

40-8027 (35)  
LH 157

March 16, 1990

The Honorable David L. Boren  
United States Senator  
440 South Houston, Suite 602  
Tulsa, Oklahoma 74127

Dear Senator Boren:

I am responding to your letter of February 15, 1990, that transmitted the concerns of Mr. and Mrs. [redacted] regarding the recent incident at the Sequoyah Fuels Plant in Gore, Oklahoma, when about 14,000 lbs of uranium tetrafluoride powder were spilled inside the reduction facility on January 22, 1990.

EX 7C

The first concern raised by Mr. and Mrs. [redacted] pertains to the issue of the sounding of an alarm when the incident occurred. We have confirmed with the New Sequoyah Fuels Corporation (SFC) that the "state of the art" alarm was not dismantled as suggested by the [redacted]. Instead, the alarm was not required to be activated because the significant potential for offsite release was not present in this event.

EX 7C

The second concern raised by the [redacted] pertains to the company's reporting of the event. The corporate position as originally expressed by Mr. Scott Knight was that the event was not reportable. The telephone calls from SFC to the NRC office in Arlington, Texas and headquarters in Rockville, Maryland were inappropriately characterized by the company as "courtesy calls." However, after further review of the event, Mr. Reau Graves, President of SFC, stated in a press conference on Friday, January 26, 1990, that this failure to report was an "error in judgement." A written report fully describing the details of the incident was submitted to the NRC on February 2, 1990. The company's actions related to the timeliness and details of reporting this incident are still under consideration by the NRC and will be the subject of an enforcement conference in mid March.

EX 7C

At the time of the event, SFC also agreed to keep the reduction facility in a shut down status until the NRC staff from both the regional office and headquarters had completed an assessment of the potential exposures of SFC employees, potential offsite releases, and corrective actions taken by the company. For your information, I have enclosed copies of the SFC report describing the incident and the company's corrective actions and NRC Inspection Report 40-8027/90-02 which assesses the licensee's actions and regulatory issues under consideration. The NRC staff believes that the actions taken by the SFC staff during the event described in this report were prompt and appropriate.

Our review of the incident also indicated that SFC's employees were equipped with respiratory protection devices during the spill control and cleanup phases so that overexposures would not occur. The exhaust ventilation system was shut down shortly after initiation of the spill to essentially isolate the building.

\*RIV:DD:DRSS      \*D:DRSS      RA      D:IMNS:AI 90-074  
LAYandell      ABBeach      RDMartin      RECunningham  
/ /90      / /90      / /90      3/14/90

NASS  
3/14/90

H/5  
CA  
DR  
3/19/90

\*Previously concurred

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions [redacted]

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FOIA-2006-0009

The Honorable David L. Boren

-2-

Visible quantities of material were seen on the roof of the facility, but no increased levels of radioactivity were detected at onsite perimeter air samplers. An analysis of site boundary ground samples and vegetation has confirmed that no significant offsite releases occurred.

EX 70  
EX 70  
The third concern raised by the letter is the need for a cancer survey to be performed in the county where the [redacted] reside. NRC does not believe EX 70 that at this time, a cancer survey would be beneficial or meaningful since no significant offsite impact is anticipated from this incident. The estimated release of uranium to the environment from this incident was about 74 microcuries which is less than one percent of the annual, routine releases from plant operations. Routine releases from past operations have had no adverse impact to the environment and have been in compliance with the Environmental Protection Agency's radiation standards. In 1985, the Oklahoma State Department of Health, Environmental Health Services, assessed the potential environmental and health impacts from operation of the Sequoyah Fuels Facility. The conclusion, based on a statistical analysis, was that for the time period 1978-1983, the incidence of cancer-related deaths in Sequoyah County and counties contiguous to Sequoyah County were less or not significantly different from the expected number of cancer deaths from the State's age adjusted rate. There have been no significant changes from the routine uranium releases at SFC since 1983, with the exception of the accidental release in January 1986. This accident resulted in an acute whole-body equivalent dose of about 2.2 mrem to the maximally exposed offsite resident. The dose is insignificant compared with the background radiation of 106 mrem/yr in the area. Therefore, NRC does not believe another cancer survey needs to be performed.

