UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

March 23, 2017

Mr. Richard B. Provencher, Manager
Department of Energy
Idaho Operations Office
1955 Fremont Ave. MS 1203
Idaho Falls, ID 83415

SUBJECT: FORT SAINT VRAIN INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) INSPECTION REPORT 07200009/2016002, 07200009/2016404

Dear Mr. Provencher:

This letter refers to the U.S. Nuclear Regulatory Commission's (NRC) routine security and safety inspection conducted on November 8-9, 2016, and November 29 to December 1, 2016, respectively, at your Fort Saint Vrain (FSV) Independent Spent Fuel Storage Installation (ISFSI). The purpose of the inspections were to verify compliance with the site specific ISFSI License SNM-2504 and associated Technical Specifications, the Safety Analysis Report (SAR), and the regulations in Title 10 of the *Code of Federal Regulations* (CFR) Parts 20, 72, and 73. The inspection included an examination of activities conducted under your license as they relate to public health and safety and the common defense and security. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Inspector debriefs were conducted with your staff to discuss the preliminary findings of the inspections prior to the inspectors leaving the site. The NRC inspectors conducted a combined telephonic exit meeting with FSV management on January 24, 2017, covering all inspection areas. Upon discovery of a violation of the NRC requirements, the NRC inspectors conducted a final telephonic exit with FSV management on February 24, 2017. This inspection report documents the results of the NRC security and safety inspections.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation related to the licensee's failure to comply with License SNM-2504, Condition 9. Because FSV placed the issue into their corrective action process, the violation was treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or significance of the NCV, 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 Regional Administrator, Region IV and (2) the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact the undersigned at 817-200-1549 or Mr. Eric Simpson at 817-200-1553.

Sincerely,

/RA/

Lee E. Brookhart., Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Dockets: 72-09
Licenses: SNM-2504

Enclosure:
Inspection Report 07200009/2016002, 07200009/2016404
w/attachments:
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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Dockets:	07200009
Licenses:	SNM-2504
Report Nos.:	07200009/2016002, 07200009/2016404
Licensee:	U.S. Department of Energy Idaho Operations Office (DOE-ID)
Facility:	Fort Saint Vrain (FSV) Independent Spent Fuel Storage Installation (ISFSI)
Location:	16805 Weld County Road 19-1/2 Platteville, CO 80651
Dates:	November 8-9, 2016 November 29 – December 1, 2016
Inspectors:	Eric J. Simpson, Inspector Fuel Cycle and Decommissioning Branch David Holman, Senior Inspector Plant Support Branch 1
Accompanying Personnel:	Linda L. Howell, Deputy Director Division of Nuclear Materials Safety
Approved By:	Lee Brookhart, Chief Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

U.S. Department of Energy Idaho Operations Office
NRC Inspection Report 07200009/2014001

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine inspection of the licensee's programs and activities for security and safe handling and storage of spent fuel at the Fort St. Vrain (FSV) Independent Spent Fuel Storage Installation (ISFSI) on November 8-9 and from November 29 to December 1, 2016. The inspections included an evaluation of the current condition of the ISFSI and reviews of a number of topics to evaluate compliance with the applicable NRC regulations and the provisions of the site-specific license. The inspection included reviews of documentation relevant to ISFSI activities and operations that occurred at FSV since the last ISFSI inspection performed in February 2014. The documentation reviewed included quality assurance records, radiological surveys, corrective action reports, and records demonstrating compliance with technical specifications and Safety Analysis Report (SAR) requirements. The ISFSI was being maintained in good physical condition. Radiological dose rates around the ISFSI were low. A review of the environmental monitoring program demonstrated that radiological exposures to offsite locations from the ISFSI were low and within NRC requirements. The quality assurance and corrective action programs were being effectively implemented to capture and correct issues related to the dry cask storage program. In summary, the licensee was conducting ISFSI activities in compliance with regulatory and license requirements, except as noted in Section 1.2.g.

Away from Reactor ISFSI Inspection Guidance (60858)

- The licensee was conducting quality assurance audits of the ISFSI program. A review of the audit and surveillance reports documented since the last inspection determined that the quality assurance group was covering risk significant areas within a broad range of topics. Any issues that were identified in the reports were entered into the site corrective action program for resolution. (Section 1.2.a)

- Radiation levels around the ISFSI facility were within the expected range. The ISFSI facility was being maintained in good physical condition. Based on documents reviewed and interviews with personnel, areas with observable degradation were repaired or remediated through the site's aging management program. At the time of the inspection there were no observable signs of degradation. Radiation levels inside the facility were near background levels and areas inside the facility with radiological dose rates were properly posted. (Section 1.2.b)

- Environmental data reviewed from the 2014 and 2015 site environmental reports determined that radiation levels offsite were not being significantly impacted by the ISFSI. (Section 1.2.c)

