U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 40-08027/86-04 License: SUB-1010

Docket: 40-08027

Licensee: Sequoyah Fuels Corporation (SFC)
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

Facility Name: Sequoyah Fuels Conversion Facility (SFCF)

Inspection At: Gore, Oklahoma

Inspection Conducted: March 14-15, 1986, and April 11-12, 1986

Inspector: R. J. Everett for 5/8/86
D. B. Spitzberg, Radiation Specialist Date

Approved: R. J. Everett 5/8/86
R. J. Everett, Chief, Nuclear Materials Safety Section Date

Inspection Summary

Inspection Conducted March 14-15, 1986, and April 11-12, 1986 (Report 40-08027/86-04)

Areas Inspected: Special, announced inspection of uranium conversion facility activities including the evacuation of excess uranium hexafluoride from a product cylinder overfilled on March 13, 1986, during the special one-time cold trap procedure, and inspection of the April 11-12, 1986, purging of uranium hexafluoride vapors from the process vessels and piping, and re-draining of on-line cold traps prior to initiation of the planned system modifications and testing.

Results: Within the areas inspected, no violations or deviations were identified.

1. Persons Contacted

S. D. Emerson, General Manager
*W. L. Utnage, Facility Manager
C. A. Grosclaude, Manager, Health Physics and Industrial Safety
L. A. Tharp, Area Manager
L. E. McCoy, Area Superintendent
J. C. Brewer, Shift Supervisor

In addition, several Chemical Operators were contacted.

*Present at the exit meeting

2. Purpose of Special Inspection Conducted March 14-15, 1986

The NRC inspector was dispatched to the site to observe the conditions of the product cylinder which had been overfilled with uranium hexafluoride (UF_6) on March 13, 1986, during the special one-time cold trap procedure, and to observe efforts to remove the excess material.

3. Inspector Findings and Observations of Overfilled Cylinder Incident

The NRC inspector determined that the Model 48X (10 ton) cylinder had been filled to a net weight of 26,017 lbs, an excess of 6,017 lbs above the fill weight specified in the special one-time cold trap procedure. (Note: Nominal net fill weight is specified at 21,030 lbs maximum). This was identified as a violation of Section 2.7 of the license application for failure to adhere to established procedures. In accordance with 10 CFR Part 2, Appendix C.V.A, because this item was identified by the licensee and immediate corrective and mitigating steps taken, a Notice of Violation in this case will not be issued. The overfill had apparently been caused by a faulty north fill station scale believed to have been damaged during the decontamination effort. It was noted that the license had no required program for surveillance testing of plant equipment (i.e. scales) important to safe operations. This matter will be forwarded to the NRC Office of Nuclear Material Safety and Safeguards for their review and disposition. Details of this overfill and its causes will be the subject of NUREG 1179, Volume 2.

The NRC inspector observed that all cold trap draining operations had been suspended. The overfilled cylinder had been moved to the accountability scale room for evacuation of excess material. Heat tape and a small heat gun had been applied to the pigtail/cylinder valve connection to maintain the flow path clear of blockage by solidifying UF_6. Continuous surveillance was maintained by the chemical operators. On March 15, 1986, the net weight of the cylinder had dropped to 21,202 lbs and, due to cooling of the product within the cylinder, the evacuation flow had ceased.

4. Purpose of Special Inspection Conducted April 11-12, 1986

On April 9, 1986, at the request of NRC, SFCF telefaxed to Region IV a newly written "Procedure to Complete the Desmoking of all Cold Traps" for review. Authorization was being sought to perform the final series of UF_6 purging and draining sequences in order to remove as much residual UF_6 from the system vessels and piping as possible prior to the planned testing and modification of the process equipment. At the time, the primary cold traps had been placed on heat, a nitrogen gas (N_2) purge had been established and two on-line cold traps were collecting residual UF_6 entrained in the purge gas. In consideration of this, SFCF management stressed to RIV staff that with the system already in the heated, purging state, a go-ahead decision would need to be reached before the weekend shifts or they would opt to bring the system down. To complete the procedure from that point could have created a prolonged, and in the opinion of SFC management, an unnecessary delay.