I trust that this adequately responds to your constituent's concerns with SFC.

Sincerely,

Original Signed By:

James M. Taylor

James M. Taylor, Executive  
Director for Operations

Enclosures:  
As stated

bcc:  
R. D. Martin  
R. M. Bernero  
A. B. Beach  
L. A. Yandell  
RIV. Files  
OCA  
EDO 0005176  
OEDO:ACB

See

RE: 9039-N



*Robert Martin*

February 2, 1990

AIRBORNE EXPRESS

Mr. Robert D. Martin  
Regional Administrator  
U.S. NUCLEAR REGULATORY COMMISSION  
Region IV  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011

RE: UF<sub>6</sub> Reduction Plant Event of 01-22-90  
Event Summary and Corrective Actions

Dear Mr. Martin:

As promised in our letter of January 26, 1990, Sequoyah Fuels Corporation (SFC) has attached information which summarizes the event at SFC's UF<sub>6</sub> Reduction Plant, which occurred on the 22nd of January and resulted in a large spill of uranium tetrafluoride in the UF<sub>6</sub> Reduction Building. The attachments to this letter include a summary of the event, as well as a description of the failure that caused the event and corrective actions which have been accomplished to restore the plant to operational status and prevent future occurrence of a similar event.

The spill was contained within the building and caused no injury, no damage and no adverse environmental effect.

The response by SFC personnel to the spill demonstrates their high-level of training and ability to properly handle abnormal operating situations. These facts were confirmed by your investigation.

SFC believes that the summary will give NRC an understanding of the situation such that NRC will be able to thoroughly review the matter prior to the decision to restart the plant which is scheduled for Wednesday, February 7, 1990.

*9002140278 SPP*

RE: 9039-N

Mr. Robert D. Martin  
February 1, 1990  
Page 2

Should you have any questions, please contact me at  
918/489-3206, or Scott Knight at 918/489-3231.

Sincerely,



Reau Graves, Jr.  
President

RG:SPK:jp

Attachments:

1. Summary of Events
2. Description of Failure
3. Corrective Actions

xc: G. L. Sjoblom ✓  
P. Garcia

ATTACHMENT 1

Summary of Events Relating To

1-22-90 DUF<sub>4</sub> Spill

UF<sub>6</sub> Reduction Plant Status Immediately Prior to Spill:

At midday on Monday, January 22, 1990, the UF<sub>6</sub> reduction plant was in operation. The reduction reactor was chemically reducing depleted uranium hexafluoride (DUF<sub>6</sub>) to depleted uranium tetrafluoride (DUF<sub>4</sub>) powder, also known as green salt. There were seven facility employees present in the building. The DUF<sub>4</sub> area manager and a maintenance supervisor were on the third level of the plant. A mechanical engineer and two mechanics were at the south end of the building in the vicinity of the autoclaves. The DUF<sub>4</sub> operator and a packaging operator trainee were located at the north end of the building in the vicinity of the product packaging station where the spill occurred. Blending of DUF<sub>4</sub> in bin #2 had been completed and product packaging of the first drum was commenced.

The Immediate Response to the Spill:

At approximately 1235 hours the spill was detected by the packaging trainee and the DUF<sub>4</sub> operator. Green salt was spilling from a vent port located on top of the product weigh bin. The trainee immediately departed using the nearest exit. The DUF<sub>4</sub> operator followed in a few seconds after turning off the screw conveyor switch, the drum dryer switch and the packaging conveyor switch. All personnel immediately evacuated the building safely and without incident.

