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1717 Wakonade Drive
Welch, MN 55089

April 29, 2020

L-PI-20-014
10 CFR 72.56

ATTN: Document Control Desk
Director, Division of Spent Fuel Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Prairie Island Independent Spent Fuel Storage Installation
Docket 72-10
Materials License No. SNM-2506

Supplement to License Amendment Request: Expand the Storage Capacity of the Independent Spent Fuel Storage Installation (ISFSI)

References: 1. Letter L-PI-19-009 from NSPM to US NRC, "License Amendment Request: Expand the Storage Capacity of the Independent Spent Fuel Storage Installation (ISFSI)", dated July 26, 2019. (EPID No. L-2019-LLA-0169) (ADAMS Accession No. ML19210D273)

In Reference 1, Northern States Power Company, a Minnesota Corporation, doing business as Xcel Energy (hereafter "NSPM"), requested a license amendment to Renewed Special Nuclear Materials (SNM) License No. SNM-2506, pursuant to 10 CFR 72.56, to increase the maximum amount of spent fuel that may be possessed and stored at the Prairie Island Independent Spent Fuel Storage Installation (PI ISFSI). Reference 1 further requested approval of the design of an additional concrete pad to be built within the confines of the existing facility utilizing alternate methods from those described in the existing PI ISFSI Safety Analysis Report (SAR) and Addendum.

Subsequent to the submittal of Reference 1, NSPM found an error in the dose analyses for the PI ISFSI, specifically, the dose analyses assumption for the height of the berm relative to the PI ISFSI casks was incorrect. Upon correcting the berm height input to the dose analyses, NSPM found that several of the dose values submitted in Reference 1 needed to be corrected. Notwithstanding the change in dose analyses results, the analyses still conclude that 10 CFR Part 72 dose limits are met under the proposed amendment.

Enclosure 1 to this letter provides the necessary updates to the Technical Evaluation included with Enclosure 1 of Reference 1. Attachment 1 of Enclosure 1 to this letter provides new PI ISFSI SAR mark up pages to replace the affected pages of Enclosure 1, Attachment 2 of Reference 1. Enclosure 2 to this letter provides new pages for the supplement to the PI ISFSI

- Enclosure 2: provides new pages for the PI ISFSI Environmental Report supplement to replace the affected pages included in Reference 1, Enclosure 2.

NSPM is notifying the State of Minnesota of this request by transmitting a copy of this letter and enclosures to the designated State Official.

Please contact Mr. Jeff Kivi at (612) 330-5788 or Jeffrey.Kivi@xenuclear.com if there are any questions or if additional information is needed.

Summary of Commitments

This letter makes no new commitments and no revisions to existing commitments.

I declare under penalty of perjury, that the foregoing is true and correct.
Executed on April 29, 2020.

Scott Sharp
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosures (2)

cc: Administrator, Region III, USNRC
Project Manager, Nuclear Material Safety and Safeguards, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
State of Minnesota
President of the Prairie Island Indian Community Tribal Council

ENCLOSURE 1

PRAIRIE ISLAND INDEPENDENT SPENT FUEL STORAGE INSTALLATION

Evaluation of Proposed Change

Supplement to License Amendment Request

Expand the Storage Capacity for the Independent Spent Fuel Storage Installation

1.0 BACKGROUND

Subsequent to the submittal of Reference 1, NSPM found an error in the dose analyses for the PI ISFSI, specifically, the dose analyses assumption for the height of the berm relative to the PI ISFSI casks was incorrect. The analyses were revised to update the berm geometry to reduce the berm height by 3.5 feet, from 20.5 feet to 17 feet, to more accurately model the actual configuration. The current license basis method was applied to evaluate the updated input, which resulted in a small change to the calculated dose rates. The approach described in Reference 1 has not changed, but the resultant change in calculated dose rates has a proportional impact on the dose results previously reported in Tables 3.1-2, 3.1-3, and 3.1-4 of Enclosure 1 to Reference 1. Therefore, it is necessary to provide revised results to support the License Amendment Request, as shown in the updated tables in Section 2.0, below.

