



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

August 29, 2023

Robert Compernelle, President
Fansteel Metals, Inc., formerly
known as FMRI, Inc.
10 Tantalum Place
Muskogee, OK 74403

SUBJECT: FANSTEEL METALS – NRC INSPECTION REPORT 2023-001

Dear Robert Compernelle:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on August 1-2, 2023, at your facility located in Muskogee, Oklahoma. This inspection examined activities conducted under your license as they relate to public health and safety, and to confirm compliance with the Commission's rules and regulations and with the conditions of your license.

Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, independent radiation measurements, and interviews with personnel. The inspection findings were discussed with James Burgess, General Manager, and Robert Miller, Radiation Safety Officer, on August 2, 2023. The enclosed report presents the results of the inspection. No violations were identified as a result of this inspection.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response, if you chose 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 Martha Poston-Brown at 817 200-1181 or the undersigned at 817-200-1249.

Sincerely,



Signed by Warnick, Gregory
on 08/29/23

Gregory G. Warnick, Chief
Decommissioning, ISFSI, and
Operating Reactor Branch
Division of Radiological Safety and Security

Docket No. 04007580

License No. SMB-911

Enclosure:

Inspection Report No. 040-07580/2023-001

cc w/enclosure:

K. Cornelius, ODEQ

D. Davidson, ODEQ

K. Bufford, ODEQ

J. Burgess, Fansteel Metals, Inc.

NRC INSPECTION REPORT 040-07580/2023-001 DATED AUGUST 29, 2023.

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NRC INSPECTION REPORT 040-07580/2023-001

ADAMS ACCESSION NUMBER: **ML23230A673**

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**U. S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket No. 040-07580

License No. SMB-911

Report No. 040-07580/2023-001

Licensee: Fansteel Metals, Inc., formerly known as FMRI, Inc.

Facility: Muskogee Plant

Location: Muskogee, OK

Dates: August 1-2, 2023

Inspectors: Martha R. Poston, Health Physicist
Uranium Recovery and Materials Decommissioning Branch
Decommissioning, Uranium Recovery and Waste Programs Division
Office of Nuclear Materials Safety and Safeguards

Stephanie G. Anderson, Senior Health Physicist
Decommissioning, ISFSI, and Operating Reactor Branch
Division of Radiological Safety and Security

Accompanied by: Christian R. Dennes, Health Physicist
Decommissioning, ISFSI, and Operating Reactor Branch
Division of Radiological Safety and Security

Kelsey Bufford, Superfund Program Manager
Site Restoration and Revitalization
Cleanup and Redevelopment Branch
Land Protection Division
Oklahoma Department of Environmental Quality

Dustin Davidson, Environmental Programs Manager
Site Restoration and Revitalization
Cleanup and Redevelopment Branch
Land Protection Division
Oklahoma Department of Environmental Quality

Approved by: Gregory G. Warnick, Chief
Decommissioning, ISFSI, and Operating Reactor Branch
Division of Radiological Safety and Security

Enclosure

EXECUTIVE SUMMARY

Fansteel Metals, Inc.
NRC Inspection Report 040-07580/2023-001

This inspection was a routine, announced U.S. Nuclear Regulatory Commission (NRC) inspection of decommissioning activities being conducted at the Fansteel Metals, Inc. (FMRI) site in Muskogee, Oklahoma. Within the scope of the inspection, no violations were identified.

Observation of Decommissioning Activities

- The inspectors identified some building and housekeeping degradation during a walkdown of the facility to observe the status of materials and equipment and the conditions of the buildings and operating systems. The housekeeping and building degradation issues were observed but did not involve the safe control and storage of licensed material. The licensee has taken action to store hazardous materials in safer parts of the building. (Section 1.2)

Occupational Radiation Protection

- The licensee implemented its radiation protection program in accordance with license and regulatory requirements. The licensee's records indicated that no workers were assigned an occupational exposure since the last inspection, all workers received required training, and no contamination issues were identified. (Section 2.2)