The DUF<sub>4</sub> area manager radioed the DUF<sub>4</sub> Control operator located in the Main Plant Control Room to declare an Unusual Event for a green salt spill within the plant and to shut down the process.

Within seconds of notification the reduction reactor and the solids handling equipment were shut down; the spill continued. The horn was sounded and an Unusual Event was declared over the plant PA system by the UF<sub>6</sub> Area Manager. The DUF<sub>4</sub> operator re-entered the building, opened breakers to de-energize the packaging system, donned an escape respirator and shut the valve (XV-5409) on bin #2 returning to the vicinity of the DUF<sub>4</sub> loading dock. This action terminated the release.

The DUF<sub>4</sub> area manager directed the DUF<sub>4</sub> Control operator to shut down the building ventilation. In addition he verified and reported that the spill had been terminated.

The Assistant Radiation Safety Officer (ARSO) inspected the UF<sub>6</sub> Reduction building, verified that the spill had stopped and directed Health and Safety Technicians (H & S) to set up a controlled access area at the loading dock on the west side of the building.

At 1252 hours the Unusual Event was closed out, but access to the UF<sub>6</sub> Reduction building was restricted.

Post-Event Follow UP:

The Radiation Safety Officer (RSO) initiated a radiological survey of the area around the UF<sub>6</sub> Reduction building. H & S collected and replaced air sample filters for assessment of airborne concentrations in the plant. Clean-up of the building commenced. The RSO prescribed respiratory protection and special anti-C clothing requirements.

The potentially exposed DUF<sub>4</sub> operator was monitored following the procedure for possible UF<sub>4</sub> exposure. The operator was examined by the company health nurse immediately after the event and no ill effects were apparent. Arrangements were made for bioassay sampling required by procedure. The operator was subsequently examined by the company doctor who found all appropriate tests to be within normal limits. The results of appropriate tests will be monitored and reviewed by a doctor who is a medical expert in this field.

Within one hour of event termination, the Senior Vice President (Senior VP), RSO and Vice President, Administration (VPA) conferred regarding the status of the UF<sub>6</sub> Reduction plant with a focus on personnel status, establishment of the root cause(s), implementation of corrective action(s), clean-up of the plant, assessment and monitoring of radiological status, possible release exceedances or off-site consequences, and regulatory reporting.

It was concluded, based upon available information and approved procedures, that an Unusual Event was the appropriate response level, that there were no injuries or damage, that clean-up efforts were being properly initiated, that there was no apparent off-site release, that appropriate data would be collected to assess off-site impact, if any, and that there were no immediate regulatory or procedural reporting requirements.

H & S Technicians collected roof vent samples, stack samples and fenceline samples for analysis. RSO established 24-hour health physics surveillance schedule for DUF<sub>4</sub> clean-up.

During the root cause investigation, the DUF<sub>4</sub> area manager noted that storage bin (#2) had a pressure of 10 psig. Bin #2 is the storage bin from which DUF<sub>4</sub> was being transferred at

the time of the spill. (Refer to Attachment 2 for explanation).

Regulatory Reporting:

Later that afternoon, the Senior VP, the RSO and VPA conferred to review regulatory reporting requirements. For NRC reporting, 10 CFR § 20.403, "Notification of Incidents", was reviewed. Section 20.403 (b) (3) was discussed as the only possible basis for a required regulatory report: "A loss of one day or more of the operation of any facilities affected".

The best available information was assessed and applied to this possible basis for required regulatory reporting.

The Senior VP indicated that the preliminary finding was that a defective solenoid valve caused nitrogen to pressurize storage Bin #2. As a result, the UF<sub>4</sub> powder fluidized and continued to flow to the product weigh bin which overflowed through a vent port located on top of the weigh bin.

The Senior VP concluded that programming changes to prevent overpressurization and the repair of the defective solenoid valve could be accomplished in a few hours. (Refer to Attachment 3 for an explanation of modifications.)