2.0 CHANGES TO LICENSE AMENDMENT REQUEST

The affected tables from Reference 1, Enclosure 1, are updated, as follows:

Table 3.1-2: Summation of 10 CFR 72.104(a) and 40 CFR 190.10(a) Annual Dose (Nearest Resident)

Source	Dose Contribution (mrem/yr)	Total (mrem/yr)	Limit (mrem/yr)	Margin (mrem/yr)
Existing ISFSI Capacity (Fully Loaded – 48 Casks)	3.05E+00	4.34	25	20.66
Additional ISFSI Capacity (16 Loaded Casks)	1.27E+00			
Planned Discharges[1]	1.50E-02			

[1] Based on the Prairie Island Nuclear Generating Plant,(PINGP) Units 1 and 2, 2017 Annual Radioactive Effluent Report (Reference 14 [of Reference 1]). Note that discharges are not due to the ISFSI; no effluent releases are associated with the ISFSI.

Table 3.1-3: Summation of 10 CFR 20.1301(a)(1) Annual Dose (Nearest Resident)

Source	Dose Contribution (mrem/yr)	Total (mrem/yr)	Limit (mrem/yr)	Margin (mrem/yr)
Proposed Licensed Operation (48 casks for the existing ISFSI with 16 additional casks for the ISFSI expansion, and planned plant discharges for PINGP, Units 1 and 2)	4.34	4.34	100	95.66

Table 3.1-4: Summation of 10 CFR 20.1301(a)(2) Dose Rate (Site Boundary)

Source	Dose Contribution (mrem/yr)	Total (mrem/hr)	Limit (mrem/hr)	Margin (mrem/hr)
Existing ISFSI Capacity (Fully Loaded – 48 Casks)	3.13E-01	0.45	2	1.55
Additional ISFSI Capacity (16 Loaded Casks)	1.33E-01			
Other Sources[1]	0.00E+00			

[1] Other sources of radiation located on the PINGP site which could add to the radiation level at the ISFSI controlled area boundary are considered to be insignificant when compared to the radiation level associated with the spent fuel storage casks. This is consistent with the existing analysis.

The newly calculated dose values at the nearest site boundary and at the nearest resident continue to meet the regulatory limits of 10 CFR 72.104(a), 40 CFR 190.10(a), and 10 CFR 20.1301(a). The addition of 16 TN-40HT casks to the PI ISFSI is considered to be acceptable with respect to the radiation levels at the nearest site boundary and at the nearest resident.

The remainder of the Technical Evaluation and the Regulatory Evaluation of Reference 1 are unchanged.

3.0 CHANGES TO ISFSI SAFETY ANALYSIS REPORT AND ADDENDUM

The following page and inserts are revised as a result of the revised dose analysis calculations:

- Page A7.5-1
- Insert R-1 for replacement of Table A7.4-3
- Insert R-2 for replacement of Table A7.4-4
- Insert R-3 for replacement of Table A7.5-2
- Insert R-4 for replacement of Table A7A.7-2, Page 1 of 2, From the ISFSI "North\South" Faces
- Insert R-5 for replacement of Table A7A.7-2, Page 1 of 2, From the ISFSI "East\West" Faces
- Insert R-6 for replacement of Table A7A.7-2, Page 2 of 2, From the ISFSI Corners

- Insert R-7 for replacement of Table A7A.7-3, Page 1 of 2, From the ISFSI "North\South" Faces
- Insert R-8 for replacement of Table A7A.7-3, Page 1 of 2, From the ISFSI "East\West" Faces
- Insert R-9 for replacement of Table A7A.7-3, Page 2 of 2, From the ISFSI Corners:
- Insert R-14 for page A7A.7-3

The revised pages included in Attachment 1 of this enclosure replace those in Reference 1, Enclosure 1, Attachment 2. The remainder of the proposed ISFSI SAR mark ups are unchanged.

