



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

August 28, 2009

Stewart B. Minahan, Vice
President-Nuclear and CNO
Nebraska Public Power District
72676 648A Avenue
Brownville, NE 68321

SUBJECT: NRC INSPECTION REPORT 050-298/09-006; 072-066/09-001

Dear Mr. Minahan:

An NRC inspection was conducted at the TriVis facility in Pelham, AL on February 23-26, 2009, as part of the Cooper Nuclear Station Independent Spent Fuel Storage Installation (ISFSI) pre-operational testing program. The purpose of the inspection was to determine if the personnel, processes and equipment demonstrated at the TriVis facility were adequate to perform canister sealing, vacuum drying, helium backfill and canister unloading operations as required by the conditions of your general ISFSI license. On August 6, 2009, a telephonic exit briefing was conducted with Mr. Art Zaremba, Director of Nuclear Safety Assurance, and other members of your staff. The enclosed report presents the scope and results of that inspection.

The inspection determined that the processes and equipment demonstrated at the TriVis facility were in compliance with the Commission's rules and regulations and within the conditions of the Cooper Nuclear Station ISFSI license. There were no violations identified. However, the majority of the procedures used during this inspection were in draft form and several aspects of the demonstrations could not be completed. As a result, several issues were identified that need further NRC review prior to Cooper Nuclear Station initiating dry fuel loading activities. These issues are described in detail in the enclosed report.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact the undersigned at (817) 860-8191 or Ray L. Kellar at (817) 860-8164.

Sincerely,

/RA J. Vincent Everett for D. Blair Spitzberg/
D. Blair Spitzberg, Ph.D., Chief
Repository and Spent Fuel Safety Branch

Docket: 050-298
072-066

License: DPR-46

Enclosure:
NRC Inspection Report 050-298/09-006; 072-066/09-001

Attachments:
(1) Supplemental Inspection Information
(2) Cooper ISFSI - Inspector Notes

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SUNSI Rev Compl.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ADAMS	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Reviewer Initials	RLK
Publicly Avail	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sensitive	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Sens. Type Initials	RLK
RIV:DNMS:RSFS	RSFS	NMSS:SFST	C:RSFS		
RLKellar; dew	LEBrookhart	CDMorell	DBSpitzberg		
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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 050-298; 072-066

License: DPR-46

Report: 050-298/09-006; 072-066/09-001

Licensee: Nebraska Public Power District

Facility: Cooper Nuclear Station

Location: 72676 648A Avenue
Brownville, NE 68321

Dates: February 23-26, 2009

Inspectors: R. Kellar, P.E., RIV/DNMS, Lead
C. Morell, NMSS/SFST

Accompanied By: L. Brookhart, RIV/DNMS

Approved By: D. B. Spitzberg, Ph.D., Chief
Repository and Spent Fuel Safety Branch, Region IV

Attachments: 1. Supplemental Inspection Information
2. Inspector Notes

ENCLOSURE 1

EXECUTIVE SUMMARY

Cooper Nuclear Station
Independent Spent Fuel Storage Installation
NRC Inspection Report 050-298/09-006; 072-066/09-001

Nebraska Public Power District elected to use a general license to load and store spent nuclear fuel at the Cooper Nuclear Station Independent Spent Fuel Storage Installation (ISFSI). The technology chosen to store the spent nuclear fuel was the Transnuclear (TN) NUHOMS Horizontal Modular Storage System, Certificate of Compliance (CoC) 1004. The initial inspection associated with the welding and fluid operations phase of pre-operational demonstrations was held at the TriVis facility on February 23-26, 2009. The remaining pre-operational inspections were scheduled to be conducted at Cooper Nuclear Station during the spring of 2009. On May 28, 2009, Cooper Nuclear Station notified Region IV that a decision had been made to delay the remaining pre-operational demonstrations and the initial dry fuel loading campaign to a latter date. On June 17, 2009, Cooper Nuclear Station notified Region IV that the reactor building overhead crane upgrade, necessary to lift the TN transfer cask, would not be completed at this time and that the crane would be returned to service using a rated load of 100 tons. The ASME B30.2 requirement to perform a load test of the crane using a test weight of approximately 125 percent of the 100 ton rated load was completed on July 13, 2009.

This inspection report covers the inspection visit made by NRC to the TriVis facility on February 23-26, 2009. The pre-operational loading demonstrations included canister welding, vacuum drying, helium backfill and non-destructive examination (NDE) activities. Portions of the pre-operational unloading demonstrations were also conducted which included removal of the canister lid welds and refilling the canister with water. Several minor problems were encountered during the demonstrations, which were resolved during the course of the inspection. There were several aspects of the demonstrations that could not be completed and will require additional follow-up by the inspectors. The licensee staff was observed practicing effective ALARA (as low as is reasonably achievable) principles during the demonstrations.

Drying/Helium Backfill

- Procedure 10.38 specified the helium backfill pressure range for the canister to be 1.6 to 3.4 psig. The helium pressure was established at approximately 2.5 psig and held for a minimum of 30 minutes during the preoperational demonstration (Attachment 2, Helium Backfill Final Pressure - 61BT, page 1).
- Procedure 10.38 required that the vacuum pressure be maintained equal to or less than 2.8 torr for the required 30 minute hold time. During the demonstration the vacuum pressure was held at 1.4 torr for approximately 31 minutes (Attachment 2, Vacuum Drying Final Pressure, page 1).

Non-Destructive Examinations (NDE)

- The acceptance criteria for the helium test was less than or equal to 2.0×10^{-7} std-cc/sec of helium. Section 4.0 of Procedure HMSLD-1004 established the minimum sensitivity of the instrument to be 1.0×10^{-9} std-cc/sec. During the demonstration the

instrument was able to detect to a sensitivity of 1.07×10^{-10} std-cc/sec (Attachment 2, HMSLD Minimum Sensitivity, page 6).

- Procedure 06260-CNS-OPS-01-R0 required that the results of the dye penetrant examinations be recorded in Attachment 9.3 of the procedure. These attachments documented the acceptance or rejections of the dye penetrant examinations and are stored with the other permanent canister records after the canister was loaded (Attachment 2, Permanent Record, page 8).

Unloading Operations

- Section 4.2 of Procedure 10.38.1 provided instructions for refilling the canister during the unloading process. A caution was included to limit the water fill so that the vent pressure did not exceed 20.0 psig during the refilling operation. During the licensee demonstration, a pressure gage was included in the flow path and monitored during the filling operation to ensure that limiting pressure of 20.0 psig was not exceeded (Attachment 2, Water Fill Rate, page 13).

