UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

September 26, 2003

Mr. A. Fred Dohmann, General Manager
Fansteel, Incorporated
Number Ten Tantalum Place
Muskogee, Oklahoma 74403

SUBJECT: NRC INSPECTION REPORT 040-07580/03-001

Dear Mr. Dohmann:

This refers to the inspection conducted on September 3-4, 2003, at Fansteel's rare earth recovery facility in Muskogee, Oklahoma. This inspection was an examination of activities conducted under your license as they relate to safety and 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, facility site tour, and interviews with personnel. The enclosed report presents the results of that inspection.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Mr. Rick Muñoz at (817) 860-8220 or the undersigned at (817) 860-8191.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle and Decommissioning Branch

Docket No.: 040-07580
License No.: SMB-911

Enclosure:
NRC Inspection Report
040-07580/03-001

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ENCLOSURE

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	040-07580
License No.:	SMB-911 (expired September 30, 2002)
Report No.:	040-07580/03-001
Licensee:	Fansteel, Inc.
Facility:	Muskogee Plant
Location:	Muskogee, Oklahoma
Inspection Dates:	September 3-4, 2003
Inspector:	R. Rick Muñoz, Health Physicist Fuel Cycle & Decommissioning Branch
Approved By:	D. Blair Spitzberg, Ph.D., Chief Fuel Cycle & Decommissioning Branch
Attachment:	Supplemental Inspection Information

EXECUTIVE SUMMARY

Fansteel, Inc., Muskogee Plant
NRC Inspection Report 040-07580/03-001

This inspection included a review of site status, radiation protection program, management organization and controls, transportation activities, radioactive waste management, and followup of a previous inspection finding.

Radiation Protection

- Occupational exposures were below regulatory limits. Site tours confirmed that security and control of radioactive material were adequate. Contamination control efforts were effective, no component had been released from the site with contamination above the release limits. Radiation survey instruments used were operable and within their calibration interval. The radiation safety committee had met quarterly through the second quarter of 2003. The licensee adequately implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the license. In summary, Fansteel's radiation protection program was appropriate for the activities being conducted at the site (Section 1).

Management Organization and Controls

- The staffing level was adequate to maintain the plant in a shutdown condition and to ensure compliance with applicable regulations and license conditions (Section 2).

Inspection of Transportation Activities

- The licensee made one shipment of calcium fluoride material to a third-party entity since the previous inspection. This shipment to a non-licensee was authorized because the material contained unimportant quantities of source material as defined in 10 CFR 40.13 (Section 3).

Radioactive Waste Management

- The licensee was maintaining adequate control of the radioactive waste material in storage at the site. All radioactive material storage areas were protected and controlled within the site boundary in accordance with the requirements of 10 CFR 20.1801. All storage areas displayed proper radiological posting as required by 10 CFR 20.1902. The radioactive waste program was conducted in accordance with the license and regulatory requirements. The licensee had effectively implemented the license requirements related to the management of radioactive waste (Section 4).

Followup

- A previous inspection follow-up item related to the organizational structure remained open. Future authorized organizational structure is contingent on the approval of the site decommissioning plan and the licensee’s long-term plans for the plant (Section 5).

Report Details

Summary of Site Status and History

From 1958 until 1989, the Fansteel facility extracted tantalum metal and columbium oxide from ore and slag feedstock. The facility ceased operations during December 1989 and was shut down. In January 1995, Fansteel was authorized onsite processing of pond residues containing precious metals as work-in-progress (WIP) material. The licensee recovered the rare metals while simultaneously reducing the total volume of radioactive waste contained in the pond material. The licensee also recovered calcium fluoride (CaF_2) material from existing onsite waste treatment ponds.