4.0 REFERENCES

1. Letter L-PI-19-009 from NSPM to US NRC, "License Amendment Request: Expand the Storage Capacity of the Independent Spent Fuel Storage Installation (ISFSI)", dated July 26, 2019. (EPID NO. L-2019-LLA-0169) (ADAMS Accession No. ML19210D273)

ENCLOSURE 1, ATTACHMENT 1

PRAIRIE ISLAND INDEPENDENT SPENT FUEL STORAGE INSTALLATION

Supplement to License Amendment Request

Expand the Storage Capacity for the Independent Spent Fuel Storage Installation

Page Updates for ISFSI SAR (Mark up)

(9 Pages Follow)

A7.5 OFFSITE COLLECTIVE DOSE ASSESSMENT

Figure 1.2-1 illustrates the Prairie Island Nuclear Generating Plant site boundary, which is also the boundary of the exclusion area as defined in 10CFR100.3. This exclusion area corresponds to the controlled area for the ISFSI as defined in 10CFR72.3.

In calculating the offsite collective dose, the entire permanent population within a 2 mile radius of the plant was conservatively taken to be at the location of the residence subject to the highest exposure, i.e. 0.45 miles NW of the ISFSI. In addition to the permanent population, there is a large transient population of persons employed at or visitors to the Treasure Island Hotel and Casino that is located within a 2 mile radius of the plant. For these calculations it is assumed that this entire transient population is located 0.8 miles from the ISFSI. The estimates of the population (both permanent and transient) within the 2 mile radius were taken from the Prairie Island Nuclear Generating Plant's evacuation time study (Reference 6). A description of the off-site locations considered in this evaluation, the relevant population data, distances and occupancy times are shown in Table A7.5-1.

A7.5-2

The dose rate resulting from cask storage at the ISFSI as a function of distance is given in Table ~~A7A.7-2~~. For a distance of 0.45 mile (724 meters) in the corner direction, the total dose rate is ~~2.20~~ E-3 rem/year. This is the annual exposure at the nearest resident location.*

3.69

Table A7.5-2 shows the total dose rates from the ISFSI at each of the assumed off-site locations. In addition, Table A7.5-2 also contains the information summarized in Table A7.5-1. For conservatism, the dose rates calculated at a distance of 1004 m from the "north-south" face of the ISFSI are utilized to determine the off-site exposures at distances greater than 0.8 miles (1280 m).

Table A7.5-2 summarizes the calculated total doses to the off-site population within a 2-mile radius due to the ISFSI operation. The total collective off-site dose is calculated to be ~~2.21~~ person-rem.

3.96

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* Note that, for the purposes of demonstrating compliance with the requirements of 10 CFR 72.104(a), 40 CFR 190.10(a), and 10 CFR 20.1301(a), a more conservative value is calculated, including the dose contribution from other sources such as planned plant discharges, as discussed in Section A7A.7.2.

Insert R-1 for replacement of Table A7.4-3:

Location #	Location	Distance (Feet From Center ISFSI)	Full Time (Personnel)	Outage (Personnel)	Dose Rate (mrem/hr)
1	34 OCA Gatehouse (D-2)	978	2	0	3.71E-02
2	22 Receiving Warehouse (D-5) 55 13 P1ex Project Office (D-5) A 4 P1ex Project Office (D-5)	953	30	0	4.00E-02
3	24 NPD Building (E-6) 33 NPD Annex Building (E-5) Quality Assurance Modular Office (E-5)	1016	60	1	3.27E-02
4	42 Fabrication Shop (C-5) 25 Steam Generator Mock up Building (C-5) 48 Fabrication Shop (D-5)	1381	2	45	8.33E-03
5	30 Warehouse (C-5) 31 Multiuse Warehouse (C-5) 21 Warehouse -8 (C-6)	1650	0	2	3.38E-03
6	12 Substation, SBO Structures (B-6)	2236	0	2	5.96E-04
7	23 New Administration Building (D-6) 6 Security Building (D-6)	1496	287	25	4.83E-03
8	4 Turbine Building (D-7) 28 Warehouse -2 (E-7) 3 Auxiliary Building (E-7) 13 New Service Building (D-8) 11 D5/D6 DG Building (D-7) 79 Security DG Building (D-7)	1650	180	192	3.38E-03
9	Outage Trailers (E-7)	1322	5	40	1.02E-02
10	60 Fabrication Shop (E-7) 29 Main Plant Warehouse (E-7) 66 Maintenance Storage Building (E-7)	1557	23	45	4.25E-03
11	20 Environmental Lab (B-9)	2534	2	0	2.67E-04
12	Training Center	905	49	0	4.57E-02
13	38 Old Administration Building (D-7) 71 Administration Building Addition (D-7)	1745	68	0	2.50E-03
14	13 New Service Building (D-8)	1905	9	0	1.52E-03