Welding

- The welding procedure specifications (WPS's) were reviewed and determined to contain the GasTungsten Arc Weld (GTAW) essential variables required by the ASME Code (Attachment 2, GTAW Essential Variables, page 16).
- Procedure 06260-CNS-OPS-01-R0, was reviewed and determined to provide adequate controls for grinding, machining and non-destructive examination of surface defects (Attachment 2, Weld Repairs - Surface Defects, page 18).

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

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P. Donahue, ISFSI Project Manager
J. Smith, Welding Program Supervisor

TriVis Personnel:

J. Kelly, Operations Manager
L. Kinney, Cask Loading Supervisor

Transnuclear Personnel:

J. Chapman, Manager, Site Projects
M. Stoltz, Director, Fuel Loading Services

INSPECTION PROCEDURES USED

60854.1 Preoperational Testing of an Independent Spent Fuel Storage Installations at
Operating Plants

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

ALARA	As Low As is Reasonably Achievable
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
CNS	Cooper Nuclear Station
DSC	Dry Shielded Canister
FSAR	Final Safety Analysis Report
GTAW	Gas Tungsten Arc Weld
HMSLD	Helium Mass Spectrometer Leak Detector
ITS	Important-To-Safety
ISFSI	Independent Spent Fuel Storage Installation
M&TE	Measuring and Test Equipment
NDE	Non Destructive Examination
NITS	Not-Important-To-Safety
NRC	Nuclear Regulatory Commission
PQR	Procedure Qualification Record
PT	Liquid Penetrant Test
QA	Quality Assurance
TS	Technical Specification
VT	Visual Test
WPQ	Welder Performance Qualification
WPS	Welding Procedure Specification
WML	Welder Maintenance Log

ATTACHMENT 2

Inspector Notes

Cooper ISFSI

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COOPER ISFSI
(Docket 72-066)
(INSPECTOR NOTES)

Category: Drying/Helium Backfill **Topic:** Helium Backfill Final Pressure - 61BT
Reference: CoC 1004, Tech Spec 1.2.3.a
Requirement: The 61BT canisters are backfilled with helium to a pressure of 1.5 to 3.5 psig and the pressure must remain stable for 30 minutes after filling.
Finding: The intent of this requirement was achieved. Procedure 10.38, Section 4.6 performed the final Dry Shielded Canister (DSC) helium backfill operation. The helium backfill pressure range was specified as 1.6 to 3.4 psig. The helium pressure was established at approximately 2.5 psig and held for a minimum of 30 minutes during the preoperational demonstration.
Documents Reviewed: CNS Procedure 10.38, "Dry Shielded Canister Sealing," Revision 0

Category: Drying/Helium Backfill **Topic:** Vacuum Drying Final Pressure
Reference: CoC 1004, Tech Spec 1.2.2
Requirement: All canisters must be vacuum dried to 3 mm Hg (torr) or less and held for 30 minutes or more. This level of dryness must be achieved in both the initial pump-down and the final pump-down.
Finding: The intent of this requirement was achieved. Procedure 10.38, Sections 4.4.41 and 4.5.24 recorded the vacuum readings and time limits as specified in NUHOMS Technical Specification 1.2.2. The procedure required that the vacuum pressure be maintained equal to or less than 2.8 torr for the required 30 minute hold time. During the demonstration the vacuum pressure was held at 1.4 torr for approximately 31 minutes.
Documents Reviewed: CNS Procedure 10.38, "Dry Shielded Canister Sealing," Revision 0

Category: Drying/Helium Backfill **Topic:** Vacuum Drying Time Limits - 61BT
Reference: CoC 1004, Tech Spec 1.2.17
Requirement: The time limit for vacuum drying a 61BT canister with a decay heat load of greater than 17.6 kW is 96 hours. For decay heat loads of 17.6 kW or less there is no the time limit. If the canister cannot be vacuum dried to 3 mm Hg (torr) or less for 30 minutes or more within 72 hours, the canister must be backfilled with helium to 0.1 atmospheres or greater within the next 24 hours. The licensee must determine the cause of the failure to achieve vacuum drying pressure. After the cause is determined, the licensee is to initiate vacuum drying actions or unload the DSC within 30 days.
Finding: This requirement was not applicable for the initial loading campaign. The licensee indicated that the first eight canisters loaded would all have a heat load less than 17.6 kW. Therefore the time limits specified in the Technical Specification would not apply for the planned loading campaign.

Documents Reviewed: CNS Procedure 10.38, "Dry Shielded Canister Sealing," Revision 0

Category: NDE Certification Exams **Topic:** Level I GENERAL Exam
Reference: SNT-TC-1A, Section 8
Requirement: The GENERAL examination is written. The GENERAL examination for VT and PT should contain a minimum of 30 questions related to the basic principles of the method.
Finding: This requirement was achieved. The minimum number of required exam questions for VT and PT examiners was located in Table 2 of Quality Procedure 06260-CNS-QP-9.200-R0. The minimum requirements specified in Table 2 were consistent with the SNT-TC-1A criteria.

Documents Reviewed: TriVis NDE Services, LLC., Quality Procedure: 06260-CNS-QP-9.200-R0, "Written Practice for the Qualification & Certification of Nondestructive Examination (NDE) Personnel," Revision 0

Category: NDE Certification Exams **Topic:** Level II Exam Grading
Reference: SNT-TC-1A, Section 8
Requirement: Level II candidates take 3 examinations; GENERAL, SPECIFIC, and PRACTICAL. A composite grade should be determined by simple averaging of the results of the 3 examinations. A passing composite grade should be 80 percent with no one examination below 70 percent.
Finding: This requirement was met. Section 8.0 of Quality Procedure 06260-CNS-QP-9.200-R0 for TriVis (VT/PT personnel) was consistent with the requirements for Level II examinations and composite grading as specified per SNT-TC-1A. Section 8.9 of Procedure 100.0 for RRL NDT Consulting (LT personnel) was also found to be consistent with the requirements for Level II examinations and composite grading as specified per SNT-TC-1A.