In addition, the clean-up activities were proceeding in good order. It was understood by the VPA, the RSO and the Senior VP that over six, 55-gallon drums had already been recovered. Each drum holds in excess of 1,400 pounds of DUF<sub>4</sub> powder when full. [It was later discovered that some of the drums were only partially full.] The initial report indicated that between 10,000 to 20,000 pounds of material had spilled. [Subsequent weighing of essentially all of the spilled material revealed the spill amount to be approximately 14,000 pounds less the unknown amount that was in the vacuum system at the time of the spill.] Additional personnel were to be assigned to the clean-up project.

Based upon clean-up progress and successful completion of corrective actions recommended by Operations, it was determined that the plant could be safely restarted within 24 hours. However, respiratory protection would be required for all personnel within the building.

Five hours after the spill, based upon available information, it was concluded that the UF<sub>6</sub> Reduction plant would be able to be restarted within 24 hours of the event. It was, therefore, reasoned that a regulatory report under 10 CFR § 20.403 (b) (3) was not required at that time.

Even though management believed that an NRC response was not necessary, consultation with the NRC was deemed advisable in

order to apprise the agency of the status of an abnormal event at the facility. It was proposed that such consultation be held with Region IV staff during normal business hours on the following day after an opportunity to review the event at the 0830 hours staff meeting to better assess event status.

#### The Following Day:

On Tuesday, January 23, 1990, H & S personnel performed calculations to confirm release estimates and preliminary estimates on building exhaust and dispersion. These calculations confirmed that respiratory protection would be required inside the UF<sub>6</sub> Reduction building during clean up, but that there was no significant release outside the building. These calculations were confirmed on Wednesday by the NRC inspector.

The RSO and ARSO inspected the building status and clean-up progress. Inspection revealed that the product recovery phase of clean-up was completed. The building was now in the decontamination phase.

Event status was reviewed at the staff meeting at 0830 hours. The cause of the spill was reviewed and corrective actions were discussed, as well as the status of recovery and clean-up activities. The requirement for regulatory reporting was reviewed. It was asserted that corrective actions required to prevent recurrence of a similar event and to allow for safe restart could be implemented before noon, but that restart would require that those present within the plant building wear respiratory protection until approved by the RSO. It was concluded that there was no mandatory report of event required by regulation. The President said that if during our consultation with the NRC they wanted the event reported, we would do so. Despite the finding, the president indicated that he would not restart the operation if respiratory protection would be required.

At 1215 hours the VPA, the Senior VP, the RSO, and the Manager, NLEC made a second telephone call to Region IV and had conversation with Mr. B. Murray, Chief, Facilities Radiological Section, Region IV, NRC. He was provided a brief summary of event and told there were no injuries, no damage, and no off-site impact. Mr. Murray took the information and indicated that he would pass it to SFC's point-of-contact. Several telephone calls were received by the VPA during the course of the afternoon from NRC staff members who sought and received additional information. It is apparent that our initial call had not contained sufficient detail and a breakdown in communication had occurred. A conference call between SFC and NRC staff was scheduled for 0900 hours the following morning.

At 0800 hours on Wednesday, January 24, 1990, the VPA received a call from Mr. John Montgomery (Deputy Administrator, Region IV, NRC) who emphasized the NRC's concern in this matter, and raised the issue of the "delay" in reporting and informed VPA that Mr. Pete Garcia (NRC Inspector) was scheduled to arrive at the facility at 1100 hours that morning. The VPA indicated that management had decided the previous evening not to restart for at least a 24-hour period. The scheduled 0900 hours teleconference was confirmed.

A teleconference was conducted between SFC management and members of the NRC staff. The President of Sequoyah Fuels Corporation assured the NRC that the company would fully cooperate with the NRC in its investigation and that the affected activities would not be restarted until he was satisfied that the plant would operate safely and without creating risk to workers, the public or the environment, and that that standard would guarantee that the NRC's concerns would be fully satisfied.