License Condition 26 provides that remediation and decommissioning activities be performed in accordance with the decommissioning plan (DP) and supplemental correspondence submitted by letter dated June 16, 1999, July 16, 1999, and November 9, 2000. The facility went into suspended operations mode November 2001. On January 15, 2002, Fansteel formally filed voluntary petitions for reorganization under Chapter 11 and simultaneously notified the NRC of the bankruptcy filing pursuant to 10 CFR 40.41(f). As such, Fansteel was operating as a debtor-in-possession under the jurisdiction of the Bankruptcy Court. By letter dated June 25, 2002, the licensee submitted a decommissioning cost estimate to the NRC in accordance with License Condition 21. Further, by application dated August 27, 2002, Fansteel requested that its operating license be renewed (expired September 30, 2002). Following a review of the decommissioning cost estimate information, the NRC concluded that the information was insufficient. Accordingly, by letter dated October 22, 2002, Fansteel's request for a license renewal was denied by the NRC and was advised to proceed with decommissioning in accordance with 10 CFR 40.42(d).

On January 14, 2003, the Licensee submitted a revised DP plan for review. Fansteel stated in the letter that the amount and type of financial assurance to be provided in connection with the DP would be set forth in a plan of reorganization that it intended to file with the Bankruptcy Court. In addition, Fansteel indicated that it would be filing an alternative schedule for completion of the decommissioning as well as a request for exemption from the regulatory funding requirements of 10 CFR 40.36(d) and (e) to support the terms and conditions of the reorganization plan. As a result of NRC requests for additional information, on April 28, 2003, the NRC informed Fansteel that the DP did not contain sufficient information to conduct a detailed review. Although the letter included some detailed comments on the DP submittal requesting additional information, some of the comments made by NRC staff were general comments on the DP because the plan was conceptual and there was not sufficient information in some sections for a detailed review.

On May 8, 2003, Fansteel resubmitted a new DP and indicated that upon emergence from Chapter 11 and in accordance with the terms and conditions of a confirmed plan of reorganization (which would include the transfer of the license to a new wholly-owned subsidiary of the "revised" Fansteel, "MRI"), MRI would undertake a four phased approach to decommission the site. In response to the NRC's staff letter, the State of Oklahoma filed a request for hearing on June 16, 2003. This action triggered a series of motions and petitions between the State of Oklahoma and the NRC. Subsequently, on July 24, 2003, Fansteel

submitted a revised decommissioning plan to the NRC which is currently under review. The NRC announced the opportunity for hearing on the proposed DP on August 18, 2003.

At the time of the inspection, the plant was in a suspended operations mode. The plant systems being maintained in service included the groundwater treatment system, waste water treatment plant, plant boilers, air compressors, and building utilities (electricity, heat, water). All process systems had been drained of potentially radioactive material. The material was bagged and placed into storage in the former sodium reduction building. All CaF_2 material in the plant was returned to onsite Ponds 8 and 9 via the waste water treatment system.

The licensee removed the carbon dioxide fire suppression system from operation on July 2, 2002, and placed the system in long-term lay up. Hydrofluoric acid and ammonium hydroxide material was held in tanks pending sale. Solvent extraction material from the process circuit was stored in 55-gallon polyvinyl chloride drums.

1 Radiation Protection (83822)

1.1 Inspection Scope

The inspector examined the licensee's radiation protection program for compliance with 10 CFR Part 20 and license requirements. The program areas reviewed included site tours including observations made regarding required postings and radiation surveys, personnel exposures, special work permits, contamination surveys, equipment release records, instrument calibrations, area monitoring and radiation protection program reviews.

1.2 Observations and Findings

a. Site Tour

A site tour was conducted to observe facility condition and any activities in progress. The tour included all buildings, ponds, and radioactive material storage areas. Radiological surveys were conducted using a calibrated NRC issued Ludlum Model 19 survey instrument Serial Number 015540, calibrated to radium-226. The site tour confirmed that all areas with radiological materials, including the ponds, french drain system, and the Chem A, Chem C and sodium reduction buildings were properly maintained and posted with "Caution, Radioactive Material," signs. The general area exposure rates in the main plant were noted to be at background levels. The highest exposure rate in areas routinely accessible to plant personnel was 50 microRoentgens/hour observed at the northwest area or Pond 3. This measurement was below the definition of a radiation area (5000 microRoentgens per hour). Adequate protective clothing and contamination control practices were evident in the plant areas.