Documents Reviewed: TriVis NDE Services, LLC., Quality Procedure 06260-CNS-QP-9.200-R0, "Written Practice for the Qualification & Certification of Nondestructive Examination (NDE) Personnel," Revision 0; RRL NDT Consulting, LLC., Procedure No. 100.0, "Procedure for Qualification and Certification of Nondestructive Examination Personnel," Revision 3

Category: NDE Personnel Quals **Topic:** Certification Records
Reference: SNT-TC-1A, Section 9
Requirement: Certification records should contain the name of the certified individual, the certification level and method, the individual's educational background and NDE experience, a statement of satisfactory completion of training per the employer's written practice, visual examination results, evidence of successful completion of examinations including grades, date of certification, and the signature of the employer.
Finding: This requirement was achieved. The NDE examiner certification packages for the TriVis VT/PT personnel and for RRL LT personnel consisted of a Certification Record, Visual Acuity Record, and resume of the NDE examiners. The Certification Records and resumes contained the name of the certified individual, the certification level and method, the individual's educational background, NDE experience, a statement of satisfactory

completion of training per the employer's written practice, evidence of successful completion of examinations including grades, date of certification, and the signature of the employer. The Visual Acuity Records contained results of the near distance and far distance acuity tests, and the color differentiation test.

Documents Reviewed: TriVis Quality Procedure 06260-CNS-QP-9.200-R0, "Written Practice for the Qualification & Certification of Nondestructive Examination (NDE) Personnel," Revision 0; RRL NDT Consulting, LLC., Procedure 100.0, "Procedure for Qualification and Certification of Nondestructive Examination Personnel," Revision 3
VT/PT and LT Certification Records
VT/PT and LT Visual Acuity Records
VT/PT Examiner Resumes

Category: NDE Personnel Quals **Topic:** MSLT Level I & II Candidates

Reference: SNT-TC-1A, Section 6, Table 6.3.1

Requirement: An MSLT Level I candidate who is a high school graduate or equivalent must have 40 hours of training and 4 months of work time experience.
An MSLT Level I candidate who has completed 2 years of engineering or science study must have 28 hours of training and 4 months of work time experience.
An MSLT Level II candidate who is a high school graduate or equivalent, must have 24 hours of training and 6 months of work time experience.
An MSLT Level II candidate who has completed 2 years of engineering or science study must have 16 hours of training and 6 months of work time experience.

Finding: The intent of this requirement was achieved. During the welding demonstration the individual that performed the helium leak test was a Level III MSLT inspector. However, the inspectors identified that the minimum training requirements specified for a Level II MSLT in Procedure 100.0 did not meet the specified SNT-TC-1A-1992 requirements. This was brought to the attention of TriVis QA personnel who initiated Condition Report CR2009-021209-04. This deficiency has been properly documented in the corrective action system and will be corrected prior to loading. No further action is required.

Documents Reviewed: RRL NDT Consulting, LLC., Procedure 100.0, "Procedure for Qualification and Certification of Nondestructive Examination Personnel," Revision 3

Category: NDE Personnel Quals **Topic:** PT Level I & II Candidates

Reference: SNT-TC-1A, Section 6, Table 6.3.1

Requirement: A PT Level I candidate who is a high school graduate or equivalent, or who is has completed 2 years of engineering or science study, must have 4 hours of training and 1 month of work time experience.
A PT Level II candidate who is a high school graduate or equivalent, must have 8 hours of training and 2 months of work time experience.
A PT Level II candidate who has completed 2 years of engineering or science study must have 4 hours of training and 2 months of work time experience.

Finding: This requirement was achieved. Table 1 of Procedure 06260-CNS-QP-9.200-R0 contained the minimum training and experience requirements for Level I and Level II certifications. The minimum requirements were consistent with SNT-TC-1A criteria.

Documents Reviewed: TriVis Quality Procedure 06260-CNS-QP-9.200-R0, "Written Practice for the Qualification & Certification of Nondestructive Examination (NDE) Personnel," Revision 0

Category: NDE Personnel Quals **Topic:** Recertification

Reference: SNT-TC-1A, Section 9

Requirement: Maximum recertification intervals are 3 years for Levels I and II, and 5 years for Level III. Recertification may be granted without testing provided there is documented continuing satisfactory performance. "Continuing" must be defined in the written practice. Without documented continuing satisfactory performance, reexamination is required for those sections deemed necessary by the Level III examiner.

Finding: This requirement was met. Section 13.0 of TriVis Procedure 06260-CNS-QP-9.200-R0 for VT/PT examiners and Section 9.4 of RRL Consulting Procedure 100.0 for LT examiners stated the NDE Level I and II personnel shall be recertified by re-examination at intervals not to exceed 3 years and NDE Level III personnel shall be recertified at intervals not to exceed 5 years by evidence of continuing satisfactory performance or by re-examination. The Certification Records for VT/PT and LT examiners contained both certification and recertification dates which were compliant to the SNT-TC-1A criteria.

Documents Reviewed: TriVis Quality Procedure 06260-CNS-QP-9.200-R0, "Written Practice for the Qualification & Certification of Nondestructive Examination (NDE) Personnel", Revision 0
RRL NDT Consulting, LLC., Procedure 100.0, "Procedure for Qualification and Certification of Nondestructive Examination Personnel," Revision 3

Category: NDE Personnel Quals **Topic:** Visual Acuity

Reference: SNT-TC-1A, Section 8.2

Requirement: The NDE examiner should have natural or corrected near-distance acuity in at least one eye capable of reading Jaeger Number 1 at a distance of not less than 12 inches on a standard Jaeger test chart, or capable of perceiving a minimum of 8 on an Ortho-Rater test pattern. This should be verified annually. The NDE examiner should demonstrate the capability of distinguishing and differentiating contrast among colors used in the applicable method. This should be verified every 3 years.

Finding: The intent of this requirement was achieved. The results of the visual exam for the leak test examiner were acceptable, however the documentation was not properly recorded based upon the requirements that were contained in RRL NDT Consultation, LLC., Procedure 100.0, Attachment F "Visual Acuity Examination Record". This was brought to the attention of TriVis QA personnel and Condition Report CR2009-021209-01 was initiated and the deficiency was subsequently corrected.

The documentation for the VT/PT examiners met the requirements of TriVis Quality Procedure 06260-CNS-QP-9.200-R0. Visual Acuity Records from VT/PT and leak test examiners used the Jaeger Number 1 chart for near distance, the Snellen Test chart for far distance acuity, and the Ishihara Test for color differentiation. Both VT/PT and LT examiners received an annual vision test. VT/PT examiner is due for their next test in October 2010 and LT examiner is due for their next test in January 2010.