Insert R-2 for replacement of Table A7.4-4:

Location #	Location	Distance (Feet From Center ISFSI)	Full Time (person-rem)	Outage (person-rem)	Total Exposure (person-rem)
1	34 OCA Gatehouse (D-2)	978	1.88E-01	0.00E+00	1.88E-01
2	22 Receiving Warehouse (D-5) 55 13 P1ex Project Office (D-5) A 4 P1ex Project Office (D-5)	953	3.01E+00	0.00E+00	3.01E+00
3	24 NPD Building (E-6) 33 NPD Annex Building (E-5) Quality Assurance Modular Office (E-5)	1016	4.90E+00	1.76E-02	4.92E+00
4	42 Fabrication Shop (C-5) 25 Steam Generator Mock up Building (C-5) 48 Fabrication Shop (D-5)	1381	4.34E-02	2.02E-01	2.46E-01
5	30 Warehouse (C-5) 31 Multiuse Warehouse (C-5) 21 Warehouse -8 (C-6)	1650	0.00E+00	3.66E-03	3.66E-03
6	12 Substation, SBO Structures (B-6)	2236	0.00E+00	6.43E-04	6.43E-04
7	23 New Administration Building (D-6) 6 Security Building (D-6)	1496	3.45E+00	7.23E-02	3.53E+00
8	4 Turbine Building (D-7) 28 Warehouse -2 (E-7) 3 Auxiliary Building (E-7) 13 New Service Building (D-8) 11 D5/D6 DG Building (D-7) 79 Security DG Building (D-7)	1650	1.52E+00	3.47E-01	1.86E+00
9	Outage Trailers (E-7)	1322	1.30E-01	2.17E-01	3.47E-01
10	60 Fabrication Shop (E-7) 29 Main Plant Warehouse (E-7) 66 Maintenance Storage Building (E-7)	1557	2.46E-01	1.01E-01	3.47E-01
11	20 Environmental Lab (B-9)	2534	1.34E-03	0.00E+00	1.34E-03
12	Training Center	905	5.59E+00	0.00E+00	5.59E+00
13	38 Old Administration Building (D-7) 71 Administration Building Addition (D-7)	1745	4.19E-01	0.00E+00	4.19E-01
14	13 New Service Building (D-8)	1905	2.89E-02	0.00E+00	2.89E-02
Total			1.95E+01	9.61E-01	2.05E+01

Insert R-3 for replacement of Table A7.5-2:

Offsite Population	Description	Distance	Occupancy Times	Population	Dose Rate (mrem/hr)	Collective Exposure (person-rem)
Permanent Population Within 2 Mile Radius	2 mile - radius	> 0.45 mile	8760	398	4.21E-04	1.47E+00
Transient Employee Population	2 mile - PI community center, government center, and clinic	0.8 mile	2000	80	4.81E-05	7.70E-03
	2 mile - Employees at Treasure Island Casino	0.8 mile	8760	435	4.81E-05	1.83E-01
Transient Recreational Population	2 mile - Treasure Island Casino	0.8 mile	8760	5400	4.81E-05	2.28E+00
Marina and RV Park	2 mile - PI community center, government center, and clinic	0.8 mile	1160	450	4.81E-05	2.51E-02
	Total Collective Within 2 Mile					**3.96E+00**

Insert R-4 for replacement of Table A7A.7-2, Page 1 of 2, From the ISFSI “North\South” Faces:

Distance from ISFSI Face (meters)	Distance from ISFSI Center (meters)	Gamma Radiation Dose Rate (mrem/hr)	Neutron Radiation Dose Rate (mrem/hr)	Total Dose Rate (mrem/hr)
0	4.03	7.84E+00	9.52E+00	1.74E+01
10	14.03	5.27E+00	6.83E+00	1.21E+01
45	49.03	1.60E+00	2.21E+00	3.80E+00
100	104.03	1.13E-01	3.32E-01	4.45E-01
200	204.03	2.79E-02	6.39E-02	9.18E-02
300	304.03	8.44E-03	1.63E-02	2.48E-02
400	404.03	2.83E-03	4.73E-03	7.56E-03
500	504.03	1.07E-03	1.52E-03	2.59E-03
600	604.03	4.44E-04	5.81E-04	1.03E-03
700	704.03	2.00E-04	2.18E-04	4.18E-04
800	804.03	9.83E-05	8.29E-05	1.81E-04
900	904.03	4.89E-05	4.14E-05	9.03E-05
1000	1004.03	2.47E-05	1.42E-05	3.89E-05

Insert R-5 for replacement of Table A7A.7-2, Page 1 of 2, From the ISFSI “East\West” Faces:

Distance from ISFSI Face (meters)	Distance from ISFSI Center (meters)	Gamma Radiation Dose Rate (mrem/hr)	Neutron Radiation Dose Rate (mrem/hr)	Total Dose Rate (mrem/hr)
0	70.47	4.85E+01	4.17E+01	9.02E+01
10	80.47	4.00E+00	6.43E+00	1.04E+01
45	115.47	9.20E-02	4.00E-01	4.91E-01
100	170.47	4.54E-02	1.52E-01	1.97E-01
200	270.47	1.12E-02	2.95E-02	4.07E-02
300	370.47	3.48E-03	7.63E-03	1.11E-02
400	470.47	1.20E-03	2.65E-03	3.84E-03
500	570.47	4.64E-04	8.11E-04	1.27E-03
600	670.47	2.21E-04	3.19E-04	5.41E-04
700	770.47	8.94E-05	1.15E-04	2.04E-04
800	870.47	4.15E-05	5.81E-05	9.96E-05
900	970.47	2.17E-05	2.22E-05	4.39E-05
1000	1070.47	1.20E-05	1.10E-05	2.30E-05

Insert R-6 for replacement of Table A7A.7-2, Page 2 of 2, From the ISFSI Corners:

Distance from ISFSI Face (meters)	Distance from ISFSI Center (meters)	Gamma Radiation Dose Rate (mrem/hr)	Neutron Radiation Dose Rate (mrem/hr)	Total Dose Rate (mrem/hr)
10	77.91	5.24E+00	7.12E+00	1.24E+01
45	107.91	7.15E-01	1.13E+00	1.84E+00
100	159.24	5.87E-02	1.76E-01	2.35E-01
200	256.49	1.61E-02	3.61E-02	5.22E-02
300	355.27	5.14E-03	9.67E-03	1.48E-02
400	454.58	1.96E-03	2.82E-03	4.78E-03
500	554.14	7.49E-04	1.03E-03	1.78E-03
600	653.84	3.18E-04	3.78E-04	6.96E-04
700	753.61	1.44E-04	1.49E-04	2.93E-04
800	853.44	7.30E-05	5.21E-05	1.25E-04
900	953.31	3.76E-05	2.55E-05	6.31E-05
1000	1053.20	2.09E-05	1.07E-05	3.16E-05

Insert R-7 for replacement of Table A7A.7-3, Page 1 of 2, From the ISFSI “North\South” Faces:

Distance from ISFSI Face (meters)	Distance from ISFSI Center (meters)	Gamma Radiation Dose Rate (mrem/hr)	Neutron Radiation Dose Rate (mrem/hr)	Total Skyshine Dose Rate (mrem/hr)
0	4.03	6.80E+00	9.52E+00	1.63E+01
10	14.03	4.58E+00	6.82E+00	1.14E+01
45	49.03	1.38E+00	2.21E+00	3.59E+00
100	104.03	1.04E-01	3.32E-01	4.36E-01
200	204.03	2.59E-02	6.39E-02	8.98E-02
300	304.03	7.89E-03	1.63E-02	2.42E-02
400	404.03	2.65E-03	4.73E-03	7.37E-03
500	504.03	9.92E-04	1.52E-03	2.51E-03
600	604.03	4.11E-04	5.81E-04	9.92E-04
700	704.03	1.82E-04	2.18E-04	4.00E-04
800	804.03	8.92E-05	8.29E-05	1.72E-04
900	904.03	4.42E-05	4.14E-05	8.55E-05
1000	1004.03	2.19E-05	1.42E-05	3.61E-05

