UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

May 2, 2000

Mr. Michael J. Mocniak, Corporate Manager
Fansteel Incorporated
Number One Tantalum Place
North Chicago, Illinois 60064

SUBJECT: NRC INSPECTION REPORT 040-7580/00-01 AND NOTICE OF VIOLATION

Dear Mr. Mocniak:

On March 17, 2000, the NRC completed an on-site inspection at the Fansteel facility in Muskogee, Oklahoma. The purpose of this inspection was to conduct a readiness review of your proposed Phase II operations and licensed activities for reprocessing and transferring source material, recovering metals, and decommissioning the site. Additionally, this inspection reviewed the circumstances surrounding the February 12, 2000, hydrofluoric acid (HF) gas release which hospitalized two operators. The preliminary inspection results were presented to members of your staff at the conclusion of the onsite inspection. A telephonic briefing was held with Mr. Dohmann and other members of your staff on May 2, 2000, following completion of in-office inspection activities, to present the findings as described in this report.

At the conclusion of the on-site inspection on March 17, 2000, the NRC concluded that controls, procedures, and training had not been sufficiently established to proceed with Phase II operations involving the receipt of bulk hazardous chemicals onsite (i.e., anhydrous ammonia and hydrochloric acid) or introducing any of these chemicals into the residue process. The NRC also developed concerns associated with two Unresolved Items identified in the inspection report which related to the February 12, 2000, event involving the release and occupational exposure of workers to HF gas. One item involves the worker activities to manually load material into an open process tank without appropriate procedural controls in place. This activity contributed to the workers' exposures to HF. The second item relates to the failure of an employee to wear respiratory protection equipment when re-entering the process building at the time of the HF release.

Because of the safety concerns identified during the inspection, and our need to better understand the management and process controls you are undertaking during Phase II startup to ensure a safe workplace, we have requested that an open management meeting be held in the Region IV office on May 31, 2000, to discuss these issues. We will send you a meeting notice and proposed agenda by separate correspondence in advance of the meeting. You and your staff should be prepared to discuss the contents of this inspection report, especially pertaining to the following: (1) the HF event and the Unresolved Items discussed in the report, (2) Phase II operations and activities to be completed to support the utilization of bulk hazardous chemicals such as anhydrous ammonia and hydrochloric acid, (3) the failure to fully implement corrective actions in response to the procedures and 10 CFR 40.60 violations of November 1999, and (4) your understanding of the requirements of Fansteel license and

decommissioning plan as it relates to activities discussed in this report and for Phase II operational activities.

During the inspection a violation involving your failure to implement the groundwater collection and remediation program as required by your license was identified. This violation and the circumstances surrounding it are described in detail in the subject inspection report and Notice of Violation (Notice). You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. For your consideration and convenience, an excerpt from NRC Information Notice 96-28, "SUGGESTED GUIDANCE RELATING TO DEVELOPMENT AND IMPLEMENTATION OF CORRECTIVE ACTION," is enclosed. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

Should you have any questions concerning this inspection, please contact Mr. Louis C. Carson II at (817) 860-8221 or Dr. D. Blair Spitzberg at (817) 860-8191.

Sincerely,

/RA/

Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety

Docket No.: 40-7580
License No.: SMB-911

Enclosures:
1. Notice of Violation
2. NRC Inspection Report 40-7580/00-01

cc w/enclosure:
Dr. Dennis LaPoint, Plant Manager
Fansteel Incorporated
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Muskogee, Oklahoma 74403-9296

Mr. Walter Beckham, City Manager
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Muskogee, Oklahoma 74401

Mr. Hugh Terrell, Safety Compliance Inspector
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ENCLOSURE 1

NOTICE OF VIOLATION

Fansteel Incorporated
Fansteel Metals Site

Docket No. 40-7580
License No. SMB-911

During an NRC inspection conducted on March 13-17, 2000, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG 1600, the violation is listed below:

> License Condition 26 states, in part, that remediation and decommissioning activities at the Muskogee facility shall be performed in accordance with the decommissioning plan and supplemental correspondence submitted by letter dated June 18, 1999, and supplemented by letter dated July 16, 1999.
>
> Section 2.1.2.8.2, of the Decommissioning Plan describes the licensee's groundwater collection and treatment system. This section states, in part, that the groundwater collection trench intercepts groundwater and routes it to a treatment facility. Treatment consist of an evaporation process that will retain all radionuclides in high-solids slurry.
>
> Contrary to the above, from February 1 to March 17, 2000, the licensee had rerouted trench intercepted groundwater to the plant wastewater treatment facility for processing, whereby all the radionuclides were being pumped to and retained in the wastewater treatment ponds. By rerouting the groundwater in this manner, treatment did not include the evaporation process.
>
> This is a Severity Level IV violation (Supplement VII).

Pursuant to the provisions of 10 CFR 2.201, Fansteel, Inc., is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be placed in the NRC Public Document Room (PDR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 2nd day of May 2000

ENCLOSURE 2

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	40-7580
License No.:	SMB-911
Report No.:	40-7580/00-01
Licensee:	Fansteel Incorporated
Facility:	Muskogee Plant
Inspection Dates:	March 13-17, 2000
Inspectors:	Louis C. Carson II, Health Physicist Fuel Cycle & Decommissioning Branch Division of Nuclear Material Safety
	William M Troskoski, Senior Nuclear Process Engineer Fuel Cycle Operations Branch Division of Fuel Cycle Safety
	Candice Drummond, Nuclear Process Engineer Fuel Cycle Operations Branch Division of Fuel Cycle Safety
	Leslie Fields, Project Manager Fuel Cycle Licensing Branch Division of Fuel Cycle Safety
	Judith Walker, Inspector-In-Training Fuel Cycle & Decommissioning Branch Division of Nuclear Material Safety
Accompanied By:	Pam Bishop, Environmental Specialist Oklahoma Department of Environmental Quality Radiation Section
	Hugh Terrell, Safety Compliance Inspector Occupational Safety and Health Administration Region 6, Oklahoma Field Office
	D. Blair Spitzberg, Ph.D., Chief Fuel Cycle & Decommissioning Branch Division of Nuclear Material Safety

Approved By: D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle & Decommissioning Branch
Division of Nuclear Material Safety

Attachment: Supplemental Inspection Information

EXECUTIVE SUMMARY

Fansteel Incorporated Muskogee Plant
NRC Inspection Report 40-7580/00-01

Inspection Scope

The Fansteel facility had been shutdown since 1989. From 1996 through 1998, Fansteel was redesigned and reconstructed, and facility operations were authorized to restart on March 15,1999. The licensee had committed to numerous regulatory requirements that would allow the Fansteel project to conduct the following operations: source material recovery, rare metals recovery, radioactive byproduct volume reduction, groundwater remediation, and site remediation.

The objectives of this inspection were as follows: evaluate and assess the licensee's response to the February 12, 2000, HF gas exposure incident, assess the readiness of the licensee's Work-In-Progress (WIP)/calcium fluoride (CaF_2) chemical process operation for Phase II operations, and to examine the implementation of the licensee's corrective action to violations identified during the November 1999 inspection.

