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July 14, 2023

L-PI-23-018
10 CFR 72.56

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

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

License Amendment Request to Revise ISFSI Technical Specification 4.4 to Allow Use of a Code Alternative to ASME Code, NB-5130, Examination of Weld Edge Preparation Surfaces, for the TN-40HT

Pursuant to 10 CFR 72.56, the Northern States Power Company, a Minnesota Corporation doing business as Xcel Energy (hereafter NSPM) hereby requests an amendment to Special Nuclear Materials (SNM) license number SNM-2506 to revise the Technical Specifications (TS) for the Prairie Island Independent Spent Fuel Storage Installation (PI ISFSI). NSPM proposes to allow use of a Code alternative as an option to the requirements of the 2004 Edition through 2006 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section III, Division 1, Subsection NB, Paragraph NB-5130 by revising TS to add the Code alternative to TS Section 4.4, Table 4.4-1, TN-40HT ASME Code Exceptions.

The TS change requested in this LAR (as described in the Enclosure) is a code alternative needed to provide additional non-destructive examination options during fabrication of the TN-40HT casks by allowing use of an equivalent method for examination of weld edge preparation surfaces.

The Enclosure contains the technical evaluation and regulatory analysis of the proposed change. Attachment 1 to the Enclosure provides a markup of the proposed revised PI ISFSI TS page. Attachment 2 to the Enclosure provides a markup of the proposed revised PI ISFSI safety analysis report page which is provided for information only.

NSPM requests approval of the proposed amendment by June 25, 2024, to support existing TN-40HT cask fabrication activities and the associated cask loading campaign. The sequencing of the cask loading campaign supports the continued ability to fully offload a reactor core into the spent fuel pool. Once approved, the amendment shall be implemented within 30 days.

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

If there are any questions or if additional information is required, please contact Mr. Jeff Kivi at (612) 330-5788.

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 July 14, 2023.

A handwritten signature in black ink, appearing to read 'T. A. Conboy', with a long horizontal flourish extending to the right.

Thomas A. Conboy
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosure

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

PRAIRIE ISLAND INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

Evaluation of Proposed Technical Specification Change

License Amendment Request to Revise ISFSI Technical Specification 4.4 to Allow Use of a Code Alternative to ASME Code, NB-5130, Examination of Weld Edge Preparation Surfaces, for the TN-40HT

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- 5.0 ENVIRONMENTAL CONSIDERATION
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ATTACHMENTS:

- 1. Prairie Island ISFSI Technical Specification Pages (Markup)
- 2. Prairie Island ISFSI Safety Analysis Report Pages (Markup – for information only)

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 72.56, the Northern States Power Company – Minnesota (NSPM) hereby requests an amendment to Special Nuclear Materials (SNM) license number SNM-2506 to revise the Technical Specifications (TS) for the Prairie Island Independent Spent Fuel Storage Installation (PI ISFSI). NSPM proposes to allow use of a Code alternative as an option to the requirements of the 2004 Edition through 2006 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code [1], Section III, Division 1, Subsection NB, Paragraph NB-5130 by revising TS to add the Code alternative to TS Section 4.4, Table 4.4-1, TN-40HT ASME Code Exceptions.

Paragraph NB-5130 states that all full penetration weld edge preparation surfaces for joint Categories A, B, C, D, and similar joints in material two inches (50 mm) or more in thickness shall be examined by the magnetic particle or liquid penetrant method. Specifically, NSPM proposes an alternative to the requirement for magnetic particle or liquid penetrant examination of the full penetration weld edge preparation surface of the shell flange for the shell flange to inner shell weld joint (a Category B joint).

2.0 DETAILED DESCRIPTION

2.1 Facility Description

NSPM owns and operates the Prairie Island Nuclear Generating Plant (PINGP), which is a two unit plant located on the west bank of the Mississippi River, approximately six miles northwest of Red Wing, Minnesota. Unit 1 began commercial operation on December 16, 1973, and Unit 2 began commercial operation on December 21, 1974. The PINGP Units 1 and 2 Renewed Facility Operating Licenses expire August 9, 2033, and October 29, 2034, respectively.