- The inspectors reviewed radiation and contamination survey results for the FSV ISFSI. Radiation levels were as expected and no removable contamination was reported at FSV. The inspector also reviewed samples of tritium monitoring results from 2014, 2015, and 2016. In no instance was tritium measured above the minimum detectable level (MDL) in any sample result. Sealed source leak test results indicated that the licensee's single non-exempt check source had remained intact. (Section 1.2.d)

- Revisions to the SAR and changes to other major programs since the last inspection were reviewed. There were no changes made to the Radiological Environmental Monitoring Program or natural gas and oil infrastructure near the site. However, small changes were made to the training and quality assurance programs to reflect updated requirements and to reflect changes in the structure and responsibilities within the organization. None of those changes reduced the effectiveness of the programs. The FSV SAR, Revision 12 changes were reviewed and found to be acceptable and within the requirements of the 10 CFR 72.48 process. (Section 1.2.e)

- Selected deficiency reports were reviewed for the period February 2014 through October 2016. A wide range of issues had been identified and resolved by the licensee. Resolutions of the identified deficiencies were appropriate for the safety significance of the issue. No adverse trends were identified during the review. (Section 1.2.f)

- Site required surveillances associated with inspection of cooling inlet and outlet screens and checks of the equipment seismic restraints had been conducted in accordance with the requirements of the FSV Technical Specifications and SAR requirements. The FSV Aging Management Program (AMP) requirements were incorporated in the licensee's Technical Specifications and SAR through the license renewal process in 2011. At the time of the inspection, the licensee had performed most of the required inspections and maintenance associated with the AMP. One exception to the AMP requirements was noted. The FSV SAR Section 9.8 required that a one-time hydrogen sampling test take place at the ISFSI before June 31, 2015. This date was extended to December 31, 2016 through the 10 CFR 72.48 process and documented in two license exemption requests (ML#15156A356 and ML#161173A007). However, at the conclusion of the final exit on February 24, 2017 the licensee had not successfully completed this test. The failure of the licensee to perform the test within the required timeframe or to perform a 10 CFR 72.48 evaluation to extend the date was found to be a violation of NRC requirements. This violation was identified as a Severity Level IV, Violation of SNM-2504 License Condition 9. Since the licensee had placed the issue into their corrective action process, the violation was not repetitive, and not willful, the violation was treated as a Non-Cited Violation (NCV) in accordance with Section 2.3.2 of the Enforcement Policy. (Section 1.2.g)

- The FSV Emergency Response Plan (E-Plan) was being maintained and was currently in Revision 14. Four changes had been made to the E-Plan since the last inspection. The changes were determined to have not caused a reduction in the effectiveness of the E-Plan. Drills, exercises, and training were performed in accordance with requirements of the E-Plan. Offsite support agencies participated in the two (May 2014 and September 2016) biennial emergency response exercises performed since the last NRC inspection. (Section 1.2.h)

- The ISFSI organization changes since the last inspection were reviewed for compliance with the FSV SAR staffing requirements and qualifications of personnel. The personnel added to the ISFSI program since the last NRC inspection met the requirements specified in the SAR. The Safety Review Committee had met at least annually and reviewed issues consistent with requirements of the SAR and the license's Technical Specifications. (Section 1.2.i)

Review of 10 CFR 72.48 Evaluations (60857)

- The licensee's required safety screenings and evaluations had been performed in accordance with site procedures and 10 CFR 72.48 requirements, with one exception (see Section 1.2.g). All other screenings and evaluations reviewed were determined to have been adequately evaluated. (Section 2.2)

Physical Security Requirements

- All aspects of site security operations during preparations for technical specification surveillances were observed and assessed against NRC Confirmatory Order EA-14-049. No findings of significance were identified. (Section 3.2)

Report Details

Summary of Facility Status

The FSV ISFSI is a modular vault dry storage (MVDS) system developed by Foster Wheeler Energy Corporation. The ISFSI provided storage for the spent fuel from the decommissioned FSV high temperature gas cooled reactor. There were 244 fuel storage containers loaded with spent fuel at the FSV ISFSI. The FSV ISFSI license was transferred from Public Service Company of Colorado to the Department of Energy Idaho Operations Office (DOE-ID) on June 4, 1999. During this inspection the facility was being maintained by Spectra Tech, Incorporated (STI) as the management and operations contractor for DOE-ID. At the time of the inspection, the ISFSI was being maintained under site specific license SNM-2504, Amendment 10, and Safety Analysis Report (SAR) Revision 12. A tour of the ISFSI facility, interview of personnel, and a review of site records confirmed the facility to be in good physical condition and in compliance with regulatory and license requirements with one exception as discussed in Section 1.2.g.

1 Away from Reactor ISFSI Inspection Guidance (60858)

1.1 Inspection Scope

An inspection of the status of the loaded storage containers at FSV was completed to verify compliance with requirements of their specific license, the FSV SAR, and federal regulations. The inspection consisted of reviews for a broad range of topics, including quality assurance audits conducted by the licensee; condition reports related to ISFSI operations; environmental radiological data collected around the ISFSI; review of the annual vault maintenance records; safety evaluations; and equipment maintenance records. A tour of the ISFSI was performed during which inspectors confirmed radiological dose rates measured around the perimeter of the ISFSI and within the ISFSI structure. The inspectors also observed DOE-ID contractor's performance of a once-every-five-years technical specification surveillance test.

