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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

DOCKETED
USNRC

'93 FEB -4 P4:24

February 3, 1993

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

Administrative Judge
James P. Gleason, Esq.
Presiding Officer
Atomic Safety & Licensing Board
U.S. Nuclear Regulatory Commission
Washington D.C. 20555

In the Matter of
SEQUOYAH FUELS CORPORATION
Source Material License No. SUB-1010
Docket No. 40-08027-MLA

Dear Judge Gleason:

Enclosed herewith please find the below listed Inspection Reports which are being added as updates to the hearing file in this matter.

1. 11/23/92 Inspection Report 92-27
2. 12/11/92 Inspection Report 93-28
3. 12/03/92 Inspection Report 92-29
4. 12/18/92 Inspection Report 92-30

Also enclosed please find an updated index of the hearing file.

As stated in my previous letters incorporating documents into the hearing file, the inspection reports, while not necessarily directly related to the instant application for renewal, are being provided as background information regarding the facility. The staff does not concede that all matters in the documents, or that all documents, are relevant to the license renewal matter, and reserves the right to contest relevance of all matters at the appropriate juncture in the proceeding.

By copy of this letter, I am also transmitting an original and one copy of the enclosures listed above for filing in the NRC docket, and one copy to Administrative Judge Kline. A copy of this letter, without enclosures but with a copy of the updated index, is being forwarded to the respective attorneys for the licensee and the intervenors.

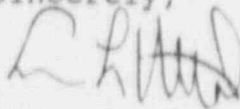
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PDR ADDCK 04008027
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Copies of the enclosed reports have been forwarded to the local public document room (LPDR) located at Sallisaw City Library, Sallisaw, Oklahoma, Docket Number 40-8027, and to the NRC Public Document Room (PDR), located at 2120 L Street NW, Washington, D.C., where they are available to the parties, pursuant to 10 C.F.R. § 2.1231(a)(1)(ii). The enclosed documents are hereby incorporated by reference into the hearing file, under authority of 10 C.F.R. § 2.1231(b).

Also enclosed you will find a copy of a Notice of Meeting regarding Sequoyah which is being provided to you for your information. A copy of this notice will also be sent to the service list.

Sincerely,



Susan L. Uttal
Counsel for NRC Staff

Enclosure: As stated

cc w/encl.: Admin. Judge Jerry Kline
Office of the Secretary
Docketing and Service

cc w/encl.: As stated
Diane Curran, Esq.
Maurice Axelrad, Esq.
Brita Cantrell, Esq.
James G. Wilcoxon, Esq.
Lance Hughes, NACE

January 11, 1993

NOTICE OF MEETING

Name of Licensee: Sequoyah Fuels Corporation (SFC)
Name of Facility: Sequoyah
Docket No: 40-8027
Date and Time: February 10, 1993, 9:00 am
Location: One White Flint North Building
Room 6-B-11
Rockville, Maryland
Purpose of Meeting: To discuss Sequoyah Fuels Corporation's future plans for its Gore, Oklahoma, facility. This is the followup to the December 1, 1992, meeting.
NRC Attendees: R. Bernero, Director, Office of Nuclear Material Safety and Safeguards, et al.
SFC Attendees: J. J. Sheppard, et al.
NOTE: Meetings between the NRC staff and licensees are open for interested members of the public to attend as observers pursuant to "Open Meeting Statement of NRC Staff Policy, 43 Federal Register 28058, 6/28/78."

Approved By: Original Signed by: _____

John W. N. Hickey, Chief
Fuel Cycle Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

cc: Maurice Axelrad, Newman & Holtzinger, P.C.
Diane Curran, Harmon, Curran, Gallagher & Spielberg
James Wilcoxon, Wilcoxon & Wilcoxon
Brita Haugland-Cantrell, Assistant Attorney General



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

JAN 12 1993

MEMORANDUM FOR: Susan Uttal
Office of the General Counsel

FROM: Merri Horn
Uranium Fuel Section
Fuel Cycle Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

SUBJECT: SEQUOYAH FUELS CORPORATION RENEWAL PROCEEDING, 40-8027-MLA

With regard to the subject proceeding, the following documents are enclosed for incorporation into the staff hearing file:

11/23/92 Inspection Report 92-27
12/11/92 Inspection Report 92-28
12/03/92 Inspection Report 92-29
12/18/92 Inspection Report 92-30

Copies of the above documents have been provided to the Local and Public Document Rooms. For your convenience, enclosed is an updated copy of the staff hearing file index (Enclosure 1). Any questions regarding the file's contents should be directed to me at 504-2606.

Merri Horn

Merri Horn
Uranium Fuel Section
Fuel Cycle Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

Enclosures: As stated

Sequoyah Fuels Corporation
Staff Hearing File
Re Renewal Application
Docket 40-8027

- Inspection Reports (see attached)

1990

08/29 SFC Renewal application (NOTE CONTAINS PROPRIETARY INFO-SEE YELLOW SHEET)
09/18 NRC to SFC Renewal deemed timely
09/18 SFC to NRC Possible revision to renewal's environmental report
09/19 NRC to SFC Order Modifying License
10/26 SFC to NRC Facility Env. Investigation Plan (Note: Main Process Building Report superseded by 12/18 submittal)
11/05 NRC to SFC Demand for Information
11/20 SFC to NRC Response to Demand for Information
11/26 SFC to NRC Main Process Bldg Investigation Prelim. Findings Report, Rev. 1 (Note: Superseded by 12/18 submittal)
12/18 SFC to NRC Main Process Bldg Investigation Final Findings Report, Rev. 2
12/18 SFC to NRC Response to Demand for Information (Management Assessment)

1991

01/10 SFC to NRC Notification that 12/18 Report supersedes previous submittals
01/14 NRC to SFC Approves SFC Mgmt Assessment Plan
02/21 SFC to NRC Solvent Extraction Bldg Investigation Report
04/02 GKonwinski to MHorn, Gore soil and water sample results
05/15 Morton/Potter to NRC Independent Management Assessment (IMA)
06/10 ABeach to CHaughney, SFC Environmental Findings
07/15 SFC to NRC Response to Recommendations in Management Assessment
07/31 SFC to NRC, SFC Facility Environmental Investigation Findings Report, Volumes I through V
08/02 SFC to NRC Environmental Air Sample Data omitted from Environmental Report, Appendix B
08/15 GKonwinski to ABeach, Gore Soil Sample Results
09/06 GKonwinski to EButcher, Review of SFC FEI
10/03 NRC to SFC Order Modifying License and Demand for Information
11/07 SFC to NRC IMA Update
11/22 SFC to NRC Interim storage cell for contaminated soils
12/03 NRC to SFC ackw. ltr on Pond 2
12/27 SFC to NRC, IMA update

Sequoia Fuels Corporation
Staff Hearing File
Re Renewal Application
Docket 40-8027

1992

01/03 SFC Plan for Achieving and Maintaining High Performance Standards
01/10 SFC Environmental Report, Revision 1
01/10 SFC Action Plan
01/13 Confirmatory Order Modifying License
01/27 Update of IMA
02/07 RHall to LCallan, SFC-Gore Water Sample Results
03/02 SFC Env. Rpt. Rev. 2
03/09 SFC to NRC, Performance Improvement Data
03/13 Order Modifying License and Demand for Information
03/15 NRC to SFC, Response to Order/Demand
03/16 SFC to NRC, Response to Order
03/25 NRC to SFC, Response to SFC 3/15 and 3/16 letters
04/03 Confirmatory Order Modifying License
04/16 NRC to SFC, Restart authorization
05/21 NRC to SFC, Initial comments for consideration
05/21 SFC to NRC, Addendum to the FEI
06/12 SFC to NRC, Revised drawing to FEI addendum
07/06 NRC to SFC, Environmental questions on renewal
09/04 SFC to NRC, Partial response to environmental questions
09/14 SFC to NRC, Replacement page for 9/4/92 response
09/30 SFC to NRC, Revised license renewal application (supersedes 8/29/90
version)
09/30 SFC to NRC, Environmental program
10/30 SFC to NRC, Partial response to environmental questions
10/30 SFC to NRC, Proprietary response to 2 environmental questions (NOTE
CONTAINS PROPRIETARY INFO-SEE YELLOW SHEET)

Sequoia Fuels Corporation
Staff Hearing File
Re Renewal Application
Docket 40-8027
Inspection Reports

<u>Report No.</u>	<u>Report Dated</u>
85-02	11/14/85
86-01	04/09/86
86-02	05/09/86
	10/14/86 Notice of Violation & Proposed Civil Penalties 86-01 & 86-02
86-03	05/19/86
86-04	05/22/86
86-05	06/25/86
86-06	07/07/86
86-07	07/25/86
86-08	09/04/86
	10/23/86 Amended page 10 to 86-08
86-09	10/23/86
86-10	10/08/86
86-11	10/27/86
86-12	11/10/86
	01/21/87 Amended page 3 to 86-12
86-13	11/21/86
86-14	01/22/87
86-15	12/29/86
86-16	02/03/87
87-01	03/31/87
87-02	04/17/87
87-03	03/16/87
87-04	04/21/87
87-05	06/05/87
87-06	05/27/87
87-07	06/01/87
87-08	06/16/87
87-09	07/29/87
87-10	08/10/87
87-11	11/16/87
87-12	12/24/87
88-01	02/22/88
88-02	06/24/88
88-03	09/30/88
88-04	10/21/88
89-01	05/01/89
89-02	07/06/89
89-03	09/15/89
89-04	11/24/89
90-01	02/21/90
90-02	03/05/90
	04/06/90 Notice of Violation 90-02
90-03	03/06/91
90-04	10/11/90

Sequoyah Fuels Corporation
Staff Hearing File
Re Renewal Application
Docket 40-8027
Inspection Reports Continued

Report No. Report Dated

90-05	11/20/90
90-06	02/21/91
90-07	03/01/91
91-01	04/05/91
91-02	05/03/91
91-03	04/29/91
91-04	06/06/91
91-05	06/11/91
91-06	06/21/91
91-07	06/21/91
91-08	06/27/91
91-09	07/01/91
91-10	07/22/91
91-11	08/26/91
91-12	12/18/91
91-13	01/28/92
91-14	02/05/92
91-15	12/23/91
91-16	12/23/91
	01/27/92

Notice of Violations 90-04, 90-05, 90-06, 90-07;
91-01, 91-02, 91-05, 91-09, 91-10

91-17	03/06/92
92-01	03/25/92
92-02	04/13/92
92-03	04/30/92
92-04	04/22/92
92-05	04/27/92
92-06	05/09/92
92-07	05/18/92
92-08	06/11/92
92-09	05/28/92
92-10	06/16/92
92-11	06/16/92
92-12	06/22/92
92-13	07/06/92
92-14	06/30/92
92-15	07/20/92
92-16	08/05/92
92-17	08/05/92
92-18	08/06/92
	08/12/92

Notice of Violation

92-19	08/13/92
92-20	08/28/92
92-21	08/28/92
92-22	08/28/92

Sequoyah Fuels Corporation
Staff Hearing File
Re Renewal Application
Docket 40-8027
Inspection Reports Continued

<u>Report No.</u>	<u>Report Dated</u>	
	08/31/92	Notice of Violation and Proposed Imposition of Civil Penalty 92-10, 92-14
92-23	09/03/92	
92-24	09/17/92	
92-25	09/30/92	
92-26	10/13/92	
92-27	11/23/92	
92-28	12/11/92	
92-29	12/03/92	
92-30	12/18/92	

Sequoyah Fuels Corporation
Staff Hearing File
Re Renewal Application
Docket 40-8027

Documents Related to November 1990 Demand and
October 1991 Demand/Order

1990

11/20 IShapiro to JLieberman SFC response to Nov 5 Demand
12/18 SFC to NRC Proposed Plan for Impartial Management Assessment

1991

10/07 SFC to NRC Limited Process Operations
10/07 SFC to NRC Removal of CCouch
10/11 NRC to SFC Acknowledge receipt of 10/07/91 letters
11/04 SFC to NRC Response to EA 91-067
11/15 SFC to NRC Organizational changes
12/02 SFC to NRC Response to 10/91 Demand/Order
12/02 SFC to NRC Update on Restart Status
12/10 SFC to NRC Selection & Prioritization of Procedures
12/18 SFC to NRC Readiness Review Committee Members

1992

01/22 PLG to NRC Readiness Review Committee Reports
01/24 SFC to NRC Response to 10/91 Demand/Order & Restart Process
01/27 PLG to SFC Sequoyah Oversight Team (SOT) Report of Activities for 1991
01/31 SFC to NRC Schedule for Procedure Review
02/27 SFC to NRC Quality Assurance Upgrade Program
03/13 SFC to NRC Response to Addit Info Requested in Inspection Rpt 91-17

FORD 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9212010019 DOC. DATE: 92/11/23 NOTARIZED: NO
 FACIL: 40-8027 Sequoyah Fuels Corp., Gore, OK,
 AUTH. NAME AUTHOR AFFILIATION
 CALLAN, L.J. Region 4 (Post 820201)
 RECIP. NAME RECIPIENT AFFILIATION
 SHEPPARD, J.J. Sequoyah Fuels Corp.

DOCKET #
 04008027

SUBJECT: Forwards insp rept 40-8027/92-27 on 920928-30 & NOV. Separate concern identified re communication sys.

DISTRIBUTION CODE: IE07D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 8+18
 TITLE: Environ & Radiological (30,40,70 DKT)-Insp Rept/Notice of Viol Respon

NOTES: LPDR 1 cy. ; OGC/SUTTAL ; OCA/COMBS, T
 FAC TYPE: URANIUM HEXAFLUORIDE PRODUCTION

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INTERNAL:	AEOD/DSP/NAS	1 1	NMSS/IMAB 6H3	1 1
	NMSS/IMOB 6H3	1 1	NMSS/SGDB 4E4	1 1
	NMSS/SGTB 4E4	1 1	NUDOCS-ABSTRACT	1 1
	OE DIR	1 1	RGN4 FILE 01	1 1
EXTERNAL:	LPDR	1 1	NRC PDR	1 1
NOTES:		3 3		

NOTE TO ALL "RIDS" RECIPIENTS:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

NOV 23 1992

Docket: 40-8027
License: SUB-1010

Sequoyah Fuels Corporation
(Subsidiary of General Atomics)
ATTN: James J. Sheppard, President
P.O. Box 610
Gore, Oklahoma 74435

Gentlemen:

SUBJECT: NRC INSPECTION REPORT NO. 40-8027/92-27 (NOTICE OF VIOLATION)

This refers to the special, announced inspection conducted by Ms. L. L. Kasner, accompanied by Mr. E. Collins, both of the NRC Region IV office, on September 28-30, 1992. The inspection included a review of activities authorized by Source Materials License No. SUB-1010. During a telephonic exit briefing conducted on October 7, 1992, the findings of the inspection were reviewed with those members of your staff identified in the enclosed report.

The inspection was an examination of activities conducted under the license as they relate to radiation safety and to compliance with the Commission's rules and regulations and the conditions of the license. The inspection consisted of selective examination of procedures and representative records, interviews of personnel, and observation of activities in progress. Additionally, the inspector reviewed the actions taken by Sequoyah Fuels Corporation (SFC) relative to incidents and findings documented in SFC correspondence dated September 11, 15, and 18, 1992.