The NRC staff reviewing the procedure found it difficult to follow and questions were raised that could have taken several days to resolve by correspondence. Therefore, a decision was made to send an NRC inspector to the site to discuss the procedure in detail with the operators and engineers, to personally walk down the systems referenced in the procedure, and to recommend changes as necessary. Following this, if approval was made from the Regional Office, the inspector would observe the initial phases of the procedure.

5. Review of Cold Trap Purge and Desmoke Procedure

Prior to the arrival of the NRC inspector on the site, the licensee, with NRC approval, had drained the No. 1 secondary cold trap (CT) and was preparing to drain the No. 5 clean up reactor cold trap (CURCT). A 30 scfm N_2 purge gas was established through No. 1 primary CT on heat, then flowing through No. 6 primary and No. 2 secondary CTs in series with both on cold. The product cylinder on the south scale had received 8100 lbs. of UF_6 and the cylinder on the north scale 300 lbs. of UF_6.

The NRC inspector met with the Facility Manager, the Area Manager, and Area Superintendent on the morning of April 11, 1986, to discuss details of the desmoke procedure. After reviewing the procedure, the NRC inspector recommended several additions which were incorporated into an addendum to the rewritten cold trap special desmoking procedure, Revision 0, dated 4/11/86 (Addendum A). The additions pertained to:

- requiring a specific hazardous work permit (HWP) for the CT desmoking
- ensuring that purge gas would flow through two CTs on cold prior to off gassing

- ensuring proper operation of stack sampling, scrubber, and off gas monitoring systems

The NRC inspector walked down the UF_6 process system, checked the product cylinder weights, verified status of CTs and vacuum system, and verified the operation of the stack sampler, scrubber, and off gas monitoring recorders. On the afternoon of April 11, 1986, the NRC inspector telephoned to RIV management his recommendation to authorize the desmoking of the primary CTS 1-4 and No. 5 CURCT in accordance with the special procedure. Later that afternoon, authorization was conferred (Addendum B).

6. Cold Trap Desmoking Operations

The NRC inspector observed several primary cold trap desmoke operations on the evening of April 11, 1986, and the draining of the No. 3 secondary CT. The Area Manager and Area Superintendent directed the operation and were assisted by two Chemical Operators. A Control Room Operator maintained continuous surveillance of the scrubber and off gas indicators and reported the readings to the Area Superintendent. The operations were carried out as planned.

The NRC inspector visited the control room prior to leaving the site to observe recorded readings for the off gas flow and temperature. With each venting of a CT, a small spike in off gas flow was recorded, as expected. Off gas temperature had remained constant at approximately -45°F. It was noted that on the last venting of the No. 4 primary CT, a simultaneous increase occurred in both the off gas flow and temperature. The Area Superintendent stated that in this instance, the venting may have proceeded more rapidly than with the other traps due to a sticky valve but that conditions were not such that UF_6 stacking could take place.

On the morning of April 12, 1986, the NRC inspector reviewed the progress of the operations from the previous night with the Shift Supervisor and Facility Manager. It was reported that the operation went according to plan but that UF_6 smoking was still evident in CTs after several desmoke operations. They concluded that it could take several more iterations of the procedure in order to purge the traps completely of UF_6 vapor. The NRC inspector reviewed the operator's log book and the off gas recorder charts for the previous evening. No anomalies were noted.

7. Exit Briefing

The NRC inspector met with the facility manager on March 14, 1986, and April 12, 1986, to discuss observations and findings made during inspections. During the April 12, 1986, exit briefing the facility manager outlined plans to submit a procedure for the final purging and desmoking of the secondary cold traps during the following week.