Documents Reviewed: TriVis Quality Procedure 06260-CNS-QP-9.200-R0, "Written Practice for the Qualification & Certification of Nondestructive Examination (NDE) Personnel," Revision 0; RRL NDT Consulting, LLC., Procedure 100.0, "Procedure for Qualification and Certification of Nondestructive Examination Personnel," Revision 3
VT/PT and LT Visual Acuity Records

Category: NDE Personnel Quals **Topic:** VT Level I & II Candidates

Reference: SNT-TC-1A, Section 6, Table 6.3.1

Requirement: Level I: A VT candidate who is a high school graduate or equivalent, must have 8 hours of training and 1 month of work time experience. A VT candidate who has completed 2 years of engineering or science study, must have 4 hours of training and 1 month of work time experience.

Level II: A VT candidate who is a high school graduate or equivalent, must have 16 hours of training and 2 months of work time experience. A VT candidate who has completed 2 years of engineering or science study, must have 8 hours of training and 2 months of work time experience.

Finding: The intent of this requirement was achieved. None of the inspections that were performed during the demonstration utilized a Level I or II VT inspector. The individual that performed the VT inspections during the demonstration was a Level III, with considerable more experience than the required minimum level. However during the review of Procedure 06260-CNS-QP-9.200-R0, the inspector discovered that the minimum required experience for Level II VT personnel listed in Table 1 of Qualify Procedure 06260-CNS-QP-9.200-R0 did not meet requirements of SNT-TC-1A-1992. This was brought to the attention of TriVis QA personnel who initiated Condition Report CR2009-021209-03 and the information was subsequently corrected. The listed minimum training and experience requirements for the Level 1 VT personnel were consistent with the SNT-TC-1A criteria.

Documents Reviewed: TriVis Quality Procedure 06260-CNS-QP-9.200-R0, "Written Practice for the Qualification & Certification of Nondestructive Examination (NDE) Personnel," Revision 0

Category: NDE Personnel Quals **Topic:** Written Practice

Reference: SNT-TC-1A, Section 5

Requirement: The employer shall establish a written practice for control and administration of NDT personnel training, examination and certification. The written practice should describe the responsibility of each level of certification for determining the acceptability of material or components. The written practice shall describe the training experience and examination requirements for each level of certification.

Finding: This requirement was achieved. Quality Procedure 06260-CNS-QP-9.200-R0, Section 2.0 and 8.0 described the responsibilities and capabilities for each certification level to determine the acceptability of material or components. Table 1 of Qualify Procedure 06260-CNS-QP-9.200-R0 contained the minimum training and experience requirements for each level of NDE certification. Tables 2 and 3 of Quality Procedure 06260-CNS-QP-9.200-R0 contained the examination requirements for each level of certification. RRL NDT Consulting, LLC., Procedure 100.0, Section 4.0 described the responsibilities and

capabilities for each certification level to determine the acceptability of material or components. Table 1 of Procedure 100.0 contained the minimum training and experience requirements for each level of NDE certification. Table 2 of Procedure 100.0 contained the examination requirements for each level of certification.

Documents Reviewed: TriVis Quality Procedure 06260-CNS-QP-9.200-R0, "Written Practice for the Qualification & Certification of Nondestructive Examination (NDE) Personnel," Revision 0; RRL NDT Consulting, LLC., Procedure 100.0, "Procedure for Qualification and Certification of Nondestructive Examination Personnel," Revision 3

Category: NDE Procedures - HT **Topic:** HMSLD Minimum Sensitivity

Reference: ANSI N14-5, Section 8.4

Requirement: The helium mass spectrometer leak detector (HMSLD) shall have a minimum sensitivity of 1/2 the acceptance leak rate. For example, a package with a leaktight acceptance criteria of 1.0×10^{-7} ref-cc/sec requires a minimum HMSLD sensitivity of 5.0×10^{-8} ref-cc/sec. This sensitivity requirement applies to both the hood and detector probe methods. The HMSLD shall be calibrated to a traceable standard.

Finding: This requirement was achieved. The acceptance criteria for the helium test was less than or equal to 2.0×10^{-7} std-cc/sec of helium. Section 4.0 of Procedure HMSLD-1004 established the minimum sensitivity of the instrument to be 1.0×10^{-9} std-cc/sec. During the demonstration the instrument was able to detect to a sensitivity of 1.07×10^{-10} std-cc/sec.

Documents Reviewed: RRL NDT Consulting Procedure Transnuclear-HMSLD-1004, "Specific Procedure for HMSLD Leak Testing of Transnuclear NUHOMS Horizontal Modular Storage System For Irradiated Nuclear Fuel Inner Top Cover Plate and Vent and Siphon Port Cover Plates," Revision 0

Category: NDE Procedures - PT **Topic:** Acceptance Criteria

Reference: ASME Section III, Article NB-5352

Requirement: Only indications with major dimensions greater than 1/16 inch should be considered relevant. The following relevant indications are unacceptable: (1) any cracks or linear indications. Linear indications have a length at least 3 times greater than the width; (2) rounded indications with dimensions greater than 3/16 inch (4.8 mm); (3) more than four rounded indications in a line, separated by 1/16 inch (1.6 mm) or less edge to edge; and (4) more than ten rounded indications in any 6 square inch area in the most unfavorable location relative to the indications being evaluated.

Finding: This requirement was achieved. Procedure QP 06260-CNS-QP-9.202-R1 included the ASME Section III, Article NB acceptance criteria specified above. The inspector observed the NDE technician using the acceptance criteria to categorize rejectable indications during the root pass of the welding demonstration on the lid-to-shell weld. The indications were removed and after subsequent welding operations, the PT results were found to be acceptable.

Documents Reviewed: TriVis Procedure QP 06260-CNS-QP-9.202-R1, "Color Contrast Liquid Penetrant (PT) Examinations Using the Solvent Removable Method," Revision 1

Category: NDE Procedures - PT **Topic:** Contaminants
Reference: ASME Section V, Article 6, T-641
Requirement: The user shall obtain certification of contaminant content for all liquid penetrant materials used on austenitic stainless steels. The certifications shall include the manufacturers batch number and sample results. Sub-article T-641(b) limits the total halogen (chlorine plus fluorine) content of each agent (penetrant, cleaner and developer) to 1.0 weight percent (wt.%) when used on austenitic stainless steels.
Finding: This requirement was achieved. The ASME requirements for contaminants were included in Procedure QP 06260-CNS-QP-9.202-R1. During the demonstration, the inspector verified that the Sherwin K019, Batch 658-F56, remover met the contamination requirements. The information for the Sherwin KO17, Batch 421-K54, penetrant and Sherwin D350, Batch 527-B71, developer were provided to the inspector post demonstration and verified to be satisfactory.
Documents Reviewed: TriVis Procedure QP 06260-CNS-QP-9.202-R1, "Color Contrast Liquid Penetrant (PT) Examinations Using the Solvent Removable Method," Revision 1