Discharged spent fuel assemblies from PINGP, Units 1 and 2, were originally intended to be stored on-site in a spent fuel pool. However, based on the fuel cycle management strategy and the limited spent fuel pool capacity, storage capacity was projected to be exhausted by 1994. Consequently, NSPM requested permission on August 31, 1990, to build and operate an onsite ISFSI in compliance with 10 CFR 72. The NRC issued the original 20-year PI ISFSI site-specific license SNM-2506 on October 19, 1993, with an expiration of October 31, 2013.

On October 20, 2011, NSPM submitted an application pursuant to 10 CFR 72.42 for renewal of the site-specific PI ISFSI license. The NRC issued the renewed license on December 9, 2015. The renewed license authorizes operation of the PINGP ISFSI in accordance with the provisions of the renewed license and its TS. The renewed license expires on October 31, 2053.

Additionally, the Minnesota Public Utility Commission (MPUC) issued a Certificate of Need (CoN) on December 18, 2009, for the storage of up to 64 TN-40/TN-40HT casks to support

continued operation of PINGP Units 1 and 2 through the end of the renewed operating licenses.

2.2 Reason for Proposed Change

The TN-40HT dry storage cask is licensed as a storage cask for spent nuclear fuel at the Prairie Island Independent Spent Fuel Storage Installation. Prairie Island ISFSI License No. SNM-2506 TS Section 4.4 states that the TN-40HT Cask containment boundary is designed, fabricated, and inspected in accordance with Subsection NB of the ASME Code to the maximum practical extent. However, the TN-40HT is not an ASME Code stamped vessel. Exceptions taken to the ASME Code are specified in Table 4.4-1 of the TS and Section A3.5 of the Prairie Island ISFSI SAR. The TN-40HT inner shell is classified as the cask containment boundary in Section A1.3.2, TN-40HT cask characteristics, of the Prairie Island ISFSI SAR.

Paragraph NB-5130 states that all full penetration weld edge preparation surfaces for joint Categories A, B, C, D, and similar joints in material two inches (50 mm) or more in thickness shall be examined by the magnetic particle or liquid penetrant method. The shell flange to inner shell weld is a full penetration butt welded joint, typically with a double-sided V-groove configuration.

For the purposes of mitigating weld distortion, some fabricators of the TN-40HT start with two inches (50 mm) thick material for welding, followed by machining to the final design thickness of 1.5 inches. In this case, magnetic particle or liquid penetrant testing NDE is required on the weld edge preparation surface of the Shell Flange by Paragraph NB-5130 since the material is two inches (50 mm) or more in thickness at the time of welding.

Two casks, cask 52 and cask 53, which are still in fabrication, did not receive the required NDE of the weld edge preparation surface prior to welding and machining; therefore, an alternative is needed to complete fabrication of these casks. Specifically, NSPM proposes an alternative to the requirement for magnetic particle or liquid penetrant examination of the full penetration weld edge preparation surface of the shell flange for the shell flange to inner shell weld joint. The proposed change provides additional NDE options during fabrication of the TN-40HT casks by allowing use of an alternate method for examination of welds that assures an equal or greater level of quality of the final weld. The note associated with the alternative specifies that the fabrication may be completed with the option to conduct pre-weld surface examination in accordance with paragraph NB-5130.

2.3 Description of Proposed Changes

NSPM proposes changes to the PI ISFSI TS Design Features to allow the use of an ASME B&PV Code Section III alternative to the surface examination requirements of NB-5130 for the TN-40HT casks which would be captured in Table 4.4-1, TN-40HT ASME CODE EXCEPTIONS. NSPM proposes to perform an alternate test consisting of a restricted radiographic examination (RT) or a supplementary phased array UT (PAUT) examination as follows:

-----NOTE-----

Use of this alternative is optional. The surface examination required by Paragraph NB-5130 may be used.