1.2 Observations and Findings

a. Quality Assurance Audits and Surveillances

As the NRC license holder, DOE-ID maintains the ISFSI Quality Assurance (QA) and oversight program. The DOE-ID contractor, STI was responsible for the day-to-day management and operations of the ISFSI. STI implemented its own QA program for the site.

DOE-ID, contractor STI, and former contractor CH2M♦WG Idaho, LLC (CWI) (see Section 1.2.1) had performed numerous QA audits and surveillances of operations at the FSV ISFSI since the last NRC inspection in February 2014. A total of two audit reports, six surveillance reports, two QA management assessments, and a QA program annual trending report were reviewed during the inspection. The QA audit and surveillance records were broadly related to the three NRC-licensed ISFSIs owned by DOE, which included FSV, Three Mile Island, Unit 2, ISFSI (TMI-2), and the Idaho Spent Fuel Facility (ISFF). For the purposes of this inspection, the inspectors focused on the audit findings and observations exclusive to the FSV ISFSI.

Audit report areas of focus included ISFSI organization, quality assurance program, implementing documents, document control, corrective action, test control, and other ISFSI related activities. Identified issues were categorized into one of three categories: (1) significant conditions adverse to quality, (2) conditions adverse to quality (CAQ), or (3) observations. Significant CAQs and CAQs required formal responses in the form of condition action requests (CARs) and deficiency reports (DRs), respectively. Those reports could be tracked through the site's corrective action program (CAP) to monitor the current status, whether resolved (closed) or still pending closure (open). None of the audit reports uncovered any significant findings. However, 9 CAQs were documented, leading to 9 DRs and 5 observations. Overall, the audit reports rated all evaluation areas as effective.

The six reviewed QA surveillances covered operational areas such as reporting and posting programs, emergency preparedness, procurement document control, 72.48 screen and evaluation process, and others programs. The surveillances reviewed by the NRC inspectors did not result in the identification of any significant issues. However, QA made seven observations to improve the programs. All surveilled areas were rated effective by the licensee.

Two quality assurance management assessments (QAMAs) were reviewed for 2014 and 2015. The QAMAs served to assess the adequacy of resources and personnel to achieve and assure quality at the three ISFSIs managed by DOE-ID, including FSV. The two assessments did not uncover any significant conditions adverse to quality or conditions adverse to quality.

The NRC inspectors reviewed the 2014 quality assurance program annual trending report (trending report) for DOE-ID's ISFSIs. The trending report served to document the analysis of QA conditions adverse to quality in order to identify adverse performance trends for the DOE-ID ISFSIs during the previous years. The findings of the trending report were identified during the performance of QA program oversight activities and applied to both CWI and DOE-ID ISFSI QA programs. In the trending report reviewed, only one significant condition adverse to quality was identified.

NRC inspectors followed-up on all CARs and DRs resulting from QA audits, surveillances, trending reports, and QAMAs to evaluate their current status. Since the audit reports and surveillances covered the combined operations of FSV, TMI-2, and ISFF ISFSIs, many of the individual audits and surveillance findings were not directly related to ISFSI operations at FSV. The CARs and DRs related to FSV ISFSI operations were evaluated to ensure that the identified problems were properly categorized based on their significance. All identified deficiencies had been entered into the licensee's CAP and were properly resolved by DOE-ID, CWI, and STI. The corrective actions taken for the identified issues were appropriate for the significance of the issues. No concerns were identified related the issues resolved through the quality assurance program at FSV.

b. Tour and Radiological Conditions of the FSV ISFSI

A tour of the FSV ISFSI facility was performed during the inspection. Recent radiological monitoring results from the ISFSI were provided to the NRC inspectors upon their arrival at the facility. The Facility Director, ISFSI Program Manager, and others accompanied the NRC inspectors during the facility tour. The NRC inspector carried a

RadEye G Model Geiger-Mueller type survey meter (NRC #46791G, Cal. Due November 4, 2017) to measure ambient gamma exposure rates in microRoentgens per hour (μR[1]/h). STI contractors used an ion-chamber type survey meter that measured gamma exposure rates in milliRoentgens per hour (mR/h). The NRC inspectors confirmed gamma radiation readings at selected areas of the ISFSI facility. No neutron measurements were taken. The NRC inspectors found the facility to be in good condition. The security tamper seals above each fuel storage container (FSC) were intact. No flammable or combustible materials were observed anywhere inside or near the ISFSI facility. External radiation readings were observed on approach to the ISFSI facility and remained at background levels. Survey meter readings were taken at several locations inside the ISFSI facility and atop FSCs and the levels were as expected based on previous survey results. There were two radiological control areas inside ISFSI facility. One area was around a radioactive source storage locker where various radioactive check sources were stored. The other controlled area was the location where depleted uranium shield plugs were stored. Both areas were roped off and properly posted based on the stored materials and radiation levels.

