



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 9, 2022

Mark McKeown, Director,
Nuclear Dry Fuel Storage Projects
Northern States Power Company, a Minnesota
corporation, d/b/a Xcel Energy
c/o Xcel Energy Services Inc.
414 Nicollet Mall
Minneapolis, MN 55401

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION INSPECTION
REPORT NO. 72-00010/2022-201

Dear Mark McKeown:

From August 22-25, 2022, the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection of licensee Northern States Power Company, a Minnesota corporation, d/b/a Xcel Energy (Xcel) and of dry storage cask (DSC) designer TN Americas LLC (TN), at the SeAH Besteel Corporation (SBC) facility in Gunsan-si, Jeollabuk-do, Republic of South Korea. TN is under contract with Xcel to design, fabricate, test, and deliver eight (8) TN-40HT spent fuel high burnup, DSCs for the interim storage of spent nuclear fuel at the Prairie Island Nuclear Generating Station (PINGS) Independent Spent Fuel Storage Installation (ISFSI) facility. This was the first NRC inspection performed at SBC in the Republic of South Korea.

With respect to SBC fabrication of the TN-40HT Cask Systems, the inspectors assessed Xcel's compliance to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor Related Greater than Class C Waste;" 10 CFR Part 21, "Reporting of Defects and Noncompliance;" conditions of the PING site-specific License No. SNM-2506, Amendment No. 11; and PINGS ISFSI, safety analysis report (SAR), revision 20 dated October 2021. The inspection was performance based in that the inspectors observed Xcel and TN's implementation of quality assurance (QA) program requirements, as approved by the NRC, that apply to design, purchase, fabrication, assembly, inspection, and testing of the TN-40HT spent fuel high burnup DSC components that are important to safety (ITS). The inspectors observed shop activities, reviewed selected procedures, records, and interviewed specific personnel. Additionally, the inspectors discussed the preliminary results of this inspection on August 25, 2022, and a final inspection exit with Xcel was conducted on September 26, 2022. The enclosed report presents the results of this inspection.

Based on the results of this inspection, the NRC staff determined that overall, except for one Severity Level IV Noncited violation (NCV) of a NRC requirement, the quality of fabrication, quality controls, and QA oversight were adequate. With respect to the NCV, the NRC inspectors

found that implementation of TN's program failed to meet a certain NRC requirement contractually imposed on SBC. The NRC inspectors noted an inadequate SBC corrective action procedure in that SBC failed to adequately prescribe guidance on how to perform a root cause or any other type of causal analysis associated with the identification of significant conditions adverse to quality. The NRC is treating this violation as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. The NRC's public website includes the current versions of both the Enforcement Policy and Manual for your reference. The specific violation and references to the pertinent requirements are identified in the enclosure to this letter.

If you contest this violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to: (1) the Director, Office of Nuclear Materials Safety and Safeguards; and (2) the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

Aida Rivera-Varona, Chief
Inspection and Oversight Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No.: 072-10

Enclosure:
NRC Inspection Report No.
07200010/2022-201

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION INSPECTION REPORT
NO. 72-1010/2022-201

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**U.S. NUCLEAR REGULATORY COMMISSION
Office of Nuclear Material Safety and
Safeguards Division of Fuel Management**

Inspection Report

Docket No.: 7200010

Report No.: 72-00010/2022-201

Licensee: Northern States Power Company, a Minnesota corporation (NSPM), incorporated in Minnesota as a wholly owned subsidiary of Xcel Energy Inc.

Facility: SeAH Besteel Corporation

Location: Gunsan-si, Jeollabuk-do, Republic of South Korea

Inspection Dates: August 22-25, 2022

Inspectors: Earl Love, Senior Transportation and Storage Safety Inspector, Team Leader
Marlone Davis, Senior Transportation and Storage Safety Inspector
Jeremy Tapp, Transportation and Storage Safety Inspector

Approved by: Aida Rivera-Varona, Chief
Inspection and Oversight Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