Inspection Findings

Emergency Preparedness; Emergency Response Procedures

- It was apparent that the February 12, 2000, HF event resulted in an occupational risk. It was not apparent that the activities which occurred at Tank T-702, where the exposed workers were manually loading material into an open tank without an approved procedure, affected the safety of licensed radioactive materials. Consequently, this issue is considered an Unresolved Item (URI 40-7580/0001-01). An Unresolved Item is a matter about which more information is required to determine whether the issue in question is an acceptable item, a deviation, a nonconformance, or a violation. The resolution by the NRC of the affect of the event on licensed material could determine whether an NRC violation occurred or whether the issue falls within the jurisdiction of OSHA. This matter will be further discussed with the licensee during the May 31, 2000, management meeting (Section 2).

- During the February 12, 2000, HF event, the shift supervisor entered the process facility without donning a respirator. The failure of this individual to use a respirator during a plant emergency was considered an Unresolved Item (URI 40-7580/0001-02). Like URI 40-7580/0001-01, this issue is unresolved pending a determination by the NRC whether this finding is a violation, or whether the issue falls within the jurisdiction of OSHA. This matter will be further discussed with the licensee during the May 31, 2000, management meeting (Section 2).

- A caustic scrubber fan (CS-312) was not fully operational during the HF event (Section 2).

- Although the HF monitor was not specifically required by the license or recommended by the Process Hazards Analysis report, the HF monitor is considered to be important for alerting workers of potentially unsafe conditions, and the HF monitor was likely not operational during the HF event (Section 2).

Management Organization and Controls; Hazard Identification and Assessment; Standard Operating Procedures; Decommissioning of Fuel Cycle Facilities; and Construction Review

- The results of the inspection indicated that the licensee was not ready to bring anhydrous NH_3 and hydrochloric (HCl) acid onsite to support Phase II operations. This conclusion was supported by observations that installation of safety features had not been completed, various process safety management requirements had not been implemented, and licensee identified safety recommendations were not implemented. In addition, no management control system (e.g., a pre-startup authorization checklist) was implemented to assure that all safety requirements were met prior to the introduction of a highly hazardous chemical in bulk quantities into the system. This matter will be further discussed with the licensee during the May 31, 2000, management meeting (Section 3).

- The licensee had not developed and implemented a mechanical integrity program per OSHA regulation 29 CFR 1910.119(j). The licensee had not developed appropriate procedures to assure operability of some safety features identified in the hazards analysis. The licensee had not established a process to ensure that plant modifications were properly installed and functionally tested. These matters will be further discussed with the licensee during the May 31, 2000, management meeting (Section 3).

- The anhydrous NH_3 tank safety relief valve vented near a flood light. Anhydrous NH_3 is highly flammable. Plant management indicated that they would remove the light prior to system startup. This matter will be further reviewed during a future inspection and is considered a Phase II operations inspection followup item (IFI 40-7580/0001-03) (Section 3).

- The licensee stated that they would evaluate the potential risks associated with inadvertent discharge of carbon dioxide (CO_2) in the solvent extraction area (Section 3).

Radiation Protection

- Fansteel's existing respiratory equipment and protection program was adequate for non-radiological requirements but did not meet NRC radiological requirements pursuant to 10 CFR Part 20 which could be required for certain Phase II operations. This matter will be further reviewed during a future inspection (IFI 40-7580/0001-04) (Section 4).

Radioactive Waste Management and Environmental Protection

- The licensee was conducting appropriate groundwater monitoring in compliance with the license requirements (Section 5).

- A violation was identified for failure to conduct groundwater cleanup operations through the groundwater evaporation system as required by License Condition 26 and the Decommissioning Plan (VIO 40-7580/0001-05)(Section 5).

Inspection Followup

- The licensee's failure to implement the radiation protection program and groundwater cleanup operation without radiation safety committee review and approval procedures, resulted in a violation. This matter remained open because Fansteel had not implemented the corrective actions that they committed to in a licensee letter dated January 25, 2000. This matter will be further discussed with the licensee during the May 31, 2000, management meeting (Section 6).

- The licensee's failure to implement 10 CFR 40.60 reporting requirements following the June 1999 tornado event resulted in a violation. This matter remained open because Fansteel had not implemented the corrective actions they committed to in a letter dated January 25, 2000. This matter will be further discussed with the licensee during the May 31, 2000, management meeting (Section 6).

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

Report Details 7

1 Site History, Strategy, and Status 7

2 Emergency Preparedness; Emergency Response Procedures; 9

Hydrofluoric Acid Gas Incident . . . . .
2.1 Inspection Scope 9
2.2 Observations and Findings 9
2.3 Conclusion 15

3 Management Organization and Controls; Hazard Identification and Assessment; Standard Operating Procedures; Decommissioning of Fuel Cycle Facilities; and Construction Review 15

Phase II Operations Review and Readiness . . . . .
3.1 Inspection Scope 15
3.2 Observations and Findings 16
3.3 Conclusion 18

4 Radiation Protection 19

Respiratory Protection Equipment . . . . .
4.1 Inspection Scope 19
4.2 Observations and Findings 19
4.3 Conclusion 20

5 Radioactive Waste Management; Environmental Protection 20
Groundwater Operations . . . . .

5.1 Inspection Scope 20
5.2 Observations and Findings 21
5.3 Conclusion 23

6 Inspection Followup 24

6.1 Procedures Violation 24
6.2 10 CFR 40.60 Violation 25

7 Exit Meeting Summary 25

Report Details

1 Site History, Decommissioning Strategy, and Status

Fansteel's Muskogee plant had been in the rare metals extraction business from 1958 to 1989 when operations ceased. Fansteel produced tantalum and columbium metals that were extracted from uranium ore, thorium ore, and tin slag feedstock using an acid digestion process. The extracted metals were made into ingots, bars, powder, alloys and compounds to be used as feed material for other Fansteel operations throughout the United States. Since 1967, this rare metals extraction facility had operated with either an Atomic Energy Commission or NRC license because of the amounts of radioactive waste (naturally occurring and technically enhanced uranium and thorium ore residues) generated from the process. There is approximately 4.7 million cubic feet of radioactive waste residue in ponds and 0.6 million cubic feet of contaminated soil at the site. Most of the remaining tantalum and columbium feedstock material that contained valuable metals and reconcentrated radioactivity (uranium and thorium) was stored in Ponds 2 and 3. Ponds 2 and 3 residues represent 10,250 metric tons of radioactive material to be reprocessed. Additionally, 500 metric tons of radioactive material from former Ponds 1, 4, and 5, and contaminated soil were contained in barrels and bags that were stored in the sodium reduction building. The concentrated uranium and thorium radioactive waste and byproduct material at the site continues to require licensing by the NRC as "source material," per 10 CFR Part 40.

From 1989 through August 1996 Fansteel conducted limited site remediation and decommissioning of selected site areas and completed the site radiological characterization. In August 1996, the NRC released for unrestricted use approximately 40 acres (Northwest property) and removed the property from the license by amendment.

Fansteel is under the NRC's Site Decommissioning Management Plan (SDMP). As a SDMP site, Fansteel's decommissioning strategy is to reprocess onsite source material for at least 10 years to concentrate and extract the source material thus reducing the volume of radioactive waste onsite. On July 6, 1998, the licensee submitted to the NRC for approval the Fansteel Decommissioning Plan pursuant to 10 CFR 20.1401(b)(3), 10 CFR 40.42(g)(4), and License Condition 25. By license application dated January 25, 1995, Fansteel requested a license amendment authorizing processing of onsite residues for recovery of precious metals. The application described the construction and operation of a facility designed to reprocess onsite licensed material. This material contains natural uranium and thorium (source material) and is designated as WIP material. The additional processing will recover rare metals, uranium and thorium, and will reduce the total volume of waste associated with the WIP material. The application also discussed contaminated groundwater collection and remediation. Fansteel also requested approval to recover CaF_2 from existing onsite waste treatment Ponds 6-9 and onsite disposal of contaminated soils. On March 25, 1997, the NRC authorized Fansteel to proceed with the WIP project and install a French drain groundwater collection and remediation system. On December 18, 1997, the NRC

issued License Amendment 1 which authorized the licensee to reprocess wastewater treatment residues that are located in Ponds 6-9.