Areas external to the ISFSI facility were also inspected. On the outside, the inlet and outlet screens were clear of debris. There were areas on the concrete external facility surface where there were signs of efflorescence along the building's east elevation. Areas of corrosion noted in a previous inspection report (ML14087A457) had been addressed by the site's AMP. Those areas had been cleaned and painted with rust-inhibiting coatings. The NRC inspectors did not note any concerns regarding the ISFSI facility structure.

c. Radiological Environmental Monitoring Reports

Site monitoring data from the 2014 and 2015 FSV annual radiological environmental monitoring reports were reviewed. The data was reviewed to confirm that radiological conditions at the site had remained stable and within regulatory requirements since the last inspection. The licensee was required by Technical Specification 5.5.4(c) to submit an annual report to the NRC within 60 days after January 1 of each year. Two reports had been submitted since the last inspection, including the 2014 report dated February 27, 2015 (ML15084A137) and the 2015 report dated February 29, 2016 (ML16067A131). The FSV Radiological Environmental Monitoring Program (REMP) was designed to monitor the predominant radiation exposure pathway for the facility, direct radiation exposure, and its impacts on the environment. There were no detectible radioactive liquid or airborne effluent releases from the ISFSI. The REMP was comprised of 20 thermoluminescent dosimeter (TLDs) located along a perimeter fence of the ISFSI. All of the TLDs were replaced with optically stimulated luminescent dosimeters (OSLDs) in October of 2015. Approximately one third of the perimeter fence dosimeters were changed out and processed each month. A control TLD was located at the Weld County Sheriff Office in Greeley, CO, approximately 17 miles NNE of the ISFSI. The control TLD was changed out and processed monthly.

[1] For the purposes of making comparisons between NRC regulations based on dose-equivalent (rem) and measurements made in Roentgens, it may be assumed that one Roentgen equals one rem. (http://www.nrc.gov/about-nrc/radiation/protects-you/hppos/qa96.html)

The following table provides the annual average exposure rates reported in the annual environmental monitoring reports:

Table 1, Fort St. Vrain Annual Radiological Monitoring Program Results

YEAR	MEAN (mR/d)	CONTROL (mR/d)
2014	0.39 +/- 0.02	0.36 +/- 0.02
2015	0.38 +/- 0.05	0.35 +/- 0.05

Correcting the daily exposure rates in Table 1, above, for background, shows a net exposure rate at the fence of about 11.0 mR/year. The site boundary monitoring results for 2014 and 2015 were within the requirements of 10 CFR 72.104(a), which limits direct radiation dose to 25 mrem per year above background. It should be noted that no dosimeter monitoring locations showed any statistically meaningful deviations from preoperational background measurements at the site.

d. Contamination Surveys and Leak Tests of Sealed Sources

The inspectors reviewed periodic radiation and contamination survey results for the FSV ISFSI. Radiation levels were as expected and no removable contamination was detected at FSV. The SAR Section 7.6.4.1, Surveys and Monitoring, documented that tritium monitoring had been instituted within the ISFSI as a means of monitoring the effects of facility aging. The tritium monitoring was intended to detect FSC failures or gross failures related to the FSC O-ring seals. Inspectors reviewed completed copies of Procedure TPR-6370, "Tritium Monitoring at Fort St. Vrain," for 2014, 2015, and 2016. In no instance was tritium above the MDL measured in any of the sample results reviewed by the inspectors.

The floor of the interior MVDS module was sloped for drainage and was connected to a gutter that lead to a drain pipe with a valve for sampling. The inspectors reviewed completed copies of Procedure TPR-5613, "FSV ISFSI Radiation Survey and Vault Drain System Sample Collection and Analysis," for sampling events in 2014, 2015, and 2016. In the copies of sample results reviewed by the inspectors, there were no documented occurrences of standing water in the vault drain system.

The NRC inspectors reviewed the sealed source leak test results for the 840 mCi americium-beryllium sealed neutron source performed on July 2014, January 2015, July 2015, and January 2016. Those test results indicated that the source had remained intact and was not a source of contamination at the site.

e. Biennial Update Reports and SAR Revisions

FSV's 2015 biennial Safety Analysis Update Report was reviewed. The June 4, 2015, report provided information related to revisions made during the two-year reporting period to the site SAR and other programs required by license Technical Specifications. Areas that were updated included the site SAR; changes, tests, and experiments; QA program; and the natural gas and oil monitoring program. The biennial report reflected changes which culminated in FSV SAR Revision 11. These included small revisions in SAR Chapters 9 and 11 to reflect position title changes at DOE-ID and other minor formatting changes. A change was made in the FSV QA Program that was associated with the aforementioned DOE-ID title change. Other changes included a 10 CFR 72.48 evaluation associated with a FSV ISFSI license exemption request. This request was

subsequently approved by NRC (ML#15156A356). Lastly a clarifying reference was added to the natural gas and oil monitoring program. The 2015 update report indicated that no changes were made to the following areas: Technical Specification bases, REMP, or training program. The NRC inspector reviewed several additional 72.48 screens/evaluations that were performed after the June 2015 update to the NRC (see Section 2, below). Some were in support of the move from the aforementioned SAR Revision 11 to the current Revision 12. The changes associated with Revision 12 were adequately performed in accordance with the 10 CFR 72.48 process.