EXECUTIVE SUMMARY

Xcel Energy NRC Inspection Report 72-00010/2022-201

The original Prairie Island Nuclear Generating Station (PINGS), site-specific, Independent Spent Fuel Storage Installation (ISFSI), Special Nuclear Material (SNM) License No. 2506, specified the use of TN America's, LLC (TN) TN-40 cask design, which the NRC certified for transport on June 10, 2011. On August 22, 2022, to August 25, 2022, a U.S. Nuclear Regulatory Commission (NRC) team of inspectors performed an announced inspection of licensee Northern States Power Company, a Minnesota corporation, d/b/a Xcel Energy (Xcel) and dry storage cask (DSC) designer TN, at the SeAH Besteel Corporation (SBC) facility in Gunsan-si, Jeollabuk-do, Republic of South Korea. The inspectors continued the inspection activities with an in-office review and held an exit meeting on September 26, 2022. The purpose of the inspection was to observe Xcel and TN's conduct and implementation of quality assurance (QA) requirements that apply to design, purchase, fabrication, assembly, inspection, and testing of the TN-40HT spent fuel high burnup DSC components that are important to safety (ITS) for compliance to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 72; 10 CFR Part 21, "Reporting of Defects and Noncompliance;" PINGS License No. SNM-2506, Amendment No.11: and the PINGS ISFSI safety analysis report (SAR), Revision 20 dated October 2021.

Representatives from the Korean Institute of Nuclear Safety (KINS) observed the inspection. This observation fostered sharing of bilateral information exchanges on spent nuclear fuel safety regulation and for the NRC to aid KINS in developing or strengthening their regulatory spent fuel management program to include oversight of vendors.

The results of this inspection are summarized below.

10 CFR Part 21 Program

The inspectors concluded that SBC's Part 21 process and applicable procedures conformed to the regulatory requirements of Part 21. The inspectors determined that SBC's personnel were familiar with the reporting requirements of 10 CFR Part 21; and SBC complied with 10 CFR 21.6, "Posting requirements." No findings of significance were identified.

Design Control

The inspectors concluded that SBC's design control processes and practices were consistent with 72.146 "Design Control," of Subpart G to 10 CFR Part 72, and American Society of Mechanical Engineers (ASME), Section III, Subsection NB code requirements. The inspectors concluded that SBC's implementation of these processes and practices provided appropriate design controls. The inspectors determined, for the items selected for review, that TN's fabrication specifications were consistent with the design commitments and requirements documented in the SAR, SNM-2506, and technical specifications. No findings of significance were identified.

Procurement Control / Commercial-Grade Dedication

The inspectors concluded that SBC's processes that addressed procurement, including traceability and receipt inspection of material was adequate. SBC properly implemented their QA program requirements and Xcel and TN provided adequate oversight of these activities. Overall, procurement specifications for materials, fabrication, inspection, and services performed at SBC met design commitments and

requirements contained in the TN-40HT PING SAR and SNM-2506. No findings of significance were identified.

The inspectors concluded that TN's and SBC's commercial grade dedication (CGD) procedures were consistent with industry guidance. The inspectors concluded that TN and SBC had adequate engineering involvement in its dedication process and conducted its CGD activities consistent with its procedures. No findings of significance were identified.

Control of Special Processes / Fabrication / Assembly / Testing

The inspectors concluded that SBC had established an appropriate means to control fabrication activities and special processes such as welding, nondestructive examination (NDE), and heat treatment for applicable TN-40HT components. The inspectors concluded that the SBC QA manual and associated fabrication and special process procedures and activities were being adequately implemented by qualified personnel, using qualified equipment and processes. No findings of significance were identified.

The inspectors examined fabrication specifications, quality plans, engineering drawings, work control procedures, and travelers. The inspectors confirmed that the SBC manufacturing and testing production activities were adequate. The inspectors noted shop travelers incorporated witness and hold points for Xcel, TN, and SBC quality control (QC) inspectors, and identified the applicable drawings, material specifications, work instructions, and procedures applicable to the manufacturing activity being performed. Overall, the inspectors determined that fabrication activities were accomplished in accordance with specified requirements and conducted in the correct sequence. No findings of significance were identified.

Control of Measuring and Test Equipment

The inspectors concluded that SBC had established appropriate and effective means to control measuring and test equipment (M&TE). No findings of significance were identified.