Security and Control of Radioactive Material

- The licensee has adequate controls in place to protect occupational workers and the public from the radioactive materials. To the extent possible, access to radioactive materials and hazardous materials are controlled by the use of locked doors and fences as well as appropriate posting and labelling. The impact on these security programs once funding is exhausted was not evaluated. (Section 3.2)

Waste Generation, Storage and Transportation

- The NRC inspectors confirmed that the licensee's program for managing and storing solid waste material was performed in accordance with license and regulatory requirements. The licensee has not transported any radioactive material offsite since the previous inspection. The licensee continued to operate the wastewater treatment system as required by the decommissioning plan. (Section 4.2)

Public Dose, Effluent Releases and Environmental Monitoring

- The licensee conducted environmental and effluent monitoring in accordance with the license and regulatory requirements. (Section 5.2)

Management Organization and Controls

- The licensee maintained adequate staffing and a program commensurate with the scope and risk associated with the site activities to ensure compliance with license and regulatory requirements. The licensee had emergency response and fire protection programs in effect that were appropriate for the current mode of plant operation and for licensee response. (Section 6.2)

Report Details

Site Status

The licensee started Phase 1 decommissioning work in 2005. Phase 1 decommissioning work included removal of Work-in-Process (WIP) residue material from Ponds 2 and 3 and shipment of the material to an out-of-state uranium mill for use as alternate feed material. The removal of WIP from Pond 3 was completed in 2010. The licensee began removing WIP material from Pond 2 in August 2011 but suspended this work in December 2011. At the time of this inspection, the licensee continued to suspend Phase 1 decommissioning due to insufficient funds. At the current spend rate, the funds for decommissioning the site are expected to be exhausted in October of 2024.

Site activities in progress during the inspection included routine license compliance activities. The licensee continued to operate the wastewater treatment system and to conduct routine radiological monitoring and surveys. In addition, the licensee occasionally decontaminated, surveyed, and free-released material from the site.

License Conditions 10 and 26 include requirements for the licensee's wastewater discharge permit. The licensee received an updated permit from the Oklahoma Department of Environmental Quality which became effective on October 1, 2020. The revised permit changed several of the water sampling frequencies and sample analysis requirements.

In accordance with NRC Materials License SMB-911, License Condition 42, the licensee is required to submit annual updates of the decommissioning schedule to the NRC. The licensee submitted the most recent schedule to the NRC by letter dated January 12, 2023¹. According to the licensee's letter, the only activities scheduled for 2023 and beyond were groundwater treatment and routine health and safety activities.

License Conditions 43, 44, and 45 require the licensee to submit annual updates for expenses, income, and cost estimates. The licensee provided the requested information by letter dated March 31, 2023². The inspectors confirmed that the licensee had submitted the required financial information, although review of these requirements is performed by the NRC Project Manager. The inspection was performed in accordance with Inspection Procedure 87104 titled Decommissioning Inspection Procedure for Materials Licensees.

¹ Agencywide Document Access and Management System (ADAMS) Accession No. ML23047A049

² ADAMS Accession No. ML23115A336

1 Observation of Decommissioning Activities (Risk Module (RM)-01)

1.1 Inspection Scope

Perform a walkdown of the licensed facility with licensee and the Oklahoma Department of Environmental Quality (ODEQ) and discuss site status under the license and regulatory requirements and assist the ODEQ Superfund Program in getting familiar with the site. Observe ongoing or completed activities that require written procedures, work plans, hazard assessments, or radiation work permits. Identify hazards and review licensee commitments in license documents and reference documents such as material safety data sheets to familiarize themselves with potential hazards onsite.

1.2 Observations and Findings

The inspectors conducted a site walkdown accompanied by representatives of ODEQ, Land Protection Division, due to FMRI recently being added to the U.S. Environmental Protection Agency's National Priority List at the request of the Governor of Oklahoma. During the walkdown, the inspectors were able to assess the condition of the various buildings and the ponds onsite. Pond 3 has been remediated. In addition to the radioactive materials stored in the Chem C building and the sodium reduction building discussed in Section 3 (Security and Control of Radioactive Materials), trash and some non-hazardous liquids are stored in the Chem C building. Liquids have been removed from metal drums and transferred to plastic drums and the majority of the trash has been transferred from metal drums to supersacks. Due to the rusted condition of some metal drums, a small amount of trash was left in the drums rather than risking injury to laborers during transfer. The rusted drums (most empty) continue to be stored in the Chem C building. The roof on the Chem C building has open areas due to a skylight where the glass has been removed or broken, but otherwise appeared to be in reasonable condition.