Based on the results of the inspection, certain of your activities involving transport and packaging of licensed material appeared to be in violation of NRC requirements, as specified in the enclosed Notice of Violation (Notice). The violations are of concern because they are associated with an incident in which loose contamination was found on a transport vehicle. Additionally, the inspection revealed several apparent weaknesses in your transportation program.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. In your response, you should document the specific actions taken and any additional actions you plan to prevent recurrence. After reviewing your response to this Notice, including your proposed corrective actions and the results of future inspections, the NRC will determine whether further NRC enforcement action is necessary to ensure compliance with NRC regulatory requirements.

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The violations were associated with two shipments (identified as SFC-021 and SFC-022) of contaminated metal to the Allied Technology Group (ATG) facility in Richland, Washington, on September 25, 1992. The violations included: (1) failure to properly label packages containing radioactive material, (2) failure to ensure that the specific packages used met DOT requirements for shipment of low specific activity material, and (3) failure to placard properly a vehicle used to transport hazardous (radioactive) materials. Additionally, as a result of a packaging failure, loose contamination was found on one of the transport vehicles. The violations were identified by staff members of the Washington Radiation Protection Program during an inspection conducted at the ATG facility on September 28 through October 2, 1992.

These violations were discussed by representatives of the Washington Radiation Protection Program with members of your staff during a management meeting held in Richland, Washington, on October 2, 1992, and were documented in Washington Department of Health's letter dated October 2, 1992, which is enclosed with the report. Ms. Kasner reviewed the findings with Washington inspectors and discussed them with Mr. John Dietrich and other members of your staff during a telephone conversation on October 5, 1992. Additionally, the inspector reviewed survey records completed by SFC and ATG personnel for each shipment.

Based upon our discussions with representatives from the Washington Radiation Protection Program, it is our understanding that SFC's permit authorizing transfer of contaminated waste materials for disposal in the state of Washington has been suspended pending satisfactory response to the Department of Health's letter. Further, the order suspending SFC's permit prohibits the transportation of any shipments containing radioactive materials from SFC within the state until the violations are resolved in accordance with provisions of the October 2, 1992, letter. As described in the October 2 letter and in discussions with Washington Department of Health representatives, this response must include; (1) a description of the corrective actions taken for the violations, (2) submission and approval of a quality assurance program for your transportation activities, and (3) confirmation that SFC is willing to participate in an independent audit of its transportation and waste packaging programs.

As discussed during a November 13, 1992, conversation between Ms. Kasner and members of your staff, it is our understanding that SFC has made a commitment to provide a duplicate copy of its response(s) to the October 2, 1992, letter to the NRC Region IV office within the period of time prescribed in Washington Department of Health's letter.

In addition to the specific violations noted above, a separate concern was also identified regarding your communication systems. During the inspection conducted on site and in subsequent telephone conversations, SFC personnel informed NRC staff members that the packages transported to Washington were properly labeled and the transport vehicles were properly placarded. However,

as was later discovered, this was not the case and in subsequent conversations with SFC managers, it appeared that they had failed to investigate these issues with the appropriate site personnel prior to discussing the matter with NRC staff.

In addition to the example noted above, the inspector identified two examples of internal communication failures. The first example involved an untreated raffinate piping leak which resulted in contamination that was later discovered near the solvent extraction building. Although health and safety personnel provided notification of their finding to the maintenance department, who were responsible for repairing the piping, the appropriate information was not forwarded to the operations department. A shift supervisor was later observed examining the pipe, which was located in an area temporarily designated as a high radiation area, without the use of proper protective clothing and safety equipment. The second case involved a "stop work order" issued by the quality assurance department prohibiting the incineration of waste materials on site until investigation of an earlier incident was completed. Although the appropriate area manager was notified of the effective date of the work order, this information was not communicated in a timely manner to staff members involved with incineration activities. Because of a lack of timely communication within the waste department, site personnel violated the stop work order the following day.

Albeit the communication problems noted above did not result in incidents posing significant safety risks, they are nonetheless a concern in that they evidence a lack of attention to detail with regard to inter and intradepartmental communications. Although SFC has undertaken several initiatives to improve its internal communication systems as well as its communications with regulatory agencies, the findings of this inspection appear to indicate that further attention to this issue is warranted. Based upon discussions held with members of your staff during the inspection, it is our understanding that the incidents discussed above are currently under investigation by your quality assurance department and other members of your staff. The actions proposed by SFC to address this concern relative to each of the aforementioned examples will be reviewed upon completion of your investigations during a future inspection.

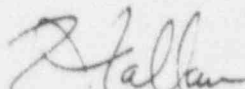
This also serves to acknowledge receipt of your letters dated September 11 and 18, 1992, transmitting reports submitted in accordance with the March 13, 1992, Order Modifying License and the April 3, 1992, Confirmatory Order. Our comments regarding the actions taken by SFC in response to the findings discussed in each letter are summarized in the enclosed report.

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 Public Document Room.

The responses directed by this letter and the enclosed Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, Pub. L. No. 96.511.

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

Sincerely,


L. J. Callan, Director
Division of Radiation Safety
and Safeguards

Enclosures:

1. Appendix A - Notice of Violation
2. Appendix - NRC Inspection Report
40-8027/92-27 with attachment
3. Washington Department of Health letter
dated October 2, 1992

cc:
Oklahoma Radiation Control Program Director

Jack Horner, SAO, RV

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Harmon, Curran & Tousley
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Newman & Holtzinger, P.C
ATTN: Maurice Axelrad
1615 L Street, N.W., Suite 1000
Washington, D.C. 20036

Sequoyah Fuels Corporation

-5-

General Atomics

ATTN: R. N. Rademacher

Vice President, Human Resources

P. O. Box 85608

San Diego, CA 92138

bcc:

DMB - Original (IE-07)

JLMilhoan

LJCallan

JPJaudon

MRodriguez, OC/LFDCB (4503)

*WLFisher

*CLCain

*LLKasner

*NMIS

*MIS System

*RIV Files (2)

*RSTS Operator

*REHall, URFO

JTGreeves, NMSS (6 H3)

JWNHickey, NMSS (6 H3)

MTokar, NMSS (6 H3)

MLHorn, NMSS (6 H3)

SLuttal, OGC (15 B18)

JGoldberg, OGC (15 B18)

TRCombs, OCA (17 A3)

JLieberman, OE (7 H5)

EECollins, DRP

GMVasquez

JGilliland

GFSanborn, EO

*W/IFS Form

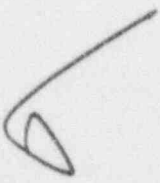
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LLKasner	CLCain	CAHackney <i>[Signature]</i>	GFSanborn	LJCallan
11/ /92	11/ /92	11/15/92	11/18/92	11/21/92

*Previously concurred

bcc:

DMB - Original (IE-07)
JLMilhoan
LJCallan
JPJaudon
MRodriguez, OC/LFDCB (4503)
WLFisher
CLCain
LLKasner
NMIS
MIS System
RIV Files (2)
RSTS Operator
REHall, URFO
JTGreeves, NMSS (6 H3)
JWNHickey, NMSS (6 H3)
MTokar, NMSS (6 H3)
MLHorn, NMSS (6 H3)
SLUttal, OGC (15 B18)
JGoldberg, OGC (15 B18)
TRCombs, OCA (17 A3)
JLieberman, OE (7 H5)
EECollins, DRP
GMVasquez
JGilliland
GFSanborn, EO

*W/IFS Form



RIV:NMIS	C:NMIS	D:DRSS		
LLKasner	CLCain	LJCallan		
11/9/92	11/10/92	11/ /92		

PREVIOUS CONCURRENCE PAGE

bcc:

DMB - Original (IE-07)

JLMilhoan

LJCallan

JPJaudon

MRodriguez, OC/LFDCB (4503)

*WLFisher

*CLCain

*LLKasner

*NMIS

*MIS System

*RIV Files (2)

*RSTS Operator

*REHall, URFO

JTGreeves, NMSS (6 H3)

JWNHickey, NMSS (6 H3)

MTokar, NMSS (6 H3)

MLHorn, NMSS (6 H3)

SLuttal, OGC (15 B18)

JGoldberg, OGC (15 B18)

TRComps, OCA (17 A3)

JLieberman, OE (7 H5)

EECollins, DRP

GMVasquez

JGilliland

GFSanborn, EO

*W/IFS Form

*RIV:NMIS	*C:NMIS	SLO	EO <i>[Signature]</i>	D:DRSS.
LLKasner	CLCain	CAHackney	GFSanborn	LJCallan
11/ /92	11/ /92	11/ /92	11/18/92	11/21/92

*Previously concurred

3000084

APPENDIX A

NOTICE OF VIOLATION

Sequoyah Fuels Corporation (SFC)
Gore, Oklahoma

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

During an NRC inspection conducted on September 28 through October 2, 1992, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the violations are listed below:

- A. 10 CFR 71.5(a) requires that licensees who transport licensed material outside the confines of their plants or deliver licensed material to a carrier for transport comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation (DOT) in 49 CFR Part 170-189.
1. 49 CFR 172.504 prescribes requirements for placarding vehicles used to transport hazardous materials. Specifically, Table 1 requires, in part, that the transport vehicle be placarded on each side and each end with a "RADIOACTIVE" placard when transporting low specific activity (LSA) radioactive materials shipped as exclusive use (footnote 5).
- 49 CFR 172.556(a) requires that except for size and color, the "RADIOACTIVE" placard must be as shown in this section.
- Contrary to the above, on September 25, 1992, the licensee prepared for a carrier, a vehicle designated for exclusive use in transporting LSA radioactive materials without using a "RADIOACTIVE" placard as prescribed in the above requirement. Specifically, the placard used had "LSA" written on the bottom of the placard.
- This is a Severity Level IV violation (Supplement V).
2. 49 CFR 173.425(b)(5) requires, in part, that packaged shipments of low specific activity (LSA) material consigned as exclusive use be transported such that there is no loose radioactive material in the conveyance.
- Contrary to the above, on September 25, 1992, the licensee transported a shipment of LSA material, using an exclusive use vehicle, which was found to have loose radioactive material on the conveyance.
- This is a Severity Level IV violation (Supplement V).
3. 49 CFR 173.425(b)(8) requires, in part, that packaged shipments of low specific activity (LSA) material consigned as exclusive use

either be packaged in DOT Specification 7A Type A packages or be marked or stenciled "RADIOACTIVE - LSA" on the exterior of each package.

Contrary to the above, on September 25, 1992, the licensee prepared for a carrier two shipments (SFC-021 and -022) containing LSA material in packages that were not DOT Specification 7A Type A packages, and the exterior of the packages were not marked or stenciled "RADIOACTIVE - LSA".

This is a Severity Level IV violation (Supplement V).

4. 49 CFR 173.475 requires, in part, that before each shipment of any radioactive materials package, the shipper must ensure by examination that each closure device of the packaging, including any required gasket, is properly installed, secured, and free of defects.

Contrary to the above, on September 25, 1992, the licensee prepared a package (sea van) containing LSA radioactive materials and failed to ensure that a gasket around the closure was properly installed, secured, and free of defects. As a result, the gasket was later found to have substantial damage and was missing in some areas of the closure, and radioactive material leaked out of the package.

This is a Severity Level IV violation (Supplement V).

Pursuant to the provisions of 10 CFR 2.201, Sequoyah Fuels Corporation is hereby required to submit a written statement or explanation to the Regional Administrator, Region IV, with a copy to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, 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, (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. If an adequate reply is not received within the time specified in this Notice, an order may be issued to show cause 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.

Dated at Arlington, Texas
this 23rd day of November 1992.

APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 40-8027/92-27

License: SUB-1010

Licensee: Sequoyah Fuels Corporation
P.O. Box 610
Gore, Oklahoma 74435

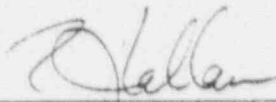
Facility Name: Sequoyah Facility

Inspection At: Gore, Oklahoma

Inspection Conducted: September 28-29, 1992

Inspectors: Linda L. Kzsner, Senior Radiation Specialist
Elmo E. Collins, Project Engineer

Approved:


Charles L. Cain, Chief, Nuclear Materials
Inspection Section

11/21/92
Date

Inspection Summary

Areas Inspected: Special, announced inspection of operations activities, radiation and industrial safety, transportation, and events and notifications.

Results:

- Several concerns were identified relative to SFC's internal communication systems and followup investigations of incidents reviewed during this inspection interval. These concerns primarily involved the detail and adequacy of internal communications regarding radiation safety issues identified by the licensee and the detail of SFC's investigation of several incidents reviewed during the inspection (Sections 2.2 and 3).
- Several weaknesses in the licensee's transportation program were identified in addition to violations of federal Department of Transportation (DOT) regulations associated with two shipments of contaminated waste to a facility in Washington (Section 3).
- Five violations of DOT requirements associated with two shipments of contaminated waste material from the Sequoyah facility to a facility located near Richland, Washington were identified. The inspector

confirmed the violations through interviews with SFC personnel and Washington inspectors, and a review of survey data associated with the shipments (Section 3).

- As a result of the transportation violations identified by Washington inspectors, the Washington Department of Health issued a letter dated October 2, 1992, documenting the violations and suspending SFC's permit authorizing transfer of low-level radioactive waste to facilities located in the state of Washington. The permit was suspended indefinitely, pending SFC's response to the letter referenced above (Section 3).
- In addition to responding to the Notice of Violation enclosed with the report, licensee management committed to provide a duplicate of its response to the Washington Department of Health to the NRC Region IV office for NRC review (Section 3).

Summary of Inspection Findings:

Violations 40-8027/9227-01, 9227-02, 9227-03, and 9227-04 were opened (Section 3).

Attachments and Enclosures:

Attachment 1 - Persons Contacted and Exit Meeting
Enclosure - Letter dated October 2, 1992, from the Washington Department Health to Sequoyah Fuels Corporation

DETAILS

1 OPERATIONS AND MANAGEMENT OVERSIGHT (88020 and 88005)

1.1 Critical Materials Control Program

In response to previous NRC findings the licensee recently implemented a comprehensive materials control program for maintenance activities involving critical process systems. (Reference NRC Inspection Report No. 40-8027/92-24 dated September 17, 1992.) The program was developed in response to an internal SFC management communication notice (MCN 92-09) and had not yet been formalized through issuance of facility operating procedures or department instructions. During the current inspection, the licensee issued temporary operating procedures affecting two facility procedures which will formally implement the program. The temporary operating procedures will remain in effect for a period of 60 days in order to identify potential errors or omissions. The inspector reviewed the changes and noted that they appeared sufficient to implement the program as described in MCN 92-09. The changes are briefly described below.

- Procedure G-201, "Maintenance Work Request"

The definition section of the procedure was expanded to include "active components" in critical systems. This will provide for comprehensive consideration of a critical system, including electrical boundaries and controls, during maintenance planning and repair. Also, the licensee incorporated the term "backlog" maintenance work orders to include the 750 outstanding maintenance work orders that existed when the revised materials control program was implemented and which have not yet been reviewed or recategorized under the revised program. Provisions have been incorporated in the procedure to require that backlog maintenance work orders be reviewed and categorized for work involving critical systems.

The procedure was expanded to include specifications for information required on flange joining and provisions for independent verification for specific parts and electrical components when work involves a critical system. The procedure also specifies four items which will not require independent verification even though they are normally part of a critical system. The inspector verified that the specific items are either under the control of other quality assurance programs or are unique at the Sequoyah facility and could not be mistaken as a result of their size or physical characteristics. The procedure also provides for "pre-approved" parts lists which have been reviewed and accepted by the engineering staff.

- Procedure G-210, "Control of Materials and Parts for Use in Critical Systems"

A number of modifications have been added to the procedure to: (1) further specify individuals' responsibilities for materials control and verification; (2) require further detail and control for identifying materials and parts stored in the licensee's warehouse; (3) require more detailed documentation of the parts and equipment used for maintenance projects; and (4) require documented verification by engineering and the assigned quality verifier (individual who provides independent verification of part selection and installation).