Corrective Action and Nonconformance Reports

The inspectors reviewed selected records and interviewed personnel to verify that SBC effectively implemented a nonconformance reporting (NCR) program in accordance with the regulatory requirements 72.170 of 10 CFR Part 72. In addition, the inspectors concluded that SBC resolved conditions adverse to quality identified in corrective action reports (CARs) in a timely manner. The inspectors concluded that SBC had procedures and controls in place for identifying and writing NCRs and CARs, resolving fabrication deficiencies, documenting corrective action(s) taken, documenting actions taken to prevent recurrence, performing CAR closure verification, and tracking CARs to closure. However, the inspectors identified one Severity Level IV violation of 10 CFR 72.150, "Instructions, procedures, and drawings" for SBC's failure to provide sufficient guidance to perform a root cause analysis (RCA) required by procedure to determine the corrective action necessary to preclude repetition. Specifically, no RCA process is documented in SB-D-7255A or another quality procedure in the SBC QA program. Except for the noted Noncited violation (NCV), the inspectors determined that SBC's corrective action program was consistent with the regulatory requirements of 72.172 "Corrective Action," of Subpart G to 10 CFR Part 72.

Audits

Regarding QA activities, the inspectors concluded that SBC has been audited by the Xcel and TN and

that audits and inspection findings were appropriately handled with corrective actions implemented in a time frame commensurate with their safety significance. In addition, the inspectors concluded that supervision and QA personnel perform appropriate oversight during fabrication activities. No findings of significance were identified.

REPORT DETAILS

1. 10 CFR Part 21

a. Inspection Scope

The inspectors reviewed program controls for 10 CFR Part 21, specifically, SB-D-7362A, "Part 21 Procedure," to evaluate if provisions were in place for evaluating deviations that could cause a substantial safety hazard and complete the required notification in a timely manner. The inspectors also reviewed SBC's posting of Part 21 requirements in accordance with 10 CFR 21.6, "Posting requirements."

b. Observation and Findings

The inspectors assessed that SBC has provisions in place for evaluating deviations and reporting defects, as required by 10 CFR Part 21. The inspectors noted that SBC did not have any Part 21 reports for the TN-40HT project. The inspectors also noted that SBC posted Part 21 requirements throughout their office and fabrication facility. No findings of significance were identified.

c. Conclusions

The inspectors concluded that SBC had adequate procedures in place to ensure that 10 CFR Part 21 was implemented as required, including postings throughout the facility.

2. Design Control

a. Scope

The inspectors reviewed project specific design documents of the TN-40HT DSC system, fabricated by SBC and determined that construction was in accordance with the commitments and requirements specified in the PINGS SAR, the NRC's corresponding safety evaluation report, 10 CFR Part 72 and Xcel's SNM-2506. The inspectors reviewed TN's procurement fabrication specification, design drawings, and fabrication drawings to verify that critical dimensions and materials, fabrication, inspection, testing, documentation, and quality assurance for TN-40HT cask were consistent with Xcel's licensing drawings. The inspectors reviewed TN and SBC certificates of conformance and the SBC's construction final documentation package of PINGS cask serial number TN-40HT-51, along with Xcel's 72.48 applicability determinations and/or screenings of deviations from TN's design drawings as documented by TN NCR's. The inspectors verified implementation of TN's project specific procedures and observed various shop activities (e.g., special processes, testing, and NDE examinations). The following is a partial list of design documents reviewed:

- TN Specification No. TN-40HT-0105, Revision 7, "Project Specification for the TN-40HT Spent Fuel High Burnup Casks and Baskets"