On March 15, 1999, the NRC issued License Amendment 4 which removed several license conditions that restricted Fansteel from starting residue recovery operations. The licensee restarted facility operations on April 1, 1999. On August 20, 1999, the NRC issued License Amendment 6 which approved Fansteel's decommissioning plan. During this inspection, the licensee was under license Amendment 7, which authorizes the possession, use, short-term storage, and transfer of uranium and thorium and their progenies contained in residues.

Since the previous inspection in November 1999, licensee activities have included the following:

- Continued processing of CaF_2 sludge for the production of cryolite. The CaF_2 material contained uranium and thorium residues with an estimated gross alpha and gross beta radioactivity concentration ranging from 100-690 picocuries/gram (pCi/g).

- Operation of the groundwater collection and treatment system.

On February 12, 2000, the Fansteel facility had an event due to the failure of the plant ventilation and caustic scrubber systems. This system failure resulted in a release of hydrofluoric acid (HF) gas to the work environment, the evacuation of personnel from the main process building (Chem A), and the hospitalization of two operators who were exposed to the HF gas.

Routine site activities by plant personnel included personnel training for Phase II operations, maintenance of the sample stations, radiological surveys, groundwater sampling, small equipment/material decontamination, laboratory work with WIP material, building and grounds maintenance, testing and construction of the WIP/CaF_2 reprocessing plant, and the operation of the reprocessing plant using CaF_2 material.

By letter dated May 3, 1999, Fansteel postponed receiving anhydrous NH_3, phosphoric acid, HCL, or any additional sulfuric acid or sodium hydroxide onsite or introducing any of these chemical into the residue process until such time as applicable procedures, controls, training, and safety measures are in place for the chemical at issue. The licensee stated that they would review and implement the controls identified in the final hazard analysis and would implement the requirements of 29 CFR 1910.119, "Process Safety Management" for the storage and use of anhydrous NH_3.

2 Emergency Preparedness (88050)
Emergency Response Procedures (88064)

2.1 Inspection Scope

The objective was to inspect the licensee's emergency preparedness and to verify the availability, adequacy, and implementation of the licensees' emergency response procedures and equipment, protocol for coordinating with offsite agencies, and worker training for responding to emergencies. Additionally, the NRC assessed the licensee's response to the February 12, 2000, HF event including the licensee's investigation of the event and its decision regarding the reportability of the event.

2.2 Observations and Findings

a. Hydrofluoric Acid Gas Incident

(1) Event Background

On February 18, 2000, the NRC's Region IV (RIV) office received a telephone message from Fansteel that a "puff" release of HF occurred from the scrubber system on February 12, 2000, that caused a plant evacuation of 7-10 employees and hospitalization of 2 individuals for over 3 days. The release was caused by a failure in the scrubber which caused a backup and subsequent pressurization of the vent line. The HF gas was vented through an open tank where two workers were manually loading material. According to the licensee, the HF detector on the north side of the plant did not alarm, because the puff blew in the direction of the south plant where no alarm is installed. The two individuals hospitalized had been released from the hospital at the time of the call.

Region IV called the licensee and inquired into whether the State of Oklahoma's Department of Environmental Quality (ODEQ), Occupational Safety and Health Administration (OSHA), or the Environmental Protection Agency (EPA) had been notified. The licensee explained that OSHA reporting would have been required if more than 2 individuals had been hospitalized. The licensee initially reviewed the event and determined that it was not reportable to the NRC, ODEQ, OSHA, or the EPA. On March 13, 2000, the licensee provided the inspectors a written review of the HF event and again determined that it was not reportable to the NRC pursuant to 10 CFR 40.60.

(2) Licensee's Incident Investigation

From February 12-18, 2000, the licensee had shutdown the plant and investigated the incident causes. The licensee's initial investigation found that the two operators exposed to HF were manually loading aluminum oxide (AlO_2) using 5-gallon buckets into an open tank (T-702) in the south end of plant without approved procedures and at the direction of the operations manager. Tank T-702 contained no licensed material. The manual mixing of AlO_2 was being undertaken because of the failure of a mechanical

mixing screw. At the same time, the caustic scrubber at the north end of the plant experienced an internal material buildup such that a piece of the material broke off and plugged the throat of the scrubber causing a backflow of water and loss of scrubber vacuum. The tank where the workers were mixing material was also vented to the scrubber so the buildup in pressure at the scrubber resulting from the plugging, caused a pressure backflow of HF to the mixing tank. The workers were on top of the tank and were exposed to a puff of HF. Both workers remained conscious through the event but were coughing. They were taken to the hospital due to a concern of a water buildup in the lungs. Both workers were released from the hospital on February,16, 2000, but had not returned to work as of the dates of the inspection.

The licensee's final investigation concluded that the causes of the event and the subsequent harm to the operators were as follows:

- Mechanical failure of the caustic scrubber system which caused back pressure in the main plant ventilation system.

- Administrative failure of operations personnel in that operators hand fed AlO_2 without an approved standard operating procedure (SOP) or special work permit (SWP) at the operations manager's direction. In addition, the operators were not wearing respiratory protection equipment.

Fansteel's proposed corrective actions as stated telephonically to the NRC on February 18, 2000, was to develop a plan of action to prevent another HF release and continue CaF_2 reprocessing. The practice of manually loading AlO_2 had been terminated. Work on top of tanks without respiratory protection was prohibited. Six new scrubber operations monitoring points were added to the three existing points. This additional monitoring was expected to be able to identify the buildup that resulted in the scrubber plugging. Additionally, the licensee planned to evaluate the system for long term modifications as needed.

The licensee's immediate corrective actions were found to be adequate and included the following:

- Prevent the buildup of material on the caustic scrubber (CS-312) venturi nozzles by cleaning them at 10-day intervals

- Workers will wear protective equipment including respirators at all times around open tanks and vent lines.

- The scrubber system has to operate for 24 hours before chemicals are added in order to insure HF acid removal.

- Loading AlO_2 without an approved SOP or SWP is prohibited.

- The CS-312 fan has been repaired and is functioning as designed.

- Based on the inspection findings surrounding the inoperative HF monitor, the licensee was re-evaluating HF monitoring capabilities.

Licensee Condition 10 states, in part, that the licensee is authorized to use licensed material in accordance with statements, representations, and conditions contained in Part 1 (Chapters 1-5) of the application submitted by letter dated May 10 and supplemented by letters dated February 3, May 17 and July 7, 1999.

Chapter 4, Section 4.1 of the license states, in part, that plant operations shall be conducted in accordance with written procedures. Standard operating procedures shall be reviewed, revised, and approved by the radiation safety committee.

On February 12, 2000, the licensee conducted AlO_2 feed operations at Tank T-702 without a written procedure that had been reviewed, signed, and approved by the radiation safety committee. Two operators were conducting the aluminum oxide feed operation from on top of the open tank without a SOP, SWP, and without respiratory protection. As a result, the two operators were exposed to HF acid gas in concentrations in excess of 90 parts/million (ppm) when the plant ventilation and HF acid gas removal system failed during a system upset that diverted HF gas flow to the Tank T-702 vent line. The effected operators were hospitalized for 4 days. The concentration of HF gas that the operators were exposed to was three times the immediately dangerous to life and health (IDLH) level of 30 ppm as established by the American Conference of Government Industrial Hygienist.