Category: NDE Procedures - PT **Topic:** Final Interpretation
Reference: ASME Section V, Article 6, T-676.1
Requirement: Final interpretation shall be made after allowing the penetrant to bleed-out for 7-60 minutes under standard temperatures (50 and 125 degrees F). The 7-60 minute clock starts immediately after application of a dry developer. For wet developer, the clock starts when the coating is dry.
Finding: This requirement was achieved. Procedure QP 06260-CNS-QP-9.202-R1, Section 6.2 included the specified requirements for allowing the penetrant to bleed out. The correct use of the procedure was observed by the inspector during the welding demonstration.
Documents Reviewed: TriVis Procedure QP 06260-CNS-QP-9.202-R1, "Color Contrast Liquid Penetrant (PT) Examinations Using the Solvent Removable Method," Revision 1

Category: NDE Procedures - PT **Topic:** Light Intensity
Reference: ASME Section V, Article 6, T-676.3
Requirement: For color contrast penetrants, a minimum light intensity of 50 foot-candles (500 lux) is required to ensure adequate sensitivity during examination and evaluation of indications.
Finding: This requirement was achieved. Procedure QP 06260-CNS-QP-9.202-R1 specified that a minimum light intensity of 100 foot-candles be verified using a calibrated light meter at the inspection site. The inspector witnessed the NDE technician using a calibrated light meter to verify the lighting conditions of the inspection area.
Documents Reviewed: TriVis Procedure QP 06260-CNS-QP-9.202-R1, "Color Contrast Liquid Penetrant (PT) Examinations Using the Solvent Removable Method," Revision 1

Category: NDE Procedures - PT **Topic:** Minimum Elements
Reference: ASME Section V, Article 6, T-621
Requirement: Each liquid penetrant (PT) procedure shall include the: (1) materials, shapes or sizes to be

examined; (2) type of each penetrant, remover, emulsifier, and developer; (3) pre-examination cleaning and drying, including the cleaning materials used and minimum time allowed for drying; (4) applying the penetrant, the length of time the penetrant will remain on the surface (dwell time), and the temperature of the surface during examination; (5) removing excess penetrant and drying the surface before applying the developer; (6) length of developing time before interpretation; and (7) post-examination cleaning.

Finding: This requirement was achieved. The requirements for the minimum elements of the dye penetrant process were present in Procedure QP 06260-CNS-QP-9.202-R1.

Documents Reviewed: TriVis Procedure QP 06260-CNS-QP-9.202-R1, "Color Contrast Liquid Penetrant (PT) Examinations Using the Solvent Removable Method," Revision 1

Category: NDE Procedures - PT **Topic:** Non Standard Temperature

Reference: ASME Section V, Article 6, T-653

Requirement: When performing liquid penetrant examinations outside the range of 50 to 125 degrees F, the examiner may use a standard temperature procedure or a non-standard temperature procedure. In either case, the examination procedure requires qualification at the proposed higher or lower temperature. This shall require the use of a quenched aluminum block, also designated as a liquid penetrant comparator block.

Finding: This requirement was achieved. The information necessary to demonstrate compliance with this requirement was provided to the inspector after the demonstration. The inspector determined that the high temperature quench blocks qualification test results were satisfactory.

Documents Reviewed: TriVis Procedure QP 06260-CNS-QP-9.202-R1, "Color Contrast Liquid Penetrant (PT) Examinations Using the Solvent Removable Method," Revision 1

Category: NDE Procedures - PT **Topic:** Permanent Record

Reference: ASME Section V, Article 6, T-676

Requirement: The inspection process, including findings (indications), shall be made a permanent part of the user's records by video, photographic, or other means which provide an equivalent retrievable record of weld integrity. The video or photographic records should be taken during the final interpretation period.

Finding: This requirement was achieved. Procedure 06260-CNS-OPS-01-R0 required that the results of the dye penetrant examinations be recorded in Attachment 9.3 of the procedure. These attachments documented the acceptance or rejections of the dye penetrant examinations and are stored with the other permanent canister records after the canister was loaded.

Documents Reviewed: Procedure 06260-CNS-OPS-01-R0, "Spent Fuel Cask Welding-61BT NUHOMS Canisters," Revision 0

Category: NDE Procedures - PT **Topic:** Removing Excess Penetrant

Reference: ASME Section V, Article 6, T-673.3

Requirement: Excess solvent removable penetrants shall be removed by wiping with a cloth or

absorbent paper until most traces of the penetrant have been removed. The remaining traces shall be removed by lightly wiping the surface with a cloth or absorbent paper moistened with solvent. Care shall be taken to avoid the use of excess solvent.

Finding: This requirement was met. Procedure QP 06260-CNS-QP-9.202-R1 included the ASME Code requirements for removal of the excess penetrant specified above. The inspector witnessed the NDE technician removing the excess penetrant according to the instructions specified above during the welding demonstration.

Documents Reviewed: TriVis Procedure QP 06260-CNS-QP-9.202-R1, "Color Contrast Liquid Penetrant (PT) Examinations Using the Solvent Removable Method," Revision 1

Category: NDE Procedures - PT **Topic:** Surface Preparation

Reference: ASME Section V, Article 6, T-642 (b)

Requirement: Prior to each liquid penetrant examination, the surface to be examined and all adjacent areas within one inch must be dry and clean.

Finding: This requirement was met. Procedure QP 06260-CNS-QP-9.202-R1 specified that the surface to be examined and all adjacent areas within one inch must be dry and clean. The inspector observed the NDE technician ensuring that the surface preparation met the specified requirements during the welding demonstration.

Documents Reviewed: TriVis Procedure QP 06260-CNS-QP-9.202-R1, "Color Contrast Liquid Penetrant (PT) Examinations Using the Solvent Removable Method," Revision 1

Category: NDE Procedures - VT **Topic:** Acceptance Criteria - Fusion

Reference: ASME Section III, Article NF-5360

Requirement: For fillet welds, incomplete fusion of more than 3/8" (10 mm) in any 4" (102 mm) segment is unacceptable. For fillet welds, incomplete fusion of more than 1/4" (6 mm) in welds less than 4" (102 mm) is unacceptable. For groove welds, any incomplete fusion is unacceptable. Rounded end conditions (starts and stops) shall not be considered indications of incomplete fusion.

Finding: This requirement was achieved. Procedure QP-9.201 included the acceptance criteria for fusion defined by the ASME Code in Section 6.1.B.