The licensee provided classroom training for all maintenance and operations personnel affected by these changes during the inspection.

1.2 Procedure Modifications

The licensee had recently issued several temporary operating procedures (TOPs) in response to incidents which had recently occurred and were still under investigation or review at the time of the inspection. Two of these were considered notable in that one addressed a recurrent problem and the second addressed a weakness noted earlier by NRC. These modifications are summarized below.

- TOP 92-392, Revision to facility procedure N-270-8

This TOP modifies a facility procedure governing the operation of the fluorination towers. During the period from July through September 1992, the expansion joints (bellows) on the fluorination towers had failed on numerous occasions because of excessive temperatures at the top of the towers. (The temperature varies with the reaction and feed rates, as well as the quality of the UF₄ used in the process.) These failures had resulted in minor releases of licensed material on several occasions.

The licensee had initiated a root cause analysis of the problem which was still under review during the inspection. However, as an interim measure, the licensee modified the applicable procedure to require visual monitoring of the tower bellows on an hourly basis and prepared log sheets for the operators to document their observations. This change resulted in increased oversight of the towers during routine operation and had resulted in the prevention of a potential bellow failure on more than one occasion at the time of the inspection.

The licensee plans to install temperature monitoring devices on each UF₆ tower bellow and on piping sections between the bellows and the upper cooling zones of the towers. This will allow operators to monitor the bellows temperature and adjust the UF₄ feed rate as necessary during routine operations.

- TOP 92-333, Revision to facility procedure G-192

This TOP incorporates additional provisions in a facility procedure governing the issuance and closure of SFC condition reports. As defined in the procedure, a condition report documents licensee identified issues involving safety concerns and may serve as the basis for implementing a root cause analysis. The licensee's condition report program requires that the condition report be forwarded to the appropriate area manager who is then assigned responsibility for developing corrective actions to address the specific concern.

In response to concerns raised earlier regarding the potential failure for managers to consider recommendations resulting from root cause analyses, the licensee modified the applicable procedure to specify that completion dates for root cause analyses be assigned at the time that the condition report is forwarded to the respective area manager. The area manager will be provided a copy of the root cause analysis report and associated recommendations prior to preparing a response to the condition report. Area managers must now provide justification if any of the recommendations are not addressed in the proposed corrective actions submitted to the licensing department. In addition to modifying the procedure, the quality assurance manager submitted all root cause analysis reports completed earlier to the appropriate area managers and requested that they provide a response indicating whether the associated recommendations had been addressed.

2 RADIATION AND INDUSTRIAL SAFETY (88322)

2.1 Reports and Notifications

Because production operations and maintenance activities were temporarily suspended for the majority of the inspection interval, the inspector's review of this program area was primarily focused on actions taken by SFC in response to incidents and findings involving radiation and industrial safety during the previous weeks. These issues were reported to NRC in accordance with the Order Modifying License (Order) dated March 13, 1992, and the requirements of 10 CFR Part 40. Three reports, dated September 11, 15, and 18, 1992, were reviewed with licensee staff. A summary of the actions taken by the licensee is provided below.

- Report dated September 11, 1992, Provided in Accordance with the Order

This report described contamination identified through SFC's unrestricted area survey program. The contamination was identified on piping and hardware located at the fertilizer load-out station at the Sequoyah facility. (The licensee had not completed surveys of the area when the report was submitted to NRC and was just finishing this project during the current inspection interval.) Contamination levels of 500,000 disintegrations per minute per 100 square centimeters

(dpm/100 sq. cm.) for fixed beta/gamma and 3,554 dpm/100 sq. cm. for removable beta/gamma contamination was identified. The material was removed from the fertilizer load-out station and transferred to the restricted portion of the facility.

The licensee also reported an Unusual Event which occurred on September 5, 1992, involving a failure of a fluorination tower bellows. The licensee estimated that as a result of the failure, approximately 1 pound of UF₆ escaped the bellow before the feed rate was slowed and the event was terminated. As noted in Section 1 of this report, the licensee subsequently implemented interim corrective measures to identify thermal problems with the tower bellows prior to failure. The licensee plans to supplement the interim measures with engineering controls.

- Report dated September 15, 1992, Provided in Accordance with 10 CFR 40.60

This report was submitted in accordance with 10 CFR 40.60(b)(1), and was concurrently telephoned to the NRC Operations Center. The licensee reported that contamination in excess of SFC's administrative limits was identified in a drainage trench adjacent to the solvent extraction (SX) yard and yellowcake storage pad. The contamination was, in part, the result of a leak in piping used to transfer raffinate from the SX building to the clarifiers (ponds) located to the north of the SX building. Initial surveys of the area revealed removable beta/gamma contamination levels as high as 3,000,000 dpm/100 sq. cm. and dose rates as high as 3.6 millirem per hour (gamma) in some locations. The licensee restricted and posted the area in accordance with 10 CFR Part 20 and attempted to decontaminate the area to the extent possible. The licensee was eventually able to reduce the contamination levels and attendant dose rate(s) to levels below those requiring that the area be posted as a radiation area. (This incident is also discussed in Section 2.2 with regard to communication issues associated with the licensee's response.)

- Report dated September 18, 1992, Provided in Accordance with the Order

The report described contamination levels found on several items stored at the fertilizer load-out station as well as some contaminated soils found in the area. (These findings were the result of SFC's continued surveys of unrestricted areas of the facility.) Contamination levels for items which were removed from the area and transferred to the restricted portion of the facility ranged from 8,000 - 32,000 dpm/100 sq. cm. for fixed alpha, and 1,000,000 - 5,000,000 dpm/100 sq. cm. for fixed beta/gamma. Removable contamination levels for the same items ranged from <200 - 1200 dpm/100 sq. cm. alpha and 8,000 - 20,000 dpm/100 sq. cm. beta/gamma. The items included two trailers which had been stored in the area since 1984, pipe fittings,

fence materials, and localized areas of soil. The soil contamination is to be considered in SFC's planned remediation of unrestricted areas of the facility.

The licensee also reported the drainage trench referenced above and one personnel contamination incident. The personnel contamination incident involved a worker assigned to the SX building who discovered skin contamination on his hand following work performed with a torn glove. Subsequent surveys completed by the health and safety staff revealed maximum contamination of 25,000 dpm for a hand, and 253 dpm for a nasal passage. Bioassays completed later revealed urine concentrations of uranium below the licensee's minimum detectable limit. (This incident is discussed further below with regard to communication and followup issues.)

The inspector noted that with exception of the communication weaknesses discussed below, the licensee had responded appropriately to each incident.

2.2 Communication and Investigation of Incidents

The inspector observed communication weaknesses associated with the licensee's response to three incidents reviewed during this inspection interval. These issues involved a failure to ensure that appropriate personnel were promptly informed of conditions which directly impacted their assigned areas of responsibility and inadequate communications related to the investigation of a personnel contamination incident. The issues are briefly described below.

The first example involved contamination identified in a drainage trench in the SX yard (reference Section 2.1, report dated September 11, 1992). Health and safety personnel promptly surveyed the area and provided notification of their findings to their supervisor. Technicians also provided verbal notification of protective clothing and respiratory protection requirements, as well as the requirement to initiate a hazardous work permit, to maintenance workers who were assigned to repair a leaking pipe in the area. However, the appropriate information was not promptly forwarded to the operations department. A shift supervisor was later observed examining the pipe, which was located in an area temporarily designated as a radiation area, without the use of the proper protective clothing and safety equipment.

The second example involved a "stop work order" issued by the quality assurance department prohibiting incineration of waste materials onsite until investigation of an earlier incident was completed. The incident involved a small fire identified on September 18, 1992, near the incinerator which is located in the restricted portion of the facility. Although the licensee planned to complete an investigation of the incident, the fire was initially believed to be the result of incineration activities which were underway at the time. A stop work order was issued on September 28, 1992, and the appropriate area manager was notified that incineration activities were to be suspended until the investigation was completed. However, this information was not promptly communicated to staff members involved with incineration

activities. As a result of a lack of timely communication within the waste department, site personnel violated the stop work order on September 29, 1992.

A third example involved the licensee's followup investigation of a personnel contamination incident. On September 15, 1992, an individual identified contamination on one hand as he performed a personal frisk required upon exit from the restricted portion of the facility. The health and safety staff was notified as required, and the individual was surveyed and decontaminated in accordance with facility procedure H-013. In addition to the hand contamination, the health and safety technicians also identified contamination in a nasal passage. Although the worker received the proper attention once the contamination was identified, the staff's initial investigation of the source(s) of contamination was not thorough. The initial contamination event report indicated that the nasal passage "could have been caused by solvent extraction tank going dry and releasing vapors." Upon further questioning by an inspector, licensee staff determined that the contamination had been transferred from the individual's hand.

Albeit the communication problems noted above did not result in any incident, they were noted as a concern in that they evidence a lack of attention to detail with regard to inter and intradepartmental communications. Licensee management was also cautioned regarding the detail of communication when investigating personnel contamination events and the need to ensure that the information obtained from the affected individual was accurate so that SFC could identify poor radiation safety practices when applicable, or determine when the implementation of further protective measures was required to reduce contamination incidents.

3 TRANSPORTATION

During this inspection interval, SFC was notified of a contamination incident involving a shipment from the Sequoyah facility to the Allied Technology Group (ATG) facility located near Richland, Washington. SFC had recently contracted the services of ATG in order to dispose of the large inventory of contaminated metals present at the site. Under this arrangement, ATG provided SFC with packaging for shipment of contaminated scrap metal, was responsible for arranging the services of a contract carrier for ground transport from SFC's facility to ATG, and acted as a waste broker. SFC was responsible for packaging the material in accordance with DOT regulations and for completing shipping papers and associated waste manifests.

On September 25, 1992, SFC prepared and released a shipment containing three packages (one "sea van" and two B-25 containers) with a combined total of approximately 2.26 millicuries of uranium (the licensee noted "natural uranium" on the shipping documents). The associated shipping papers and manifest identified this shipment as SFC-021. According to SFC's waste manager, the total quantity of radioactivity in the package was determined by analysis of representative samples of the metal parts with adjustment for the total package weight. The waste manager noted that SFC did not maintain records of the specific articles contained in any package transferred under

this program and therefore, he could only confirm that the packages held miscellaneous contaminated scrap metal. The waste manager also stated that in some cases, SFC had attempted to decontaminate the exterior surface of scrap metal and hardware transferred to ATG. However, in order to expedite the reduction of waste inventory, SFC had discontinued this practice for recent shipments.

On September 28, SFC was notified by the contract carrier that liquid appeared to be seeping from the bottom of the sea van. At that time, the contract driver was in the state of Oregon. SFC's waste manager discussed the problem with the driver, and later stated that the driver estimated that the total volume of liquid was approximately 2-3 pints and appeared to be oil seeping from the package. SFC's waste manager advised the driver, who had telephoned from a truck stop, to spread an absorbent over the liquid and to await further instruction. SFC's waste manager later stated that he had contacted a representative from ATG to determine the appropriate course of action, and that he arranged for the shipment to proceed to ATG where the source of the liquid could be investigated and appropriate surveys could be performed. The waste manager stated that the driver was instructed to proceed to Washington during a subsequent telephone conversation on September 28, 1992.

The Washington Department of Health, Division of Radiation Protection, was contacted by an ATG representative when the shipment arrived at the ATG facility on September 28, 1992. ATG performed a cursory survey of the trailer bed upon arrival at its facility and transmitted the survey results by facsimile to the Sequoyah facility. An inspector reviewed the survey data, which revealed removable contamination levels of ~1200 and ~200 dpm/100 sq. cm. for beta/gamma and alpha, respectively, and an average of 1000 dpm/100 sq. cm. for gamma by direct frisk. However, the initial surveys did not include the area where the majority of the liquid had seeped from the sea van container. ATG representatives informed SFC that they intended to delay further investigation until a representative from the Washington Department of Health was present. Washington inspectors arrived at the ATG facility on September 28, but due to inclement weather thorough surveys of the trailer could not be completed at that time.

On September 20, ATG representatives performed a more thorough survey of the trailer and shipping containers. Contamination levels on areas of the trailer adjacent to the sea van averaged 3,000 and 400 dpm/100 sq. cm. for beta/gamma and alpha direct, respectively. A few "hot spots" were identified on the trailer bed with direct survey readings as high as 100,000 and 10,000 dpm/100 sq. cm. for beta/gamma and alpha, respectively. The highest removable contamination levels found on the trailer bed were 1,200 and 300 pm/100 sq. cm. for beta/gamma and alpha, respectively. Additionally, the Washington inspectors and ATG representatives collected a sample of loose contaminated material (this was presumed to be residual absorbant used by the driver) from the trailer bed which was measured at 18,000 counts per minute on contact. Radiation levels measured on the bed of the trailer did not exceed 0.05 millirem per hour. Smear surveys were also obtained from the inside surfaces of the sea van. The highest removable contamination was found on the

floor of the van, where smear samples revealed a maximum of 14,700 dpm/100 sq. cm. for beta/gamma.

On October 1, SFC dispatched two representatives to meet with Washington Department of Health representatives at the ATG facility. Based upon the Washington inspectors' findings, Washington Department of Health representatives requested to meet with SFC managers to discuss SFC's waste transfer and transportation program. Also on October 1, an inspector conducted telephonic interviews of SFC representatives who inspected the packages prior to shipment and the Division of Radiation Protection representatives who conducted the inspection at the ATG facility.

The SFC representative who supervised packaging of the waste materials stated that the shipping containers were properly labeled for a shipment of "low specific activity" (LSA) material and that the vehicle was placarded when it departed from the Sequoyah facility. Additionally, on October 2, a SFC representative informed the inspector that a second shipment, also containing waste material to be transferred to ATG, had departed the Sequoyah facility shortly after the first shipment on September 25. The second shipment, which contained contaminated scrap metal packaged in a sea van and three B-25 containers, had arrived at the ATG facility on October 1, 1992. Licensee staff confirmed that packages in the second shipment, identified as SFC-022, were properly labeled for shipment of LSA material when the shipment departed the Sequoyah facility. In regard to the containers used for the first shipment, SFC representatives noted that the sea van had been loaded for shipment using a forklift rather than the crane which was normally used at the site. SFC representatives also stated that the packages were supplied by ATG, and that no testing of package integrity was performed at the Sequoyah facility.

Representatives from the Washington Department of Health interviewed several individuals involved with the subject shipments including; ATG representatives, the contract driver of the first shipment, and SFC representatives. The Washington inspectors reviewed their findings with a NRC inspector, noting that they had identified several violations of DOT requirements. As noted in a letter from the Washington Department of Health dated October 2, 1992, the violations included: (1) packages in both shipments (SFC-021 and SFC-022) were not marked "Radioactive - LSA" as required; (2) a shipping container in shipment SFC-021 did not meet the "strong, tight package" criteria required by DOT in that it had leaked contaminated fluids during shipment; (3) loose radioactive material was found on the conveyance; (4) the seal, or gasket, of the sea van on shipment SFC-021 was either missing or defective; and (5) the placard used on the conveyance for shipment SFC-022 was not as prescribed under DOT regulations.

In addition to the specific violations, representatives from the Washington Department of Health also noted other concerns regarding the subject shipments and the specific circumstances associated with them. Specifically, the

Washington inspectors noted that the gasket on the back of the sea van in shipment SFC-021 evidenced notable damage and that the communication between SFC and the contract carrier was inadequate in this case.