Insert R-8 for replacement of Table A7A.7-3, Page 1 of 2, From the ISFSI “East\West” Faces:

Distance from ISFSI Face (meters)	Distance from ISFSI Center (meters)	Gamma Radiation Dose Rate (mrem/hr)	Neutron Radiation Dose Rate (mrem/hr)	Total Skyshine Dose Rate (mrem/hr)
0	70.47	4.14E+01	4.15E+01	8.29E+01
10	80.47	3.45E+00	6.43E+00	9.88E+00
45	115.47	8.06E-02	4.00E-01	4.80E-01
100	170.47	4.11E-02	1.52E-01	1.93E-01
200	270.47	1.02E-02	2.95E-02	3.97E-02
300	370.47	3.17E-03	7.63E-03	1.08E-02
400	470.47	1.08E-03	2.65E-03	3.73E-03
500	570.47	4.18E-04	8.11E-04	1.23E-03
600	670.47	1.99E-04	3.19E-04	5.18E-04
700	770.47	7.85E-05	1.15E-04	1.93E-04
800	870.47	3.56E-05	5.81E-05	9.37E-05
900	970.47	1.84E-05	2.22E-05	4.06E-05
1000	1070.47	9.87E-06	1.10E-05	2.09E-05

Insert R-9 for replacement of Table A7A.7-3, Page 2 of 2, From the ISFSI Corners:

Distance from ISFSI Face (meters)	Distance from ISFSI Center (meters)	Gamma Radiation Dose Rate (mrem/hr)	Neutron Radiation Dose Rate (mrem/hr)	Total Skyshine Dose Rate (mrem/hr)
10	77.91	4.51E+00	7.10E+00	1.16E+01
45	107.91	6.17E-01	1.13E+00	1.75E+00
100	159.24	5.38E-02	1.76E-01	2.30E-01
200	256.49	1.50E-02	3.61E-02	5.11E-02
300	355.27	4.81E-03	9.67E-03	1.45E-02
400	454.58	1.84E-03	2.82E-03	4.66E-03
500	554.14	6.95E-04	1.03E-03	1.73E-03
600	653.84	2.93E-04	3.78E-04	6.71E-04
700	753.61	1.31E-04	1.49E-04	2.80E-04
800	853.44	6.59E-05	5.21E-05	1.18E-04
900	953.31	3.35E-05	2.55E-05	5.90E-05
1000	1053.20	1.86E-05	1.07E-05	2.93E-05

Insert R-14 for page A7A.7-3:

The ISFSI dose rate as a function of distance results and the dose contribution due to other uranium fuel cycle operations conducted on the site are used to determine the total normal operation radiation dose values at the nearest site boundary and at the nearest resident to show compliance with the requirements of 10 CFR 72.104(a), 40 CFR 190.10(a), and 10 CFR 20.1301(a). The dose at the nearest site boundary due to other uranium fuel cycle operations is assumed to be negligible when compared to the radiation level associated with the ISFSI. The dose at the nearest resident due to other uranium fuel cycle operations is obtained from the 2017 Annual Radioactive Effluent Report. The dose at the nearest resident due to other uranium fuel cycle operations is 1.50E-02 mrem/yr.

Comparisons between normal operation radiation dose values and the dose limits of 10 CFR 72.104(a), 40 CFR 190.10(a), and 10 CFR 20.1301(a) are presented below.

