembly burnup. Additional corrective actions are being taken in accordance with the Corrective Action Program.

5. PREVIOUS OCCURRENCES

There have been no spent fuel assemblies loaded in the incorrect location in MPS2 SFP in the past 3 years.

6. Energy Industry Identification System (EII) codes

- None (no broken equipment)