The shell flange side of the shell flange to inner shell weld if 2 inches (50 mm) or more in thickness at the time of welding may be exempt from the magnetic particle or liquid penetrant examination required by NB-5130, provided Conditions 1 and 2 below are met:

- 1) The shell flange is produced from a forging.
- 2) The volumetric examination of the completed weld shall be modified or supplemented under option a or b below:
 - a. Radiographic examination (RT): The acceptance standard for RT of the completed weld joint shall be tightened (smaller allowance of defects). The criterion for elongated indications shall be NB-5320(b)(1) instead of NB-5320(b)(2). This tighter criterion shall be applied in addition to NB-5320(a), (c), (d), and (e), without change. In addition, tighter criteria for the selection of penetrameters per NB-5111(a) shall be applied. A 0.016 inch diameter source side image quality indicator (IQI) wire shall be used as the essential wire. The area of interest shall cover the weld, the weld volume and 0.5 inches beyond the toe of the weld on the forging side.
 - b. Phased Array Ultrasonic examination method (PAUT): PAUT shall be performed on the completed weld joint with a defined area of examination of the weld surface and 0.5 inches beyond the toe of the weld on the forging side. The PAUT is in addition to completion of RT of the joint with acceptance standards of NB-5320 without modification. The acceptance standards of the PAUT shall be NB-5331(a)(1) and (b). Later editions of the ASME Section V can be used for completion of the PAUT procedure and qualification.

Attachment 1 to this enclosure provides a markup of the ISFSI TS revised page. Attachment 2 to this enclosure provides a markup of the ISFSI Safety Analysis Report revised page for information only.

3.0 TECHNICAL EVALUATION

3.1 Technical Basis for Change

ASME Code Section V Paragraph T-720 states in part, "The magnetic particle examination method may be applied to detect cracks and other discontinuities on or near the surfaces of ferromagnetic materials... Typical types of discontinuities that can be detected by this method

are cracks, laps, seams, cold shuts, and laminations.” Section V Paragraph T-620 states, “The liquid penetrant examination method is an effective means for detecting discontinuities which are open to the surface of nonporous metals and other materials. Typical discontinuities detectable by this method are cracks, seams, laps, cold shuts, laminations, and porosity.” Paragraph NB-5130 requires either magnetic particle (MT) or liquid penetrant (PT) examination of weld edge preparation surfaces in material 2 inches (50 mm) or more in thickness. The NB-5130 examination checks for subsurface defects in thick plate that become exposed during the machining of weld preparations prior to welding. Such defects can propagate in size during the completion of a full penetration weld joint, resulting in rejection of the weld joint from the volumetric examination.

A laminar defect is the type of defect of most concern because it could have length parallel to the weld joint that results in extensive repairs upon identification. Laminar defects do exist in ferrous base metals but are commonly found only in rolled plate. It is noted that the requested code alternative is applicable to a weld preparation that is machined into a forging only, not rolled plate. Forgings, however, can have internal conditions that are remnant from the ingot formation process and consist of voids or material inclusions, but not laminar in form. Any internal condition that is detrimental in size would be identified and eliminated when the mill of origin performed the ultrasonic (UT) examination required on all forgings in Paragraph NB-2540. Thus, it is unlikely that the surface examination requirements of Paragraph NB-5130 will find laminar defects in a forging.

Non-laminar indications could exist in a machined surface of a weld preparation. This is possible for rolled plate and forgings. The potential concern with these types of indications is a resulting lack of fusion during the completion of the weld joint. There are two outcomes when completing the full penetration weld that has a non-laminar indication in the weld preparation. First, and most likely, is that the weld process has sufficient heat input to create weld deposition into the weld preparation, not just at the surface, and thereby eliminates the pre-existing non-laminar indication in the weld preparation. The second possibility is that the non-laminar indication is not fully removed, and the imperfection is identified in the radiographic (RT) film of the weld and evaluated for acceptability in accordance with NB-5320. If the imperfection results in a rejection of the weld, the weld would be repaired. In both scenarios, the result is a final weld that meets the NDE requirements of NB-5000.

