



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-4511

April 17, 2019

Mr. Robert Compernelle, President
FMRI, Inc.
Number 10 Tantalum Place
Muskogee, OK 74403

SUBJECT: FMRI, INC. – NRC INSPECTION REPORT 040-07580/2019-001

Dear Mr. Compernelle:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on March 11-12, 2019, 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, conduct of independent radiation measurements, and interviews with personnel. The inspection findings were discussed with Mr. James Burgess, General Manager, and Mr. Robert Miller, Radiation Safety Officer, at the conclusion of the onsite inspection on March 12, 2019. The enclosed report presents the results of the inspection. No violations were identified, and no response to this letter is required.

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.

R. Compennolle

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Should you have any questions concerning this inspection, please contact Ms. Marti Poston, Health Physicist, at 817-200-1181 or the undersigned at 817-200-1156.

Sincerely,

/RA by JFK, PhD, CHP Acting for/

Heather J. Gepford, PhD, CHP Branch Chief
Materials Licensing and Decommissioning
Branch
Division of Nuclear Materials Safety

Docket No.: 040-07580

License No.: SMB-911

Enclosure:

Inspection Report No. 040-07580/2019-001

Attachment:

Supplemental Information

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

Docket No.: 040-07580
License No.: SMB-911
Report No.: 040-07580/2019-001
Licensee: FMRI (a subsidiary of Reorganized Fansteel, Inc.)
Fansteel, Inc.
Facility: Muskogee Plant
Location Inspected: Muskogee, OK
Inspection Dates: March 11-12, 2019
Inspectors: Marti R. Poston, Health Physicist
Fuel Cycle and Decommissioning Branch
Chris D. Steely, Health Physicist
Fuel Cycle and Decommissioning Branch
Austin C. Roberts, Health Physicist
Fuel Cycle and Decommissioning Branch
Approved by: Heather J. Gepford, PhD, CHP, Chief
Materials Licensing and Decommissioning Branch

Enclosure

EXECUTIVE SUMMARY

FMRI (a subsidiary of Reorganized Fansteel) and Fansteel, Inc.
NRC Inspection Report 040-07580/2019-001

This inspection was a routine, unannounced inspection of decommissioning activities being conducted at the FMRI site in Muskogee, Oklahoma. Within the scope of the inspection, no violations were identified.

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. (Section 1.2)

Radiation Protection and Maintenance and Surveillance of Safety Controls

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)

Low Level Radioactive Waste Storage, Solid Waste Management and Transportation of Radioactive Materials

The NRC inspectors confirmed that the licensee's program for managing, transporting, and storing radioactive waste material was performed in accordance with license and regulatory requirements. The licensee has not transported any radioactive material offsite since the previous inspection. (Section 3.2)

Effluent Control and Environmental Protection

The licensee conducted environmental and effluent monitoring in accordance with license conditions and regulatory requirements. (Section 4.2)

Emergency Preparedness and Fire Protection

The license had emergency response and fire protection programs in effect that were appropriate for the current mode of plant operations and licensee response. The licensee took appropriate corrective actions to address a previously identified violation associated with its fire protection program. (Section 5.2)

REPORT DETAILS

Site Status

The license started Phase 1 decommissioning work in calendar year (CY) 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 licensee stated by removing, bagging, and shipping WIP material from Pond 3 in CY2005. The removal of WIP from Pond 3 was completed in CY2010.

The licensee began removing WIP material from Pond 2 in August 2011 but suspended this work in December 2011. Since CY2011, the license conducted bagging and shipping operations on an intermittent basis as funds were available to perform these activities. During 2017, the license shipped previously bagged WIP material. At the time of the inspection, the license had suspended Phase 1 decommissioning due to lack of funds.

The license continues to decontaminate, survey, and free-release scrap material from the site. The license also continued to operate the waste water treatment system in accordance with license requirements. This system processed waste water for release through a monitored outfall. The license continued to conduct routine radiological monitoring and surveys in accordance with license requirements.

In accordance with NRC License SMB-911, License Condition (LC) 42, the licensee is required to submit an annual update of the decommissioning plan schedule. The licensee submitted the most recent schedule update to the NRC on January 15, 2019. The most current schedule indicates that Phase 1 decommissioning is anticipated to be completed by the end of 2019 but is subject to uncertainties based on funding.