f. Corrective Action Program

A list of ISFSI deficiency reports issued since the last NRC inspection was provided to the inspectors by the licensee. Identified issues were processed in accordance with Procedure MCP-598, "Corrective Action System," Revision 33. When a problem was identified the licensee would document the issue as a DR in their Issue Communication and Resolution Environment (ICARE) system with a DR number for tracking purposes.

Of the list of DRs provided to the inspectors, approximately 16 were selected for closer review. The DRs related to a number of different topics including conditions related to facility changes, inadequacies identified during a FSV biennial emergency exercise, and problems related to ambiguous wording in the FSV SAR. The DRs reviewed were well documented and properly categorized based on the significance of the issues. The corrective actions taken were appropriate for the situations. No concerns were identified related to the deficiency reports reviewed during this inspection.

g. Compliance with Technical Specifications and SAR Requirements

Technical Specification 3.3.1 required the licensee to conduct a leak test of one FSC from each vault every 5 years. The most recent leak test was performed during the current routine inspection. NRC inspectors observed the performance of three of six leak tests at FSV and were present onsite for the entire testing evolution. The leak test was originally scheduled to be performed in June 2015. However, two NRC approved license exemption requests (ML#15156A356 and ML#161173A007) extended the deadline for the test to no later than December 2016. NRC inspectors verified that TS 3.3.1, FSC seal leak rate test, was successfully performed, met license requirements, and was documented by STI using Procedures STI-NLF-OPS-002, "FSV Fuel Storage Container O-Ring Vacuum Leak Test," Rev. 0 and STI-NLF-OPS-038, "Small Volume Pressure Change Leak Test," Rev. 0.

Technical Specification 3.1.1.1 required that the cooling inlet and outlet screens be visually inspected every 7 days to verify that no blockages were present. If a blockage was observed on the screens, compensatory actions were required within specified time limits. Procedure records were reviewed for Technical Specification compliance for a random week during the months of June 2014, December 2015, and July 2016. Procedure TPR-5593, "Visual Inspection of Fort St. Vrain ISFSI Cooling Inlets and Outlets/Tornado Clamp Verification," Rev. 18, had been utilized to perform the visual inspections. The licensee completed the visual inspections in a timely manner and identified no obstructions during the weeks selected for review. Additionally, no obstructions were observed by the inspectors on the inlet or outlet screens during the NRC inspection of the facility.

The FSV ISFSI license includes Technical Specification 5.5.5 which requires that an AMP be established as a means for monitoring and mitigating potential aging effects on the ISFSI. The AMP was being implemented at FSV through PLN-2974, "Fort St Vrain Independent Spent Fuel Storage Installation Maintenance Program," Rev. 3. The purpose of the AMP was to ensure that all ISFSI structures, systems, and components considered important to safety, including enhanced quality items, remain functional through the duration of the licensing period. The enhanced quality items at FSV included the structural concrete and concrete fill that comprised the ISFSI structure. The inspection and maintenance of these areas was implemented through the use of Technical Procedures. Inspection and maintenance periodicity varied from monthly, for some active components, to every 10 years for passive systems. NRC inspectors reviewed three aging management related work-orders that were completed since the last inspection. The work-orders documented the inspection and maintenance of components such as the structural concrete and steelwork, equipment functionality, and the condition of the electrical components of the ISFSI. No significant deficiencies were documented by the licensee or observed by the inspector during the routine inspection.

The licensee had completed all of the items listed in Technical Specification 5.5.5, Aging Management, including the establishment and implementation of procedures for remote inspection of ISFSI vault and floor areas for degradation; repair and follow-up inspection of concrete and metal conditions which exceeded second tier-criteria described in ACI 349.3R, "Evaluation of Existing Nuclear Safety-Related Concrete Structures;" and the development of a concrete inspector training and qualification program. The AMP inspections took place prior to the TS specified date of June 2014.

SAR Table 9.2-1 required a weekly check of the MVDS seismic restraints. The same records that were reviewed for Technical Specification 3.1.1.1, above, were reviewed to verify the performance of this requirement. The licensee had completed the required visual check on the seismic restraints as required by the SAR with no discrepancies noted. Additionally, the seismic restraints were verified as engaged during the week of the inspection.