Subject: **COLD TRAP SPECIAL**

1.0 INTRODUCTION

1.1 Purpose:

To establish the procedure for removing the residual uranium hexafluoride (UF_6) from the cold traps, subsequent to cold trap draining.

1.2 Background:

The nine cold traps contain UF_6, primarily as a vapor, following the traps having been heated and drained. This residual UF_6 must be purged from the cold traps to facilitate planned modifications to the UF_6 drain line manifold and cylinder fill stations, and to allow the cold traps to be pressure tested.

2.0 SAFETY PRECAUTIONS

2.1

WARNING

The operator must maintain continuous visual surveillance of the cold trap purging operation throughout its duration.

2.2

WARNING

UF6 cylinders filled relative to the draining and purging of the cold traps must not be placed in the steam chests for reheating.

2.3

WARNING

The UF6 dump tank pressure relief system must be in service with a gauge reading of 0.0 psig +/- 2 psig on the tap between the rupture disc and relief valve.

2.4

WARNING

The pressure indicators on the cold traps are to be carefully monitored during draining and purging operations. Pressure must be maintained within the ranges specified in the referenced procedure N-270-4, Rev. 2, "Primary Cold Trap Operation," page 3.

2.5

==NOTE==

Ensure that the venting lines from the cold traps are being properly heated by the steam tracings.

2.6 Testing of purge gas from cold traps will be conducted under a specific Hazardous Work Permit (HWP).

2.7 During the desmoking operations for the primary cold traps (#1 through #4) and the clean-up reactor (#5), the clean-up reactor trap (#6) will be cold and on-line backed up by a secondary cold trap, cold and on-line. Purge gas from the desmoking operations will pass through these on-line traps, then through the HF scrubber and on to the HF scrubber stack.

2.8 The Shift Supervisor will verify the following systems are fully operational prior to proceeding with the desmoking operations:

A. Off-Gas HF Scrubber System

B. Off-Gas Flow and Temperature Recorder

C. Off-Gas HF Scrubber Stack Sampling System

2.9 UF_6 cylinders filled during this procedure will not be filled in excess of 20,000 lbs.

2.10 All work is to be performed according to Operating Procedure G-001, Rev. 3, "Health and Safety Precautions and Requirements."

3.0 REFERENCES

3.1 Operating Procedure N-280-1, Rev. 6, "Uranium Hexafluoride Product Handling and Shipping"

3.2 Emergency Procedure E-008, Rev. 4, "Uranium Hexafluoride (UF_6) Release"

3.3 Operating Procedure N-270-3, Rev. 2, "Secondary Cold Trap Operation"

3.4 Operating Procedure N-270-4, Rev. 2, "Primary Cold Trap Operation"

3.5 Operating Procedure N-270-5, Rev. 1, "Emergency Dump Tank"

3.6 Operating Procedure N-270-9, Rev. 0, "Refrigerant Vapor Heating System"

3.7 Operating Procedure N-170-1, Rev. 0, "H_2-F_2 Burner and Scrubber Operation"

4.0 UF_6 COLD TRAP SYSTEM STATUS AND OPERATIONAL CONDITION

4.1 As of 4/9/86 at 0800, the following conditions existed:

4.4.1 Primary Cold Traps

#1 Heated; under nitrogen purge of 20 scfm; emptied

#2 Heated; inlet and outlet valves closed; emptied

#3 Heated; inlet and outlet valves closed; emptied

#4 Heated; inlet and outlet valves closed; emptied

4.1.2 Clean-Up Reactor Cold Traps

#5 Ambient; inlet and outlet valves closed; possibly contains some UF_6

#6 Cold; receiving purge gas from #1 primary cold trap; probably contains solid UF_6

4.1.3 Secondary Cold Traps

#1 Ambient; inlet and outlet valves closed; emptied

#2 Cold; inlet and outlet valves closed; emptied

#3 Cold; receiving purge gas from #6 clean-up cold trap; probably full

4.2 Actions taken subsequent to 4/9/86 (0800). All other trap conditions remain as indicated in 4.1; following conditions exist on 4/11/86 at 1400.