Site security was provided by a contract security company and by site personnel during regular business hours. Access to the site was limited by locked gates during non-business hours to prevent unauthorized access to the facility. The security contractor is on shift 24 hours per day. The site perimeter fence was in good condition and properly posted. All radioactive material storage areas were secured and controlled

within the site boundary in accordance with the requirements of 10 CFR 20.1801. All storage areas displayed proper radiological postings as required by 10 CFR 20.1902(e).

b. Occupational Exposures

Section 3.3 of the license application stipulates that thermoluminescent dosimeters are to be worn whenever workers are engaged in activities where radioactive material is present. Six individuals are monitored for external dose. The thermoluminescent dosimeter results through July 2003 were reviewed. The dosimeter results indicated that no site worker or visitor received a radiation dose that exceeded the total effective dose equivalent occupational dose limit of 5 Rem as specified in 10 CFR 20.1201. NRC Form 5 documents were provided to all monitored individuals on February 3, 2003 .

The licensee monitored workers for internal exposures in accordance with Section 3.5.1 of the license application. Monitoring consisted of lapel air samplers to selected workers, specifically those conducting work under the requirements of special work permits. The sample results through the second quarter of 2003 were reviewed. The air sampler filters were collected and analyzed for gross alpha content. If the action limit was exceeded, the plant radiation safety officer was required to identify the source of the radioactive material and implement suitable corrective measures. According to the licensee's internal procedures, lapel air samples were counted at least twice, once immediately and once 72 hours later to allow for decay of short-lived radioisotopes. The second count was considered the "final" count, and a derived air concentration value was calculated and assigned to workers based on this final count. A decrease in air sample results was noted by the inspector. This downward trend could be attributed to plant shutdown and removal of licensed material from all plant systems.

c. Special Work Permits

In accordance with Section 3.2 of the license application, the licensee had a special work permit program in place. Special work permits (SWP) were used for all maintenance tasks, including any work involving licensed material. Half face respirators were required for jobs in potential airborne radiation areas lasting greater than four hours. The SWPs listed both radiological and non-radiological safety hazards, personnel protective equipment requirements, and monitoring requirements. Workers were required to sign the SWPs indicating that they had read and understood the permit requirements. A review of the 2003 SWPs was conducted. The latest SWP was issued on April 29, 2003, for work on an exhaust fan in the sodium reduction building. There has been no work involving active movement on licensed material since the last inspection. Section 4.4 of procedure SOP G-013, "Special Work Permit", requires re-approval by the plant radiation safety officer for any change or modification to the SWP. Records reviewed demonstrated that the re-approval protocol occurred whenever the potential for exposure increased. The inspector concluded that the licensee was using the special work permit program to minimize potential radiological hazards to plant workers.

d. Contamination Control

The inspector reviewed the surface contamination control program for compliance with Section 3.5.2 of the license application. The licensee had a contamination control program in place at the site that included routine sampling for contamination in the plant. The licensee conducted weekly surface contamination surveys at random locations within the onsite lunchroom and biweekly swipe sample surveys of plant areas. All other plant areas were surveyed on a rotational basis which were managed on a routine radiological survey cycle log. The inspector reviewed the survey records through August 2003. No swipe sample exceeded the action level suggesting that the licensee's control of loose contamination was effective.

Section 3.5.2 of the licensee application states that surface contamination surveys will be conducted prior to release of equipment from radiologically controlled areas. The licensee had a contamination control program in place at the site that included equipment release control. The inspector reviewed the equipment release records through August 2003 and determined that no item had been released with contamination above the limits for activity on equipment and structure surfaces as specified in License Condition 27 of the license.

The inspector noted that the licensee had conducted surveys during the month of August 2003, with an instrument which had been assessed an incorrect efficiency. The calibration sheet provided did not state the efficiency so the health and safety technician assigned an efficiency of 26 percent using a bench test when the instrument was delivered by the instrument manufacturer. The plant radiation safety officer noted the error and issued a condition report on July 9, 2003, to investigate the cause. Fansteel determined that the technician unknowingly used the wrong efficiency (2π) as listed on the bench test form. The manufacturer was contacted and an efficiency of 13 percent was verified for the instrument. All free release surveys where this instrument was used were updated to the correct alpha direct readings using the appropriate efficiency factor. The technician was counseled on the procedural requirements on receiving instruments and putting them back into service. In addition, Procedure HSDI-400 was updated to implement a new checklist for verification and documentation of instrument efficiency. The inspector concluded that the over-sight by the manufacturer and assigned efficiency problem was an isolated occurrence and was of minor safety significance because the licensee identified the problem, re-evaluated all surveys performed and verified that no administrative nor regulatory release limits were exceeded. The licensee issued a condition report for the efficiency discrepancy problem to document the event and initiated corrective actions to prevent recurrence. The licensee's quality assurance review was effective.