- TN Project Plan No. 1042A, Revision 1, “Scope and Technical Requirements for the Engineering, Fabrication and Delivery of TN-40HT Casks” (including appendix A, Technical Specification for Engineering, Supply and Services)
- Xcel Contract Agreement No. 79442, dated September 2019 (including Amendment No. 4 Addendum dated April 2022)
- PINGS Site Specific Safety Analysis Report, Revision 18 and Drawing 10428-4036, Revision 6, “TN-40HT High Burnup Dry Storage Cask Configuration Drawing”
- NRC Renewed License SNM-2506, Amendment No. 11, dated October 29, 2020, issued to Northern States Power Company, a Minnesota corporation (NSPM), Docket 72-10
- NRC Safety Evaluation Report, Materials License SNM-2506, Amendment No. 11
- TN Certificate of Conformance, Cask Serial Number TN-40HT-51, dated May 26, 2022 (including a list of TN design Drawings and Procurement Specifications)
- Xcel 72.48 Applicability Determination and Prescreening No. 8315, TN-40HT Lid Seal inspection hole misalignment
- Xcel 72.48 Applicability Determination and Prescreening No. 8663 and Screening No. 5741, “TN-40HT Overpressure Ports overlay over-thickness”
- SBC Certificate of Conformance No. SBC-CoC-220509-01, dated May 09, 2022, Cask ID: TN-40HT-51

b. Observation and Findings

All selected review areas of TN specification and project related documents along with SBC manufacturing drawings were confirmed to conform to the requirements of ASME code, 2004 Edition, including 2006 Addenda and Xcel's contract agreement. The inspectors found that TN and Xcel's document review and design control developed satisfactorily detailed manufacturing drawings appropriately signed off and approved from corresponding specifications and design drawings. The inspectors also evaluated SBC's process for distributing controlled fabrication drawings and procedures, their locations, and retrieval to verify that old or uncontrolled versions were not being used.

c. Conclusions

The inspectors concluded that TN and Xcel's design control processes and practices were consistent with 72.146, “Design Control,” of Subpart G to 10 CFR Part 72, and ASME code requirements. The inspectors determined, for the items selected for review, that fabrication specifications were consistent with the design commitments and requirements and that TN and Xcel implementation of these processes and practices provided appropriate design controls. No findings of significance were identified.

3. Procurement Control/Commercial Grade Dedication

a. Scope

The inspectors reviewed SBC's processes that addressed procurement, including traceability and receipt inspection of material, to verify SBC properly implemented their QA program and Xcel and TN provided adequate QA oversight of these activities. The inspectors reviewed selected drawings and records and interviewed selected personnel to verify that the procurement specifications for materials, fabrication, inspection, and services performed at SBC met design commitments and requirements contained in the SAR and SNM-2506 of the TN-40HT at PINGS. The inspectors reviewed the procurement documents specific to the fabrication of the TN-40HT at SBC including purchase orders (PO) and receipt inspections. The inspectors reviewed the following implementing procedures and procurement documents:

- SB-D-6152A, "Procurement Document Control Procedure," Revision 1
- SB-D-6153A, "Vendor Qualifications
- SB-D-7151A, "Receiving Inspection," Revision 2
- SB-D-8155A, "Designation, Dedication and Control of Commercial Grade Items," Revision 4
- XCL-1901-ASL-001, "Approved Suppliers List," Revision 21

The inspectors verified that SBC used Xcel graded approach for identifying ITS components and applied this graded quality level to component and material procurement documents, which SBC used to procure items from contractors. The inspectors reviewed procurement documents related to the following TN-40HT items:

- Lid outer plate (ASME SA350)
- Metal Seals
- Lid Bolts (ASME SA540)
- Inner Shell (ASME SA203)
- Welding Material (SFA 5.23/F7P10-ENi3-Ni3 Wire and Flux OP121TT)
- TN-40HT Cask Basket Assembly, S/N 4 (manufactured by Hitachi Zosen Corporation, Japan)

b. Observations and Findings

Overall, the inspectors concluded that SBC had adequate control of the procurement process for the ITS components selected and reviewed. The inspectors determined that SBC procured ITS components consistent with design requirements and approved QA implementing procedures. SBC's material traceability, procurement, and receipt inspection controls were adequate. The inspectors determined that the POs were adequate and specified the applicable criteria and requirements including Part 21. The material ordered and received at SBC met the design requirements, the critical characteristics for dedicated material. Additionally, SBC verified and maintained the traceability throughout the procurement and receipt process. The inspectors determined that SBC purchased and applied controls over sub-contractors and vendors currently on the SBC's approved suppliers list.

c. Conclusions

Overall, the inspectors concluded that SBC had adequate control of the procurement process for the ITS components selected and reviewed. The inspectors concluded that TN and SBC implementation of CGD procedures were consistent with industry guidance. The inspectors concluded that TN had adequate engineering involvement in its dedication process and

conducted CGI dedication activities consistent with its procedures. No findings of significance were identified.