In addition, the other tests and examinations required by the ASME Code and the TN-40HT license provide assurance of the final quality of the weld. These tests and examinations are as follows: MT or PT of the surface of the weld to the acceptance criteria of NB-5340 or NB-5350, hydrostatic testing to 1.25 times the design pressure followed by MT or PT examination in accordance with NB-6200 and NB-5410 and helium leak testing per the American National Standards Institute (ANSI) N14.5 to the acceptance criteria of 1.0E-7 reference cubic centimeters per second. These tests and examinations provide assurance that any weld defects do not exceed the maximum allowable size, that the weld has been fabricated properly by stressing the weld, and that there are no significant leak paths that could reduce the component's confinement functions.

To provide further assurance of the acceptability of the final weld, NSPM proposes conservative changes to the NDE required of the final weld. The fabricator could select either of the two options described below, which NSPM finds equivalent in terms of the final results of the weld.

Option 1

The first option is to tighten the radiographic acceptance standard when evaluating the area of interest with Paragraph NB-5320(b), as shown below.

NB-5320	Current Requirement NB-5320(b)(2)	Proposed Alternative NB-5320(b)(1)	Change
Max indication size	0.5 inches	0.25 inches	50% reduction

In addition, the penetrameter requirements of NB-5111(a) shall be tightened as shown below.

NB-5111	Current Requirement NB-5111(a)	Proposed Alternative NB-5111(a)	Change
Source Side Image Quality Indicator wire size for the 1.50 inches thick material	0.032 inches	0.016 inches	50% reduction

Indications characterized as cracks, lack of fusion, or incomplete penetration remain unacceptable regardless of length.

Option 2

The second option is in addition to the standard RT examination required by NB-5000. Option 2 shall also include performance of PAUT of the weld joint and 0.5 inch from the toe of the weld on the forging side of the weld joint. The acceptance standard is NB-5331 but for an assumed plate size of 0.75 inches inclusive (NB-5331(a)(1)), thus any imperfection is unacceptable with a length exceeding 0.25 inches. Indications characterized as cracks, lack of fusion, or incomplete penetration remain unacceptable regardless of length.

It is prudent that two NDE options are proposed since the availability and capability of NDE methods and equipment can vary geographically. Either method of volumetric examination reduces the allowable indication size to 0.25 inches in the final weld and adjacent base metal of the forging side of the weld joint. Indications characterized as cracks, lack of fusion, or incomplete penetration remain unacceptable regardless of length. This alternative does not represent a reduction in quality. The code alternative allows a fabricator to eliminate an unnecessary surface examination on a weld preparation by agreeing to select source material (i.e., forging) that is recognized to be free from laminar defects and perform more conservative volumetric examinations of the final weld and adjacent base metal. Thus, no evaluations (e.g., structural calculations for NB-3000 compliance) are necessary since allowable imperfections are reduced by 50% from that currently allowed in NB-5000.

Conclusion

As an option from fully complying with NB-5130, during fabrication activities, NSPM is requesting an alternative to the ASME Code Paragraph NB-5130 requirement for magnetic particle or liquid penetrant examination of the full penetration weld edge preparation surface of the shell flange side of the inner shell to shell flange weld joint, if 2 inches (50 mm) or more in thickness at the time of welding.

It is reasonable to conclude that with the following conditions, the code alternative ensures an acceptable level of quality and safety:

1. The shell flange shall be made from forging material only. Plate is not allowed.
2. Volumetric NDE of the final weld and 0.5 inches of base metal on the side of the forging shall include one of the following two options:
 - a. Option 1, RT acceptance standard uses NB-5320(b)(1) instead of NB-5320(b)(2). NB-5320(a), (c), (d), and (e) apply without modification in addition to tightened penetrometer requirements of NB-5111(a).
 - b. Option 2, PAUT is performed with acceptance standard of NB-5331(a)(1) and (b) after completion of RT with acceptance standard of NB-5320 without modification.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 72.44, "License Conditions"

Title 10 CFR 72.44 states, "(c) Each license issued under this part must include technical specifications. Technical specifications must include requirements in the following categories:" This regulation requires Technical Specifications to include: 1) functional and operating limits and monitoring instruments and limiting control settings; 2) limiting conditions; 3) surveillance requirements; 4) design features; and 5) administrative controls.