As noted above, the inspector reviewed the findings of the inspection conducted at ATG with representatives from the Washington Department of Health. Additionally, the inspector reviewed survey data associated with each shipment as provided by SFC and ATG. Based on these reviews, the inspector discussed the findings with licensee management who acknowledged the findings as described above. The inspector noted that the following violations were identified:

- (1) Violation of 49 CFR 173.425(b)(5) which requires that LSA materials be transported such that there is no loose radioactive material in the conveyance. In the case of the shipment identified as SFC-021, loose radioactive material was found on the conveyance, including the absorbant which had been left on the bed of the trailer during transport.
- (2) Violation of 49 CFR 173.425(b)(8) which requires that LSA materials be transported in packages that are stenciled or otherwise marked "RADIOACTIVE - LSA." Packages in both shipments, SFC-021 and SFC-022, were not marked in accordance with this requirement.
- (3) Violation of 49 CFR 172.504 requires, in part that each transport vehicle be placarded with the type of placard specified in tables found in this section, including the specifications for the placards described in 49 CFR 172.519 through 172.558. Table 1 of 49 CFR 172.504 specifies that transport vehicles which are exclusive use shipments of LSA material transported in accordance with 49 CFR 173.425(b) must be placarded with a "RADIOACTIVE" placard. 49 CFR 172.556(a) requires that except for size and color, the "RADIOACTIVE" placard must be as shown in this section. In the case of the shipment identified as SFC-022, the placard was not as prescribed in 49 CFR 172.556(a) and had "LSA" written in the bottom of the placard.
- (4) Violation of 49 CFR 173.475(c) requires that before shipment of any radioactive materials package, the shipper must ensure by examination that each closure device of the packaging, including any required gasket, is properly installed, secured, and free of defects. In the case of the shipment identified as SFC-021, the sea van container was found to have a defective gasket around the closure of the van.

SFC later determined that the gasket on the sea van was damaged as a result of the use of the forklift during package loading. The concerns regarding communications between the carrier and SFC representatives were focused on the fact that the driver thought he had been instructed to proceed to the state border where, according to the driver, he assumed that Washington state patrol representatives could perform a survey of the trailer. According to SFC's waste manager, he thought that the driver had confirmed that the state patrol

representatives would meet him in Oregon (at the time he was within 4 miles of the state border) and perform the survey there. Additionally, after the initial notification to SFC, the driver had proceeded through Oregon on his own accord rather than remaining at the truck stop as instructed. Confusion also existed as to how the driver had removed the contaminated absorbent from the bed of the trailer.

A NRC inspector also discussed with licensee management several additional concerns related to SFC's transportation program and the licensee's investigation of this incident. The first concern involved the staff's apparent lack of understanding of DOT regulations. Specifically, the individuals responsible for verifying that packages were properly categorized and labeled failed to identify: (1) that none of the packages on the first shipment were labeled "RADIOACTIVE - LSA", (2) the vehicle placards and package labels used for the second shipment did not meet the prescribed requirements of DOT regulations, and (3) the gasket on one package was defective and in some places, missing. A second concern involved the licensee's followup once the problem was identified. Although the licensee was responsive to inquiries from Washington Department of Health representatives, licensee personnel failed to fully investigate the subject packaging activities at the time of NRC's inspection. As a result, the waste manager was uncertain about the specific package labels and vehicle placards that had been used for the two shipments and was unable to confirm that the packages were checked for signs of leakage prior to release. These issues were noted as concerns warranting further review as the licensee develops corrective actions in response to the violations.

In addition to issuing formal citations as described in its October 2 letter, the Washington Department of Health suspended SFC's permit authorizing the transfer of low-level radioactive waste to facilities within the state of Washington indefinitely, pending SFC's response to the aforementioned letter. The Washington Department of Health also required SFC to submit a transportation quality assurance program for review by Washington representatives and requested that SFC participate in an independent inspection of its transportation and packaging program. According to SFC management, SFC acknowledged that a quality assurance program would be developed and that SFC would consent to an independent audit subsequent to the October 2 meeting.

Licensee management confirmed during the exit briefing that a duplicate copy of its response to the Washington Department of Health would be provided to the NRC Region IV office.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

- John Ellis, Senior Vice President
 - * John Dietrich, Vice President, Regulatory Affairs
 - * Scott Munson, Manager, Health and Safety
 - Richard Parker, Manager, Operations
 - * Phil Frost, Waste Manager
 - * Craig Harlin, Licensing Manager
 - Joe Bohannon, Quality Assurance Manager
 - Ron Fine, Health Physicist
 - Leon Seguin, QA Engineer (Contract)
 - Emma Smith, Waste Department Supervisor
- * Denotes individuals present during the telephonic exit briefing conducted on October 7, 1992.

The inspectors also communicated with other site personnel during the course of the inspection.

1.2 Washington Department of Health Representatives

Gary Robertson, Head, Waste Management Section
Division of Radiation Protection
Mike Elson, Inspector, Division of Radiation Protection

2 EXIT BRIEFING

On October 7, 1992, the inspector conducted a telephonic exit briefing with the licensee representatives listed above. The inspector reviewed her findings as presented in this report, with specific focus on the issues discussed in Section 3. Licensee personnel confirmed that they would provide a copy of their response to the Washington Department of Health within the time period described in the enclosed letter dated October 2, 1992.

ENCLOSURE

KRISTINE M. GEBBIE
Secretary



RECEIVED
NRC
REGION 7

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
DIVISION OF RADIATION PROTECTION

Airustrial Center, Bldg. 5 • P.O. Box 47827 • Olympia, Washington 98504-7827
October 2, 1992

Philip Frost, Manager
Waste Management
Sequoyah Fuels Corporation
P.O. Box 610
Gore, Oklahoma 74435

Dear Mr. Frost:

Permit #1719

This letter refers to a shipment of radioactive waste material sent to the Allied Technology Group facility located near Richland, Washington. The material, listed as Radioactive Material - low specific activity on Manifest #s 132908 and 132910, was shipped on September 25, 1992, and was received on September 28, 1992. Inspections of your shipment #s SFC-021 and SFC-022 revealed the following violations of U.S. Department of Transportation Regulations:

Container Number
or Description

Summary of
Violations

Shipment SFC-021,
Container Numbers
1, 2, and 3

No "Radioactive - LSA" marking was applied to these packages. 49 CFR 173.425(b)(8).

Container #1

Lack of strong, tight package, resulting in leakage of package contents. 49 CFR 173.425(b)(5) and 49 CFR 173.24(b).

Trailer #2-518

Loose radioactive material was found on the conveyance. The material had approximately 18,000 cpm. 49 CFR 173.425(b)(5).

Container #1

Gasket to back doors of Sea Van was either missing or defective. 49 CFR 173.475(c).

Shipment #SFC-022,
Container Numbers
1, 2, 3, and 4

No "Radioactive - LSA" marking was on these packages. 49 CFR 173.425(b)(8).

Shipment #SFC-022

The radioactive placard was not as prescribed in 49 CFR 172.556. The lower portion of the placard had LSA written in it.

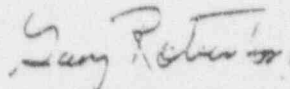
Other Problems Noted:

1. On both shipment SFC-021 and SFC-022, there was no way to correlate the packages with the manifest.
2. Removable contamination was found on the packages shipped on shipment SFC-021. Although the U.S. Department of Transportation limits specified in 49 CFR 173.443 were not exceeded, quality assurance procedures should be instituted to prevent removable contamination from being present on open transport vehicles.

Because of the nature of the violations found in this shipment, authorization to use the commercial low-level radioactive waste disposal site by Sequoyah Fuels Corporation, permit #1719 has been suspended indefinitely. It is the intent of this suspension order that no shipments containing radioactive material be accepted into the state of Washington until all of the above violations have been satisfactorily resolved. Shipments in transit prior to October 1, 1992, will be admitted to the site. Further shipments will be refused pending reinstatement of the site use permit.

If you wish to reestablish shipping and site use privileges, you must respond in writing to: Gary Robertson, Head, Waste Management Section, Division of Radiation Protection, P.O. Box 47827, Olympia, Washington 98504-7827. In your response, please describe the action you have taken or plan to take to bring your activities into full compliance with all applicable state and federal regulations. This should be in the form of a quality assurance program. If no response is received within 90 days, your site use permit will be terminated.

Sincerely,



Gary Robertson, Head
Waste Management Section
(206) 753-3459

GR:krf

cc: US Ecology, Louisville, KY
US Ecology, Richland, WA
Kathleen N. Schneider, Nuclear Regulatory Commission
Greg Yuhas, Region V, Nuclear Regulatory Commission
DOH Division of Radiation Protection, Richland, WA
Joe Keefe, UTC
Mike Garner, Ecology
Lloyd Kirk, OK

IFS Data Entry Form

Reviewed By: UgeDate: 11/23/92Site Name: SECURITY FUELS CORPORATIONReport Transmittal Date: 11/23/92Lead Inspector: LEIKResponsible Org. Code: 4302Report End Date: 10/07/92Region: 4Report NBR
A 92-27Docket NBR
403027Materials Only
License NBR
513-1010

*Docket Name

B _____

C _____

Update? (Y/N): _____ Opened IR/LER/P21 LOG/IFS Number: _____

***Sequence NBR: 01 Item Type: _____ **Severity: _____ **Supplement: _____

Status	*UPD VR	*Proj. Closeout	*Actual Closeout	10 CFR	Materials Only License Cond.	Tie Down
A	_____	____/____/____	____/____/____	_____	_____	_____
B	_____	____/____/____	____/____/____	_____	_____	_____
C	_____	____/____/____	____/____/____	_____	_____	_____

Title: _____ (55 character width)

*Closeout Org: _____ *Closeout EMP: _____ *Contact EMP: _____ *Procedure: _____ *Funct Area: _____

*Cause CD: _____ **EA Number: _____ **NOV/NNC Issue Date: _____

Text: _____

Update? (Y/N): _____ Opened IR/LER/P21 LOG/IFS Number: _____

***Sequence NBR: 02 Item Type: _____ **Severity: _____ **Supplement: _____

Status	*UPD VR	*Proj. Closeout	*Actual Closeout	10 CFR	Materials Only License Cond.	Tie Down
A	_____	____/____/____	____/____/____	_____	_____	_____
B	_____	____/____/____	____/____/____	_____	_____	_____
C	_____	____/____/____	____/____/____	_____	_____	_____

Title: _____ (55 character width)

*Closeout Org: _____ *Closeout EMP: _____ *Contact EMP: _____ *Procedure: _____ *Funct Area: _____

*Cause CD: _____ **EA Number: _____ **NOV/NNC Issue Date: _____

Text: _____

* Optional Fields.

** Severity, Supplement, and NOV/NNC only applicable for Violations; EA Number only applicable for Apparent Violations.

*** Sequence NBR is not applicable for docket related/P21, LER, or non-docket related items.

ITEMS CONTINUED? (Y/N): _____

FORD 1



REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9212160058 DOC. DATE: 92/12/11 NOTARIZED: NO DOCKET #
 FACIL: 40-8027 Sequoyah Fuels Corp., Gore, OK, 04008027
 AUTH. NAME AUTHOR AFFILIATION
 CALLAN, L.J. Region 4 (Post 820201)
 RECIP. NAME RECIPIENT AFFILIATION
 SHEPPARD, J.J. Sequoyah Fuels Corp.

SUBJECT: Forwards insp rept 40-8027/92-28 on 921013-23 & NOV. Insp
 team concluded that licensee satisfactorily completed
 commitments in response to 911003 order.

DISTRIBUTION CODE: IE07D CCPIES RECEIVED: LTR / ENCL / SIZE: 5+37
 TITLE: Environ & Radiological (30,40,70 DKT)-Insp Rept/Notice of Viol Respon

NOTES: LPDR 1 cy. ; OGC/SUTTAL ; OCA/COMBS, T 04008027 /
 FAC TYPE: URANIUM HEXAFLUORIDE PRODUCTION

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	
	THARPE, V	1 1	HORN, M	1 1	
INTERNAL:	AEOD/DSP/NAS	1 1	NMSS/IMAB 6H3	1 1	
	NMSS/IMOB 6H3	1 1			
	NMSS/SGTB 4E4	1 1	NUDOCS-ABSTRACT	1 1	
	OE DIR	1 1	RGN4 FILE 01	1 1	
EXTERNAL:	LPDR	1 1	NRC PDR	1 1	
NOTES:		3 3			

NOTE TO ALL "RIDS" RECIPIENTS:

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 ROOM P1-37 (EXT. 504-2065) TO ELIMINATE YOUR NAME FROM DISTRIBUTION
 LISTS FOR DOCUMENTS YOU DON'T NEED!

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

DEC 11 1992

Docket: 40-8027
License: SUB-1010

Sequoyah Fuels Corporation
(Subsidiary of General Atomics)
ATTN: James J. Sheppard, President
P.O. Box 610
Gore, Oklahoma 74435

Gentlemen:

SUBJECT: NRC INSPECTION REPORT 40-8027/92-28 (NOTICE OF VIOLATION)

This refers to the special, announced inspection conducted on October 13-23, 1992, by Mr. Elmo E. Collins, Inspection Team Leader, and the inspectors identified in the attached report, of the NRC Region IV and Region II offices. The inspection included a review of activities authorized by Source Material License No. SUB-1010 for the Sequoyah Fuels Corporation (SFC). At the conclusion of the inspection, the findings were discussed with you and those members of your staff identified in the enclosed report at a public exit briefing held on October 23, 1992, at the SFC Carlisle Training Center.

The inspection was conducted to determine SFC's completion of procedure reviews and upgrades conducted in response to the Order Modifying License and Demand For Information (Order) dated October 3, 1991. The procedures reviewed during the inspection included health and safety and environmental procedures scheduled for revision following restart of the facility. This schedule was documented in SFC letters dated November 4 and December 10, 1991. In addition, the inspection assessed SFC's progress in implementing its planned actions to improve management controls.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of a review of management organization and controls, a selective review of procedures and representative records, the worker training associated with procedures, interviews of personnel, and observations of activities in progress.

Overall, the team concluded that SFC has satisfactorily completed the commitments in response to the October 3, 1991 Order. Further, SFC senior managers have demonstrated a commitment to achieving the objectives described in SFC's performance improvement plan and appear to have been effective in communicating these objectives to the staff. However, SFC is still in the initial stages of implementing performance improvements, and the findings of the inspection clearly illustrate the need for management to continue to be diligent in implementing SFC's planned initiatives.

LED7
11

In general, the team found that the procedures reviewed were technically adequate and that workers were adequately trained. Some of the procedure discrepancies identified by the team indicated a lack of attention to detail in developing the procedures, and some examples of poor procedure implementation and training were observed, as discussed below

Based on the results of this inspection, certain licensed activities appeared to be in violation of NRC requirements, as specified in the enclosed Notice of Violation (Notice). The violations involved the failure to complete health and safety technician training certifications, the failure to document some instances of skin contamination as required by procedure, and the failure to impose some quality control checks for environmental airborne sample analysis. These violations are of concern because they show that improvements in procedure implementation and procedure training are warranted.


You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. In your response, you should document the specific actions taken and any additional actions you plan to prevent recurrence. After reviewing your response to this Notice, including your proposed corrective actions and the results of future inspections, the NRC will determine whether further NRC enforcement action is necessary to ensure compliance with NRC regulatory requirements.

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

The responses directed by this letter and the enclosed Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, Pub. L. No. 96.511.