4. Control of Special Processes / Fabrication / Assembly / Testing

a. Scope

The inspectors reviewed SBC's implementing policies, quality plans, drawings, travelers and work control procedures for fabrication, welding, NDE, and heat treating. Specifically, for welding activities, the inspectors observed various shell welding processes (e.g., gas tungsten arc and submerged arc welding), reviewed shop travelers, weld procedure specifications (WPS), supporting procedure qualification records (PQR), weld data sheets (WDS), welder qualifications, and the calibration certificates of M&TE. For NDE, the inspectors observed, and reviewed examination reports associated with magnetic particle testing (MT), visual testing (VT), bubble leak testing (BLT), and radiograph testing (RT). The inspectors reviewed Level II and III inspector and welder qualifications, and the calibration certificates of M&TE. In addition, the inspectors reviewed the SBC process for welding material control, interviewed personnel at the welding material station, and reviewed applicable records used for material control process implementation, including the welding material control log and welding material issue cards.

The following is a listing of fabrication and special processes observed and documents reviewed:

- Traveler No. XCL-1901-TRV-B03-03, Revision 3, Cask s/n's 52 and 54, Inner Shell Welding, various weld joints and associated WDS's
- WPS No. SB-WPS-G-104, Revision 2, Gas Tungsten Arc Weld (GTAW) Manual and associated supporting PQR No. SB-PQR-GA-010 dated May 05, 2020
- Reports of MT examinations Nos. XCL-1901-MTR-366 and 367, dated August 23, 2022, various weld joints of Upper/Lower Outer Shell Rings and Plates
- XCL-1901-NDE-003, Revision 10, "Magnetic Partical Examination"
- Reports of VT examination Nos. XCL-1901-VTR-291 and 290, dated August 23, 2022, various weld joints of Upper/Lower Outer Shell Rings and Plates and removal of temporary attachments
- XCL-1901-NDE-005, Revision 7, "Visual Examination"
- BL Examination, Report No. XCL-1901-BLTR-004, dated August 24, 2022, Cask Body Assembly – Outer Shell welds
- XCL-1901-BLP-001, Revision 5, "Bubble Leak Test"
- Traveler No. XCL-1901-TRV-B01-10, Revision 1, Cask s/n 49, Sequence A030, BLT
- RT examination, Report No. XCL-1901-RTR-027, Revision 2, dated July 13, 2022, Inner Shell welds after post weld heat treatment and machining
- XCL-1901-NDE-001, Revision 20, "Radiograph Examination"

- XCL-1901-HTP-001, Revision 8, “Heat Treatment Procedure”
- XCL-1901-HTI-202, Revision 2, “Heat Treatment Instruction” (Cylinder Shell + Bottom Inner Plate)
- XCL-1901-RTP-001, Revision 9, “Random Testing Procedure”

b. Observation and Findings

The inspectors confirmed that the SBC manufacturing process used shop travelers to control shop production activities. The shop travelers incorporated witness and hold points for TN, Xcel and SBC QC inspectors, and identified the applicable drawings, material specifications, work instructions, and procedures applicable to the manufacturing activity being performed.

The inspectors found that the shop travelers assured that the fabrication activities were accomplished in accordance with specified requirements and conducted in the correct sequence.

The inspectors determined that SBC’s welding on ASME code materials and fabrication of ASME code items was performed by qualified welders and welding operators in accordance with approved welding procedure specifications. The inspectors noted that SBC’s welding procedure specifications, welders, and welding operators were qualified in accordance with the requirements of ASME Section III and Section IX, “Welding and Brazing Qualifications.”

Regarding NDE, the inspectors noted that NDE examiners were qualified as Level III and II in nondestructive testing methods in accordance with the American Society for Nondestructive Testing (ASNT) recommended practice No. SNT-TC-1A. The inspectors reviewed a list of SBCs certified NDE examiners inspectors and reviewed a sample of Level II and III certification/training records.