Some hazardous liquids and potentially contaminated trash were stored in the Chem A building, either in the small bay at the back of the building (trash) or the northside of the large main bay. The floor of the Chem A building has depressions where grating should be in place to make the floor level, however, the grating has either fallen into the depression or has been removed. The north side of the building where the floor for the second story (roof of the first story) is in relatively good condition, but the south side of Chem A which is a mixture of 2 distinct levels as seen on the north side of the building and an open bay two stories high (with no floor separation), shows signs of damage. Specifically, debris on the floor of the open bay shows a lot of crumbling of the structure and there are several places where sunlight shines into the Chem A building. Despite this evidence of building degradation, the inspectors did not identify any issues associated with the safe control and storage of licensed material.

The inspectors did not go inside the former sodium reduction building due to limited walk-in access to the building due to the stacking of the supersacks. The inspectors walked around all the ponds to assess conditions, the pond levels were low with many floats resting on what appeared to be dry soil.

1.3 Conclusions

The inspectors identified some building and housekeeping degradation during a walkdown of the facility to observe the status of materials and equipment and the conditions of the buildings and operating systems. The housekeeping and building degradation issues were observed but did not involve the safe control and storage of licensed material. The licensee has taken action to store hazardous materials in safer parts of the building.

2 **Occupational Radiation Protection (RM-02)**

2.1 Inspection Scope

Assess trends in radiation protection program performance such as increase in occupational exposure. Assess implementation of ALARA principles. Review employee training, radiation work permits, routine monitoring, instrument calibration and other elements of the radiation protection program.

2.2 Observations and Findings

The licensee maintained a radiation protection program commensurate with the limited activities in progress. The radiation protection program activities in place at the time of the inspection included routine radiological surveys, worker training, and instrument calibrations. Equipment release surveys were conducted as needed to support site activities. No special work permits were issued since the last inspection, and no occupational monitoring was conducted since the last inspection.

The licensee discontinued use of external personnel monitoring devices at the end of 2007 as allowed by Title 10 of the *Code of Federal Regulations* (10 CFR) 20.1502, based on historical results and the work activities onsite. The licensee also discontinued the use of personnel lapel air samplers for monitoring internal dose in 2012.

Part B to the license, referenced in License Condition 10, states in part, that radon sampling is conducted on a quarterly basis in areas identified by the radiation safety officer (RSO). Currently this sampling is limited to the Chem A building.

The inspectors reviewed a selection of the daily, weekly, bi-weekly, monthly, quarterly, and annual surface contamination and area radiation surveys conducted since the previous inspection. The RSO established the survey frequencies based on prior history and a checklist of required surveys is maintained by the health physics technician responsible for conducting the surveys at the site. All survey forms were determined to be complete with the specific locations of measurements being specified on the forms. No survey result exceeded the associated action levels. The inspectors noted that the completed surveys were reviewed by the RSO.

The licensee established a program for routine site inspections. The routine inspections were documented on log sheets that specified the attribute to be inspected and the frequency requirement. The items inspected included survey

meter source checks, perimeter sample station checks, pond pH level measurements, and visual inspection of the licensed area including fire protection equipment, locked doors, secure environmental sampling equipment, and posting. The inspectors confirmed that the licensee was maintaining its program for routine site inspections. Routine site inspections and surveys are performed by the health physics technician and reviewed and approved by the RSO. These records were reviewed, and only minor errors were identified.

Radiation safety training was provided annually to all site workers in June and July of 2023. The training included emergency response training. Visitors to the site were provided safety and health training before being allowed to access areas other than the administration building.

The licensee continued to maintain calibration records for the radiological survey meters, filter sample counter, and environmental air samplers in use at the site. The inspectors verified instruments in use had current calibrations and were in working order.

