



**Prairie Island License Amendment Request
to Revise ISFSI TS 4.4, Codes and Standards
for the TN-40HT Casks**

06.23.2023

Agenda

- **Purpose**
- **Background**
- **Proposed Licensing Action**
- **Schedule**

Purpose

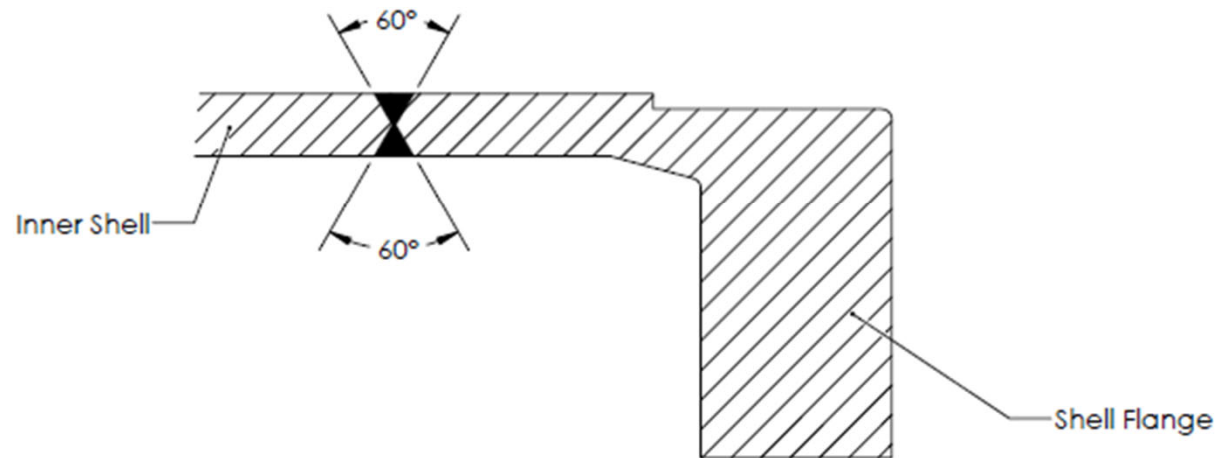
Discuss proposed license amendment for Prairie Island Nuclear Generating Plant (PINGP) Independent Spent Fuel Storage Installation (ISFSI) Technical Specifications (TS) to allow use of a code alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.

Background

- Xcel Energy is fabricating TN-40HT casks through the OEM (Orano/TN Americas)
- The current fabrication order is for eight TN-40HT casks. Four casks have been received, three of which have been loaded.
- During fabrication of the remaining four casks, the OEM identified that a required non-destructive examination (NDE) magnetic particle (MT) inspection of the shell flange base material prior to welding (see Figure 1) was not performed in accordance with the fabrication sequence.

Background (continued)

Figure 1 - Weld Configuration



Background (continued)

- Orano and Xcel Energy have developed an alternative NDE examination for the base metal and weld.
 - The alternate method uses an enhanced RT examination or a Phase Array ultrasonic (PAUT) examination along with radiography (RT) on the completed weld.
 - The examinations have been completed satisfactorily, but a License Amendment Request (LAR) is required to allow the alternate inspection method.

Proposed Licensing Action

- Revise PINGP ISFSI TS 4.4, Table 4.4-1, TN-40HT ASME CODE EXCEPTIONS, to add optional volumetric examinations for TN-40HT inner shell welds.

Proposed Licensing Action (continued)

Summary of Proposed Technical Specifications Changes

Design Features
4.0

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 CFR 72 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.

Proposed Licensing Action (continued)

Summary of Proposed Technical Specifications Changes

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 in. (50 mm) or more in thickness shall be examined by the magnetic particle or liquid penetrant method.</p>	<p>The shell flange side of the shell flange to inner shell weld if 2 in. (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. The area of interest shall cover the weld, the weld volume and ½ in. 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 ½ in. 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. <p>NOTE: The fabricator may elect to not implement this code alternative and perform the surface examination required by Paragraph NB-5130.</p>
--	----------------	--	---

Schedule

- Submittal date - 7/31/23
- NRC approval - 6/25/24
- These dates support fabrication and the cask loading schedule.