The inspector noted, personnel performing welding, QC inspections (e.g., receiving, final, in-process, pressure testing), and NDE (e.g., helium leak, liquid penetrant, MP, RT, VT) activities were qualified and were maintaining their qualification in accordance with applicable quality procedure XCL-1901-NDE-007, Revision 2, “NDE Personnel Qualification and Certification Procedure.”

c. Conclusions

The inspectors concluded that SBC had established an appropriate means to control fabrication and special processes such as welding, NDE, and heat treatment for fabrication assembly and testing of TN-40HT cask systems. The inspectors concluded that TN-40HT components were being fabricated and the casks were being assembled and tested per approved drawings and QA implementing procedures as well as TN’s fabrication specification. The inspectors evaluated SBC’s control of the fabrication process through observations, examinations of records, and personnel interviews in the areas of fabrication and assembly, test and inspection, and tools and equipment. Overall, TN and SBC fabrication and special process procedures and activities were being adequately implemented by qualified personnel, using qualified equipment and processes. No findings of significance were identified.

5. Control of Measuring and Test Equipment

a. Scope

The inspectors reviewed selected M&TE used in the shop, records, and quality procedure SB-D-7353A, "Calibration Control Procedure," Revision 0 to verify that equipment used in activities affecting quality were properly controlled and calibrated. The inspectors compared a sampling of M&TE in current use for fabrication activities to determine overall compliance to procedural requirements.

b. Observation and Findings

The inspectors reviewed calibration records, interviewed calibration personnel, and toured areas in the shop for storage and calibration of M&TE to verify compliance to the quality procedure requirements. In addition, the inspectors verified that if the M&TE had been sent offsite for calibration that the calibration service providers were appropriately qualified.

c. Conclusion

The inspectors concluded that SBC had established an appropriate means for the storage and calibration of M&TE for the equipment selected and reviewed. The inspectors concluded that SBC implementation of the storage and calibration procedures were consistent with industry guidance and that M&TE activities were adequately implemented. No findings of significance were identified.

6. Corrective Action and Nonconformance Reports

a. Scope

The inspectors determined whether adequate corrective actions for identified issues related to quality have been implemented in a time frame commensurate with their significance, and whether NCRs documenting deficiencies have been initiated and adequately resolved.

The inspectors reviewed selected records and interviewed personnel to verify that SBC effectively implemented a corrective action program in accordance with the requirements of 10 CFR Part 72 and SBC's corrective action procedure, SB-D-7255A, "Corrective Action Procedure," revision 4. The inspectors reviewed a selection of CARs written since the start of fabrication activities at SBC for the TN-40HT cask and focused the review on CARs that were designated as significant condition adverse to quality (SCAQ).

In addition, the inspectors reviewed selected records and interviewed personnel to verify that SBC effectively implemented a nonconformance control program in accordance with the requirements of 10 CFR Part 72 and approved QA procedures. Specifically, the inspectors reviewed SB-D-7355A, "Nonconformance Control Procedure," revision 5. The inspectors reviewed a selection of NCRs written since the start of fabrication activities at SBC for the TN-40HT DSC to verify that the NCRs were identifiable, traceable, and the disposition of the nonconformance was adequate. The inspectors focused on issues involving ITS structures, systems, and components and NCRs with a disposition of "use-as-is" (UAI) or "repair," which require an engineering analysis and potentially a 10 CFR 72.48 evaluation as well. The inspectors reviewed these NCRs to evaluate if the disposition was appropriate, adequately

performed as necessary, and properly closed out in accordance with SB-D-7355A.

The inspectors also reviewed a selection of TN supplier nonconformance reports (SNCRs) written because of issues identified by SBC or TN during fabrication of the TN-40HT cask at SBC. The inspectors verified that TN SNCRs were written for those NCRs dispositioned as UAI or repair by SBC. The inspectors also verified that for the TN SNCRs reviewed, the UAI or repair disposition was adequately evaluated.

b. Observations and Findings

The inspectors assessed that SBC generally resolved the issues identified in the CARs reviewed in a technically sound and, as resources allowed, timely manner. The inspectors also assessed that SBC had procedures and controls in place for identifying and writing CARs, documenting corrective action(s) taken, documenting actions taken to prevent recurrence, performing CAR closure verification, and tracking CARs to closure. However, the inspectors identified that SBC did not provide adequate guidance to perform RCAs in its quality procedures as part of the corrective action program.