The licensee's failure to use an approved procedure, SOP or SWP for the manual AlO_2 feed operation was a contributing factor to the operators' injuries. While it was apparent that the HF event resulted in an occupational risk, it was not apparent that the activities which occurred at Tank T-702 without an approved procedure affected the safety of licensed radioactive material. Consequently, this issue is considered an Unresolved Item (URI 40-7580/0001-01). An Unresolved Item is a matter about which more information is required to determine whether the issue in question is an acceptable item, a deviation, a nonconformance, or a violation. The resolution by the NRC of the affect of the event on licensed material could determine whether an NRC violation occurred or whether the issue falls within the jurisdiction of OSHA.

(3) The NRC's HF Investigation

The licensee's investigation, as conducted by the plant safety director, did not include an assessment of the workers HF exposure. The inspector obtained an estimate of the HF concentration that the workers were exposed to from the engineering staff. The inspectors noted that the licensee's root cause and investigation report was concise and addressed two causes of the event that lead to personnel injury. However, the investigation report did not sufficiently address other barriers that could have prevented the consequences of this HF event. The inspectors identified that the licensee's investigation did not include contributing factors or precursors to the HF event such as:

- Failure to have a lockout/tagout program to isolate workers from operating equipment and processes.

- The HF detector, monitor, and alarm feature was likely inoperative.

- The lack of an adequate maintenance retest and mechanical integrity program pursuant to 29 CFR 1910.119(j). For example, after the HF event, the caustic scrubber fan CS-312 was found to have been running in the reverse direction because it was wired incorrectly and had not been adequately retested.

- The Fansteel Process Hazard Analysis or investigation report did not evaluate whether a backflow check valve could be installed in the process vent line to mitigate the consequences of a HF scrubber and system failure.

(4) HF Monitor

The inspectors noted from the licensee's investigation that the HF monitor did not initiate the plant evacuation alarm, although a leak had been reported in the vicinity of the HF detector. During the May 1999 inspection, inspectors from the NRC and OSHA identified that the licensee's Process Hazard Analysis did not recommend the installation of an HF monitor in the plant. Nonetheless, an HF monitor was installed in August 1999.

During the current inspection, the HF monitor generally indicated that the HF concentration in the vicinity measured -3.0 to -4.0 parts/million (ppm). The inspectors asked if the monitor was operational prior to the February 12, 2000, HF event and if the monitor had been checked since the event. The licensee stated that the monitor had been calibrated. Licensee records indicated that the HF monitor had been calibrated three times between August - December 1999 and twice in March 2000. The licensee used the vendor manual instructions concerning the HF monitor. Licensee management explained the reason that the monitor was reading negative was due to drifting that required the monitor to be adjusted. The licensee made what they thought were the necessary electronic adjustments. However, the negative readings came back. The licensee ordered new HF detector probes because they suspected that the HF monitoring system was not reliable. The radiation safety committee had not reviewed the recent HF monitor calibration and reliability concerns.

From approximately August 1, 1999, when the HF detector was first installed to March 3, 2000, the licensee did not perform operational response checks of the detector on a weekly basis as recommended by the manufacturer. Because of instrument drift and the unreliability of the instrument probes, the inspectors concluded that the HF monitor was likely not operational during the month of March 2000 despite the three calibrations that had been performed. The inspectors recognized an HF monitor was not specifically required by the license or recommended by the Process Hazards Report. However, an operational HF monitor is considered important for alerting workers of potentially unsafe conditions.

(5) CS-312 Scrubber, Fan, and Ventilation System Failure

Based on the licensee's HF investigation report a mechanical root cause of the event was identified. Licensee management described that material accumulated in the inlet line of caustic scrubber (CS)-312. The material broke off from the inlet line and partially plugged the caustic scrubber dip-leg which is the discharge point for the accumulation of water in CS-312. Water filled the scrubber and eliminated the airflow through the scrubber to the plant stack. The airflow was then redirected backwards to the main vent piping into the south portion of the plant. Licensee management's explanation seemed reasonable. However, neither the investigation report nor licensee management identified that the CS-312 fan was found to be wired up incorrectly such that the fan was operating in a reverse mode. This information was identified by the NRC inspector during discussions with one of the operators on March 23, 2000. On March 27, 2000, the NRC requested that the licensee provide the information regarding this finding.

The original design of the HF scrubber and ventilation system specified that the CS-312 fan discharge and dilute air from the plant at 4,200 cubic feet/minute (cfm) at a vacuum pressure of 22 inches water. In May 1999, the licensee had changed the stack ventilation exhaust fan flowrate from 4,200 cfm to 5,200 cfm. Upstream of the CS-312 system is the water scrubber (WS-311) system that has a blower fan that measured 3,000 cfm. On February 23, 2000, the licensee found that the airflow downstream of the CS-312 blower only measured 3,700 cfm and the vacuum pressure was well below the design curve, 6 inches of vacuum. The licensee determined that the plant ventilation system had an additional 700 cfm airflow capacity with the fan incorrectly wire. However, the licensee thought that the CS-312 fan was defective and contacted the manufacturer. On March 3, 2000, the licensee determined that the fan had been running in reverse since January 3, 2000, when an electrical contractor had been brought onsite to hookup the wires to the fan motor. The licensee rewired the fan and the test results measured the airflow of the fan to be 5,000 cfm at 18.5 inches of vacuum pressure. On March 6, 2000, the licensee determined that the both scrubber system fans were operating correctly.

Based on the inspectors' review of the licensee's information, the inspectors determined that the licensee measurement of 3,700 cfm included 3,000 cfm from the WS-312 fan plus 700 cfm from other system considerations such as system draft. The inspectors determined that Fan CS-312 was not blowing airflow in reverse into the plant, but airflow from Fan WS-312 was bypassing the CS-312 fan housing. If the fan had been running correctly during the HF event, as water accumulated in the CS-312 scrubber, the CS-312 fan might have sucked the water out of the scrubber. Under this postulated scenario, water would not have built up in the scrubber with sufficient volume to divert the flow of HF gas to the 700 section of the plant. The inspectors concluded that the main plant ventilation system had diminished operational capacity from January 3 to March 3, 2000. Furthermore, the fan operating in reverse during the February 12, 2000, event contributed to the HF laden airflow being diverted to the plant ventilation system in reverse.

(6) HF Event Reporting Based on the Ventilation System Failure

Section 2.6 of the license requires the licensee to investigate incidents and evaluate situations that could result in an NRC reportable event. On March 13, 2000, the license provided the inspectors with their determination of whether the HF event was required to be reported to the NRC pursuant to 10 CFR 40.60. The licensee concluded that the February 12, 2000, HF event and ventilation system failure was not reportable. The licensee's position was as follows:

- The caustic scrubber was designed to remove any excess fluoride emissions and ventilate fumes from the south end of the plant. The cyclone and HF scrubber system [WS-311] are very efficient at removing solids.

- The HF water scrubber [WS-311] is designed as a stand alone system. Fansteel placed the caustic scrubber [CS-312] in service initially to handle the rest of the plant. It was decided that Fansteel could provide additional fluoride scrubbing by rescrubbing the HF water scrubber discharge.