Documents Reviewed: TriVis Quality Procedure QP-9.201, "Visual Weld Examination of Dry Cask Assembly," Revision 4

Category: NDE Procedures - VT **Topic:** Acceptance Criteria - Lengths

Reference: ASME Section III, Article NF-5360

Requirement: For welds 3" and longer, weld lengths shorter than specified by more than 1/4" (6 mm) are unacceptable. For welds less than 3" long, weld lengths shorter than specified by more than 1/8" (3.2 mm) are unacceptable. Intermittent welds not spaced within 1" (25 mm) of the specified location are unacceptable.

Finding: This requirement was achieved. Procedure QP-9.201, Paragraph 4.2.3 included the necessary acceptance criteria for the weld lengths.

Documents Reviewed: TriVis Quality Procedure QP-9.201, "Visual Weld Examination of Dry Cask Assembly," Revision 4

Category: NDE Procedures - VT **Topic:** Acceptance Criteria - Undercut

Reference: ASME Section III, Article NF-5360

Requirement: Undercuts deeper than 1/32" (.8 mm) on one side for the full length of the weld are unacceptable. Undercuts deeper than 1/32" (.8 mm) on one side for one-half the length of the weld AND deeper than 1/16" (1.6 mm) on the same side for one-fourth the length of the weld, are unacceptable.

Finding: This requirement was achieved. Procedure QP-9.201 specified the allowable weld undercut requirements in Section 6.1. D. During the welding demonstration, the inspector witnessed the technician call several areas as meeting the undercut criteria, which were subsequently repaired.

Documents Reviewed: TriVis Quality Procedure QP-9.201, "Visual Weld Examination of Dry Cask Assembly," Revision 4

Category: NDE Procedures - VT **Topic:** Eye Position and Lighting

Reference: ASME Section V, Article 9, T-952

Requirement: Direct visual examinations shall be conducted with the eye within 24" (610 mm) of the surface, at an angle not less than 30 degrees. The light intensity must be at least 100 footcandles (2001 edition). The light intensity must be at least 15 footcandles for general examination and 50 footcandles for the detection and study of small anomalies (1995 edition).

Finding: This requirement was achieved. Section 4.2.2 of Procedure QP-9.201 included the eye position and lighting requirements specified by the ASME Code. The inspector observed the visual examinations being performed to the specified criteria during the welding demonstration.

Documents Reviewed: TriVis Quality Procedure QP-9.201, "Visual Weld Examination of Dry Cask Assembly," Revision 4

Category: NDE Procedures - VT **Topic:** Minimum Elements

Reference: ASME Section V, Article 9, T-921.1

Requirement: Each Visual Testing (VT) procedure shall include the: (1) technique used; (2) surface conditions; (3) surface preparation and cleaning; (4) method or tool(s) required for surface preparation; (5) direct or indirect viewing method; (6) special illumination; (7) equipment to be used; (8) sequence of performing examination; (9) data to be documented; (10) report forms to be completed; (11) personnel qualifications; and (12) procedure qualification reference.

Finding: This requirement was achieved. Section 4.0 of Procedure QP-9.201 included the minimum elements specified in Section V of the ASME Code.

Documents Reviewed: TriVis Quality Procedure QP-9.201, "Visual Weld Examination of Dry Cask Assembly," Revision 4

Category: NDE Procedures - VT **Topic:** Procedure Requalification
Reference: ASME Section V, Article 9, T-921.2
Requirement: Whenever a change is made to the following essential variables in a VT Examination procedure, the procedure must be requalified: (1) technique used; (2) surface conditions; (3) direct or indirect viewing method; (4) special illumination; (5) personnel qualifications; (6) procedure qualification reference.
Finding: The requirement was not present in the procedure during the demonstration. The deficiency was made known to TriVis personnel and the procedure was subsequently updated to incorporate the requirement.
Documents Reviewed: TriVis Quality Procedure QP-9.201, "Visual Weld Examination of Dry Cask Assembly," Revision 4;

Category: NDE Procedures - VT **Topic:** Procedure Validation
Reference: ASME Section V, Article 9, T-941
Requirement: The visual testing (VT) procedure shall contain, or reference, a report of what method was used to demonstrate that the examination procedure was adequate. In general, a fine line 1/32 inch (0.8 mm) or less in width, an artificial imperfection or a simulated condition, located on the surface or a similar surface to that to be examined, may be considered as a method for procedure demonstration. The condition or artificial imperfection should be in the least discernible location on the area surface to be examined to validate the procedure.
Finding: This requirement was achieved. Paragraph 4.2.1 of Procedure QP-9.201 contained the specified requirements for procedure validation.
Documents Reviewed: TriVis Quality Procedure QP-9.201, "Visual Weld Examination of Dry Cask Assembly," Revision 4

Category: Quality Assurance **Topic:** Measuring & Test Equipment
Reference: 10 CFR 72.164
Requirement: The licensee shall establish measures to ensure that tools, gauges, instruments, and other measuring and testing devices used in affecting quality are properly controlled and calibrated at specified periods to maintain accuracy within necessary limits.
Finding: This requirement was not achieved during the demonstrations and will be reviewed prior to the initial canister loading operations. The demonstrations performed at the TriVis facility utilized calibrated gauges, however the licensee planned to use alternate gauges that were not available during the demonstrations. Specifically, the gauges planned for the helium backfill process and the vacuum drying process were not available. Therefore the calibration tolerances of these gauges could not be verified to determine if the specified procedural acceptance limits were conservative.
Documents Reviewed: CNS Procedure 10.38, "Dry Shielded Canister Sealing," Revision 0

Category: Radiation Protection **Topic:** Canister Unloading Operations
Reference: CoC 1004, Tech Spec 1.1.2

Finding: The intent of this requirement was achieved. Although this process was not demonstrated, Procedure 10.38.1 provided adequate instructions for the method of hydrogen monitoring. Section 4.4 of Procedure 10.38.1 provided the instructions for how to monitor for hydrogen gas during the canister lid cutting operations. The limit placed in the procedure was that the amount of hydrogen would not exceed 2.4 percent or all operations would stop and purging would continue until the concentration of hydrogen dropped below 2.4 percent. To ensure that the concentration of hydrogen remained below 2.4 percent, a continuous flow of inert gas was required to be present using a flow of approximately 30 scfh. The adequacy of the hydrogen monitoring equipment will be demonstrated and reviewed during the remaining portion of the welding demonstration dealing with explosive gas monitoring.