e. Instrument Calibrations

At the time of the inspection, the licensee had five radiological survey instruments calibrated and fully functional available for use. The inspector verified that the survey instruments in use were in calibration. The removable contamination counter was efficiency checked each day prior to use using calibrated check sources and last serviced by the manufacturer on February 6, 2003. Lapel air samplers were calibration

checked just prior to use using a flow calibrator. The flow calibrator was calibration checked on an annual basis. Equipment removed from service had been clearly tagged out-of-service.

f. Radon Sampling

Quarterly radon sampling was conducted at seven locations around the site. The only area location that consistently exceeded the action level of 30 picocuries per liter was the sodium reduction building. Sample results varied from 32.0 picocuries per liter (pCi/l) during the last quarter of 2002 to 41.7 pCi/l for the second quarter of 2003. This building was used to house and store bagged pond material and work in progress material. The building was posted as an airborne radiation area and a special work permit was required for entry into the building. The building was controlled by lock and key.

g. Radiation Protection Program Reviews

License application Section 2.1.2 stipulates that a radiation safety committee be established and meet quarterly. In addition, the radiation safety committee reviewed and evaluated data from the previous 18 months for trending analysis. This was performed annually as a requirement of Section 2.1.2 of the license application. The committee met at least quarterly through August 27, 2003. The inspector reviewed the meeting minutes for 2003. The committee discussed relevant issues including documentation which verified no upward trends.

A review of the content and implementation of the licensee's radiation protection program was required annually by 10 CFR 20.1101(c). The licensee conducted the 2002 review in March 2003. The review appeared to be thorough and included all program areas.

1.3 Conclusions

Occupational exposures were below regulatory limits. Site tours confirmed that security and control of radioactive material were adequate. Contamination control efforts were effective, no component had been released from the site with contamination above the release limits. Radiation survey instruments used were operable and within their calibration interval. The radiation safety committee had met quarterly through the second quarter of 2003. The licensee adequately implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the license. In summary, Fansteel's radiation protection program was appropriate for the activities being conducted at the site.

2 Management Organization and Controls (88005)

2.1 Inspection Scope

The inspector interviewed licensee staff regarding the licensee's organizational structure and reviewed related documentation. Organizational structure was reviewed to

determine whether management controls were in place to ensure compliance with license and regulatory requirements.

2.2 Observations and Findings

The licensee had reduced its onsite staff to 11 individuals in response to its financial status. At the time of the inspection, there were eight Fansteel employees, three contract workers and one security guard. This organizational structure was considered a short-term staffing plan. On May 8, 2003, as part of the new decommissioning plan submittal, Fansteel indicated that upon emergence from Chapter 11, it proposed to transfer the license to a new wholly-owned subsidiary of the revised Fansteel which would be called MRI. MRI would undertake the decommissioning of the Fansteel facility under a new corporate organization. The decommissioning plan is under review.

During the inspection, the plant was in the suspended operations mode. The staff was used to maintain the waste water, groundwater, and environmental monitoring systems. The current staffing level was determined to be adequate to maintain compliance with regulatory and license requirements while the plant remained shut down.

2.3 Conclusions

The staffing level was adequate to maintain the plant in a shutdown condition and to ensure compliance with applicable regulations and license conditions.

3 Inspection of Transportation Activities (86740)

3.1 Inspection Scope

The inspector reviewed the licensee's program for the shipment and transportation of potentially radioactive material.