NRC License SMB-911, originally issued in 1967, expired on September 30, 2002, although it has continued in effect, in accordance with Title 10, *Code of Federal Regulations* (CFR) 40.42(c).

1 **Management Organization and Controls (IP 88005)**

1.1 Inspection Scope

Ensure the licensee has established an organization to administer the technical and safety policies, programs, and procedures necessary, commensurate with the scope and risks associated with the program, to satisfy NRC regulatory requirements and the requirements as detailed in the NRC license.

1.2 Observations and Findings

The licensee's organizational requirements are provided in Figure 9-1 of the Decommissioning Plan, referenced in LC 10. At the time of the inspection, the site staffing consisted of the general manager, one radiation protection technician, one laborer, and a part time radiation safety officer (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 site. The license 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 the routine regulatory and license requirements and commensurate with the scope and risk associated with the current site activities.

License Conditions (LC) 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 LC 10. The annual program review for 2018 was attached to the 4th quarter radiation safety committee report. The annual audit report was reviewed and found to provide a comprehensive overview of the radiation protection program.

1.3 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.

2 Radiation Protection (IP 83822) and Maintenance and Surveillance of Safety Controls (IP 88025)

2.1 Scope

Verify that the licensee has established a radiation protection program, commensurate with the scope and risks associated with the licensee's activities, to satisfy the NRC regulatory and license requirements and to ensure adequate protection of the environment and the safety and health of workers and the public.

2.2 Observations and Findings

The licensee maintained a radiation protection program that was commensurate with the limited activities in progress. The existing radiologically restricted areas included the evaporation ponds, waste disposal area, and contaminated equipment yard. During the inspection, the radiation protection programs in place included worker training and instrument calibrations. Equipment release surveys and personnel contamination surveys were conducted as needed to support site activities.

Radiation safety training was provided annually to all site workers. Visitors to the site were provided safety and health training before being allowed to access areas other than the administration building. Repeat visitors were required to repeat this safety and health training annually. The licensee discontinued use of external personnel monitoring devices at the end of CY2007 based on historical results and the work activities onsite. The licensee discontinued the use of personnel lapel air samplers for monitoring internal dose in 2012 based on monitoring results from CY2011 and CY2012.

The NRC inspectors reviewed a selection of daily, weekly, bi-weekly, monthly, quarterly, and annual area radiation surveys since the previous inspection. The RSO set the survey frequencies based on prior history and posted a summary of required surveys in the laboratory for use by the radiological technician responsible for conducting the

surveys at FMRI. Radiation survey forms were reviewed by the NRC inspectors and were determined to be complete with specific locations of measurements being specified on the form. The inspectors noted that the completed surveys were reviewed by the RSO.

Discussion with the licensee and a review of instrument calibration records indicated that the licensee possessed two Ludlum 2220 scaler/ratemeters, both with annual calibrations in February. Ludlum 2220 S/N 58314 was out for calibration at the time of the inspection and was returned to service on February 28, 2018, at which time S/N 48394 was pulled from service. The survey instrument (S/N 48394) was still not calibrated at the time of the inspection. This uncalibrated instrument is being held to spread out the calibration interval between these two instruments. A review of records determined that the uncalibrated instrument has not been used since it was pulled from service.

License SMB-911, LC 33 requires that "Before releasing any equipment, [the] licensee shall characterize all surfaces, interior and exterior, and remediate all contaminated equipment to the limits of Regulatory Guide 1.86." Free-release survey forms covering the period from March 2018 through March 2019 were reviewed for items with potential contamination such as tools, equipment and vehicles. The NRC inspectors confirmed that the free release criteria were met. The NRC inspectors noted that the RSO had reviewed and approved all release survey results of equipment leaving the FMRI controlled area.

The NRC inspectors noted that at the time of the inspection, three Special Work Permits had been opened and/or closed since the previous inspection. Special Work Permit (SWP) #1867 for emptying the ammonium hydroxide tank was opened August 7-8, 2018, SWP #1866 for removal of the laboratory chemicals was opened July 17-25, 2018, and SWP #1865 for the packaging of 14 bags of material to complete a shipment, opened June 6, 2017, was closed on June 8, 2018.