- The caustic scrubber is a redundant system.

Under the circumstances associated with the February 12, 2000, HF event and current license requirements, the NRC concluded that the event was not clearly reportable per 10 CFR 40.60.

(7) HF Event Emergency Response

Based on the February 12, 2000, HF event the inspectors assessed the implementation of the licensee's emergency response procedures, equipment, and worker training for responding to process upset conditions involving high risk chemical hazards such as HF. The inspectors noted that the two injured operators had been admitted into the Muskogee Regional Medical Center at 12:00 p.m. Licensee personnel reported that hospital personnel were confused about handling the situation with the Fansteel workers. Licensee management explained that the hospital had lost the Fansteel hazards data manual that had been prepared for the hospital for such events. The inspectors further noted that the hospital notified the Poison Control Center in Oklahoma City, Oklahoma, and treatment was rendered to the workers.

The inspectors focused on Fansteel's Phase I process feed operations for the CaF_2 sulfation process, the plant ventilation, and HF acid scrubber during the course of the event. The inspectors conducted facility walkdowns and held discussions with Fansteel management and personnel. The inspectors reviewed the implementation of emergency response protective equipment and emergency response kit locator map. The locator maps informed licensee personnel and offsite emergency responders of the locations of emergency response equipment and appropriate evacuation routes.

During the February 12, 2000, HF event the plant evacuation alarm was sounded at 10:25 a.m., signifying a plant emergency because of a plant ventilation/HF scrubber system failure and subsequent HF gas release. Chemistry and operations personnel

with one exception appropriately used Drager tubes for analyzing air samples, pH (litmus) paper for analyzing water samples, and respiratory protection equipment. The licensee's investigation report identified that the shift supervisor entered the plant at 10:30 a.m. to investigate the event without donning respiratory protection equipment. Chapter 3, Section 3.4 of the license states, in part, that respiratory protection equipment must be used in the event of a plant emergency. The inspectors noted that as recent as January 7, 2000, operations personnel had been provided written guidance requiring the donning of respirators during a plant emergency. The shift supervisor not donning the respirator during a plant emergency was considered an Unresolved Item (URI 40-7580/0001-02). This issue is unresolved pending a determination by the NRC whether this finding is a violation of NRC requirements, or whether the issue falls within the jurisdiction of OSHA.

2.3 Conclusions

While it was apparent that the HF event resulted in an occupational risk, it was not apparent that the activities which occurred at Tank T-702 without an approved procedure affected the safety of licensed radioactive materials. Consequently, this issue is considered an Unresolved Item (URI 40-7580/0001-01). The resolution by the NRC of the affect of the event on licensed material could determine whether an NRC violation occurred or whether the issue falls within the jurisdiction of OSHA

The shift supervisor not donning the respirator during a plant emergency as required by the license was considered an Unresolved Item (URI 40-7580/0001-02). This issue is unresolved pending a determination by the NRC whether this finding is a violation of NRC requirements, or whether the issue falls within the jurisdiction of OSHA.

The caustic scrubber fan (CS-312) and HF monitor were determined to not have been fully operational during the HF event.

3 Management Organization and Controls (88005)
Hazard Identification and Assessment (88507)
Standard Operating Procedures (88058)
Decommissioning of Fuel Cycle Facilities (88104)
Construction Review (88001)

3.1 Inspection Scope

Based on the Fansteel letter dated May 3, 1999, the licensee postponed receiving anhydrous NH_3, phosphoric acid, HCL, or any additional sulfuric acid or sodium hydroxide onsite or introducing any of these chemical into the residue process until such time as applicable procedures, controls, training, and safety measures are in place for the chemical at issue. The licensee stated that they would review and implement the controls identified in the Final Hazard Analysis and the requirements of 29 CFR 1910.119, "Process Safety Management" for the storage and use of anhydrous NH_3. The scope of this inspection included the following:

- Review of the "Hazard Analysis for Fansteel Recovery Process Final Report," applicable piping and instrument diagrams (P&IDs) and procedures.

- Conduct of a system walkdown with process operators to determine whether the licensee had identified the potential safety risks and implemented appropriate safety controls for receiving bulk hazardous chemicals such as anhydrous ammonia (NH_3) and hydrochloric (HCl) acid.

- Review of the licensee's management of change program to determine whether a system had been established.

3.2 Observations and Findings

a. Anhydrous Ammonia System

Drawing OPF-P101-02.dwg, Fansteel WIP/CaF_2 P&ID, dated March 11, 1998, and Chemical Storage Section 100, Page 2, shows the anhydrous NH_3 tank with an excess flow check valve. Such an excess flow check valve is required by American National Standard K-61.1, Safety Requirements for the Storage and Handling of Anhydrous NH_3 and OSHA's 10 CFR 1910.111, in order to limit the potential release for any down stream pipe break. However, no excess flow check valve had been installed. Discussions with plant management indicated that the valve had been ordered. The recommendation to install the valve along with an NH_3 leak detector were documented in an internal plant memorandum. The inspectors noted that the licensee lacked a pre-startup checklist that would have the installation and functional test of the valve and leak detector as a requirement prior to the introduction of anhydrous NH_3 to the bulk storage tank.

The inspectors reviewed the Process Hazard Analysis Action Items associated with the anhydrous NH_3 system (Actions Items 56-68) to verify that the licensee had developed and implemented the controls identified in the hazard analysis. The inspectors noted that three of the action items addressed a vaporizer which the licensee subsequently decided not to install. Action Item 56 placed a pressure limit on the delivery truck unloading pump. The operator was unaware of the limit and it was not discussed in the operating procedure. During discussions with licensee management, the inspectors were informed that the vendor had not been informed of the limit. The inspectors stated that any limit developed by the licensee's hazard analysis should be conveyed to those plant employees or contractor/vendor employees responsible for implementing the limit. The licensee acknowledged the inspectors' comments.

Action Item 57 required that the P&ID be updated to confirm a pressure interlock on the unloading pump. Review of the P&ID indicated that this action item had not been done and there was no other system in place to schedule its completion. Pressure limiting functions were identified as significant safety features (SR: II) in Appendix E, Detailed Analysis Worksheets, Pages 18-20.

Action Item 62 required addition of an isolation loop around the NH_3 pressure control valve, "as shown on the P&ID." The inspectors noted that no isolation loop had been

installed in the field or shown on the existing P&ID, and the operators were not aware of this feature.

Action Item 65 required that the operating procedures never fill the tank above 80 percent. The inspectors' review of the operating procedure indicated that the limit had been conservatively set to 66 percent. The inspectors asked the operators how they would determine what the maximum level would be and were informed that they would estimate it based on a sight glass. The inspectors discussed this with the licensee and noted that an approved operator aide, such as a mark on the sight glass, could identify the maximum limit. The inspectors' comments were acknowledged.

During the walkdown, the inspectors asked the operators if they were qualified to use respirators and were informed that they had been fit tested. The operators stated that the appropriate cartridges for NH_3 environments should be in the control room storage locker. However, no NH_3 cartridges were there. Discussions with licensee management indicated that the cartridges were onsite but had not yet been distributed. The inspectors noted that there was no tracking mechanism to assure distribution of the NH_3 cartridges prior to receipt of NH_3.

The inspectors held discussions with plant management concerning the development of a mechanical integrity program for highly hazardous chemicals. Plant management stated that although it was their intent to develop an appropriate program, none had yet been finalized. The licensee had stated that Oklahoma State inspectors had witnessed the hydrostatic test of the NH_3 tank, but there were no formal records that included the test procedure or acceptance criteria available for inspection. Such records are important to demonstrate the safety basis of the system and to allow the tracking of the next required inspection/test.