3.2 Observations and Findings

The raw material and product sampling requirements are provided in Section 3.5.11 of the license application. Since the last inspection, the licensee transported 51 pounds of CaF_2 material in a single shipment to an offsite third-party entity. The inspector reviewed the documentation associated with this shipment and concluded that the material could be transferred to non-licensees because the material complied with the requirements of 10 CFR 40.13, "Unimportant Quantities of Source Material." The licensee's records indicated that the average source material content in the CaF_2 was no more than 0.04 percent by weight, a value that was below the 0.05 percent limit specified in 10 CFR 40.13.

3.3 Conclusions

The licensee shipped 51 pounds of CaF_2 material in one parcel to a third-party entity since the previous inspection. The licensee was allowed to ship the material to a non-

licensees because the material contained unimportant quantities of source material as defined in 10 CFR 40.13.

4 Radioactive Waste Management (88035)

4.1 Inspection Scope

The inspector interviewed licensee representatives, toured the radioactive waste storage area, and reviewed applicable records related to radioactive waste management to determine if the licensee had established and maintained an effective program.

4.2 Observations and Findings

The requirements for temporary storage of licensed material was provided in Section 3.6 of the license application and License Condition 25. The inspector observed and toured three radioactive waste storage locations. There were one hundred eighty 55-gallon polyvinyl chloride drums of concrete debris material stored at a temporary storage area located outdoors behind the thermite building. The containers were properly covered with plastic on pallets within a bermed concrete pad. The sodium reduction building housed the super-sacks of work in progress material containing uranium waste material in the temporary storage area. The bags were stored on pallets inside the building. The third area observed was the bone yard on a back pad behind the Chem C building. The scrap metal material was segregated and surveyed. Metal pieces measuring greater than twice background (40-45 cpm) established by the licensee, were moved to an adjacent concrete pad area. Radiological surveys were conducted by the inspector using the Ludlum Model 19 survey instrument and noted that the exposure rate measurements of this material did not exceed twice background. All areas were properly posted with caution radioactive material signs. The inspector noted that the licensee was storing the waste product in accordance with the license application commitments.

4.3 Conclusions

The licensee was maintaining adequate control of the radioactive waste material in storage at the site. All radioactive material storage areas were protected and controlled within the site boundary in accordance with the requirements of 10 CFR 20.1801. All storage areas displayed proper radiological posting/labeling as required by 10 CFR 20.1902. The radioactive waste programs had been conducted in accordance with the license and regulatory requirements. The licensee had effectively implemented the license requirements related to the management of radioactive waste.

5 Followup (92701)

(Open) Inspection Followup Item 040-07580/9902-01: Submittal of a license amendment request for an organizational change

During a previous inspections, the NRC noted that the licensee's onsite organizational structure was not in agreement with license requirements. Specifically, the position of

plant operations manager was split into two positions, plant operations manager-process and plant operations manager-mining and utilities. This item was tracked as an inspection follow-up item.

The licensee submitted an updated organizational structure to the NRC as part of the new decommissioning plan. As a result of the licensee filing bankruptcy under Chapter 11 in December 2001, the licensee proposed to transfer the license to a new wholly-owned subsidiary of the revised Fansteel which would be called MRI. MRI would undertake the decommissioning of the Fansteel facility under a new corporate organization. The decommissioning plan is under review. Additional review of this inspection followup item will be conducted pending approval of the new organizational structure and will be reviewed during a future inspection.

6 Exit Meeting Summary

The inspector reviewed the scope and findings of the inspection during the exit meeting conducted at the conclusion of the onsite inspection on September 4, 2003. The licensee did not identify as proprietary any information provided to, or reviewed, by the inspector.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

C. Adams, Radiation Technician
F. Dohmann, General Manager
K. Payne, Manager, Regulatory Compliance

INSPECTION PROCEDURES USED

IP 88005	Management Organization and Controls
IP 83822	Radiation Protection
IP 86740	Inspection of Transportation Activities
IP 88035	Radioactive Waste Management
IP 92701	Followup

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None.

Closed

None.

Discussed

040-07580/9902-01	IFI	Submittal of a license amendment request for an organizational change

LIST OF ACRONYMS USED

CaF_2	calcium fluoride
CFR	Code of Federal Regulation
IFI	Inspection Followup Item
IP	Inspection Procedure
NRC	Nuclear Regulatory Commission
pCi/L	picocuries per liter