The inspectors reviewed documentation related to calibration of radiation detection equipment. The licensee has maintained an adequate number of survey meters to properly monitor for radioactive contamination. Survey meters are calibrated annually by an outside vendor. The most recent sets of calibration occurred in February 2019. The NRC inspectors confirmed that survey instrument calibration was performed in accordance with ANSI guidance.

The radiation detection equipment onsite was used for equipment and material release surveys and surveys of onsite conditions. The inspectors reviewed the survey records generated since the last inspection as well as the instrument calibration records. The appropriate instrument was used for each type of survey conducted and all instruments were in calibration at the time of use.

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 Low Level Radioactive Waste Storage (IP 84900) and Transportation of Radioactive Material (IP 87640)

3.1 Inspection Scope

The inspectors evaluated the management, transportation, and storage of the solid waste program for compliance with license and regulatory requirements.

3.2 Observations and Findings

The inspectors reviewed the licensee's storage of WIP material. At the time of the inspection, the licensee was storing bagged WIP material within the Chem C building which totaled 52 blue one-ton bags of WIP precipitated with ammonium hydroxide and four white one-ton bags of WIP, specifically, natural uranium and thorium. The licensee does not know when this material will be disposed of or shipped off-site. Also, the licensee has not performed off-site shipments since the last inspection in March 2018.

The licensee continued to store approximately 2,000 bags of contaminated soil in the Sodium Reduction building. This material originated from the berms of former Ponds 1N, 1S, and 5. The licensee also continued to store about 7,000 cubic yards of potentially contaminated soil in an outdoor area under synthetic liners. The soil was excavated during the construction of the groundwater intercept trench in 1998-1999.

The inspectors observed the operation of the waste water treatment system. At the time of the inspection, the system was collecting approximately 8-10 gallons per minute of incoming fluid, primarily from the intercept trench. The waste water was being treated with lime (calcium oxide), to adjust the pH of the water. The treated water was pumped to Ponds 8 or 9 for settling.

During site tours, the inspectors conducted independent radiological surveys within the restricted areas. Ambient gamma radiation levels were measured with a Ludlum Model 19 survey meter (NRC Inventory No. 15330, Serial Number 32888, calibrated July 12, 2018). With a background of approximately 100 microRoentgen/hour (μR), the highest contact exposure rate was measured 300 $\mu\text{R/hr}$ including background. Background was measured in the administration building parking lot. No area was identified that met the definition of a radiation area (greater than 5,000 $\mu\text{R/hr}$ at one foot). The inspector's radiation measurements were consistent with the measurements documented in routine surveys conducted by the licensee.

3.3 Conclusion

The NRC inspectors confirmed that the licensee's program for managing, transporting, 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.

4 Effluent Control and Environmental Protection (IP 88045)

4.1 Inspection Scope

Review the effluent and environmental protection program to ensure compliance with license and regulatory requirements.

4.2 Observations and Findings

Section 11 of the Decommissioning Plan (DP) described the environmental monitoring program. Plant waste water was discharged through Outfall 001 while Outfalls 002, 003 and 005 were used for discharge of storm water runoff. All outfalls discharge to the Arkansas River. The licensee was required to collect water samples prior to and during waste water releases and to sample storm water outfalls during rain events. In addition, nineteen wells and four sumps were used to monitor groundwater at the site. Samples from the well and sumps are collected quarterly. Water samples are analyzed for gross alpha and gross beta. If any sample exceeded the 15 picocuries per liter action level for alpha or the 50 picocuries per liter action level for beta, a condition report was generated, and the sample was analyzed for uranium and thorium. Since the previous inspection, the licensee generated 23 condition reports associated with outfall sampling and groundwater sampling.

Since the previous inspection, nine samples exceeded the gross alpha action limit and eight samples exceeded the gross beta action limit. The inspectors reviewed the analytical results from the laboratory for all these events. The analytical results are compared to 10 CFR 20, Appendix B, Table II, values for effluents. Analytical results that exceed more than 10 times the values in 10 CFR 20 Appendix B Table II, require reporting to the NRC. The inspector reviewed the condition reports related to the sampling of outfalls exceeding the action levels (6 of 23) and related to well sampling (9 of 23). As required by the DP, the licensee had submitted samples to an offsite laboratory for analysis. The inspectors reviewed the analytical results for the samples from the condition reports reviewed and no sample result exceeded ten times the limits specified in the 10 CFR 20, Appendix B, Table II requiring reporting to the NRC. In summary, the licensee established and implemented a liquid effluent environmental monitoring program as described in the decommissioning plan.