During the review of CARs sampled during the inspection, the inspectors identified that for some SCAQ conditions reviewed, the root cause identified by SBC was not adequate. For example, CAR No. XCL-1901-CAR-065, revision 1, was written for issues identified regarding an inadequate Management Review Report that included numerous deficiencies to the QA program requirements. This included failure to perform trending evaluations and an overall QA program assessment. The root cause identified in the CAR was improper understanding of the QA requirements, however, this analysis failed to go further to identify the root cause and determine why SBC personnel had an improper understanding of the QA requirements.

The inspectors reviewed the applicable corrective action quality procedure and identified that SBC did not provide adequate guidance to perform RCA. During the review of quality procedure SB-D-7255A, the inspectors noted that Step 5.3.3 requires, in part, the root cause to be determined for SCAQ. The inspectors reviewed SB-D-7255A and the QA program in general but did not identify any guidance in the quality procedures on how to perform a root cause or any other type of causal analysis. The inspectors determined this was a violation of NRC requirements. Specifically, 10 CFR 72.150, "Instructions, procedures, and drawings" states, in part, that the licensee shall prescribe activities affecting quality by documented instructions, procedures, or drawings of a type appropriate to the circumstances.

Contrary to the above, as of August 25, 2022, SBC's corrective action procedure SB-D-7255A did not provide sufficient guidance to perform an RCA required by Step 5.3.3 to determine the corrective action necessary to preclude repetition. Specifically, no RCA process is documented in SB-D-7255A or another quality procedure in the SBC QA program.

The inspectors dispositioned the violation using the traditional enforcement process in Section 2.3 of the Enforcement Policy. The inspectors determined the violation was of more-than-minor safety significance in accordance with Inspection Manual Chapter (IMC) 0617, "Vendor and Quality Assurance Implementation Inspection Reports," appendix E, "Minor Examples of Vendor and QA Implementation Findings," Example 16.c; because SBC failed to adequately perform adequate RCA as required. The inspectors characterized the violation as a Severity Level IV violation in accordance with the NRC's Enforcement Policy, Section 6.5. TN entered the issue into its CAP under 2022-179. Because this violation was of low safety significance and was entered into TN's CAP, the issue was not repetitive or willful, this is being treated as an NCV,

consistent with Section 2.3.2.a of the Enforcement Policy. (72-00010/2022-201-01)

c. Conclusions

Overall, the inspectors determined that SBC had an adequate CAP in place to resolve identified issues, and, in general, completed corrective actions for identified deficiencies in a technically sound and timely manner. The inspectors identified one violation of NRC requirements concerning the failure by SBC to have an adequate procedure for the conduct of a cause analysis to ensure SCAQ receive the necessary corrective actions to preclude repetition. In addition, the inspectors concluded that SBC and TN effectively implemented their nonconformance control programs and SBC has adequate procedures in place to ensure compliance with the applicable regulations and QA program requirements.

7. Audits

a. Scope

The inspectors reviewed the Xcel and TN's audits of the SBC to determine if Xcel and TN scheduled, planned, and performed the audits and surveillances in accordance with their QA programs and implementing procedures. The inspectors reviewed audits that Xcel performed on TN and the audits that TN performed on SBC. Additionally, the inspectors reviewed SBC's internal audit program to determine if SBC scheduled, planned, and performed audits and surveillances in accordance with their quality management system and quality implementing procedures. The inspectors reviewed the following documents:

- SMS-QMS-1004, "SeAH Besteel Quality Assurance Manual," Revision 6
- SB-D-7253A, "Audit Personnel Qualification Procedure," Revision 0
- SB-D-7254A, "Auditing and Commercial Grade Survey Procedure, Revision 3.