The NRC inspector arrived on-site at 1110 hours Wednesday.

## ATTACHMENT 2

### DESCRIPTION OF FAILURE WHICH CAUSED SPILL

The cause of the  $\text{DUF}_4$  powder spill of January 22, 1990 has been reconstructed as follows:

- Product storage bin #2 was blended during the morning. The blend cycle involves pulsing the powder bed with nitrogen injected through six solenoid operated valves at the bottom of the bin.
- At the end of the blend cycle, the vent valve to the dust collector was automatically sealed by closing a 10" butterfly valve.
- One (or more) of the solenoid operated nitrogen injection valves apparently failed to reseat properly at the end of the blending cycle, the inleakage of nitrogen pressurized Product Storage Bin #2 (actual pressure unknown, but nitrogen pressure is controlled at 25 psig). The operator was unaware of this condition.
- The packaging cycle was initiated about 12:30 pm. The 8" butterfly valve on the bottom of Product Storage Bin #2 opens automatically at the start of the cycle.
- When the weigh bin feed screw conveyor started running, the angle of repose of the powder was broken and the powder began flowing in the screw barrel. With pressure in the bin, the  $\text{DUF}_4$  powder became fluidized and flowed at a higher than normal rate and continued to flow even after the weigh bin feed screw conveyor was off.
- $\text{DUF}_4$  powder continued flowing under the driving force of pressure until the 8" butterfly valve on the bottom of Product Storage Bin #2 closed by operator action.

ATTACHMENT 3

CORRECTIVE ACTIONS - MODIFICATIONS  
TO UF<sub>6</sub> REDUCTION PLANT

Removed from this document because it  
contains PROPRIETARY INFORMATION of  
SEQUOYAH FUELS CORPORATION

### OTHER CORRECTIVE ACTIONS

1. As a result of the lessons learned from this event, SFC will be reviewing its current Contingency Plan and the related implementing procedures and incorporating any appropriate changes into the upcoming Emergency Plan and Emergency Plan Implementing Procedures which are currently being developed for implementation under the new emergency planning regulations.
2. Operations has completed a review of the UF<sub>6</sub> Reduction Process with a view to identification of any possible similar failure modes or equipment in the system. Results of investigation were negative.
3. Refresher training will include lessons learned from this event.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 1000  
ARLINGTON, TEXAS 76011

MAR 5 1990

In Reply Refer To:  
Docket No. 40-8027/90-02  
EA No. 90-045

New Sequoyah Fuels Corporation  
ATTN: Scott Knight  
Vice President - Administration  
P. O. Box 610  
Gore, Oklahoma 74435

Dear Mr. Knight:

This refers to the special, announced inspection conducted by Mr. Pete J. Garcia of the Uranium Recovery Field Office on January 24-26, 1990, of the activities authorized by Source Material License SUB-1010 and to the discussion of our findings held by the inspector with members of your staff at the conclusion of the inspection. The inspector was accompanied during the inspection by Mr. C. Robinson of the Office of Nuclear Material Safety and Safeguards. Mr. A. B. Beach, Director, Division of Radiation Safety and Safeguards, Region IV, and Mr. J. Gilliland, Public Affairs Officer, Region IV, also attended the exit briefing.

A followup site visit was conducted by the inspector on February 2, 1990. The enclosed Inspection Report 40-8027/90-02 also documents this inspection and its results. Major conclusions resulting from the inspection were also discussed via telecon between Mr. Reau Graves of the New Sequoyah Fuels Corporation and Mr. Beach and Mr. Garcia on February 28, 1990.

The inspections were in response to an incident involving a spill of uranium tetrafluoride in the reduction facility on January 22, 1990. The inspection consisted of a review of emergency actions taken to mitigate and evaluate impacts from the spill, an evaluation of proposed corrective actions, followup verification of completion of the corrective actions, interviews of personnel, and observations by the inspector.