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

Sincerely,


L. J. Callan, Director
Division of Radiation Safety
and Safeguards

Enclosures:

1. Appendix A - Notice of Violation
2. Appendix B - NRC Inspection Report
40-8027/92-28 w/attachment

cc: (See next page)

CC:
Oklahoma Radiation Control Program Director

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Harmon, Curran & Tousley
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Human Resources
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San Diego, CA 92138

bcc:

DMB - Original (IE-07)

JLMilhoan

LJCallan

JPJaudon

MRodriguez, OC/LFDCB (4503)

*WLFisher

*CLCain

*EECollins, DRP

*NMIS

*MIS System

*RIV Files (1)

*RSTS Operator

*REHall, URFO

JTGreeves, NMSS (6 H3)

JWNHickey, NMSS (6 H3)

MTokar, NMSS (6 H3)

MLHorn, NMSS (6 H3)

SLuttal, OGC (15 B18)

JGoldberg, OGC (15 B18)

TRCombs, OCA (17 A3)

JLieberman, OE (7 H5)

LLKasner

GMVasquez

JGilliland

GFSanborn, EO

GBKuzo, RII

GRKonwinski, URFO

*W/IFS Form

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RIV.DRP	NMIS	NMIS	RII	URFO
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12/8/92	12/8/92	12/8/92	12/8/92	12/8/92

C:NMIS	D:DRS			
CLCain	LJCallan			
12/9/92	12/10/92			

150019

bcc:

DMB - Original (IE-07)

JLMilhoan

LJCallan

JPJaudon

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*MIS System

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JLieberman, OE (7 H5)

LLKasner

GMVasquez

JGilliland

GFSanborn, EO

GBKuzo, RII

GRKonwinski, URFO

*W/IFS Form

RIV:DRP	NMIS	NMIS	RII	URFO
EECollins	LLKasner	GMVasquez	GBKuzo	GRKonwinski
12/8/92	12/8/92	12/8/92	12/8/92	12/8/92

C:NMIS	D:DRS			
CLCain	LJCallan			
12/9/92	12/10/92			

APPENDIX A

NOTICE OF VIOLATION

Sequoyah Fuels Corporation (SFC)
Gore, Oklahoma 74435

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

During an NRC inspection conducted on October 13-23, 1992, two violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the violations are listed below:

A. License Condition 9 of License SUB-1010 authorizes use of licensed material in accordance with the statements, representations, and conditions contained in Chapters 1-8 of the license renewal application dated August 23, 1985, as supplemented. Section 2.2, Chapter 2 of said license renewal application states that the Manager, Health and Safety, shall be responsible for implementing procedures in the functional area of health physics.

1. Procedure HS-013, "Personnel Contamination Assessment and Decontamination," Section 4.2.9 as modified by temporary operating procedure No. 92-476, instructs health and safety technicians to indicate on the contamination event record whether contamination was found on the skin or clothing or both skin and clothing.

Contrary to the above, the contamination event report for an SFC manager dated October 19, 1992, did not indicate that the individual was actually contaminated on both skin and clothing. The documentation indicated skin contamination only.

2. Procedure HSDEPT-102 specified the training for health and safety technicians prior to assignment on shift, including practical factors and an overall certification by the health and safety department manager.

Contrary to the above, at the time of the inspection, 10 SFC health and safety technicians assigned on shift had not completed training on all required practical factors and had not received the overall certification by the health and safety department manager.

This is a Severity Level IV violation (Supplement VI).

B. License Condition 9 of License SUB-1010 authorizes use of licensed material in accordance with the statements, representations, and conditions contained in Chapters 1-8 of the license renewal application dated August 23, 1985, as supplemented. Section 5.2, Chapter 5, of said license renewal application states, in part, that the Sequoyah facility shall use the quality assurance guidance outlined in those sections of Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring

Programs (Normal Operations) - Effluent Streams and the Environment," which apply to a uranium conversion facility.

Section 6.3.1 of Regulatory Guide 4.15 states that spiked and blank samples should be submitted for analysis as unknowns to provide an intralaboratory basis for estimating the accuracy of the analytical results. Further, Section 6.3.2 of the Regulatory Guide states that laboratories of licensees or their contractors that perform environmental measurements should participate in the EPA's Environmental Radioactivity Laboratory Intercomparison Studies (Cross-check) Program, or an equivalent program.

Contrary to the above, at the time of the inspection, SFC had not submitted spiked samples for analysis in the health and safety laboratory used to analyze environmental airborne samples to provide an intralaboratory basis for estimating the accuracy of the analytical results. Also, the health and safety laboratory used to analyze environmental airborne samples had not participated in EPA's Environmental Radioactivity Laboratory Intercomparison Studies (Cross-check) Program, or an equivalent program.

This is a Severity Level IV violation (Supplement VI).

Pursuant to the provisions of 10 CFR Part 2.201, Sequoyah Fur Corporation is hereby required to submit a written statement or explanation to the Regional Administrator, Region IV, with a copy to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, 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, (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. If an adequate reply is not received within the time specified in this Notice, the Commission may issue an Order or Demand for Information as to 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.

Dated at Arlington, Texas
this 11th day of December , 1992

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 40-8027/92-28

License No. SUB-1010

Docket: 40-8027

Licensee: Sequoyah Fuels Corporation
P.O. Box 610
Gore, Oklahoma 74435

Facility Name: Sequoyah Facility

Inspection At: Gore, Oklahoma

Inspection Conducted: October 13-23, 1992

Team Leader: Elmo E. Collins
Elmo E. Collins, Team Leader, Division
of Reactor Projects, Region IV

12/9/92
Date

Team Members: Linda L. Kasner, Senior Radiation Specialist, Region IV
G. Michael Vasquez, Senior Radiation Specialist, Region IV
Gary R. Konwinski, Project Manager, URFO
George B. Kuzo, Senior Radiation Specialist, NRC Region II
Mary L. Thomas, Health Physicist, Office of Nuclear
Regulatory Research

Approved: Charles L. Cain
Charles L. Cain, Chief, Nuclear Materials
Inspection Section, Region IV

12/9/92
Date

Inspection Summary

Inspection Conducted October 13-23, 1992 (Report No. 40-8027/92-28)

Areas Inspected: The team reviewed SFC's commitments in response to Item B of Section VI of the October 3, 1991, Order Modifying License and other SFC actions relative to improving personnel performance at the Sequoyah facility.

Results:

- SFC has met the commitments made in response to Item B of Section VI of the October 3, 1991, Order Modifying License and Demand for Information.

- The procedures reviewed were technically adequate and, in general, contained sufficient detail for field implementation.
- The licensee has adequately trained workers on the requirements of the new and modified procedures.
- In general, workers were appropriately implementing procedure requirements.
- SFC management has made progress in implementing measures to achieve the eight objectives identified in its "Plan for Achieving and Maintaining High Performance Standards" (Plan). However, SFC was still in the initial stages of implementing performance improvements, and the findings of the inspection clearly illustrate the need for management to continue to be diligent in their continued efforts to implement planned initiatives.
- There has been a substantial improvement in the implementation of the environmental program.

Summary of Inspection Findings:

- Violation 40-8027/9228-01 was opened (paragraphs 2.1 and 2.2)
- Violation 40-8027/9228-02 was opened (paragraph 2.8)

Attachment:

- Attachment 1 - Persons Contacted and Exit Meeting

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ATTACHMENT 1 - EXIT MEETING AND ATTENDEES

EXECUTIVE SUMMARY

The inspection team assessed the adequacy of procedure reviews for SFC's health and safety and environmental programs, as well as the effectiveness of worker training on new and modified procedures. The selection of activities reviewed during this inspection included SFC commitments in response to the October 3, 1991, Order which were scheduled for completion following restart of the facility. In addition, management's effectiveness in improving facility performance was assessed. Based upon the inspection findings, the licensee has satisfied its commitments in response to the October 3, 1991, Order.

The health and safety and environmental procedures reviewed were found to be technically adequate and contained sufficient detail to facilitate field implementation. Improvement in the content of the procedures was also noted. However, the absence of clearly assigned responsibilities when multiple departments were involved in specific tasks was noted in some procedures, and in others several minor discrepancies were observed. Additionally, inspectors noted that a clear, site-wide, procedure hierarchy had not yet been developed.

Licensee training for the new and modified procedures was generally found to be adequate. In particular, environmental technicians appeared very knowledgeable regarding their procedure requirements. However, concerns were noted regarding the effectiveness of the "read-and-sign" methodology which had been used to train workers on some complex procedures. When this methodology was used, there was no method employed to verify the effectiveness of the training, and the responsibility for thoroughness of the training fell with individual employees.

In general, workers were appropriately implementing procedure requirements; however, two examples of a procedure violation were observed. Additionally, a second violation was identified involving the failure to comply with quality control testing for environmental analyses as specified in the license. These issues are discussed in detail in Sections 2.1, 2.2, and 2.8 of the report.

The effectiveness of management oversight of facility activities was reviewed with particular focus on management's progress in implementing measures to achieve the eight objectives identified in SFC's "Plan for Achieving and Maintaining High Performance Standards" (Plan), as described in SFC letter dated January 3, 1992. Based upon the inspection findings, SFC managers have demonstrated a commitment to achieving the objectives described in the Plan and appear to have been effective in communicating these goals to the staff. The most notable improvements in management oversight were the efforts taken by senior SFC management in becoming further involved in plant activities and the improvement in communications with all levels of the staff. However, this effort was not fully effective with mid-level managers who were less successful in sustaining visibility within the plant.

Although many improvements in overall performance were observed, SFC was in the initial stages of implementing its long-term improvement program, and the findings of the inspection clearly illustrate the need for SFC management to continue to reinforce its objectives and goals and to institutionalize them within the organization.

DETAILS

1 BACKGROUND INFORMATION AND TEAM CHARTER

On October 3, 1991, the NRC issued an Order Modifying License and Demand for Information (Order). The Order required the removal of one individual from supervisory or managerial responsibilities over NRC-regulated activities for a period of 1 year and requested certain information regarding the SFC managers listed in the Demand For Information. The Order also prevented facility operations until SFC submitted and obtained NRC approval of a plan and schedule for outside consultants to review the adequacy of the health and safety and environmental programs. By letters dated November 4 and December 10, 1991, SFC submitted a plan and schedule that listed the procedures SFC planned to review, revise as appropriate, and implement.

NRC Inspection Report 40-8027/91-17 dated March 6, 1992, documented the NRC's conclusions regarding the procedures that SFC had identified for review within the bounds of the Order; SFC's basis for deferring review of certain procedures until after restart; the adequacy of selected revised procedures and the effectiveness of associated retraining provided to SFC personnel; and the licensee's corrective measures taken in response to concerns raised in the Demand For Information issued by the NRC on November 5, 1990 (Demand).

NRC Inspection Report 40-8027/91-17 documented that:

- The licensee had complied with the explicit requirements of Item B of Section VI of the October 3, 1991, Order;
- Revised Health and Safety Department and Environmental Department procedures selected for review prior to restart were adequate to meet their intended function;
- Workers appeared adequately trained on revised procedures; and,
- The responses and actions required by the 1990 Demand had been satisfactorily addressed by the licensee.

The NRC determined that further information was needed regarding future plans to evaluate the adequacy of health and safety technician staffing and the interim management oversight programs which SFC intended to implement while the permanent long-term oversight programs were being developed. SFC responded by letter dated March 13, 1992, describing the additional interim management oversight measures that SFC intended to implement upon facility restart and the actions taken and planned with regard to the permanent staffing of health and safety technicians.

On March 17, 1992, the NRC Commissioners held a meeting to review SFC's status with regard to restarting the facility. By letter dated April 16, 1992, NRC

authorized facility restart and rescinded Section VI.B of the Order. Facility operation resumed with long term procedure improvements and training commitments to be completed.

The two main purposes of this inspection were to determine if SFC met the remaining commitments in response to the Order and to evaluate management oversight. Within the scope of the inspection, the procedures reviewed and updated after facility restart and SFC's progress in implementing its long-term improvement plan were evaluated.

Section VI.A of the Order and the responses required by the Demand For Information were not within the scope of this inspection.

2 HEALTH AND SAFETY AND OTHER PROCEDURES (83822)

The inspectors reviewed the following procedures to determine the adequacy of the technical content, the effectiveness of the worker training, and the effectiveness of procedure implementation.

The procedures reviewed were found to be technically adequate and contained sufficient detail to facilitate field implementation. Likewise, improvement in the content of the procedures was noted, and licensee training for the new and modified procedures was generally found to be adequate. However, some concerns were noted regarding the effectiveness of the read-and-sign methodology which had been used to train workers on some complex procedures.

2.1 Procedures G-158, "Contamination Control"; and HS-013, "Personnel Contamination Assessment and Decontamination"

An inspector reviewed the above two procedures and found that they appeared technically adequate and contained sufficient detail for field implementation. Although the content of the procedures appeared satisfactory, inspectors observed some inconsistencies in the implementation of the procedures, some misunderstandings by the health and safety technicians regarding implementation of HS-013, and a violation of Procedure HS-013.

Procedure G-158 described SFC's overall contamination control program. The procedure appeared to contain sufficient emphasis regarding worker responsibility to be attentive and to report conditions which could result in the spread of contamination. However, the team observed some inconsistencies in contamination controls as described below.

SFC procedures allow low contamination levels in the semi-controlled areas but did not include clear provisions for protective clothing measures to prevent personnel contamination. Inspectors observed workers in the semi-controlled area touch desk surfaces, door knobs, table tops, and equipment without using gloves and observed air breathing hoses on the ground with unprotected open ends. In addition, inspectors noted that workers did not perform surveys to monitor potential beta contamination and instead monitored only for alpha

contamination prior to entering the in-plant reading room where eating was allowed.

Inspectors discussed these practices with the licensee, and the licensee indicated that further improvements in contamination controls were planned.

Specifically, SFC management planned to emphasize three areas: (1) health and safety involvement in the engineering stages of facility modifications; (2) health and safety involvement in maintenance activities; and (3) development of data on personnel contamination incidents to identify SFC's weaknesses in contamination controls. To achieve the third objective, documentation and evaluation of personnel contaminations, SFC issued Procedure HS-013, "Personnel Contamination Assessment and Decontamination" on August 31, 1992. SFC also planned to move the personnel contamination monitors into the change room buffer zones to improve identification of contamination events.

The team found that Procedure HS-013 was technically adequate to meet SFC's objective. The procedure specified how contamination events were documented, how to assess the amount of activity on clothing and skin, how to decontaminate individuals, and required health and safety technicians to evaluate where and how the person became contaminated.

Although the content of the procedure appeared adequate, the team found several problems with the procedure's implementation. On October 13, 1992, an inspector reviewed the personnel contamination monitor printout and noted that nine alarms had occurred between midnight and about 3:00 p.m. However, health and safety supervisors noted that no contamination events had been reported. After further review, health and safety supervision reported that two individuals had notified health and safety technicians about clothing contamination, but the technician had not documented the events (nor reported them to health and safety supervision) because the technician thought that documentation requirements did not apply to clothing contaminations. In response, the licensee issued a temporary operating procedure on October 14, 1992, clarifying the requirements for documenting clothing contaminations. Additionally, SFC installed card readers on the personnel contamination monitors to provide automatic identification for individuals who used personnel contamination monitors as they exited the restricted area. If a person were contaminated, his badge number would be recorded along with the contamination information.

The team also reviewed the documentation and evaluation of a personnel contamination event. On October 19, 1992, a manager found himself contaminated. The documentation of the event stated that the cause of the contamination was possibly due to wearing a contaminated smock. The smock was found to have some fixed contamination and was disposed of. The documentation also indicated that the worker's hair was contaminated although his hard hat was clean and that other head and hand contamination was found.