While conducting the system walkdown, the inspectors observed that the anhydrous NH_3 safety relief valve discharge lines vented about 5 feet below a large outdoor flood light. Anhydrous NH_3 in concentrations of about 15 percent is highly flammable. Discussions with plant management indicated that the light was not explosion proof and that they would remove it prior to system startup. This matter will be further reviewed during a future inspection and is considered a Phase II operations inspection followup item (IFI 40-7580/0001-03).

As a result of the above findings, the inspectors conducted discussions with plant management regarding the schedule for completing work on the anhydrous NH_3 system. The inspectors were informed that the licensee did not plan to bring anhydrous NH_3 onsite for about two more months and that the licensee would give the NRC prior notice.

b. Hydrochloric Acid System

The inspectors noted that the "as-built" system did not match the plant drawings. The P&ID showed an atmospheric vent line on the storage tank (to protect the storage tank from high differential pressures). However, the actual tank had a vacuum breaker (which also served as a pressure relief device). The inspectors brought this to the attention of plant management.

The hazard analysis identified several instruments and alarms as having a safety function. The inspectors asked plant management whether appropriate maintenance procedures had been established to test the instruments to assure their operability and were informed that the maintenance procedures still had to be developed and approved. Plant management indicated that they were still a month away from developing the procedures.

The inspectors conducted further discussions with plant management concerning the readiness of the HCl system for operation and were informed that they currently believed that it would not be ready until about 1-month after receipt of anhydrous NH_3.

c. Management of Change

The Process Hazards Analysis Report did not reflect the "as-built" conditions in the plant. The inspectors found that there was no formal system to assure that the hazards analysis was kept up-to-date as various process modifications were made to the plant after submittal of the application to the NRC. Through discussions with plant management, the inspectors were informed that further process modifications were under consideration to substantially increase the strength of the HF acid concentration. The inspectors were also informed that changes to the ventilation system that tied the tank vent system into the caustic scrubber system were not evaluated for potential hazards or controls to prevent or mitigate those hazards. Furthermore, the inspectors noted that the tank vent system was not included in the original analysis nor shown on the referenced system drawings. This matter will be further discussed with the licensee during the May 31, 2000, management meeting.

d. Fire Protection

While touring the solvent extraction area, the inspectors noted that a CO_2 fire suppression system was installed. Discussions were conducted with plant management concerning the potential hazards and risks associated with CO_2 fire suppression systems and a recent accident at a Department of Energy facility that resulted in a fatality when the system was spuriously activated. The licensee informed the inspectors that they were not aware of the event, but would review the information for applicability to their system. The inspectors had no further questions.

3.3 Conclusions

As of March 17, 2000, Fansteel was not ready to bring anhydrous NH_3 and HCL onsite to support Phase II operations. The requirements of the OSHA Process Safety Management Rule, 29 CFR 1910.119, and the Storage and Handling of Anhydrous Ammonia Rule, 29 CFR 1910.111, were not met. Furthermore, (1) the licensee did not have a management control system in place to assure that the hazard analysis was up-to-date and reflected the "as-built" condition of the system; (2) the hazard analysis recommendations were not appropriately addressed and implemented; (3) the process hazard analysis was not current; (4) no process existed to ensure that modifications were properly installed and functionally tested; and (5) a mechanical integrity program had not been developed and implemented per OSHA regulation 29 CFR 1910.119(j).

The licensee had not established a system to assure that plant changes were properly evaluated for potential hazards and that appropriate controls to prevent or mitigate the consequences of an accident were established. The anhydrous NH_3 tank safety relief valve vented near a flood light. Anhydrous NH_3 is highly flammable. Plant management indicated that they would remove the light prior to system startup. This matter will be further reviewed during a future inspection and is considered a Phase II operations inspection followup item (IFI 40-7580/0001-03). Licensee management stated that they would evaluate the potential risks associated with the inadvertent discharge of CO_2 in the solvent extraction area.

4 Radiation Protection (83822)

4.1 Inspection Scope

The licensee's respiratory protection program was inspected to determine the licensee's compliance with requirements in the license and 10 CFR Part 20, Subpart H. In February 2000, new requirements for respiratory protection and controls to restrict internal exposure went into effect. Part I, Section 3 of the license describes the licensee's radiation protection program. Chapter 3, Section 3.4 of the license requires that respiratory protection equipment must be used in the event of a plant emergency. The inspectors reviewed the licensee's respiratory protection program to assess its readiness for Phase II operations.

4.2 Observations and Findings

At the time of this inspection, the licensee's respiratory equipment and protection program was not in place to meet the requirement of 10 CFR Part 20, Subpart H. Aspects of the licensee's nonradiological respiratory protection program were not consistent with some of the standards that are adopted in 10 CFR 20 for respiratory protection pursuant to ANSI Z88.2, "American National Standard for Respiratory Protection," such as assigned protection factors (APF) and special training. However, the licensee's program was in place to meet the requirements of OSHA. Based on the low concentration of radioactivity in the process feed operations for the CaF_2 sulfation process, the licensee determined that a 10 CFR Part 20 respirator protection program was not necessary during Phase I operations.

Based on information that the licensee sent to the NRC in February and July 1999, Fansteel will not need to have a 10 CFR Part 20, Subpart H respiratory protection program in place until Phase II operations begin processing WIP material. The licensee had identified that airborne radioactivity could exceed 10 CFR Part 20, Appendix B, derived airborne concentration (DAC) levels in two areas of the process plant during WIP operations and under certain accident conditions.

The licensee developed a respiratory protection procedure for occupational safety requirements in February 2000. The licensee has not written a procedure for implementing a 10 CFR Part 20, Subpart H program respiratory protection program.

After reviewing the licensee's current safety procedure for respiratory protection, the inspectors determined that the licensee's program did not include information contained in revised 10 CFR 20.1703. The current procedure did not include the following:

- Recordkeeping and limitations on respirator use
- Supervision and training of respirator users
- Fit testing with fit factor $\geq$ 10 times the APF for negative pressure devices
- A fit factor $\geq$ 500 for positive pressure, continuous flow, and pressure-demand devices,
- A provision to ensure that respirators fit tight and the face piece is inspected before the first field use of respirators and periodically inspected at a frequency not to exceed 1-year.

The licensee stated that Fansteel would have to further evaluate the existing respiratory equipment and protection program for 10 CFR Part 20 requirements. This matter will be further reviewed during a future inspection and is considered a Phase II operations inspection followup item (IFI 40-7580/0001-04).

4.3 Conclusions

Fansteel's existing respiratory equipment and protection program was adequate for non-radiological requirements but did not meet NRC radiological requirements pursuant to 10 CFR Part 20 which could be required for certain Phase II operations. An inspection followup item was opened to track review of this area during a future inspection.

5 Radioactive Waste Management (88035) Environmental Protection (88045)

5.1 Inspection Scope

The licensee's site environmental monitoring program was reviewed to determine compliance with license conditions involving liquid effluent releases (radiological and nonradiological) and groundwater monitoring. The environmental program requirements are identified in Section 3 of the supplement to the license (Part I). The inspectors reviewed the licensee's National Pollution Discharge Elimination System Permit OK0001643 which is a U.S. Environmental Protection Agency program administered by the State of Oklahoma Department of Environmental Quality (ODEQ). The environmental program consisted of groundwater sampling and liquid effluent sampling of site discharges to the Arkansas River.