4.2.1 Secondary Cold Traps

#1 Cold; inlet and outlet valves closed; emptied

#2 Cold; receiving purge gas from #6 clean-up reactor cold trap; probably contains UF_6

#3 Heated; inlet and outlet valves closed; probably full; ready to drain at any time after 2000 hours

4.2.2 Clean-Up Reactor Cold Traps

#5 Heated; inlet and outlet valves closed; possible UF_6; ready for draining

5.0 DESMOKING PROCEDURE

5.1 Drain #5 clean-up reactor cold trap in accordance with the precautions set forth in this procedure and in accordance with N-280-1, Rev. 6, "Uranium Hexafluoride Product Handling and Shipping."

5.2 Drain #3 secondary cold trap in accordance with the precautions set forth in this procedure and in accordance with N-280-1, Rev. 6.

5.3 After draining, place #3 secondary cold trap in cold condition with block valves closed; keep #5 clean-up cold trap hot but close all inlet and outlet valves.

5.4 Purge #2 Primary Cold Trap (Note - #2P is hot; valves closed; empty.)

5.4.1 Connect air supply to drain header.

5.4.2 Open #2 primary cold trap drain valve.

5.4.3 Open air supply valve and pressure #2 to 10 psig.

5.4.4 Close drain #2 valve; hold pressure for 30 minutes.

5.4.5 Slowly bleed pressure from #2 through the gas discharge valve. (i.e. - through #6 and then to #2 secondary); close gas discharge valve.

5.4.6 Repeat steps 5.4.2 through 5.4.5 two more times.

5.4.7 Open #2 primary cold trap drain valve and pressure up the trap to 1-2 psig; close drain valve.

5.4.8 Close #2 primary cold trap pressure transmitter block valve; disconnect transmitter fitting.

5.4.9 Slowly open transmitter block valve and exhaust air into vacuum hose. Observe for UF_6 smoke; close transmitter block valve.

5.4.10 If any UF_6 fume is observed, repeat section 5.4 again, but not until trap skin temperature reaches 150°F.

5.4.11 If no UF_6 fume is observed, leave the trap in a hot; all valves closed; empty status.

5.5 Purge #3 Primary Cold Trap

Follow the same procedure as set forth in section 5.4.

5.6 Purge #4 Primary Cold Trap

Follow the same procedure as set forth in section 5.4.

5.7 Realign N_2 purge gas to #4 primary cold trap.

5.7.1 Close the gas inlet and outlet valves to primary cold trap #1.

5.7.2 Open the gas inlet and outlet valves to #4 primary cold trap; this places #4 primary cold trap; this places #4 on-line for continued purging of the UF_6 feed header.

5.8 Purge #1 Primary Cold Trap

Follow the same procedure as set forth in section 5.4.

5.9 Purge #5 Clean-Up Reactor Cold Trap
(Note - #5 CUR is hot; valves closed; empty)

5.9.1 Connect air supply to drain header.

5.9.2 Open #5 clean-up cold trap drain valve.

5.9.3 Open air supply valve and pressure #5 to 10 psig.

5.9.4 Close #5 drain valve; hold pressure for 30 minutes.

5.9.5 Slowly bleed pressure from #5 through the gas inlet valve. (Note - This is different than #1, 2, 3 or 4.); close gas inlet valve.

5.9.6 Repeat steps 5.9.2 through 5.9.5 two more times.

5.9.7 Open #5 drain valve and pressure up the trap to 1-2 psig; close the drain valve.

5.9.8 Continue the test for UF_6 as set forth in 5.4.8 through 5.4.11.

5.10 Drain #6 Clean-Up Reactor Cold Trap

5.10.1 Remove the air purge from the UF_6 drain line and block valve all air purge connections.

5.10.2 The Shift Supervisor must check to assure that N_2 purge is flowing from #4 primary cold trap, then through #2 secondary cold trap, then through the HF scrubber and to the HF scrubber stack.