Documents Reviewed: CNS Procedure 10.38.1, "Dry Shielded Canister Unsealing," Revision 0

Category: Unloading Operations **Topic:** Water Fill Rate

Reference: FSAR 1004, Sections K.8.2.2.19

Requirement: The water fill rate into the DSC must be regulated during the reflooding operation to ensure that the DSC vent pressure does not exceed 20.0 psig.

Finding: This requirement was achieved. Section 4.2 of Procedure 10.38.1 provided instructions for refilling the canister during the unloading process. A caution was included to limit the water fill so that the vent pressure did not exceed 20.0 psig during the refilling operation. During the licensee demonstration, a pressure gage was included in the flow path and monitored during the filling operation to ensure that the limiting pressure of 20.0 psig was not exceeded.

Documents Reviewed: CNS Procedure 10.38.1, "Dry Shielded Canister Unsealing," Revision 0

Category: Weld Testing **Topic:** Helium Leak Rate Limits - 61BT

Reference: CoC 1004, Tech Spec 1.2.4

Requirement: The canister inner top cover closure welds, including the vent and siphon port pressure boundary welds, are leak tested to demonstrate that the ANSI N14.5 leak tight criteria is met following installation of the outer cover plate root pass weld. ANSI N14.5 (1997) defines leak tight as no more than 1.0×10^{-7} reference cubic centimeters per second (ref-cc/s) of air or 2.0×10^{-7} ref-cc/s of helium.

Finding: This requirement was achieved. The acceptance criteria for the helium test was specified in Procedure HMSLD-1004 as being less than or equal to 2.0×10^{-7} std-cc/sec of helium. Procedure 10.38 established the Technical Specification helium leak test to occur after the completion of the root pass of the outer lid in step 4.8.14. During the welding demonstration, the inner top cover weld and the vent and siphon port cover welds were included in the evacuated envelope for the helium leak test.

Documents Reviewed: RRL NDT Consulting Procedure Transnuclear-HMSLD-1004, "Specific Procedure for HMSLD Leak Testing of Transnuclear NUHOMS Horizontal Modular Storage System For Irradiated Nuclear Fuel Inner Top Cover Plate and Vent and Siphon Port Cover Plates," Revision 0
CNS Procedure 10.38, "Dry Shielded Canister Sealing," Revision 0

Category: Welding Personnel Quals **Topic:** Expiration
Reference: ASME Section IX, Part QW-322.1
Requirement: The performance qualification of a welder or welding operator, for any process, shall expire when he has not welded with that process for six months or more.
Finding: This requirement was met. Selected welder qualifications continuity logs were reviewed and found to meet the performance qualifications requirements of ASME Section IX.
Documents Reviewed: Welding Operator Qualifications continuity logs for Welder ID number 2393 and Welder ID number 9691

Category: Welding Personnel Quals **Topic:** Welder Performance Qualification (WPQ)
Reference: ASME Section IX, Parts QW-301.4, 356, 452.1, 6
Requirement: The record of welder performance qualification (WPQ) tests shall include the essential variables listed in QW-350, the type of test and test results, and the ranges qualified in accordance with QW-452. The essential variables for manual GTAW welding are: (1) Backing; (2) Base metal P-number; (3) Filler metal F number; (4) Consumable inserts; (5) Filler metal form; (6) Maximum weld deposit thickness; (7) Welding positions; (8) Welding progression; (9) inert gas backing; and (10) Current type and polarity. Two side bend tests are required for groove weld test coupons 3/8 inch thick or greater. Groove weld tests qualify fillet welds.
Finding: This requirement was met. Selected welder qualifications were reviewed and verified to meet the performance qualification requirements of ASME Section IX.
Documents Reviewed: Welding Operator performance qualifications for Welding Operator qualifications records for Welder ID number 2393 and Welder ID number 9691

Category: Welding Personnel Quals **Topic:** Welder Performance Qualification Test (WPQ)
Reference: ASME Section IX, Part QW-301.2
Requirement: The welder performance qualification test shall be welded in accordance with a qualified welding procedure specification (WPS), unless preheat or post weld heat treatment is specified.
Finding: This requirement was met. Selected welder qualifications were reviewed and verified to ensure that their performance qualifications met the requirements of ASME Section IX.
Documents Reviewed: TriVis Procedure QP-9.0, "Welding Program," Revision 7
Welding Operator qualifications records: Welder ID number 2393 and Welder ID number 9691

Category: Welding Personnel Quals **Topic:** Welding Operator Performance Qualification
Reference: ASME Section IX, Parts QW-301.4, 361.2, 452.1, 6
Requirement: The record of welding operator performance qualification (WOPQ) tests shall include the essential variables listed in QW-360, the type of test and test results, and the ranges qualified in accordance with QW-452. The essential variables for machine welding are: (1) welding process; (2) direct or remote visual control; (3) automatic arc voltage control (GTAW); (4) automatic joint tracking; (5) position qualified; (6) consumable

inserts; (7) backing; and (8) single or multiple passes per side. Two side bend tests are required for groove weld test coupons 3/8 inch thick or greater. Groove weld tests qualify fillet welds.

Finding: This requirement was met. Selected welder performance qualifications were reviewed and found to meet the requirements of ASME Section IX.

Documents Reviewed: Welding Operator performance qualifications records for Welder ID number 2393 and Welder ID number 9691

Category: Welding Procedures **Topic:** GTAW Essential Variables

Reference: ASME Section IX, Part QW-256

Requirement: The welding procedure specification (WPS) for Gas Tungsten Arc Welding (GTAW) shall describe the following essential variables: (1) Base metal thickness range; (2) Base metal P number; (3) Filler metal F number; (4) Filler metal A number; (5) Filler metal product form (flux, metal, powder); (6) Maximum weld deposit thickness; (7) Minimum preheat temperature; (8) PWHT conditions; (9) Shielding gas mixture; and (10) Trailing Shielding gas mixture and flow rate.

Finding: This requirement was achieved. The welding procedure specifications (WPS's) were reviewed and determined to contain the GTAW essential variables required by the ASME Code.

Documents Reviewed: TriVis WPS, GTAW, WPS SS-8M-TN, Revision 5 and WPS SS-8-A-TN, Revision 2

Category: Welding Procedures **Topic:** GTAW Non Essential Variables (1-14)

Reference: ASME Section IX, Part QW-256

Requirement: The welding procedure specification (WPS) for Gas Tungsten Arc Welding (GTAW) must describe the following non-essential variables: (1) Joint design; (2) Backing; (3) Backing material; (4) Root spacing; (5) Retainers; (6) Filler metal size; (7) Consumable inserts; (8) Filler metal SFA specification number; (9) Filler metal AWS classification number; (10) Welding positions; (11) Welding progression; (12) Trailing Shielding gas composition and flow rate; (13) Pulsing current; (14) Current type and polarity;

Finding: This requirement was met. The WPS's were reviewed and found to include the non-essential variables 1 thru 14, as specified above.