This LAR proposes changes to the TN-40HT TS Design Features acceptance criteria but does not involve the addition or deletion of any required specification categories identified above.

Thus, with the changes proposed in this LAR, the requirements of 10 CFR 72.44 continue to be met.

10 CFR Part 72, Subpart F – General Design Criteria

Subpart F of 10 CFR 72 provides general design criteria for storage of high-level nuclear wastes of which some apply to independent spent fuel storage facilities. The Prairie Island ISFSI comprises storage of dry spent fuel storage casks within a licensed storage facility. Since this LAR only affects design features for the casks, criteria applicable to the facility are not affected by this amendment. Table 4-1 below lists the sections of Subpart F which contain general criteria and identifies if the section is affected by the changes proposed in this amendment request. For those sections affected, more detailed discussion is provided.

Table 4-1
Criteria Sections Affected by the TN-40HT Design Modifications

Regulation	Title	Affected by this Amendment
72.120	General considerations	No
72.122	Overall requirements	Yes
72.124	Criteria for nuclear criticality safety	No
72.126	Criteria for radiological protection	No
72.128	Criteria for spent fuel, high-level radioactive waste, and other radioactive waste storage and handling	Yes
72.130	Criteria for decommissioning	No

72.122 Overall requirements

This section defines criteria applicable to dry spent fuel storage casks including quality standards, protection against environmental conditions and natural phenomena, fires and explosions, confinement barriers and systems, instrumentation, and controls, and retrievability. The TN-40HT cask design continues to meet these criteria with the proposed change, because the proposed Code alternative provides an equivalent level of quality and safety.

72.128 Criteria for spent fuel, high level radioactive waste, and other radioactive waste storage and handling

This section defines design criteria to ensure adequate safety under normal and accident conditions. Based on the technical evaluation provided herein, the TN-40HT cask design and fabrication continues to ensure adequate safety under normal and accident conditions in accordance with the applicable criteria in this section.

Thus, with the changes proposed in this LAR, the requirements of 10 CFR Part 72, Subpart F continue to be met.

4.2 Conclusions

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

NSPM has determined that the proposed change would involve an amendment to a materials license identified in 10 CFR 51.60(b)(1) which is administrative, organizational, or procedural in nature, or which results in a change in process operations or equipment. However, the proposed amendment does not involve (i) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, (ii) significant increase in individual or cumulative occupational radiation exposure, (iii) significant construction impact, or (iv) significant increase in the potential for or consequences from radiological accidents. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(11). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

In addition, NSPM has determined that the proposed amendment would not involve (i) a significant expansion of a site, (ii) a significant change in the types of effluents, (iii) a significant increase in the amounts of effluents, (iv) a significant increase in individual or cumulative occupational radiation exposure, (v) a significant increase in the potential for or consequences from radiological accidents, or (vi) a significant increase in spent fuel storage capacity. Therefore, pursuant to 10 CFR 51.60(b)(2), no environmental report need be prepared in conjunction with the proposed amendment. The proposed change does not require any changes to the PI ISFSI Environmental Report.

6.0 REFERENCES

1. American Society of Mechanical Engineers, ASME Boiler and Pressure Vessel Code, Sections III-NB and V, 2004 Edition including 2006 Addenda
2. ANSI N14.5, 1997, "Leakage Tests on Packages for Shipment," February 1998.