License Condition 33 requires, before the release of any equipment, characterization of all interior and exterior surfaces including remediation as appropriate in accordance with Regulatory Guide 1.86. Four equipment releases surveys to allow for equipment maintenance or repair were conducted in calendar year (CY) 2022 since the previous inspection and no concerns were found. No equipment releases have been needed for CY 2023 year to date.

2.3 Conclusions

The licensee implemented its radiation protection program in accordance with license and regulatory requirements. The licensee's records indicated that no workers were assigned an occupational exposure since the last inspection, all workers received required training, and no contamination issues were identified.

3 **Security and Control of Radioactive Materials (RM-03)**

3.1 Inspection Scope

Observe the licensee's security and control of radioactive materials with particular emphasis on storage of radioactive waste.

3.2 Observations and Findings

The inspectors observed the licensee's security of the facility and control of licensed material. The licensee uses a monitored security system which includes motion detectors and alarming entries. The general manager is notified by phone if the security system is triggered. If the general manager does not respond to the alerts in a timely manner, the security company will contact the local police. The licensee also maintains a posted perimeter fence and gates around the licensed area.

The inspectors reviewed the licensee's indoor storage of licensed material. At the time of the inspection, the licensee was storing bagged WIP material within the Chem C building and the sodium reduction building. The inventory of material onsite has not changed since the previous inspection, as the licensee has not shipped any of the waste material offsite since the previous inspection. The licensee also continued to store about 7,000 cubic yards of potentially contaminated soil in an outdoor area under synthetic liners. The liner has deteriorated such that approximately half of the soil is exposed, and vegetation has started to grow in that exposed soil. The inspectors walked around the soil pile and did not see any signs of animal intrusion and only small amounts of rilling.

3.3 Conclusions

The licensee has adequate controls in place to protect occupational workers and the public from the radioactive materials. To the extent possible, access to radioactive materials and hazardous materials are controlled by the use of locked doors and fences as well as appropriate posting and labelling.

4 **Waste Generation, Storage and Transportation (RM-04)**

4.1 Inspection Scope

Verify the licensee has transferred or disposed of license material in accordance with NRC requirements. Review waste packaging, storage, loading and transportation activities onsite and any associated records based on these activities since the last inspection.

4.2 Observations and Findings

The Chem C building houses a collection of rusting metal drums, many were empty as the contents have been transferred into plastic drums (liquids) or supersacks (trash). More hazardous material, such as kerosene was stored in the Chem A building. There are a few smaller bays in the Chem A building one of which is an alternate trash storage area and a main bay. Plastic barrels containing kerosene were stored on the North end of the main bay for the Chem A building due to concerns with the integrity of the roof in the Chem A building on the south side. There were several locations on the south side of the main bay where sunlight filters through and other areas where rubble from the roof supports has fallen to the floor of the building. The roof on the north side of the Chem A building does not show these same signs of deterioration. Near the maintenance shack behind Chem A there is a small boneyard of equipment, piping, and tanks starting to accumulate. When asked, the RSO indicated that this material in the boneyard was not contaminated. Contaminated soils removed from the soil and transferred to supersacks were still stored in sodium reduction building onsite, awaiting the funds for shipping to a disposal facility. Since the site has no funding to continue with the decommissioning work, trash and other items have accumulated onsite. No shipments of radioactive material offsite have occurred since the previous inspection.

4.3 Conclusions

The inspectors confirmed that the licensee's program for managing and storing solid waste material was performed in accordance with license and regulatory requirements. The licensee has not transported any radioactive material offsite since the previous inspection.

The licensee continues to operate the wastewater treatment system as required by the decommissioning plan.

5 Public Dose, Effluent Releases and Environmental Monitoring (RM-05)

5.1 Inspection Scope

Verify that the licensee is implementing a radiation protection program that ensures radiation dose levels and effluent releases in unrestricted areas did not exceed the limits for public dose during decommissioning. Assess trends in effluent and environmental monitoring data, including groundwater monitoring.