10 CFR 72.104(a) and 40 CFR 190.10(a) Annual Dose (Nearest Resident)

Source	Total (mrem/yr)	Criteria (mrem/yr)	Margin (mrem/yr)
Original ISFSI (Fully Loaded)	**4.34**	**25**	**20.66**
Southeast ISFSI (16 Casks)			
Planned Discharges			

10 CFR 20.1301(a)(1) Annual Dose (Nearest Resident)

Source	Total (mrem/yr)	Criteria (mrem/yr)	Margin (mrem/yr)
Licensed Operation	**4.34**	**100**	**95.66**

10 CFR 20.1301(a)(2) Dose Rate (Site Boundary)

Source	Total (mrem/hr)	Criteria (mrem/hr)	Margin (mrem/hr)
Original ISFSI (Fully Loaded)	**0.45**	**2**	**1.55**
Southeast ISFSI (16 Casks)			
Other Sources			

The calculated dose values at the nearest site boundary and at the nearest resident meet the acceptance criteria of 10 CFR 72.104(a), 40 CFR 190.10(a), and 10 CFR 20.1301(a). Note that this analysis does not establish any restrictions on cask placement. In other words, the analysis bounds any distribution of 64 TN-40HT (or TN-40) casks across the three ISFSI pads (e.g., 48 casks on the original ISFSI pads and 16 casks on the southeast pad, or 24 casks on the southeast pad and 40 casks on the original pads).

ENCLOSURE 2

PRAIRIE ISLAND INDEPENDENT SPENT FUEL STORAGE INSTALLATION (PI ISFSI)

Supplement to License Amendment Request

Expand the Storage Capacity for the Independent Spent Fuel Storage Installation

1.0 CHANGES TO THE SUPPLEMENT TO THE PI ISFSI ENVIRONMENTAL REPORT

The following pages of the supplement to the ISFSI Environmental Report are revised as a result of the revised dose analysis calculations:

3-16
3-17

The revised pages on the following pages replace those in Reference 1, Enclosure 2. The remainder of the Environmental Report is unchanged.

2.0 REFERENCES

1. Letter L-PI-19-009 from NSPM to US NRC, “License Amendment Request: Expand the Storage Capacity of the Independent Spent Fuel Storage Installation (ISFSI)”, dated July 26, 2019. (EPID NO. L-2019-LLA-0169) (ADAMS Accession No. ML19210D273)

(2 Pages Follow)

from the center of the PI ISFSI. Tables A7.4-3 and A7.4-4 summarize the calculated total doses to full time and outage help at the various locations due to PI ISFSI operation.

As part of the analysis supporting PI ISFSI expansion, NSPM determined the additional dose rates and collective doses to station personnel due to the storage of up to 64 casks within the PI ISFSI. NSPM used the same scaling approach for 64 casks as was used to account for the increase in the site boundary and nearest resident doses (see discussion in Section 3.10.5). As a result, NSPM was required to update ISAR Tables A7.4-3 and A7.4-4; updates include the following:

- For ISAR Table A7.4-3, the station personnel location and dose rates in mrem/hr were updated and increased for all 14 locations considered as a result of the Proposed Action.

- For ISAR Table A7.4-4, the station personnel collective dose was increased from 12.88 person-rem, total exposure to 20.5 person-rem, total exposure as a result of the Proposed Action.

In summary, the ISAR calculations for occupational exposures for cask loading, transport, and emplacement; along with those for design basis PI ISFSI maintenance operations annual exposures will remain unchanged with storage of up to 64 casks. Additional dose rates and collective doses to station personnel will increase with storage of up to 64 casks. For all these analyses, it should be stated that the purpose of the estimates in the ISAR are to provide an estimated total dose and not to prescribe limits or restrictions on dose rates, times to complete tasks, or number of persons working on tasks. Actual loading and maintenance activities may deviate from those shown in the tables but are conducted such that exposure is ALARA. Localized regions of elevated dose rates are anticipated and minimized with good ALARA practices.

3.10.5 Dose to the Public

As stated in Section E2.4.6 of the 2011 ISFSI ER, the existence of the PI ISFSI results in dose to members of the public during normal operations from the gamma and neutron radiation that is emitted from the cask surfaces. The 2015 Final EA stated that the only means of exposure to members of the public from the PI ISFSI is the scattered radiation from the PI ISFSI (skyshine) because the shielded casks and earthen berm greatly limit direct radiation to the public (Ref. 7.15). The dose rate decreases rapidly as a function of distance from the PI ISFSI.