ENCLOSURE, ATTACHMENT 1

PRAIRIE ISLAND INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

License Amendment Request to Revise ISFSI Technical Specification 4.4 to Allow Use of a Code Alternative to ASME Code, NB-5130, Examination of Weld Edge Preparation Surfaces, for the TN-40HT

ISFSI TECHNICAL SPECIFICATION PAGES (Markup)

(2 pages follow)

TABLE 4.4-1
TN-40HT ASME CODE EXCEPTIONS
(Page 1 of 4)

Insert 1

Component	Reference ASME Code/Section	Code Requirement	Alternatives, Justification & Compensatory Measures
TN-40HT Cask, Basket	NB/NF/NG-1100 NB/NF/NG-2130 NB/NF/NG-4121	Stamping and preparation of reports by the Certificate Holder, Use of ASME Certificate Holders	The TN-40HT cask is not stamped, nor is there a code design specification or stress report generated. A design criteria document is generated in accordance with Transnuclear's (TN) Quality Assurance (QA) Program and the design and analysis is performed under TN's QA Program. The cask may also be fabricated by other than N-stamp holders and materials may be supplied by other than ASME Certificate holders.
TN-40HT Cask, Basket	NCA	All	Not compliant with NCA. TN Quality Assurance requirements, which are based on 10 CFR72 Subpart G, are used in lieu of NCA-4000. Fabrication oversight is performed by TN personnel in lieu of an Authorized Nuclear Inspector.
Pressure Test of the Containment Boundary	NB-6000	Hydrostatic testing	The containment vessel is hydrostatically tested in accordance with the requirements of the ASME B&PV Code, Section III, Articles NB-6200 with the exception that some of the containment vessel may be installed in the shield shell during testing. The containment vessel is supported by the shield shell during all design and accident events.
Weld of Bottom Inner Plate to the Containment Shell	NB-5231	Full penetration corner welded joints require the fusion zone and the parent metal beneath the attachment surface to be UT'd after welding	The joint may be welded after the containment shell is shrink-fit into the shield shell. The geometry of the joint does not allow for UT inspection. In this case, the joint will be examined by RT and either PT or MT methods in accordance with ASME subsection NB requirements. If the containment shell is welded complete before shrink fitting, UT examination per NB-5231 will be performed.

INSERT 1

<p>TN-40HT Inner Shell Welds</p>	<p>NB-5130</p>	<p>All full penetration weld edge preparation surfaces for joint Categories A, B, C, D, and similar joints in material 2 inches (50 mm) or more in thickness shall be examined by the magnetic particle or liquid penetrant method.</p>	<p>-----NOTE----- Use of this alternative is optional. The surface examination required by Paragraph NB-5130 may be used. -----</p> <p>The shell flange side of the shell flange to inner shell weld if 2 inches (50 mm) or more in thickness at the time of welding may be exempt from the magnetic particle or liquid penetrant examination required by NB-5130, provided Conditions 1 and 2 below are met:</p> <ol style="list-style-type: none"> 1) The shell flange is produced from a forging. 2) The volumetric examination of the completed weld shall be modified or supplemented under option a or b below: <ol style="list-style-type: none"> a. Radiographic examination (RT): The acceptance standard for RT of the completed weld joint shall be tightened (smaller allowance of defects). The criterion for elongated indications shall be NB-5320(b)(1) instead of NB-5320(b)(2). This tighter criterion shall be applied in addition to NB-5320(a), (c), (d), and (e), without change. In addition, tighter criteria for the selection of penetrameters per NB-5111(a) shall be applied. A 0.016 inch diameter source side image quality indicator (IQI) wire shall be used as the essential wire. The area of interest shall cover the weld, the weld volume and 0.5 inches beyond the toe of the weld on the forging side. b. Phased Array Ultrasonic examination method (PAUT): PAUT shall be performed on the completed weld joint with a defined area of examination of the weld surface and 0.5 inches beyond the toe of the weld on the forging side. The PAUT is in addition to completion of RT of the joint with acceptance standards of NB-5320 without modification. The acceptance standards of the PAUT shall be NB-5331(a)(1) and (b). Later editions of the ASME Section V can be used for completion of the PAUT procedure and qualification.
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ENCLOSURE, ATTACHMENT 2

PRAIRIE ISLAND INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

License Amendment Request to Revise ISFSI Technical Specification 4.4 to Allow Use of a Code Alternative to ASME Code, NB-5130, Examination of Weld Edge Preparation Surfaces, for the TN-40HT

ISFSI SAFETY ANALYSIS REPORT PAGES (Markup – For Information Only)