NRC License SNM-2504, Condition 9 authorizes use of the ISFSI, in part, in accordance with statements, representations, and the conditions of the SAR as supplemented and amended in accordance with 10 CFR 72.70 and 10 CFR 72.48. SAR Section 9.8, Aging Management Program, required that one FSC in each of six vault modules be sampled for hydrogen gas buildup no later than December 31, 2016 (as documented through the licensee's 10 CFR 72.48 process and two license exemption requests). Contrary to the SAR requirement, the licensee had not successfully performed the hydrogen measurement by the specified deadline. In addition, the licensee failed to complete the 10 CFR 72.48 screen or evaluation required for extending the date as specified in the SAR requirements and documented in the two license exemption requests (ML15156A356 and ML161173A007).

The licensee entered the failure to complete the hydrogen test into their CAP as DR-2017-004. The failure to complete a 10 CFR 72.48 screening or evaluation to deviate from a SAR requirement was entered into their CAP as DR-2017-003. The failure to successfully perform the hydrogen test was viewed as having a low safety significance, since analyses have showed that neither oxygen levels nor gas temperatures present in an FSC would be favorable to a hydrogen ignition event. In addition, there are no credible sources of sparks in a stationary FSC. The FSV SAR

stated that prior to any fuel movements the licensee will analyze the gas environment in the FSC, determine if flammable levels of hydrogen are present, and evacuate or purge the FSC with air. These measures would assure that hydrogen concentrations are below flammable levels prior to any fuel movements. However, the performance of the hydrogen test remains a standing DOE commitment to the NRC from the license renewal process. DR-2017-003 documented that the licensee will submit a letter to the NRC updating their commitment to perform the hydrogen test no later than June 2017. The required 10 CFR 72.48 screening (STI-17-017) to extend the date of the SAR required hydrogen test was completed and signed on February 9, 2017.

The NRC has determined this to be a Severity Level IV Violation of an NRC license requirement. Since licensee staff have entered the issue into their CAP, the safety significance of the issue was low, and because the violation was not willful or repetitive, this violation was treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 072-009/1602-01).

h. Emergency Planning

Revisions to the licensee's emergency planning program since the last NRC inspection in February 2014 were reviewed. TPLN-143, "ICP FSV Emergency Response Plan," had been revised once since the last inspection. The E-Plan was currently on Revision 14. Four minor changes had been made since its previous revision. The changes were limited to listing additional agencies and procedures in various appendices to the E-Plan and editorial/formatting changes. The changes to the E-Plan were screened through the 72.48 process and determined to have not reduced the effectiveness of the plan.

Required emergency plan drills/exercises were listed in Section 6.6.1.2 of the E-Plan. The required periodic drills included radiological/health physics, medical, and fire. Biennial exercises were larger drills that tested the adequacy of the implementing plan procedures, emergency equipment and communications networks, and ensured that emergency response personnel were familiar with their duties. Offsite response organizations were invited to participate in the biennial exercises. The licensee had conducted 33 drills and exercises since the last ISFSI inspection. NRC inspectors reviewed exercise after action reports (AARs) for the two biennial exercises that took place since the last inspection. Those exercises occurred on May13-14, 2014, and September 20, 2016. The biennial exercises met the objectives of site E-Plan. The exercise AARs included a description of the exercise, the scenario, and identification of exercise weaknesses. The exercise deficiencies that were identified were placed into the licensee's corrective action program for resolution. FSV had invited several offsite support agencies to participate in its biennial exercises. The offsite agencies that participated 2014 and 2016 biennial exercises included the North Colorado Medical Center, Banner Health Paramedic Services, Platteville/Gilcrest Fire Protection District, Weld County Sheriff's Office, and others.

The licensee's Letters of Agreement (LOAs) with offsite response agencies per Section 6.6.2.3 of their E-Plan were reviewed by the inspectors. The number of LOAs with offsite agencies was down to four from five, because two of the previous organizations had merged into one. The reviewed LOAs had not expired and were documented as current. The organizations included North Colorado Medical Center, Platteville/Gilcrest Fire Protection District, Weld County Sheriff's Department, and the DOE Golden Field Office.

i. Organization and Training

During this inspection the facility was being maintained by STI as the management and operations contractor for DOE-ID. STI replaced the former management and operations contractor for the ISFSI, CWI. NRC received notification of the change in ISFSI management in a letter dated January 12, 2016 (ML#16021A478). The official transition date was March 31, 2016. As required by License Condition 14, DOE-ID submitted a letter to NRC, on September 27, 2016, (ML#16287A428) verifying that the replacement contractor had no negative effect on the execution of licensed responsibilities for FSV.

According to TS 5.3.1, each member of the facility staff must meet the minimum qualifications specified in the FSV SAR, Section 9.1.4.1, Minimum Qualification Requirements. The listed requirements established specific education and training requirements for certain positions at the FSV ISFSI. Two individuals had transitioned into management positions at FSV since the last NRC routine inspection. The NRC inspectors reviewed the qualifications of the two individuals against the position qualifications specified in the FSV SAR for the positions of Quality Assurance Manager and Manager ISFSI Management. The NRC inspector determined that the two individuals' training and experience identified in supporting documentation met all the specified SAR requirements.