The team learned that the worker's pants, shirt, pens, calculator cover, and tie were also contaminated, but these contaminations were not originally

documented. Additionally, an inspector who was present at the time observed that although the technician made inquiries into how the worker may have been contaminated, the technician did not inquire into the worker's activities. The team later identified that the worker was handling contaminated liquids in the process laboratory without using gloves. This indicated that the technician's evaluation of the contamination event was superficial.

License Condition 9 of License SUB-1010 authorizes use of licensed material in accordance with the statements, representations, and conditions contained in Chapters 1-8 of the license renewal application dated August 23, 1985, as supplemented. Section 2.2, Chapter 2 of the renewal application states that the Manager, Health and Safety, shall be responsible for implementing procedures in the functional area of health physics. Procedure HS-013, "Personnel Contamination Assessment and Decontamination," Section 4.2.9 as modified by Temporary Operating Procedure 92-476, specifies that the staff must indicate on the contamination event record whether contamination was found on the skin or clothing or both skin and clothing. The contamination event report for an SFC manager dated October 19, 1992, did not indicate that the individual was contaminated on both skin and clothing. The documentation indicated skin contamination only. This is a violation (40-8027/9228-01).

Inspectors later learned that SFC had used the read-and-sign methodology to train workers on Procedure H-103 and Temporary Operating Procedure 92-476. Based upon the finding discussed above, the read-and-sign methodology appeared ineffective in this case because health and safety technicians were uncertain about what the new procedure required and how it was to be accomplished.

2.2 Procedures G-020, "Sequoyah Facility Training System"; and HSDEPT-102, "Shift Health and Safety Technician Training and Qualification Procedure"

The inspector reviewed the current program guidance, instructional details, and implementation of training for experienced and new-hire health and safety technicians. The inspector noted that the licensee had established a full-time training staff position in the training department to provide health and safety technician instruction. This position was filled with an experienced individual.

Guidance for health and safety technician training was contained in Procedure HSDEPT-102. The training topics detailed in HSDEPT-102 were appropriate for initial training. However, although health and safety technician training was provided by the training department staff, there was no assignment of responsibilities to the training department for the conduct and coordination of the training for these individuals within the licensee's general training program, Procedure G-020.

Several weaknesses were identified regarding training for personnel involved with health and safety departmental activities. For example, except for limited guidance in HSDEPT-102 and the general training requirements specified in G-020, the licensee had no documented guidance addressing health and safety trainer qualifications nor for evaluation of training effectiveness.

Additionally, methods to update lesson plans had not been developed. For example, Lesson Plan HST01-16, "Airborne Radioactivity Controls," dated February 11, 1992, referenced an out-of-date revision to Procedure HS-104, and did not include new Procedures HS-105 and HS-106. This lesson plan was used to train four new health and safety technicians at the time of the inspection. The inspector also noted that no health and safety personnel participated in the October 1992 "train the trainer" program to instruct selected personnel from each department in proper conduct of refresher training.

Additionally, training requirements for health and safety supervisors and personnel from other departments who use health and safety department procedures, e.g. environmental specialists, had not been evaluated by the licensee.

The inspector concluded that the lack of general guidance for health and safety technician training was a program weakness. The licensee planned to add guidance to the appropriate procedure to specify the necessary qualifications of people conducting health and safety training. The licensee also planned to develop and implement a performance based training program to address the maintenance of lesson plans and provide methods of evaluating training effectiveness.

The inspector also identified that some health and safety technician training was not completed. Revision 4 of HSDEPT-102 specified the completion of training requirements for health and safety technicians prior to assignment on shift. From review of training records of one calibration and nine health and safety technicians, and from interviews with individuals, the inspector concluded that the technicians had not completed some practical factors required for final certification. The unsigned proficiency tasks included the inspection of stack sampling equipment and personnel decontamination. Further, Section V of Attachment E, which denotes final certification of the trainees, was not completed by the Manager, Health and Safety, as required.

License Condition 9 of NRC License No. SUB-1010 authorizes use of licensed material in accordance with the statements contained in Chapters 1-8 of the license application dated August 23, 1985. Section 2.2, Chapter 2 of the renewal application states that the Manager, Health and Safety, shall be responsible for implementing procedures in the functional area of health physics. Procedure HSDEPT-102 specifies the required training for technicians prior to assignment on shift. The failure to complete the practical factors listed in Attachment D of HSDEPT-102 prior to assigning health and safety technicians on shift was identified as a violation (40-8027/9228-01).

2.3 Procedure N-270-8, "Primary Fluorination Tower Operation"

The team reviewed the procedure with regard to safety precautions during change-out of ash receivers and, in general, found that the procedure contained sufficient precautions to ensure worker safety. However, inspectors observed problems involving the failure to clearly specify safety requirements in a temporary operating procedure recently issued to modify ash receiver

changeout requirements. In addition to the specific guidance provided in temporary operating procedure No. 92-436, interdepartmental communications weaknesses contributed to problems as discussed below. Other procedures involved with the ash receiver changeout included: G-158, "Contamination Control"; G-160, "Health and Safety Precautions and Requirements"; HS-012, "Entry Into High Radiation Areas"; G-150, "Respiratory Protection Program"; HS-503, "Selection of Respiratory Protection Equipment (RPE)"; and G-002, "Temporary Operating Procedures." Two inspectors observed portions of an ash receiver changeout.

An inspector discussed the procedure with operators certified to perform the changeout. The operators appeared knowledgeable on the procedure requirements and safety precautions. However, one operator expressed discomfort in performing the evolution because the operator had not done it in about 3 years. The operator explained that certifications can be maintained with classroom training only and no hands-on work. The inspector concluded that the maintenance of operator certifications with classroom training alone did not necessarily ensure operator proficiency.

SFC earlier found that workers performing ash receiver changeouts may have entered atmospheres that were immediately dangerous to life and health and may not have used the appropriate respiratory protection, as required by the Occupational Safety and Health Administration. SFC workers had used a supplied air respirator alone; however, the Occupational Safety and Health Administration requires an in-line emergency escape air tank to be attached with supplied air respirators in immediately dangerous to life and health atmospheres. Subsequently, SFC took additional safety precautions to ensure compliance with the Occupational Safety and Health Administration requirements. By the end of September 1992, SFC had fabricated a "clamshell" which was designed to be placed around the ash receiver flange to contain hydrogen fluoride vapors that, at times, may have exceeded the minimum concentration defined for an immediately dangerous to life and health atmosphere.

On September 29, 1992, SFC issued temporary operating procedure No. 92-436 which described how the clamshell was to be used. Although the temporary operating procedure specified a 90 day duration, it was also designated as "test or evaluation." Due to the effective period defined in the temporary operating procedure, health and safety management believed that the clamshell was being used continuously. However, on October 13, 1992, inspectors found that operators had not used the clamshell since October 1 when the operators believed that the test had been completed. Further, inspectors observed an ash receiver changeout where operators did not use the clamshell and failed to use an in-line emergency escape air tank with their supplied air respirator.

SFC's ineffectiveness in addressing this safety issue appeared to be due to errors in communication between the health and safety and operations department and a lack of clarity in how temporary operating procedures designated as "test or evaluation" were to be implemented. On October 13, 1992, temporary operating procedure No. 92-473 was issued to address the

procedural weaknesses. Temporary operating procedure No. 92-473 specified that in the event the clamshell was not used, a supplied air respirator with an emergency escape air tank was required. The temporary operating procedure also included a caution against the use of inappropriate respiratory protection.

On October 14, 1992, an inspector discussed temporary operating procedure No. 92-473 with five operators certified in ash receiver changeouts. Four of the five operators could not explain to the inspector the correct respiratory protection requirements when the clamshell was not used. Apparently the wording of the temporary operating procedure caused some confusion. This information indicated that several operators and supervisors were not aware of the relationship between the clamshell and the emergency escape air tank. The licensee planned additional training for operators covering the correct respiratory protection required during the ash receiver changeout evolution.

The team noted that SFC's respiratory protection requirements for entering immediately dangerous to life and health atmospheres were contained in Procedures G-150, "Respiratory Protection Program" and HS-503, "Selection of Respiratory Protection Equipment (RPE)." However, although operators sometimes enter immediately dangerous to life and health atmospheres, operations staff were not required to read and understand these two procedures. Licensee management planned to evaluate the training requirements for the operations staff involving these two procedures.

As a long-term solution, SFC was evaluating a continuous ash removal system that would automatically process uranium tetrafluoride (UF₆) ash. This system would eliminate manual changeout of the ash receivers.

2.4 N-280-6, "UF₆ Drain Filter Bundle Change Out"

An inspector observed a drain filter bundle changeout to determine the adequacy of the safety precautions described in the subject procedure. Generally, the inspector found that the precautions were adequate. Operations, maintenance, and health and safety workers appeared to coordinate their activities. Health and safety technicians performed prejob surveys and the hazardous work permit prescribed appropriate protective clothing. Maintenance workers wore acid-resistant suits, supplied air respirators, and appropriate monitoring devices. Further, the inspector observed the workers using vacuum hoses to contain releases. The evolution was performed in accordance with procedural requirements.

2.5 HS-101, "Bioassay Program"

The revised procedure was technically adequate, and the inspector noted substantial improvements over previous revisions. However, the inspector noted instances where the procedure was vague and did not specify some responsibilities. The licensee was continuing to evaluate the procedure because it was difficult to use for other than the specific cases discussed.

The inspector reviewed SFC documentation and found that procedural requirements appeared to have been implemented unnecessarily.

However, the team questioned the licensee's 2-week routine bioassay frequency for workers frequenting areas that use soluble uranium compounds. Since the biologic half-life of soluble uranium compounds is relatively short, a 2-week frequency, considering the detection limits, was noted as a potential concern. The team's concern addressed cases where a worker could receive an uptake without indications that the event occurred.

2.6 Procedures G-150, "Respiratory Protection Program"; HS-503, "Selection of Respiratory Protection Equipment (RPE)"; and HS-502, "Issuing Respiratory Protection Equipment"

These procedures were technically adequate and contained sufficient detail for field implementation. The respiratory protection program covered both radiological and chemical hazards. Health and safety technicians interviewed were knowledgeable of procedural requirements for selecting respirators.

An inspector reviewed SFC's program for mask issue, use, return, wash, and repair, and found that activities were conducted in accordance with applicable SFC procedures. SFC had recently designated an area in the plant for mask issuance. This was an improvement in the control of respirators and associated documentation. SFC had also purchased several additional respirators to ensure an appropriate inventory. Potentially contaminated masks which were returned after use were surveyed and sent to the mask wash area.

The mask wash and repair area contamination controls and documentation were complete. Technicians were knowledgeable about procedural requirements.

2.7 Procedure G-109, "Environmental Airborne Radiological Monitoring"

The procedure met the specifications outlined in Chapter 5.2.2 of the license application. Sampling results from June through September 1992 showed proper implementation of the procedure by licensee personnel.

During review of sample calculations, the inspector identified inconsistent methods used to determine sample volume. Depending upon the department that was implementing the procedure, either an estimated or actual calculation of the sample volume was used. The inspector concluded, however, that because of the extensive length of the sampling period (weekly), no significant errors were introduced into sample results because of this inconsistency.

2.8 Procedure HSDEPT-118, "Quality Control of Counting Instruments"

From a review of selected quality control activities in the health and safety counting room laboratory, the inspector verified that, in general, technicians were knowledgeable of the procedural requirements.

However, the health and safety laboratory, which was used to count environmental airborne samples, did not implement the quality control activities outlined in Regulatory Guides 4.15 and 4.16 as required by Section 5.2 of the license application. Tests to ensure the quality of results such as duplicate analyses and periodic cross-check analyses with independent laboratories were required. While these analyses were performed at the offsite environmental laboratory, they were not being performed for the health and safety laboratory where the air particulate samples were analyzed.

Section 6.3.1 of Regulatory Guide 4.15 states that spiked and blank samples should be submitted for analysis as unknowns to provide an intralaboratory basis for estimating the accuracy of the analytical results. Further, Section 6.3.2 of the Regulatory Guide states that laboratories of licensees or their contractors that perform environmental measurements should participate in the EPA's Environmental Radioactivity Laboratory Intercomparison Studies (cross-check) Program, or an equivalent program.

The failure of the health and safety laboratory to meet the quality control specifications detailed in Section 5.2 of the license application was identified as a violation of License Condition No. 9 (40-8027/9228-02).

2.9 In-Plant Air Sampling Procedures

The inspector reviewed the following procedures:

- HS-104, "Fixed Location and Nonroutine Air Sampling";
- HS-105, "Personal Air Sampling"; and,
- HS-106, "Personnel Exposure Assessment Using Air Sampling Data."

The inspector reviewed the procedures against applicable requirements of 10 CFR Part 20 and Section 3.3.4 of the license conditions. The inspector concluded that the procedures were technically adequate and satisfactorily implemented regulatory requirements.

The inspector discussed the required sample analyses, calculations, and assessment of worker airborne maximum permissible concentrations hours with health and safety technicians and found that several of the technicians were confused regarding the number of radioactive count/recount analyses required for each particulate sample. Also, technicians were not certain regarding who was responsible for completing the exposure assessment. However, the inspector concluded that all required analyses and calculations ultimately were completed as required.

The inspector noted that the technicians' uncertainty was due, in part, to a failure to provide detailed training for this complex calculation. The licensee had used the read-and-sign method of training for this upgraded procedure. The licensee planned to clarify the procedural guidance and

conduct additional training for the health and safety technicians. This training had not been completed by the end of the inspection.

2.10 Procedure FAP-1505, "Decommissioning Record Keeping"

The inspector found that the procedure did not contain clear instructions defining the type of information required to be entered into the decommissioning file or assigning responsibilities to enter the information into the decommissioning file. The licensee was, as a matter of practice, entering events reported pursuant to 10 CFR Part 40.60 reports. Additionally, the inspector noted that many unrestricted area surveys were marked to be entered into the decommissioning file, but had not been entered. The licensee indicated that the resources assigned to formulate guidance and responsibilities for the decommissioning files had been diverted to the license renewal activities. At the end of the inspection, the licensee was in the process of reviewing draft guidance for the decommissioning file.

2.11 Other Procedures

Inspectors also reviewed the following procedures and did not identify any significant concerns.

- Procedure G-160, "Industrial Safety Precautions and Requirements."
- Procedure HS-010, "Radiation and Radioactive Material Incident Investigation and Reporting."

2.12 Conclusions

Overall, the procedures reviewed were technically adequate, and, in general, the level of instruction was sufficiently detailed to support field implementation. Improvements in the level of detail, assignments of responsibility, and quality of safety precautions were seen. Some weaknesses were found that indicated a lack of attention to detail. Additionally, a clear, site-wide, procedure hierarchy was not present.

The licensee had adequately trained workers on the requirements of new and modified procedures. Weaknesses were seen, however, in the effectiveness of the read-and-sign methodology used to train workers on complex procedures. When this methodology was used, the responsibility for the thoroughness of the training fell with the worker.

In general, the workers were appropriately implementing procedure requirements; however, three notable exceptions to this were identified.

First, the requirements of personnel contamination assessment in Procedure HS-013 were not fully implemented. The team identified early in the inspection that some clothing contaminations were not documented, apparently because technicians did not clearly understand that this was the intent of the

procedure. To address this weakness, SFC issued a procedure change on October 14, 1992, to state that clothing contaminations were required to be documented. On October 20 a worker had both skin and clothing contamination, but the clothing contamination was not documented. This was identified as a violation.