The licensee conducted airborne effluent monitoring in accordance with the program described in the July 24, 2003, letter referenced in LC 10. The licensee routinely samples airborne radioactivity at four perimeter stations, a background station, and an offsite station. During the site tour, the inspectors observed that all the perimeter stations were operational, and the air samplers were in calibration. The licensee collected and analyzed the samples for gross alpha on a weekly basis. The inspectors reviewed the sample results and determined that the air sample results were small fractions of the administrative action level of 2.85E-14 microcuries per milliliter. Radon sampling is conducted at eight locations, including the environmental stations. All sample results were below the 10 picocuries per liter effluent concentration limit specified in 10 CFR 20, Appendix B, for radon-222.

4.3 Conclusions

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

5 Emergency Preparedness (IP 88050) and Fire Protection (IP 88055)

5.1 Inspection Scope

The inspectors reviewed the licensee's emergency preparedness program to ensure that the program was being maintained in compliance with license and regulatory requirements. The inspectors also reviewed the organization, equipment, and controls available to implement the fire protection program. The inspectors reviewed whether the licensee took appropriate and lasting corrective actions to address a previous violation related to the licensee's fire protection program.

5.2 Observations and Findings

The inspectors reviewed procedure EP-100, "General Emergency Response," Revision 1. The emergency response procedure indicated that no process lines were currently in operation. Section 3.0 of the procedure included information on the characteristics of the hazardous materials present on site and indicated the location of the materials. Overall, the procedure provided sufficient instructions for the licensee to respond to emergencies.

During the previous NRC inspection in March 2018, the NRC inspectors identified a violation (VIO 040-07580/1801-01) associated with License Condition 10, which requires the licensee to meet with the Muskogee Fire Department (MFD) on an annual basis to discuss potential fire hazards and prevention at the facility, and maintain an agreement with the MFD that they will come to the aid of FMRI in case of a fire at the facility (ADAMS Accession No. ML18106A019).

The licensee responded to the Notice of Violation by letter dated May 10, 2018 (ADAMS Accession No. ML18136A547). The licensee's corrective actions included meeting with the MFD at the FMRI facility to discuss potential fire hazards and prevention, adding an annual meeting with the MFD to its Health and Safety routines sheet, and obtaining verbal confirmation from the Fire Chief that since the facility is located within the MFD Fire District, the MFD is obligated to respond to any fire at FMRI. The implementation of these corrective actions closes the violation.

5.3 Conclusion

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. The licensee took appropriate corrective actions to address a previously identified violation associated with its fire protection program.

6 Exit Meeting Summary

The inspectors presented the inspection results to the licensee's representatives at the conclusion of the onsite inspection on March 12, 2019. During the inspection, the licensee did not identify any information, reviewed by the inspectors and included in the report, as proprietary.

SUPPLEMENTAL INFORMATION

Partial list of Persons contacted

Licensee

J. Burgess, General Manager
T. Lawrence, Radiation Technician
R. Miller, Radiation Safety Officer

Inspection Procedures Used

IP 83822 Radiation Protection
IP 84900 Low Level Radioactive Waste Storage
IP 88005 Management Organization and Controls
IP 88045 Effluent Control and Environmental Protection
IP 86740 Solid Radioactive Waste Management and Transportation of Radioactive Materials
IP 88025 Maintenance and Surveillance of Safety Controls
IP 88050 Emergency Preparedness
IP 88055 Fire Protection

Items Opened, Closed and Discussed

Open

None

Closed

040-07580/1801-01 VIO Failures to meet and have agreement with local fire department

Discussed

None

List of Acronyms

ADAMS Agencywide Documents Access and Management System
CFR *Code of Federal Regulations*
CY Calendar Year
IP Inspection Procedures
LC License Condition
 $\mu\text{R/hr}$ microRoentgen per hour
MFD Muskogee Fire Department
NRC U.S. Nuclear Regulatory Commission
RSO Radiation Safety Officer
SWP Special Work Permit
WIP Work in Process

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