(2 pages follow)

PRAIRIE ISLAND INDEPENDENT SPENT FUEL STORAGE INSTALLATION

SAFETY ANALYSIS REPORT

Insert 1

Revision: 13

Page A3.5-2

Component	Reference ASME Code/Section	Code Requirement	Alternatives, Justification & Compensatory Measures
Weld of bottom inner plate to the containment shell	NB-5231	Full penetration corner welded joints require the fusion zone and the parent metal beneath the attachment surface to be UT'd after welding.	The joint may be welded after the containment shell is shrink-fit into the shield shell. The geometry of the joint does not allow for UT inspection. In this case, the joint will be examined by RT and either PT or MT methods in accordance with ASME subsection NB requirements. If the containment shell is welded complete before shrink fitting, UT examination per NB-5231 will be performed.
Containment Shell Rolling Qualification	NB-4213	The rolling process used to form the inner vessel should be qualified to determine that the required impact properties of NB-2300 are met after straining by taking test specimens from three different heats.	If the plates are made from less than three heats, each heat will be tested to verify the impact properties.
Welds of the Bottom Shield to Shield Shell and Shield Shell to Shell Flange	NB-4243 and NB-5230	Category C weld joints in vessels and similar weld joints in other components shall be full penetration joints. These welds shall be examined by UT or RT and either PT or MT.	Certain welds are partial penetration welds. As an alternative to the NDE requirements of NB-5230, for Category C welds, all of these closure welds are multi-layer welds that are progressive PT examined.
Containment Vessel	NB-7000	Vessels are required to have overpressure protection	No overpressure protection is provided. Function of containment vessel is to contain radioactive contents under normal and accident conditions. The containment vessel is designed to withstand maximum internal pressure considering 100% fuel rod failure and maximum accident temperatures.
Containment Vessel, Basket	NB-8000 NG-8000	Requirements for nameplates, stamping and reports per NCA-8000	The TN-40HT cask is to be marked and identified in accordance with 10 CFR 72 requirements. Code stamping is not required. QA data package to be in accordance with TN approved QA program.

INSERT 1

<p>TN-40HT Inner Shell Welds</p>	<p>NB-5130</p>	<p>All full penetration weld edge preparation surfaces for joint Categories A, B, C, D, and similar joints in material 2 inches (50 mm) or more in thickness shall be examined by the magnetic particle or liquid penetrant method.</p>	<p>-----NOTE----- Use of this alternative is optional. The surface examination required by Paragraph NB-5130 may be used. -----</p> <p>The shell flange side of the shell flange to inner shell weld if 2 inches (50 mm) or more in thickness at the time of welding may be exempt from the magnetic particle or liquid penetrant examination required by NB-5130, provided Conditions 1 and 2 below are met:</p> <ol style="list-style-type: none"> 1) The shell flange is produced from a forging. 2) The volumetric examination of the completed weld shall be modified or supplemented under option a or b below: <ol style="list-style-type: none"> a. Radiographic examination (RT): The acceptance standard for RT of the completed weld joint shall be tightened (smaller allowance of defects). The criterion for elongated indications shall be NB-5320(b)(1) instead of NB-5320(b)(2). This tighter criterion shall be applied in addition to NB-5320(a), (c), (d), and (e), without change. In addition, tighter criteria for the selection of penetrameters per NB-5111(a) shall be applied. A 0.016 inch diameter source side image quality indicator (IQI) wire shall be used as the essential wire. The area of interest shall cover the weld, the weld volume and 0.5 inches beyond the toe of the weld on the forging side. b. Phased Array Ultrasonic examination method (PAUT): PAUT shall be performed on the completed weld joint with a defined area of examination of the weld surface and 0.5 inches beyond the toe of the weld on the forging side. The PAUT is in addition to completion of RT of the joint with acceptance standards of NB-5320 without modification. The acceptance standards of the PAUT shall be NB-5331(a)(1) and (b). Later editions of the ASME Section V can be used for completion of the PAUT procedure and qualification.
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