In addition, the procedure required an evaluation of the possible cause for the personnel contamination. The team found that SFC's evaluation was shallow in that the activities that the worker had been performing were not assessed.

This procedure was a new procedure, and the information regarding the nature of personnel contaminations that SFC planned to gather using this procedure was intended to drive future improvements in the ability of SFC to control contamination events onsite. The weaknesses in implementing this procedure were attributed, in part, to the read-and-sign method of training technicians on this procedure.

Second, while the inspection team found that the SFC commitments in response to the Order to perform health and safety technician training were completed, not all practical factors specified in health and safety department Procedure 102 were completed prior to assignment on shift. In addition, the overall certification by the health and safety department manager was not performed. This was identified as a violation.

Third, the team found weaknesses in procedure implementation involving the ash receiver changeout evolution. Certain aspects of this evolution involved the creation of a dangerous atmosphere. SFC attempted to implement compensatory measures by requiring that special actions be taken to control atmospheric release of hazardous materials. The procedure change that implemented the necessary actions, however, was not understood by the plant operators to be a procedure requirement. Consequently, the required actions to ensure worker safety were not being implemented. The apparent cause for this weakness in procedure implementation was that this type of procedure change did not have clear instructions regarding its use.

The team also found that there was a failure to implement an independent cross-check analysis of environmental airborne samples; however, the majority of quality control results for laboratories demonstrated there were no concerns with the accuracy of the results. This was identified as a violation.

3 ENVIRONMENTAL PROGRAM (88045)

3.1 Procedure HS-111, "Collection, Preparation, and Shipment of Bottom Sediment"

Discussions with the licensee indicated that the relevant portions of HS-111 had been incorporated into environmental department Instruction EDI-204. A review of Procedure EDI-204 indicated that the procedure was current,

complete, and technically adequate. The licensee rescinded Procedure HS-111 on October 13, 1992.

3.2 Procedure HS-102, "Airborne and Liquid Effluent Monitoring"

This procedure discussed the air and liquid monitoring performed by the health and safety technicians. Interviews with health and safety technicians showed that they were knowledgeable of the procedure requirements. The most recent copy of the procedure was available to the technicians for use.

Air samples were delivered by the health and safety technicians to the health and safety trailer for counting. This represented a change in that previously the technicians that collected the samples did the counting. This was not reflected in the procedure. The inspector noted that a revision to clarify counting location and responsibility may be warranted.

A "Daily Radiological and Environmental Status Report" was produced by SFC. This report listed the air monitoring locations and sample results. Where applicable, the maximum permissible concentration and the SFC action level were listed. These parameters allowed for a rapid visual review by the Manager, Health and Safety.

The inspector reviewed the reports directed by the procedure and concluded that the reports were complete, accurate, and filed in accordance with procedure guidelines.

3.3 Procedure HSDEPT-106, "Stormwater Runoff Sampling"

The Manager, Environmental, was responsible for the administration of this procedure; however, the sample collection was performed by the health and safety technicians because they were on site at all times and were available when precipitation events took place.

Several minor procedure discrepancies were identified. The procedure specified that Outfalls 008, 009, and 010 should be sampled. Although Outfalls 009 and 010 were no longer in operation, technicians still sampled them. Also, the procedure cited the position of radiation safety officer as the responsible individual for sample collection and submittal. This position no longer exists at SFC. In addition, the inspector noted that the procedure should be revised to reference the individuals that actually collect the samples. Similarly, the procedure should be revised to clearly identify which chain of custody forms should be used.

A review of the stormwater runoff logbook indicated that there were four instances within the last 6 months where the automated sampler was not prepared to automatically collect a sample. Eight entries within the last year indicated that the sampler was out of service or that the sampler was inhibited. These conditions indicated that additional training was needed in resetting and maintaining the sampler.

3.4 Procedure N-290-8, "Combination Stream Contamination Control"

The inspector reviewed the training certification sheets for two operators who routinely sampled the combination stream and concluded that both operators had been appropriately certified in the required training. The inspector observed an operator sampling the combination stream on October 15, 1992. The inspector found that the sampling, container labeling, and delivery of the sample were all done in accordance with the procedure. The inspector reviewed the senior shift supervisors logbook and past deviation reports and did not identify any events where procedural limits were exceeded. One minor procedure discrepancy was identified where the procedure referenced Attachment 2 in Section 4.1.1F of Procedure N-290-8 as a sampling schedule. The sampling schedule was actually contained in Table 1 of the procedure.

3.5 Procedure EDI-101, "Environmental Department Monitoring Schedule"

The inspector found that the well monitoring schedule in Procedure EDI-101 did not include all wells that were being sampled. The procedure did not include the groundwater monitoring wells installed during the facility environmental investigation completed in 1991. The inspector concluded, however, that SFC's recent commitments to periodically sample the new wells, in addition to those identified in the license application, had been met. The licensee planned to revise Procedure EDI-101 to include all wells that are actually being sampled.

Numerous underdrains, sumps, and recovery wells were discussed in this procedure. There was not, however, any mention of tracking the amount of water that was recovered. The inspector discussed with licensee personnel the importance of these types of data to determine the zone of influence of these various components.

The procedure also discussed the requirement for sample collection and monitoring work to be recorded in a logbook. The log book was reviewed, and all of the information discussed in the procedure was recorded as required.

3.6 Procedure EDI-102, "Groundwater Sampling"

This procedure discussed the protocol for groundwater sampling used at the site. The methods were consistent with industry standards and were clearly described in the procedure. One minor procedure discrepancy was identified where an Attachment 2 column heading was incorrect.

3.7 Procedure EDI-205, "Stormwater Sampling"

This procedure discussed the automated storm water runoff sampler designated as 008, that sampled the primary outfall from the SFC property. Sample results served to determine the water quality and the constituents that were contained within the site's runoff. The sampling location was inspected and the sampler and associated components were found to be in good working order. There have been occasions when the sampler was not reset (paragraph 3.3);

however, at the time that Outfall 008 was inspected, the sampler was reset and capable of taking an automatic sample.

3.8 Procedure EDI-206, "Management of Automated Pumping/Sampling Systems"

This procedure discussed the automated underdrain pumps, the recovery well pumps, and the Outfall 008 sampler. These components were described in the environmental pump log sheets. The results of these weekly records were summarized in the monthly report that was prepared by the environmental engineer and submitted to the Manager, Environmental.

A review of weekly records revealed that the information was being recorded as required by the procedure. The weekly logs indicated that the pumps in the various underdrain systems were commonly out of service. The licensee planned to install different check valves and different types of pumps to address the maintenance problems.

3.9 Procedure SFL/ENV/SOP-1, "Aqueous Sample Receiving and Preparation"

All of the sample preservation methods discussed in the procedure were current and consistent with industry standards. Laboratory files and logbooks were reviewed to verify procedure compliance. The inspector concluded that the documentation was complete and well organized.

The inspector observed that the thorium-230 lower limit of detection was 0.2 pCi/l for liquid samples and 0.025 pCi/gm for forage samples. Based upon a review of selected sample analysis results, it appeared that the lower limits of detection referenced in the procedure may not be reliably achieved. The inspector noted that the established values may warrant further review.

3.10 Uranium Analysis Procedures

The inspector reviewed the following uranium analysis procedures:

- SFL/ENV/SOP-7, "Fluorometric Uranium Analysis";
- SFL/ENV/SOP-20, "Soluble Uranium in Aqueous Solutions";
- SFL/ENV/SOP-22, "Uranium in Urine"; and,
- SFL/ENV/SOP-25, "Total Uranium In Aqueous Solutions."

Each of the laboratory instruments used for these analyses were operated and calibrated according to the manufacturers specifications. The procedures reflected the operating instructions that were supplied by the manufacturer.

The data sheets that accompanied the procedures were well organized and included the appropriate data and numerical values required for the data derivation.

3.11 Procedure SFL/ENV/SOP-23, "Environmental Laboratory Quality Assurance"

This procedure discussed training, record keeping, and instrument calibration for the laboratory. Each laboratory technician was trained in instrument operation, laboratory procedures, and had a current, completed required reading list. The records indicated that required training had been completed. Deviation reports documenting lab comparisons with greater than two standard deviations were reviewed, and the inspector found that in each case a probable cause was determined for the deviation. Subsequent comparison results indicated that the deviations did not persist. Instrument calibrations were performed as required. Records documenting the calibrations, which used traceable standards, were recorded and filed in the laboratory.

3.12 Environmental Program Review

The growth in the environmental data base and the resulting level of understanding derived from this information has equipped SFC with a sufficient monitoring program to determine changes at the site. However, the amount of data collected and the number of monitoring locations made it very difficult to analyze the results without some form of automation. This may warrant further review by the licensee.

The licensee planned to install two recovery wells prior to the end of 1992. One well would be located west of the restricted area boundary and one well would be located north of Unit 12. The function of these wells would be to limit the spread of contaminants in these areas. The licensee also planned to install a nitric acid recovery system and an ion exchange column. The nitric acid recovery system would eliminate the need for the treated raffinate storage ponds and reduce the need for the clarification ponds. The ion exchange column would target several known contributors of uranium to the combination stream.

During recent months, SFC was recovering about 2,000 to 3,000 gallons of seepage per day from a combination of recovery wells, the french drain, and the 18 trench monitors that have been installed at the site. Additionally, the underdrain systems were also recovering seepage. However, the combined efforts of these systems were not capable of containing the seepage that has entered the groundwater. Water level maps indicated that the zone of influence of these recovery systems was limited to a small area around the main process building and adjacent to the solvent extraction building.

To address existing environmental contamination, SFC planned a risk-based approach. Based on an evaluation of the risk associated with the contamination, a decision would be made to decide future action.

The systematic elimination of contaminant sources was a long-term goal of SFC. The first step in this process was the decommissioning of Pond 2. Shipping of sludge was an ongoing process. This program had been expanded to include the sludge and liquids from the clarifier basins. The licensee also planned to

dispose of contaminated equipment. SFC has initiated a study to determine the mobility of uranium currently residing in the soil. The results of the study will dictate future recovery efforts.

In response to leaking raffinate storage ponds, SFC has begun to study the area. The objectives were to determine the pond or ponds that were leaking and repair the liners. The first step in this process was to remove all of the solution from Pond 6 and make necessary repairs to the liner. The dewatering work was taking place at the time of the inspection. The dewatering of one pond will allow the transfer of solution from adjacent ponds which will provide access for liner inspection and repairs. SFC planned to complete this task during the fall of 1992.

3.13 Conclusions

The team concluded that the licensee has met the environmental monitoring program commitments in response to the October 3, 1991, Order.

Overall, there has been a substantial improvement in the implementation of the environmental program. Adequate resources have been devoted to organizing and implementing an environmental program that was capable of tracking releases from the site. Additionally, key procedures that affected this program have undergone revisions. Generally, the procedure revisions reflected adequate review; although, there were several areas where minor editing of procedures was necessary. This indicated that more attention to detail may be necessary in future procedure reviews. However, the implementation of the actions discussed in the procedures was not affected.

The team found that the procedure delineating the groundwater monitoring wells sampling schedule did not include all wells that were being sampled. SFC committed to revising the procedure to include these wells. The team concluded, however, that the required sampling was being performed.

The team recognized that SFC aggressively pursued, and has been successful at reducing the source of contaminants from the site process. However, the team noted that the underdrain pumping system, a remediation system, was frequently inoperative. Maintenance of remediation systems requires the same enthusiasm and aggressiveness that SFC employed to reduce contamination at the source. The team was also concerned that the attention that was devoted to the seepage recovery systems and planning for additional seepage remediation components was not as intense as was previously observed. The same aggressiveness applied to reducing the source of contaminants is appropriate for recovery systems.

4 MANAGEMENT OVERSIGHT (88005)

This portion of the inspection was primarily focused on the management organization and its effectiveness in improving overall licensee performance. In reviewing the historical problems within the organization and those described in the October 3, 1991, Order, the licensee identified two

underlying causes of the programmatic problems. As described by SFC management in a letter dated January 3, 1992, these causes included: (1) a failure to instill a strong nuclear safety and regulatory compliance culture throughout the organization, and (2) the failure to implement a disciplined, formal management process within the organization.

Licensee management supplemented its response to the Order with a "Plan for Achieving and Maintaining High Performance Standards" (Plan). The plan focused on eight objectives which SFC management identified as principle factors in developing corrective measures for the underlying problems within the organization. NRC reviewed the licensee's plan during a team inspection conducted in January 1992 and determined that the licensee's proposed management improvement programs adequately addressed the management issues referenced in the Order. This inspection addressed SFC's progress in implementing performance improvements.

The team concluded that SFC had made notable progress in improving the effectiveness of its management organization and program controls. In particular, inspectors observed that senior SFC managers had demonstrated a commitment to achieving the objectives described in the plan and appeared effective in communicating these goals to the staff. Evidence of the senior managers' commitment to achieving the objectives described in SFC's plan included their level of involvement in facility activities, the commitment of resources to achieve desired staffing levels in crucial program areas, and the commitment of resources to implement engineering enhancements to address process controls improvements and reduction of environmental effluents.

However, SFC is in the initial stages of implementing its long-term improvement program, and the findings of the inspection illustrate the need for SFC management to continue to reinforce its objectives and goals. Although interviews of the staff indicated that many individuals had accepted the licensee's specified performance standards, the commitment to a set of defined corporate goals had not fully permeated down through all levels of the staff.

The actions taken by SFC to improve management oversight within the organization are summarized below. The objectives described in the licensee's plan are referenced where applicable.

4.1 Management Staff and Support Systems

4.1.1 Management Staffing and Organizational Changes

One of the key objectives in improving management effectiveness was the selection of qualified management personnel with experience in the nuclear fuel cycle and the nuclear power industry. Additionally, SFC planned to improve the organizational structure and to retain consultants with expertise in operations similar to SFC's to supplement the existing management staff.

During the previous team inspection, the Vice President, Regulatory Affairs, and the Manager, Quality Assurance, were temporarily filled. A third key position, Senior Vice President, remained vacant. The licensee subsequently hired permanent employees to serve in these positions. The individuals appointed as Senior Vice President and Vice President, Regulatory Affairs, have several years experience in the nuclear industry, including activities similar to those for which they are currently responsible. The individual appointed as the Manager, Quality Assurance, has worked at the Sequoyah facility for several years and is very familiar with the technical aspects of its production processes. To supplement the quality assurance staff, SFC continued to use experienced quality assurance engineers and experienced quality assurance managers from General Atomics.

SFC has supplemented the organization with a training manager, licensing manager, assistant health and safety manager, and engineering manager. Three of these positions have been filled with permanent employees and the fourth, the engineering manager, has been filled by a manager from General Atomics. These individuals have experience in the nuclear industry and regulatory environment.

The addition of these positions had served to improve the interface between department management and the operations and health and safety staffs. NRC inspectors noted substantive improvement in the oversight of health and safety technician activities and in the guidance provided for the engineering staff. The progress that had been made in organizing the engineering project backlog and initiating work on key projects was largely credited to the reorganization of the engineering department.

During the months following restart of the Sequoyah facility, SFC management continued the use of consultants to provide technical advice on matters related to restart, operation of the facility, and to provide independent assessments of the effectiveness of the changes implemented by SFC management. These activities are summarized below.

The Readiness Review Committee evaluated the Sequoyah facility before restart and again after restart on August 25-26, 1992. After the second review, the committee found that substantial progress had been made. However, several recommendations were provided for strengthening SFC's quality assurance program, further improving management effectiveness, improving contamination controls, and upgrading process systems. The committee's recommendations addressed a broad spectrum of issues including items of specific regulatory concern, production, and process controls. SFC had initiated actions to implement some of the recommendations; however, the remaining recommendations were still under evaluation.