SAR Section 9.1.3.1.1 and license Technical Specification 5.2.1 required that a Safety Review Committee (SRC) be formed to oversee operations at the FSV ISFSI. The SRC was stipulated in the license as having a minimum of three committee members including required representation of technical disciplines appropriate for matters under consideration with the Facility Director required to establish a quorum. In addition, the SRC was required to meet at least once every twelve months and at least once not more than three months prior to the start of defueling operations.

The NRC inspector reviewed the minutes from four SRC meetings that took place on April 24, 2014, November 17, 2014, September 30, 2015, and August 9, 2016. The frequency of the meetings satisfied the 12 month frequency of the Technical Specification requirement. A review of the attendance lists for the meetings also confirmed that a quorum had been established for each meeting. Additionally, the NRC inspector confirmed that as required by TS 5.2.1.4 the annual agenda topics covered included performance indicators; evaluations performed pursuant to 10 CFR 72.44(e), 10 CFR 44(f), 10 CFR 72.48, etc.; proposed license amendments; selected activities of the ALARA committee and staff level document review committee; routine operations and preparation for major operations for potential safety hazards; and special reviews at the direction of the FSV Facility Director. The issues discussed in the meetings were consistent with the objectives specified in the SAR and license Technical Specifications.

1.3 Conclusions

The licensee was conducting quality assurance audits of the ISFSI program. A review of the audit and surveillance reports documented since the last inspection determined that the quality assurance group was covering risk significant areas within a broad range of topics. Any issues that were identified in the reports were entered into the site corrective action program for resolution.

Radiation levels around the ISFSI facility were within the expected range. The ISFSI facility was being maintained in good physical condition. Based on documents reviewed and interviews with personnel, areas with observable degradation were repaired or remediated through the site's aging management program. At the time of the inspection there were no observable signs of degradation. Radiation levels inside the facility were near background levels and areas inside the facility with radiological dose rates were properly posted.

Environmental data reviewed from the 2014 and 2015 environmental reports determined that radiation levels offsite were not being significantly impacted by the ISFSI.

The inspectors reviewed radiation and contamination survey results for the FSV ISFSI. Radiation levels were as expected and no removable contamination was reported at FSV. The inspector also reviewed samples of tritium monitoring results from 2014, 2015, and 2016. In no instance was tritium measured above the MDL in any sample result. Sealed source leak test results indicated that the licensee's single non-exempt check source had remained intact.

Revisions to the SAR and changes to other major programs since the last inspection were reviewed. There were no changes made to the REMP or natural gas and oil infrastructure near the site. However, small changes were made to the training and QA programs to reflect updated requirements and to reflect changes in the structure and responsibilities of the organization. None of those changes reduced the effectiveness of the programs. The FSV SAR, Revision 12 changes were reviewed and found to be acceptable and within the requirements of the 10 CFR 72.48 process.

Selected DRs were reviewed for the period February 2014 through November 2016. A wide range of issues had been identified and resolved. Resolutions of the identified deficiencies were appropriate for the safety significance of the issue. No adverse trends were identified during the review.

Site required surveillances associated with inspection of cooling inlet and outlet screens and checks of the equipment seismic restraints had been conducted in accordance with the requirements of the FSV Technical Specifications and SAR requirements. The FSV AMP requirements were incorporated in the licensee's Technical Specifications and SAR through the license renewal process in 2011. At the time of the inspection, the licensee had performed most of the required inspections and maintenance associated with the AMP. One exception to the AMP requirements was noted. The FSV SAR Section 9.8 required that a one-time hydrogen sampling test take place at the ISFSI before June 31, 2015. This date was extended to December 31, 2016 through the 10 CFR 72.48 process and documented in two license exemption requests (ML#15156A356 and ML#161173A007). However, at the conclusion of the final exit on February 24, 2017 the licensee had not successfully completed this test. The failure of the licensee to perform the test within the required timeframe or to perform a 10 CFR 72.48 evaluation to extend the date was found to be a violation of NRC requirements. This violation was identified as a Severity Level IV, Violation of SNM 2504 License Condition 9. Since the licensee had placed the issue into their corrective action process, the violation was not repetitive, and not willful, the violation was treated as a NCV in accordance with Section 2.3.2 of the Enforcement Policy.

The FSV E-Plan was being maintained and was currently in Revision 14. Four changes had been made to the E-Plan since the last inspection. The changes were determined to have not caused a reduction in the effectiveness of the E-Plan. Drills, exercises, and training were performed in accordance with requirements of the E-Plan. Offsite support agencies participated in the two (May 2014 and September 2016) biennial emergency response exercises performed since the last NRC inspection.

The ISFSI organization changes since the last inspection were reviewed for compliance with the FSV SAR staffing requirements and qualifications of personnel. The personnel added to the DOE-ID ISFSI program since the last NRC inspection met the requirements specified in the SAR. The SRC had met at least annually and reviewed issues consistent with requirements of the SAR and the license's Technical Specifications.

2 Review of 10 CFR 72.48 Evaluations (60857)

2.1 Inspection Scope

The licensee's 10 CFR 72.48 screenings and evaluations since the 2014 NRC ISFSI inspection were reviewed to determine compliance with regulatory requirements.