As a result of the Proposed Action and the increases due to additional cask storage, NSPM will update Table A7A.7-2 (Dose Rates as a Function of Distance from the ISFSI) and A7A.7-3 (Skyshine Dose Rates as a Function of Distance from the ISFSI). NSPM performed an analysis to evaluate the radiation dose impact of adding spent fuel equivalent to 16 TN-40HT casks to the new southeast PI ISFSI pad. The purpose and scope of this calculation was to determine the total normal operation radiation dose values at the nearest site boundary and at the nearest resident when including the dose from the existing 48 cask PI ISFSI, the dose from the 16-cask expansion, and the dose due to non-ISFSI related operation of the PINGP. Collectively, the normal operation radiation dose should not exceed dose requirements of 10 CFR 72.104(a), 40 CFR 190.10(a), and 10 CFR 20.1301(a). The results of NSPM's calculation demonstrate that the dose from a PI ISFSI loaded with up to 64 TN-40HT casks will be in compliance with the requirements of 10 CFR 72.104(a), 40 CFR 190.10(a), and 10 CFR 20.1301(a), as shown below in Tables 3.10-1, 3.10-2 and 3.10-3.

Table 3.10-1 Summation of 10 CFR 72.104(a) and 40 CFR 190.10(a) Annual Dose (Nearest Resident)			
Source	**Total (mrem/yr)**	**Criteria (mrem/yr)**	**Margin (mrem/yr)**
48 Loaded TN-40HT Casks	4.34	25	20.66
Additional 16 Loaded TN-40HT Casks			
Planned Discharges*			
* Based on the PINGP, Units 1 and 2, 2017 Annual Radioactive Effluent Report. Note that discharges are not due to the PI ISFSI; no effluent releases are associated with the PI ISFSI (Ref. 7.2).			

Table 3.10-2 Summation of 10 CFR 20.1301(a)(1) Annual Dose (Nearest Resident)			
Source	**Total (mrem/yr)**	**Criteria (mrem/yr)**	**Margin (mrem/yr)**
Licensed Operation	4.34	100	95.66

Table 3.10-3 Summation of 10 CFR 20.1301(a)(2) Dose Rate (Site Boundary)			
Source	**Total (mrem/hr)**	**Criteria (mrem/hr)**	**Margin (mrem/hr)**
48 Loaded TN-40HT Casks	0.45	2	1.55
Additional 16 Loaded TN-40HT Casks			
Other Sources*			
* Other sources of radiation located on the PINGP site which could add to the radiation level at the PI ISFSI controlled area boundary are insignificant when compared to the radiation level associated with the spent fuel storage casks. This is consistent with the existing analysis.			

ISAR Table A7.5-2 summarizes the calculated total dose to the off-site population within a two-mile radius due to PI ISFSI operation. This calculation assumed that the entire permanent population within a two-mile radius of the plant was conservatively taken to be at the location of the residence subject to the highest exposure, i.e., 0.45 miles northwest of the PI ISFSI. In addition to the permanent population, there is a large transient population of persons employed at or visitors to the Treasure Island Resort and Casino. For these calculations it was assumed that this entire transient population is located 0.8 mile from the PI ISFSI. A description of the off-site locations considered in the evaluation, the relevant (2010) populations, and occupancy times are presented in Table A7.5-1 of the current ISAR.

As a result of the Proposed Action, NSPM revised its calculation of the off-site collective dose for up to 64 TN-40HT casks and updated ISAR Table A7.5-2. The Proposed Action will result in an increase in the site population dose rates and collective dose from 2.21 person-rem (collective exposure within 2 miles) to 3.96 person-rem (collective exposure within 2 miles). At a distance of 0.45 mile in the corner direction, the total annual dose rate will increase from 2.20 E-3 rem/year at the nearest resident location to 3.69 E-3 rem/year under the Proposed Action. These calculations, based on 64 TN-40HT casks, would be within the regulatory limits set forth in 40 CFR 190 even when combined with dose from the operating PINGP.