5.2. Observations and Findings

a. Liquid Effluents

Liquid effluent collection and discharge systems were inspected. Discharge systems reviewed included the Pond 3 collection cistern, transfer system, plate filter system, Ponds 6, 7, 8, and 9, and Outfall 001 effluent discharge station. All ponds and equipment were in a good state of maintenance.

Records of 1999 Outfall 001 discharges were reviewed for flow, pH, fluorides, NH_3 , total suspended solids, chemical oxygen demand, sulfate, tantalum, columbium, lead and zinc. No anomalous readings were identified. Samples were composited and analyzed for alpha and beta radiation emission content. Based on these samples, discharges were below the 10 CFR Part 20, Appendix B effluent limits. However, the NPDES permit had been exceeded for NH_3 and biological toxicity. The licensee and the ODEQ were monitoring the NPDES exceedances, and the licensee was developing an action plan for implementing corrective actions.

c. Groundwater Monitoring

(1) Regulatory Requirements

The inspectors reviewed the licensee's groundwater monitoring program to determine compliance of Section 3.5 of the General License and License Condition 27. Section 3.5, "Groundwater Monitoring" of the General License requires the licensee to analyze groundwater samples for gross alpha and beta radiation and non-radiological chemical parameters on a quarterly basis. Section 3.5 of the General License requires the following depending on the groundwater and effluent results:

- If the gross alpha concentration exceeds 15 picocuries/liter (pCi/l) or gross beta-gamma concentration of 50 pCi/l, isotopic analyses will be made to identify major radionuclides such as U-234, U-238, Th-228, and Th-232.

- If the concentration of any radionuclide in groundwater or liquid effluents exceeds 25 percent of the effluent concentration limits listed in 10 CFR Part 20, Appendix B, Table II, an investigation will be made to determine the cause and corrective action.

- If the concentration of any radionuclide in groundwater or liquid effluents exceeds effluent concentration limits listed in 10 CFR Part 20, Appendix B, Table II, Fansteel will submit a report to the NRC RIV Regional Administrator within 30 days.

(2) Groundwater Monitoring Data

During the November 1999 inspection, the inspectors assessed the capability of the licensee to monitor and examine potential trends in the monitoring well data. Several monitoring wells and sumps had gross alpha radioactivity in excess of 15 pCi/l and had

gross beta radioactivity in excess of 50 pCi/l. Groundwater sump results from May, August, and September 1999 indicated that gross alpha radioactivity in Sumps 2 and 3 were 238 pCi/l and 763 pCi/l. The gross beta radioactivity in Sumps 2 and 3 were 229 pCi/l and 3550 pCi/l. The isotopic analysis report that identified major radionuclides in the groundwater at Sump 2 containing U-234, U-235, and U-238 at 3930 pCi/l, 881 pCi/l, and 5580 pCi/l, respectively. The inspectors noted that 5580 pCi/l analysis was in excess of any contamination previously reported in Fansteel groundwater. The concentration of U-238 radioactivity in the Sump 2 groundwater was more that 18 times in excess of the 10 CFR 20, Appendix B, effluent concentration level for U-238.

On December 13, 1999, the NRC received Fansteel's groundwater monitoring report that was issued as required by Section 3.5 of the license. The licensee's report confirmed that radioactive liquid samples from Sump No. 2 were well in excess of the Appendix B, effluent concentration limit for U-234 and U-238. The licensee reported that because of the groundwater system design, no radiological material had been released offsite. The inspectors determined that the licensee was not investigating the reason for the elevated radioactivity in Sump No. 2, because the groundwater treatment system was, specifically, designed to treat contaminated groundwater by evaporators.

(3) French Drain System Operations

Inspectors toured the groundwater corrective action system (french drain system) including the sumps and evaporators. According to the December 1997 Fansteel Environmental Assessment, the licensee had committed to operate the french drain system concurrent with reprocess operations. The following observations were made:

- Sump Pumps 1, 3 and 4 were fully operational. The gauges showed discharge pressure at 40 pounds/square in gauge (psig), and the licensee operated the sample collection systems for each sump pump. Within all three sumps, the water appeared reasonably clear as it flowed from the sample collection outlets.

- Sump Pump 2 did not appear to be operating, although the system was energized. No differential pressure (5 psig) was indicated on the gauge, and no water flowed when the sample collection valve was opened. The licensee indicated they would have to investigate why the sump pump was not operating. The licensee explained that sump Pump 2 had experienced recurring problems in the past.

- The sidewall of the caisson on sump Pump 2 was stained a light brown where water flow from the sample outlet would come into contact. The licensee indicated well water is consistently very dirty. Also, sump water varied from a pH of 2.9-8.8 probably due to an NH_3 and HF acid from past operations.

- The pump outlet line from sump Pump 2 had a separate above-ground line running to the plant wastewater treatment and the evaporator building. The line originated at the access manhole near the sump House 2. The licensee indicated that it was necessary due to frequent clogging of the normal system, which has combined flow from Sumps 1 and 2.

- The groundwater treatment/evaporator system was not operational and had been bypassed as part of a piping reconfiguration.

Under normal operation, groundwater would be pumped into the treatment building, where chemical addition, to precipitate materials, would be followed by evaporation. The residual material would then be put into the process with material/water from the CaF_2 ponds (currently Pond 9). The licensee indicated that the evaporator system was redundant to the existing plant process wastewater treatment operations. Therefore, the groundwater evaporator operations were discontinued for cost savings. Under revised operations, the groundwater is pumped directly into Pond 9, the beginning of the wastewater treatment process. Water from Pond 9 was, subsequently, moved to Pond 8, and then Ponds 7 and 6, and eventually pumped into the river as part of the wastewater treatment system.

The licensee indicated that the heavily silted water from Sump 2 has caused some difficulties in earlier evaporator operations. Visual observation of the evaporator tubes revealed a heavy silt coating. The licensee indicated that an operating procedure would have to include a periodic chemical cleaning of the evaporator to ensure continued operations. The licensee indicated that the groundwater system was not fully functional, but undergoing testing to determine steady-state operating levels. Data was collected and logged at regular intervals. The licensee indicated that other unrelated site operational issues were currently taking precedence and a completed operational procedure would take about two months to complete.

License Condition 26 states, in part, that remediation and decommissioning activities at the Muskogee facility shall be performed in accordance with the decommissioning plan and supplemental correspondence submitted by letter dated June 18 and supplemented by letter dated July 16, 1999. Section 2.1.2.8.2, of the Decommissioning Plan states, in part, that the trench intercepts groundwater and routes it to the a treatment facility. Treatment consists of an evaporation process that will retain all radionuclides in high-solids slurry. From February 1 to March 17, 2000, the licensee had rerouted groundwater to the plant wastewater treatment facility for processing, whereby all the radionuclides were being retained in the facility wastewater treatment ponds. In so doing, the groundwater treatment did not include an evaporation process. This was a violation of the license (VIO 40-7580/0001-05).

5.3 Conclusions

A review of the licensee's environmental monitoring and radioactive waste management programs found that the licensee was conducting appropriate groundwater monitoring in compliance with the license requirements. A violation was identified for failure to conduct groundwater cleanup operations through the groundwater evaporation system as required by License Condition 26 and the Decommissioning Plan.