2.2 Observations and Findings

The licensee's 10 CFR 72.48 screenings and evaluations since the last NRC routine ISFSI inspection were reviewed to determine compliance with regulatory requirements. The licensee utilized Procedure MCP-2925, "Screen and Evaluate Changes," Revision 19 to perform the 10 CFR 72.48 safety screenings and evaluations. The licensee reported that it had been in the process of making numerous modifications in and around their ISFSI facility. Several screenings and evaluations had been performed since the last NRC inspection. From a list of screens provided by the licensee, 14 screens and two safety evaluation were selected for closer review. The screenings ranged from simple procedure revisions to modifications made to the ISFSI inlet structure. The evaluations were related to large-scale modifications being made to ISFSI infrastructure and NRC license exemption requests. The NRC inspectors determined that all 10 CFR 72.48 screenings and evaluations reviewed were adequately evaluated, with one exemption as discussed in section 1.2.g of this report.

2.3 Conclusions

The licensee's required safety screenings and evaluations had been performed in accordance with site procedures and 10 CFR 72.48 requirements, with one exception (see Section 1.2.g). All other screenings and evaluations reviewed were determined to have been adequately evaluated.

3 Physical Security Requirements

3.1 Inspection Scope

Review all aspects of site security operations during fuel handling evolutions to ensure compliance with NRC Confirmatory Order EA-14-049.

3.2 Observations and Findings

On November 8-9, 2016, two regional physical security inspectors completed an announced security inspection. The inspectors reviewed selected licensee corrective action program documents, observed security officers completing required duties, and discussed observations with supervisors and managers.

3.3 Conclusion

All aspects of site security operations during preparations for technical specification surveillances were observed and assessed against NRC Confirmatory Order EA-14-049. No findings of significance were identified.

4 Exit Meeting

The inspectors presented the inspection results to the licensee's representatives during a final telephonic exit conducted on February 24, 2017. Representatives of the licensee acknowledged the findings as presented. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

S. Ferrara, Facility Director, DOE
D. Bland, ISFSI Program Manager, STI
F. Borst, Facility Manager, STI
J. Stalnaker, System Engineer, STI
A. Fahrenbruch, Physical Security Analyst, WAI
J. Newkirk, FSV Safety Officer, WAI

INSPECTION PROCEDURES USED

IP 60858 Away-From-Reactor ISFSI Inspection Guidance
IP 60857 Review of 10 CFR 72.48 Evaluations
NRC Confirmatory Order EA-14-049

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

07200009/2016002-01	NCV	Failure to operate in accordance with ISFSI License SNM 2504 Condition 9.

Discussed

None

Closed

None

LIST OF ACRONYMS

AAR	after action reports
ACI	American Concrete Institute
ADAMS	Agencywide Documents Access and Management System
ALARA	As low as reasonably achievable
AMP	Aging Management Program
CAP	Corrective Action Program
CAQ	conditions adverse to quality
CAR	Condition Action Request
CFR	Code of Federal Regulations
CWI	CH2M-WG Idaho, LLC
DOE-ID	Department of Energy Idaho Operations Office
DNMS	Division of Nuclear Material Safety
DR	Deficiency Report
E-plan	Emergency Response Plan
FSAR	Final Safety Analysis Report
FSC	Fuel Storage Container
FSV	Fort Saint Vrain
ICARE	Issue Communication and Resolution Environment system
ICP	Idaho Cleanup Project
ISFF	Idaho Spent Fuel Facility
ISFSI	Independent Spent Fuel Storage Installation
LOA	Letters of Agreement
MDL	Minimum Detectable Level
µR/h	microRoentgens per hour
mrem	milliRoentgen equivalent man
mR/h	milli-Roentgens per hour
MVDS	Modular Vault Dry Store system
NCV	non-cited violation
NRC	U.S. Nuclear Regulatory Commission
OSLD	optically stimulated luminescent dosimeters
QA	Quality Assurance
QAMA	quality assurance management assessments
REMP	Radiological Environmental Monitoring Program
RP	radiation protection
SAR	Safety Analysis Report
SRC	Safety Review Committee
STI	Spectra Tech, Incorporated
TMI-2	Three Mile Island, Unit 2
TPR	Technical Procedure
trending report	quality assurance program annual trending report
TLD	thermoluminescent dosimeter

FORT SAINT VRAIN INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)
INSPECTION REPORT 07200009/2016002, 07200009/2016404 - DATED MARCH 23, 2017

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ADAMS ACCESSION NUMBER: ML17059C642

☒ SUNSI Review By: EJS	ADAMS: ☒ Yes ☐ No	☐ Sensitive ☒ Non-Sensitive	☐ Non-Publicly Available ☒ Publicly Available	Keyword NRC-002

OFFICE	RIV:DNMS/FCDB	RIV:DNMS/FCDB	RIV:DRS/PSB1	RIV:DRS/PSB1 C	RIV/DNMS/DD
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