5.2 Observations and Findings

The licensee's airborne effluent monitoring program was described in the July 24, 2003, decommissioning plan letter referenced in License Condition 10. The program included monitoring the licensee's release rates of uranium and thorium by measuring alpha activity in weekly air samples continuously collected at six locations. The inspectors confirmed the alpha sample results were below the licensee's approved administrative level of 2.85E-14 microcuries per milliliter ($\mu\text{Ci}/\text{mL}$) and the action level of 4.3E-14 $\mu\text{Ci}/\text{mL}$ since the previous inspection. In addition, quarterly radon samples were collected at three locations: the background perimeter, environmental perimeter (which represents the maximum exposed member of the public), and the front gate. Radon concentrations since the previous inspection were verified by the inspectors to be below ten percent of the effluent limit.

License Conditions 10 and 26 reference Part B of the license application and the 2003 decommissioning plan. Section 11 of the 2003 decommissioning plan described the requirements for the liquid effluents and environmental monitoring programs. Additional liquid effluent requirements were provided in the licensee's discharge permit issued by ODEQ. Groundwater collected from the intercept trench and the Pond 3 French drain was treated and discharged into the Arkansas River through Outfall 001. Three additional outfalls into the Arkansas River, Outfalls 002, 003, and 005, were used only for discharge of storm water runoff. The rainfall in CY 2023 has been so sparse, that discharge of storm water runoff through Outfalls 002, 003 and 005 has not been needed. The licensee was required to collect water samples prior to Outfall 001 releases.

Nineteen wells and four sumps were used to monitor groundwater at the site. Samples collected since the last inspection were reviewed and none of the sample results exceeded the 15 picocuries per liter (pCi/L) action level for gross alpha or the 50 pCi/L action level for gross beta. In summary, the licensee had implemented the liquid effluent and groundwater monitoring programs as described in the 2003 decommissioning plan.

5.3 Conclusions

The licensee conducted environmental and effluent monitoring in accordance with the license and regulatory requirements.

6 Management Organization and Controls (RM-06)

6.1 Inspection Scope

Verify the licensee has implemented the appropriate programs for management oversight and control of decommissioning activities. Ensure the licensee maintained adequate staffing and a program commensurate with the scope and risk associated with the current activities to ensure compliance with the license and regulatory requirements.

6.2 Observations and Findings

The licensee's organizational requirements are provided in Figure 9-1 of the 2003 decommissioning plan, referenced in License Condition 10.

Staffing consisted of the general manager, health physics technician, and a part time primary RSO. The general manager assumes the position of alternate RSO when the primary RSO is not onsite. The general manager reported to the company president, who occasionally visited the FMRI site. The licensee had established arrangements with a contract firm for a supply of laborers should the need arise for additional staff. In summary, site staffing was adequate to ensure compliance with regulatory and license requirements and commensurate with the scope and risk associated with current site activities.

License Conditions 10 and 14 specify the requirements for the radiation safety committee. The licensee's records indicated that the committee met quarterly as required. Annual program reviews were conducted as required by 10 CFR 20.1101(c) and License Condition 10. The annual program review for 2022 was attached to the 4th quarter radiation safety committee report. The 2023 annual audit had not been completed at the time of inspection. The 2022 annual audit report was reviewed by the inspectors and provided a comprehensive overview of the radiation protection program.

6.3 Conclusions

The licensee maintained adequate staffing and a program commensurate with the scope and risk associated with the site activities to ensure compliance with license and regulatory requirements.

7 Final Status Surveys (RM-07)

Risk Module 7, Final Status Surveys was not reviewed during this inspection as there was not property identified by the licensee that was ready for survey to release from the licensed area.

8 Exit Meeting Summary

The inspectors presented the inspection results to the licensee's representatives on August 2, 2023. 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

J. Burgess, General Manager
G. Daniels, Health Physics Technician
R. Miller, Radiation Safety Officer

Inspection Procedure Used

IP 87104 Decommissioning Inspection Procedure for Materials Licensees

Items Opened, Closed and Discussed

Open

None

Closed

None

Discussed

None

List of Acronyms

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
CY	Calendar Year
IP	Inspection Procedure
µR/hr	microrentgen/per hour
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
RM	Risk Module
RSO	Radiation Safety Officer
WIP	Work in Process