6 Followup (92701)

6.1 (Open) VIO 40-7580/9902-01: Failure to implement the radiation protection program and groundwater cleanup operation with approved procedures

Chapter 4, Section 4.1 of the license states, in part, that plant operations shall be conducted in accordance with written procedures. Standard operating procedures shall be reviewed, revised, and approved by the radiation safety committee.

At the time of the November 1999 inspection, the licensee had not written an SOP for the french drain and groundwater system or conducted any training on its operation. The licensee had not developed and implemented radiation protection procedures.

From July to November 1999, the licensee implemented the radiation protection program and the groundwater cleanup operations without procedures that had been reviewed, signed, and approved by the radiation safety committee.

a. Failure to implement the radiation protection program with approved procedures

During this inspection, the inspectors reviewed the licensee's implementation of the corrective actions that were identified in Fansteel's letter "Reply to the Notice of Violation" dated January 25, 2000. The licensee stated that they would develop a procedure on procedural development and modifications by March 1, 2000. However, the inspectors found that the licensee had not written the procedure. The licensee stated that they had not had time to write the procedure and would have the procedure written and approved by April 1, 2000. The inspectors found that the licensee had written and approved radiation protection procedures as stated in the Fansteel letter. This matter will remain open until the administrative procedural development document is established.

b. Failure to implement the groundwater operations with approved procedures

During this inspection, the inspectors reviewed the licensee's implementation of the corrective actions that were identified in Fansteel's letter "Reply to the Notice of Violation" dated January 25, 2000. The licensee stated that they would develop a procedure on procedural development and modifications by March 1, 2000. However, the inspectors found that the licensee had not written the procedure. The licensee stated that they had not had time to write the procedure and would have the procedure written and approved by April 1, 2000. The inspectors found that the licensee had written and approved a temporary groundwater operations procedure and a permanent procedure would be developed later. This matter will remain open until the administrative procedural development document is established.

The matters identified in items (a) and (b) above will be further discussed with the licensee during the May 31, 2000, management meeting.

6.2 (Open) VIO 40-7580/9901-02: 10 CFR 40.60 Tornado Damage Reporting Determination

On June 1, 1999, the Fansteel Sodium Reduction Building was substantially damaged by a tornado which resulted in an unplanned contamination spill of at least 1000 pounds of radioactive material on the ground. The NRC determined that the licensee's failure to report the tornado event to the NRC pursuant to 10 CFR 40.60(b)(1) and 10 CFR 40.60(c)(1) was a violation of NRC requirements.

During this inspection, the inspectors reviewed the licensee's implementation of the corrective actions that were identified in Fansteel's letter "Reply to the Notice of Violation" dated January 25, 2000. The licensee stated that at their next radiation safety committee meeting they would make the committee aware of the intent of the 10 CFR 40.60 reporting requirements. Additionally, Fansteel stated that by March 1, 2000, they would issue a memorandum to management concerning 10 CFR 40.60 reporting requirements to ensure that Fansteel's management is aware of and in agreement with the reporting requirements following the next unforseen incident. The inspectors found that the licensee's radiation safety committee meeting minutes from January 13 through March 17, 2000, did not address the specific requirements of 10 CFR 40.60. Furthermore, the licensee had not issued a memorandum to management concerning 10 CFR 40.60 requirements. The licensee did not have a reasonable explanation for these oversights. This matter will remain open until the licensee implements the commitments as stated in the violation response letter. This matter will be further discussed with the licensee during the May 31, 2000, management meeting.

7 Exit Meeting Summary

On March 17, 2000, the inspectors presented the preliminary inspection results to licensee representatives at the conclusion of the onsite inspection. Licensee representatives acknowledged the findings as presented. A final telephonic exit meeting was conducted on May 2, 2000, to discuss the findings as presented in this report.

During this inspection, Fansteel provided proprietary documents to the inspector for review. However, the inspectors did not retain or incorporate any of the proprietary information in the NRC inspection report.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

*J. Burgess, Operations Manager
M. Mocniak, Vice President and General Counsel
*M. Mooring, Plant Safety Director/ Plant Radiation Safety Officer
*H. Notzel, Plant Chemical Engineer
*C. Petit, Process Operations Manager
*G. Richards, Process Engineering Manager
*J. Stutzman, Radiation Technician

Licensee Contractors

*D. LaPoint, Site Manager (Acting), Pittsburgh Minerals, Environmental, and Technology
*T, Weyland, President, Pittsburgh Minerals, Environmental, and Technology

State of Oklahoma

P. Bishop, ODEQ, Radiation Management Section (RMS)

Occupational Safety and Health Administration

H. Terrel, OSHA Region 6, Safety Compliance Inspector

Nuclear Regulatory Commission

*L. Carson II, RIV, Division of Nuclear Material Safety (DNMS), Health Physicist
*B. Spitzberg, RIV, Fuel Cycle & Decommissioning, Branch Chief

(*) Denotes those who attended the NRC Exit Meeting on March 17, 2000.

INSPECTION PROCEDURES USED

TI 2600/004	Headquarters Inspections of Critical Mass and Rare Earth Fuel Cycle Licensees
TI 2603/001	Chemical Safety Inspections of Fuel Cycle Licensees
IP 83822	Radiation Protection
IP 88001	Construction Review
IP 88005	Management Organization and Controls
IP 88035	Radioactive Waste Management
IP 88045	Environmental Monitoring
IP 88050	Emergency Preparedness
IP 88057	Hazard Identification and Assessment
IP 88058	Standard Operating Procedures
IP 88064	Emergency Response Procedures
IP 88104	Decommissioning of Fuel Cycle Facilities
IP 92701	Followup
IP 93001	OSHA Interface Activities

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

40-7580/0001-01	URI	Failure to implement AlO_2 loading operations without Radiation Safety Committee reviewed and approved procedures.
40-7580/0001-02	URI	Failure to don respiratory protection during the HF plant emergency
40-7580/0001-03	IFI	Highly flammable NH_3 relief valve discharges near a flood light.
40-7580/0001-04	IFI	10 CFR Part 20 respiratory protection program for Phase II operations.
40-7580/0001-05	VIO	Failure to operate groundwater collection and cleanup system as required by License Condition 26.

Discussed

40-7580/9902-02	VIO	Failure to implement the radiation protection program and groundwater cleanup operation without Radiation Safety Committee reviewed and approved procedures.
40-7580/9902-03	VIO	Tornado damage and event reporting requirements pursuant to 10 CFR 40.60 and 10 CFR 20.2202.

Closed

None

LIST OF ACRONYMS USED

AlO_2	aluminum oxide
APF	assigned protection factors
CaF_2	calcium fluoride
cfm	cubic feet per minute
CFR	Code of Federal Regulations
Chem	chemical
DAC	derived air concentration
DCS	distributed control software
dpm	disintegrations per minute
FHAR	Final Hazards Analysis Report
HCL	hydrochloric acid
H_2SO_4	sulfuric acid
IFI	inspection followup item
IP	Inspection Procedure
LC	License Condition
µCi/ml	microcurie (2.22E+6 dpm)/milliliter
NH_3	ammonia
NMSS	Nuclear Material Safety and Safeguards
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
pCi	picocurie (2.22 dpm)
pCi/l	picocurie per liter
pCi/g	picocurie per gram
PHA	Process Hazard Analysis
P&ID	piping and instrument diagrams
PRSO	plant radiation safety officer
PSD	Plant Safety Director
SDMP	Site Decommissioning Management Plan
SWP	special work permit
URI	unresolved item
WIP	work-in-progress