The inspections enabled us to conclude that the emergency actions taken to terminate the spill and evaluate the health physics and environmental impacts of the spill were prompt and appropriate. We also conclude that the corrective actions implemented to prevent a recurrence are adequate. No further actions or responses in these areas are therefore necessary.

However, the inspections also resulted in the finding of two potentially significant issues involving the reporting of the event pursuant to the requirements of 10 CFR 20.403. We are concerned that information provided to the NRC was initially characterized as a courtesy, and that the notification of

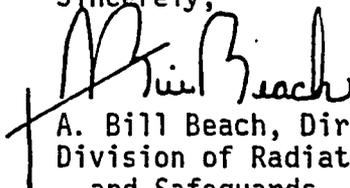
the event to NRC was not made in accordance with 10 CFR 20.403. In addition, the information conveyed to the NRC was not complete to satisfy all of the requirements of 10 CFR 40.9. The NRC expects its licensees to satisfy the applicable reporting requirements, and encourages open communication with its licensees to exchange information when problems arise. However, information discussed must be factual and complete. Because of the failures of communication in this area, we have concluded that an enforcement conference with the New Sequoyah Fuels Corporation personnel at our Arlington, Texas office is necessary. During the telephone conversation on February 28, 1990, it was agreed that the enforcement conference would be held on March 15, 1990. We will contact you to provide further details in the near future.

At the enforcement conference, please also be prepared to discuss the site Contingency Plan, the Contingency Plan Implementing Procedures and the classification of events. In our view, your rationale to classify this event as an Unusual Event may have further perpetuated the communication problems discussed in this report. However, it is also our view that responsible individuals focused too much attention on evaluating why the event should not be reported to the NRC based on its classification rather than why the event should be reported and properly communicated to the NRC. This issue is identified in the Inspection Report as an unresolved item which is an item that requires additional information or clarification before the NRC can come to a conclusion regarding its adequacy.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room.

Should you have any questions concerning this letter, we will be pleased to discuss them with you.

Sincerely,



A. Bill Beach, Director  
Division of Radiation Safety  
and Safeguards  
Region IV

Enclosures:

Appendix - Inspection Report 40-8027/90-02

cc:

C. Robinson, NMSS  
D. McHard, State of Oklahoma

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION

REGION IV

URANIUM RECOVERY FIELD OFFICE

NRC Inspection Report: 40-8027/90-02

License No.: SUB-1010  
Docket No.: 40-8027

Licensee: New Sequoyah Fuels Corporation  
Oklahoma City, Oklahoma 73125

Facility: Gore Uranium Conversion Facility

Inspection at: Gore, Oklahoma

Inspection Conducted: January 24-26 and February 2, 1990

Inspector:

L. A. Yandell for  
Pete J. Garcia, Jr., Project Manager  
Uranium Recovery Field Office  
Region IV

March 5 1990  
Date

Approved By:

L. A. Yandell for  
Ramon E. Hall, Director  
Uranium Recovery Field Office  
Region IV

March 5 1990  
Date

Inspection Summary

Inspection conducted on January 24-26 and February 2, 1990 (Report 40-8027/90-02)

Areas Inspected: Special, announced inspection of an incident involving the spill of approximately 14,000 pounds of uranium tetrafluoride in the reduction facility on January 22, 1990. The inspection included a review of emergency actions taken by the licensee, corrective actions proposed to prevent a recurrence, radiation safety and environmental impacts resulting from the spill, and followup verification of completion of corrective actions.

The inspection involved a total of 24 inspector-hours onsite by one inspector.

Results: Within the areas inspected, two apparent violations were identified:

- o Failure to properly report the spill of uranium tetrafluoride which occurred on January 22, 1990 in accordance with a CFR 20.403(d)(2).
- o Failure to provide complete and accurate information properly characterizing the spill and its size in accordance with 10 CFR 40.9.