Documents Reviewed: TriVis WPS, GTAW, WPS SS-8M-TN, Revision 5 and WPS SS-8-A-TN, Revision 2

Category: Welding Procedures **Topic:** GTAW Non Essential Variables (15-27)

Reference: ASME Section IX, Part QW-256

Requirement: The welding procedure specification (WPS) for Gas Tungsten Arc Welding (GTAW) must also describe the following non-essential variables: (15) Amperage range; (16) Voltage range; (17) Tungsten size; (18) String or weave bead; (19) Orifice or gas cup size; (20) Method of initial and interpass cleaning; (21) Method of back gouging; (22) Oscillation width; (23) Multiple or single pass per side; (24) Multiple or single electrodes; (25) Electrode spacing; (26) Travel mode and speed; and (27) Peening.

Finding: This requirement was met. The Welder Procedure Specifications (WPS's) listed were reviewed and the non-essential variables 15 thru 27 were determined to have been incorporated into the WPS's.

Documents Reviewed: TriVis WPS, GTAW, WPS SS-8M-TN, Revision 5 and WPS SS-8-A-TN, Revision 2

Category: Welding Procedures **Topic:** GTAW Supplementary Essential Variables

Reference: ASME Section IX, Part QW-256

Requirement: The welding procedure specification (WPS) for Gas Tungsten Arc Welding (GTAW) must describe the following supplementary essential variables, when required: (1) Base metal group number; (2) Base metal thickness range; (3) Welding positions; (4) Maximum interpass temperature; (5) PWHT conditions; (6) Current type and polarity); (7) Multiple or single pass per side; and (8) Multiple or single electrodes.

Finding: This requirement was achieved. The WPS's were reviewed and the GTAW Supplementary Essential Variables were found to be have been incorporated.

Documents Reviewed: TriVis WPS, GTAW, WPS SS-8M-TN, Revision 5 and WPS SS-8-A-TN, Revision 2

Category: Welding Procedures **Topic:** Procedure Qualification Record (PQR)

Reference: ASME Section IX, Part QW-200.2

Requirement: Each manufacturer or contractor shall prepare a Procedure Qualification Record (PQR) for each procedure. The completed PQR shall document all essential and, when required, all supplementary essential variables of QW-250 through QW-280 for each welding process used during the welding of the test coupon. Non essential variables may be documented at the contractor's option. The PQR shall be certified accurate by the manufacturer or contractor.

Finding: This requirement was achieved. The PQR and the associated WPS's were reviewed and found to meet the ASME Section IX requirements for qualifying PQR's and WPS's.

Documents Reviewed: TriVis PQR 1, Revision 1 and WPS GTAW, WPS SS-8M-TN, Revision 5 and WPS SS-8-A-TN, Revision 2

Category: Welding Procedures **Topic:** Tack Welds

Reference: ASME Section III, Article NB-4231.1

Requirement: Tack welds used to secure alignment shall either be removed completely when they have served their purpose, or their stopping and starting ends shall be properly prepared by grinding or other suitable means so that they may be satisfactorily incorporated into the final weld. When tack welds are to become part of the finished weld, they shall be visually examined and defective tack welds shall be removed.

Finding: This requirement was achieved. The inspector determined that Paragraph 8.3, "Tack Welds," in Procedure 06260-CNS-OPS-01-RO and WPS SS-8-A-TN, along with the Supplementary Information provided adequate controls to meet the requirements of ASME Section III, Article NB-4231.1 for tack welds. During the welding demonstration, the inspector observed the contractor adhering to the requirements specified above.

Documents Reviewed: Procedure 06260-CNS-OPS-01-RO, "Spent Fuel Cask Welding- 61BT Nuhoms Canister," Revision 0, WPS SS-8-A-TN, Revision 2 and Supplementary Information.

Category: Welding Procedures **Topic:** Weld Repairs - Base Metal Defects
Reference: ASME Section III, Article NB-4132
Requirement: Weld repairs exceeding in depth the lesser of 3/8 inch (10 mm) or 10 percent of the section thickness, shall be documented on a report which shall include a chart which shows the location and size of the prepared cavity, the welding material identification, the welding procedure, the heat treatment, and the examination results of the weld repair.
Finding: This requirement was achieved. Procedure 06260-CNS-OPS-01-RO, Paragraph 8.11 "Base Metal Repairs," clearly stated that " Any time that a base metal defect is noted, all activities shall stop and supervision shall be notified in order to obtain engineering disposition."
Documents Reviewed: Procedure 06260-CNS-OPS-01-RO, "Spent Fuel Cask Welding- 61BT Nuhoms Canister," Revision 0

Category: Welding Procedures **Topic:** Weld Repairs - Surface Defects
Reference: ASME Section III, Article NB-4452; NB-2538.c
Requirement: Surface defects may be removed by grinding or machining without weldout provided the minimum section thickness is maintained, the depression is blended and liquid penetrant testing is performed to ensure the defect is removed.

Areas ground to remove oxide scale or other mechanically caused impressions for appearance or to facilitate proper ultrasonic testing need not be examined by the magnetic particle or liquid penetrant test method.
Finding: This requirement was met. Procedure 06260-CNS-OPS-01-RO, was reviewed and determined to provide adequate controls for grinding, machining and non-destructive examination of surface defects.
Documents Reviewed: Procedure 06260-CNS-OPS-01-RO, "Spent Fuel Cask Welding- 61BT Nuhoms Canister," Revision 0,

Category: Welding Procedures **Topic:** Welding Procedure Specification (WPS)
Reference: Section IX, Part QW-200.1
Requirement: Each manufacturer or contractor shall prepare written Welding Procedure Specifications for making production welds to code requirements. Welding Procedure Specifications shall include the essential, non-essential, and (when required) supplementary essential variables for each welding process. The variables are listed in QW-250 through QW-280 and are defined in Article IV, Welding Data.
Finding: This requirement was met. The PQR and associated WPS's were reviewed and it was determined that all essential and non-essential items of the ASME Section IX requirements for qualifying PQR's and WPS's had been identified and included.
Documents Reviewed: TriVis PQR 1, Revision 1 and WPS GTAW, WPS SS-8M-TN, Revision 5 and WPS SS-8-A-TN, Revision 2