The inspectors selected a sample of audits and evaluations from the initial fabrication to the present. This included a sample of the lead auditor certifications and qualifications. The inspectors particularly focused on area identified in Xcel and TN audits to verify SBC resolved audit findings. The inspectors also reviewed the audit results to determine if SBC identified deficiencies and addressed these deficiencies within their corrective action program. The inspectors evaluated whether Xcel, TN, SBC provided adequate supervision with QC/QA personnel for appropriate oversight during fabrication activities.

b. Observations and Findings

Overall, the inspectors assessed that for the audits and evaluations sampled that SBC generally conducted oversight with qualified and certified personnel, scheduled and evaluated applicable quality elements associated with fabrication activities. The inspectors noted that Xcel and TN also provided oversight representatives to verify that fabrication activities occurring at SBC were adequate and performed audits of SBC that identified observations and findings in accordance with implementing procedures. The inspectors also assessed that SBC appropriately identified issues and implemented corrective actions in a time frame commensurate with their safety significance when identified in audits and evaluations.

c. Conclusions

Overall, the inspectors assessed that for the audits and evaluations sampled that SBC generally

conducted oversight with qualified and certified personnel, scheduled and evaluated applicable quality elements associated with fabrication activities. No findings of significance were identified.

8. Exit Meeting

On August 25, 2022, the inspectors presented the inspection scope and findings during a de-brief meeting with Mark McKeown, NSPM Director, Nuclear Dry Fuel Storage Projects, Xcel and other TN and SBC personnel. The inspectors continued the inspection activities with an in-office review and held an exit meeting on September 26, 2022.

ATTACHMENT

1. PERSONS CONTACTED

M. McKeown	Director Nuclear Dry Fuel Storage Projects, Xcel
Yeonoh Lee	SBC General Manager, SBC
Yongjin Kim	Executive Vice President, SBC
Jung Jaehun	Nuclear Business Team Manager, SBC
Santash Pawar	Quality Assurance Engineer, SBC
B. Shamsher	Consultant, SBC
G. Guerra	TN
K. O'Connor	TN
M. Lopez Solano	TN
J. Burns	TN
C. Laughlin	TN

The following KINS individuals observed the inspection from August 22-25, 2022:

Jeongken Lee	Senior Researcher, Department of Decommissioning and Research
Sang-eun Han	Principal Researcher, Transport & Accelerator Project Manager, Radiation Regulation Division, Office of Radiation Safety
GyeongMi Kim	Department of Radiation Protection & Radioactive Waste Safety

2. INSPECTION PROCEDURES USED

IP 60852, "ISFSI COMPONENT FABRICATION BY OUTSIDE FABRICATORS"

NUREG-6314, "Quality Assurance Inspections for Shipping and Storage Containers"

Regulatory Guide 7.10, "Establishing Quality Assurance Programs for Packaging Used in the Transport of Radioactive Material"

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Type</u>	<u>Description</u>
72-0010/2022-201-01	Closed	NCV	Inadequate quality procedure for guidance in conducting an RCA

4. LIST OF ACRONYMS USED

ASNT	American Society for Nondestructive Testing
ASME	American Society of Mechanical Engineers
BLT	Bubble Leak Testing
CAR	Corrective Action Report
CFR	Code of Federal Regulations
CGD	Commercial Grade Dedication
DSC	Dry Storage Cask
ITS	Important to Safety
ISFSI	Independent Spent Fuel Storage Installation
IP	Inspection Procedure
KINS	Korean Institute of Nuclear Safety

M&TE	Measuring & Test Equipment
MT	Magnetic Particle Testing
NCR	Nonconformance Report
NCV	Noncited Violation
NDE	Nondestructive Examination
NRC	Nuclear Regulatory Commission
PINGS	Prairie Island Nuclear Generating Station
PO	Purchase Order
QA	Quality Assurance
QC	Quality Control
QAM	Quality Assurance Manual
RCA	Root Cause Analysis
RT	Radiograph Testing
SAR	Safety Analysis Report
SCAQ	Significant Condition Adverse to Quality
SNM	Special Nuclear Material
TN	TN Americas , LLC
TS	Technical Specification
UAI	Use-as-Is
VT	Visual Testing
Xcel	Northern States Power Company, a Minnesota corporation, d/b/a Xcel Energy