5.10.3 Open the bypass line around the #5 and #6 clean-up cold traps.

5.10.4 Place #3 or #1 secondary cold trap on cold and on-line. (This will provide two secondary cold traps on-line in parallel.)

5.10.5 Close the gas inlet and outlet valves to the #6 clean-up cold trap and begin the tempering and heatup cycle per referenced procedures.

5.10.6 When #6 cold trap is hot, drain #6 in accordance with N-280-1 and the one-time draining procedure, "Special", Rev. 0, 4/2/86.

5.10.7 When draining is complete, allow the cold trap to remain hot and close the #6 cold trap drain valve.

5.10.8 Open the #1 or #3 secondary cold trap drain valve and vacuum the residual UF_6 from the drain line to the secondary cold trap.

5.11 Purge #6 Clean-Up Cold Trap

5.11.1 Connect the air purge supply line to the UF_6 drain line header.

5.11.2 Open the #6 cold trap drain valves and pressure up the trap to 10 psig; hold pressure for 30 minutes.

5.11.3 Slowly bleed off the pressure in #6 cold trap through the gas outlet valve to the on-line secondary cold traps. Close the #6 cold trap gas outlet valve.

5.11.4 Repeat steps 5.11.2 through 5.11.3 two more times.

5.11.5 Open the #6 cold trap drain valve and pressure up the trap to 1-2 psig; close the drain valve.

5.11.6 Close the #6 cold trap pressure transmitter block valve and remove the transmitter.

5.11.7 Carefully and slowly open the #6 cold trap pressure transmitter block valve and catch the purge gas with a vacuum hose. Observe for UF_6 fumes.

5.11.8 If UF_6 fumes are observed, repeat steps 5.11.2 through 5.11.5. Do this until no UF_6 fumes are observed.

5.11.9 Close all valve on #6 cold trap and keep the trap hot.

ADDENDEM TO DESMOKE PROCEDURE

PER NRC

1. This procedure will be conducted in accordance with a specific HWP.# 44604

2. At all times of the Desmoke Procedure the purge will pass through one CUR cold trap (#6) on line and cold. Then on to one secondary cold trap on line and cold. The off gas will then be sent through the HF scrubber before venting to the stack.

3. The Shift Supervisor will verify the following systems are fully operational prior to proceeding with Desmoke Purge Procedure:

   A. Stack sampling system
   B. Off gas HF scrubber system
   C. Off gas flow and temperature recorder

4. This procedure applies only to the primary cold traps and one CUR cold trap (#5).

4/11/86

W L Ulrich
4-1-86

APR 11 1986

Docket No: 040-08027
License No: SUB-1010

Sequoyah Fuels Corporation
ATTN: S. D. Emerson
General Manager
P. O. Box 25801
Oklahoma City, Oklahoma 73125

Gentlemen:

We have reviewed your "Procedure To Complete the Desmoking of All Cold Traps" and an addendum to the procedure received on April 11, 1986. It is our understanding that this procedure applies to and will be used to purge the primary cold traps and #5 CUR cold trap. The purging of the secondary cold traps and #6 CUR cold trap will be addressed separately. Any drainage of cold traps associated with this procedure will be conducted in accordance with the Special One-Time Instructions for the Draining of Cold Traps, dated 4/2/86.

Sincerely,

Original Signed by:
R. L. BANGART

Richard L. Bangart, Director
Division of Radiation Safety
and Safeguards

cc:
Oklahoma Radiation Control Program Director
C. Gazda, EPA, Region VI

bcc:
DMB - Original (IE-46)
RDMartin
RLBangart
RJEverett
JPartlow
RCunningham, NMSS
BCrow, NMSS
CWisner
RDSmith
NMSS
RIV Files (2)

RIV:C:DNMSS
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D:DRSS&S
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Addendum C