The inspector met with SFC's Nuclear Committee chairman to review the committee's activities subsequent to restart of the facility. The committee held quarterly meetings at the Sequoyah facility as scheduled by the board of directors. During these meetings, committee members toured the facility and conducted review sessions with various plant managers. The committee noted

weaknesses in the licensee's condition reporting system and engineering department which have since been addressed by SFC management. Additionally, the committee assisted in obtaining resources for SFC's quality assurance and engineering departments, and assistance in financing from General Atomics for engineering projects which have been proposed for the upcoming year. In general, it appeared that the committee had provided an additional level of oversight of facility activities and had ensured that the parent corporation maintained a high level of involvement with the facility.

4.1.2 Establishing Management Policies and Communication of Management Expectations

During the previous team inspection, SFC managers discussed with NRC staff a number of organizational weaknesses which contributed to the programmatic weaknesses referenced in the Order. These problems included, in part, (1) lack of a structured organization and management system, (2) a failure to implement a structured business and budget planning system to prioritize the allocation of resources, and (3) a failure to establish and maintain effective formal communication systems. In its plan, SFC identified a number of actions planned to address these deficiencies. (Reference Objectives 2 and 3 of SFC letter dated January 3, 1992.) A summary of the licensee's progress in implementing these actions is provided below.

SFC established corporate mission and policy statements which address items relative to SFC's licensed operations, general production, and business goals. These were introduced to the staff by formal publication of policies and mission statements and had been reinforced through management communication with employees. SFC also incorporated these goals into the business plan to develop a structured approach to achieve corporate and departmental objectives.

The inspectors reviewed the final version of the business plan and concluded that the licensee had remained aggressive in assigning priority to safety and environmental issues. Although several proposed projects had been delayed, the licensee had met the scheduled completion for the majority of its goals. In general, this system assisted management in the allocation of resources according to defined priorities. Additionally, the system defined a set of departmental objectives and served as a tool for management to assess departmental performance.

The licensee also initiated other communication programs during the restart and continued to modify the programs to make them more effective. These programs included daily planning meetings between all department managers, written "plan of the day" memorandums published for the staff, weekly meetings between department managers and their staffs, periodic meetings between senior management and all employees, and impromptu meetings between senior managers and selected staff members.

Based upon interviews of staff members, the inspector concluded that the initiatives to improve communication systems had generally been effective and

well received. Department managers noted that although the number of regularly scheduled meetings had increased demands on their time, the improvement in interdepartmental communications had allowed them to function more effectively in planning for special maintenance activities and projects. Additionally, staff members noted that improved interdepartmental communications had resulted in more effective planning and support from the health and safety and maintenance staffs.

Staff members provided favorable comments regarding senior management's efforts to ensure that they were informed of corporate goals and the licensee's regulatory status. Additionally, the staff's comments indicated that the senior managers' credibility among the staff had improved since the previous team inspection, largely because they had continued periodic meetings with employees and had remained visible throughout the facility through routine tours. This was notable because many comments indicated that employees' willingness to implement the changes mandated by management was, in part, due to the staff's association with senior managers during periodic meetings and plant tours.

Several staff members, however, including some supervisors, indicated that they did not fully understand the bases for the controls which had recently been imposed on certain operations activities. Although none of the comments indicated a failure to comply with licensee standards, they did indicate that management has not been fully effective in communicating the new standards. Also, mid-level management was not as visible within the plant. Some staff members questioned if this was evidence of a lack of support for both the workers and the programs which management was attempting to implement.

The inspectors concluded that although senior management generally appeared to have been effective in communicating program objectives, further efforts appeared warranted to ensure that a commitment to the established objectives permeated throughout the staff. The observation that some managers had not been successful in sustaining visibility within the plant was a concern because the failure of management to become involved with plant activities was a contributing factor to the problems in SFC's former management.

4.2 Programs to Formalize Operations and Management Policies

SFC's plan included programs focused on improving performance at all levels of the staff. The independent management appraisal completed during 1991 concluded that SFC had not developed formal corporate policies on personnel performance standards. In response, SFC initiated efforts in early 1991 to develop a conduct of operations program. SFC also initiated a comprehensive procedure improvement program and developed a more formal approach towards operations in general, including communication of shift activities and process status. SFC's initiatives stressed individual accountability for compliance with company and regulatory requirements.

Although progress was observed in implementing the conduct of operations program, a significant amount of work remains to be done. However, the

licensee had implemented some aspects of the program during facility restart. Additionally, in response to events which occurred during the restart period, the licensee had implemented other measures to formalize operations such as a maintenance planning group, a materials control program, and alarm response procedures. The detail of communications provided during shift and operator turnover sessions and in operations logs continued to need improvement.

The establishment of a corporate policy on procedures and development of a hierarchy for existing facility procedures had not progressed significantly at the time of the inspection.

4.2.1 Conduct of Operations Program

The guiding document for development of the program at the Sequoyah facility, titled "Conduct of Operations," was reviewed during the previous team inspection. The document described a comprehensive program including training requirements and policies that would impact front line workers and members of the management organization. The document has not been implemented by the licensee. Therefore, the level of management support for the program was unclear. This observation was discussed with the Vice President, Business Affairs, who is responsible for developing the program. The vice president acknowledged that the guiding document had not been issued or recognized as a formal management policy and stated that the issue would be discussed with SFC management.

At the time of this inspection, SFC had completed a draft procedure for the operations department titled, "Conduct of Operations" (currently designated as N-001-1, Rev. 0). In addition to the conduct of operations procedure, operations management noted that the implementing procedure references approximately 11 department instructions which must be developed in support of certain sections of the procedure. Operations managers plan to implement the program in 1993.

During restart of the facility in April 1992, the licensee initiated formal shift turnover briefings as an effort to improve communications between operations shifts. During the current inspection interval, the licensee began preparing formal shift briefing memos. Additionally, the current briefing was combined with the "Plan of the Day" memo to include all pertinent information regarding plant activities within a 24-hour period for the staff.

Although the licensee expected these efforts to improve shift turnover, inspectors observed that the effectiveness of shift turnovers was primarily dependent upon the communication skills of the senior shift supervisor, the individual charged with leading the briefing. As a result, the shift briefings continued to vary in their effectiveness. This was an area in which communications warranted additional attention to make the sessions effective.

The licensee implemented formal alarm response requirements in Procedure G-323 dated August 25, 1992. The requirements included categorization of safety/critical alarms for all process areas, requirements for operators to

log all safety/critical alarms received and the actions taken to restore normal process parameters, publication of the possible causes or recommended responses for safety/critical alarms for the DUF₄ facility, and independent verification of operators' compliance with this management directive. The licensee also implemented requirements for operations clerks to verify with responsible control room operators the status of safety and critical alarms during shift turnover. Any alarms that are in "active" status at shift turnover must be documented on shift briefing records and are announced to the oncoming shift during shift briefing sessions.

During the restart, the licensee experienced difficulties in ensuring that the operations staff had reviewed the extensive number of procedure revisions prior to assuming their duties within the plant. Additionally, there were potential problems related to procedure compliance because procedures were not available at the work stations.

SFC implemented the use of work station procedure manuals (use of the work station manuals also addressed one element of the licensee's conduct of operations document) which included copies of all procedures and temporary operating procedures applicable to the respective process area. Instructions regarding the use of the procedure manuals were promulgated in Operations Department Instruction ODI-011, "Workstation Procedure Books." The inspectors concluded that the program was an improvement in that it provides a mechanism to hold individuals accountable for procedure compliance and addressed a weakness in not having procedures accessible to the operations staff.

Although the licensee had not begun labeling plant equipment, management had established a series of steps required to complete this task. The engineering department was transferring all SFC process system diagrams to computerized files. Once this project has been completed, SFC will begin labeling plant equipment and process systems. When system labeling is completed, operations management plans to implement the use of procedure checklists for all activities involving adjustment of valve configuration or pumps used to control process systems bearing source or hazardous materials.

Although the licensee's planning for maintenance activities had improved, the staff continued to experience repair delays and problems associated with ineffective planning. To correct these issues, operations management developed a team approach towards maintenance planning. This was preceded by other programs which included changes in the licensee's maintenance request and work order process. The senior vice president appointed a planning team for all nonemergency maintenance requests. Although the program had only been operational for a few weeks, many staff members reported that the group had been effective in improving scheduling of maintenance activities and reducing the administrative tasks that shift supervisors had previously been assigned.

4.2.2 Procedure Improvements

In addition to the procedure improvements required under the Order, SFC had initiated a procedure improvement program (PIP) focused on revising and improving facility operating procedures.

Generally, the program appeared beneficial in improving the quality of the licensee's existing operating procedures, and the consultants assisting the licensee in this effort had proved useful in identifying inconsistencies in the licensee's procedures and in improving the detail of the procedures overall. In particular, the revised procedures contained additional references for process parameters and provided more detailed instructions for actions to be taken when parameters fell outside of normal operating range(s). An additional benefit of the program was the development of a procedure writing guide which the licensee will retain for future use.

In addition to revising facility procedures, the licensee had made a number of changes in its procedure review and implementation processes. Although concerns were identified in regard to the method used to train the staff on procedure revisions in certain cases, several of the licensee's initiatives appeared beneficial. In particular, the procedure review process had been streamlined by the licensee's plant operating review committee. Previously, the review process had been lengthy, and procedures contained errors and out of sequence steps making compliance difficult or impossible. To reduce the number of errors, the operations staff became more involved in the plant operating review committee process. Operators were requested to participate in plant operating review committee meetings. Licensee management noted that this resulted in operator "ownership" of procedures and greater assurance that the procedures could be implemented.

The licensee also implemented measures to address the high number of outstanding temporary operating procedures. The large number of temporary operating procedures had resulted in administrative problems related to closing them and issuing "permanent" procedure revisions, and difficulties were experienced by the operators as they attempted to implement the numerous changes.

In response, the licensee allowed for plant operating review committee approval of temporary operating procedures requiring modification of operating procedures with automatic revision of the applicable procedure provided that all members of the plant operating review committee unanimously approve the recommended change. Inspectors noted that this initiative should reduce the number of temporary operating procedures existing at the facility, reduce the duplication in staff training for minor procedure modifications, and reduce the administrative workload for the plant operating review committee members.

In conclusion, SFC had made notable improvements in developing its proposed programs for formalizing facility operations and had implemented several measures beyond its initial plans. However, substantial work remains to be done to implement the conduct of operations program throughout the facility

and in completing the PIP project. Additionally, management needs to remain diligent in its efforts to improve staff communications if the proposed programs are to be effective.

4.3 Staffing and Training

One of the objectives in SFC's plan involved an assessment of staffing levels and development of an effective training program. In accordance with the initiatives described in the plan, an organizational functional analysis was completed by a independent consultant. The inspector reviewed the consultant's report and found that the report's recommendations represented moderate changes within a few departments rather than a revision of the organization as a whole. Some recommendations had been implemented, but SFC was still evaluating the remaining recommendations at the time of the inspection.

The most notable change in the licensee's organization was the separation of the maintenance and engineering departments. SFC was assisted by General Atomics (GA) who provided a temporary engineering manager. Additionally, SFC used contract engineers to assist in implementing a number of improvements within the engineering department. The additional staffing of the engineering department and the appointment of a dedicated manager had resulted in improvements within this functional area.

SFC also continued to use contract quality assurance and health and safety personnel. These individuals have contributed expertise which strengthened SFC's internal programs. SFC has posted a position for one permanent quality assurance engineer and has hired several additional permanent health and safety technicians. SFC also added additional staffing for a fourth operations shift in the DUF₄ facility in response to concerns raised regarding incidents which occurred in the DUF₄ facility during periods when it was unattended by operations personnel.

Operations management has received approval to hire five shift managers to oversee all production activities. This decision was made to reduce the administrative workload on shift supervisors and area managers. The excessive administrative tasks reduced the amount of time available for each manager to spend within process areas supervising the operations staff and production activities. Operations management believes that the additional level of supervisory staff will alleviate some of the administrative tasks currently assigned to area managers and afford them additional opportunities to oversee technical matters and improve their visibility within the facility.

SFC had also added two full-time trainers and a training manager to the training staff. The new manager had previous training experience at a nuclear facility, as did one of the trainers. Although the training staff had implemented some of the department objectives outlined in SFC's business plan, the progress did not meet the licensee's projected schedule.

The training department had implemented a training certification program which was offered to several staff members who routinely participate in training at the Sequoyah facility. However, implementation of the principles taught in the course varied because some of the trainers did not have sufficient time to devote to developing instruction material. Additionally, the training department was in the initial stages of developing a comprehensive training program to define the type of training required for various staff members. Full implementation of a formal program is expected to be delayed until a job task analysis is completed. At the time of this inspection, the analysis had not been scheduled.

While some improvements had been made in the training, several weaknesses were identified by the team. One item of concern included the method used to train the staff on new complex procedures. SFC often used a read-and-sign method of training for new and revised facility and department procedures. While this method was satisfactory when procedure revisions involved only minor modifications, for complex procedures it did not ensure that operators and health and safety technicians fully understood the procedure requirements. Examples of weaknesses identified by the team are documented in paragraphs 2.1, 2.3 and 2.8.

Another weakness was identified in operator recertification training. Operators certified in multiple process areas had not maintained proficiency in the process areas for which they were certified because operator recertification involved only classroom training. In some cases, operators had been reassigned to areas other than their "routine" process area and felt uncertain about some tasks. This item was discussed with operations and training management. The team concluded that the absence of maintaining proficiency in operator certification was a weakness.

Overall, the team concluded that a substantial amount of work will be required to achieve SFC's objectives for its training program. In particular, developments appeared warranted in the area of operator recertification training and in evaluating the effectiveness of the "read and sign" method of training workers on complex procedures. This method had been employed too broadly and has not been effective in ensuring that individuals understood procedure requirements.

4.4 Programs for Identification and Correction of Problems

The licensee has made substantial progress in developing its quality assurance program, including publication of a quality assurance manual with formal audit procedures, completion of an ambitious audit schedule, and the addition of a quality assurance staff. In addition to routine quality assurance functions, the staff was also assigned responsibility for plant surveillance during restart and continuing through the current inspection, and was used as the primary source for completing investigations and root cause analyses.

Based on a review of the surveillance reports generated during the restart period and the issues identified, the quality assurance staff had played a

valuable role in the licensee's self-assessment process. The issues identified by the staff were substantive and in many cases resulted in recommendations that had a direct impact on industrial and radiation safety.

The licensee plans to reassign surveillance and investigation responsibilities to other departments but will continue to use the quality assurance staff in this capacity until the necessary skills are developed in other departments. SFC had recently provided root cause analysis training to several staff members outside of the quality assurance department and plans to provide additional training in incident investigation during the upcoming year.

Inspectors reviewed audits completed by the quality assurance staff and found them to be substantially improved over audits performed at SFC in the past. The audits were programmatic rather than procedure oriented and were generally more detailed. However, inspectors found that the activities examined during the audit were primarily focused on those described by procedure or policy. In particular, a recent audit performed on SFC's industrial safety program appeared largely focused on proceduralized tasks and, therefore, failed to identify several issues recently raised by NRC. This issue was discussed with SFC management and was noted as an item warranting continued monitoring as the quality assurance program develops.

Inspectors also observed that the quality of the audit reports had improved. The categorization of audit findings, however, appeared confusing. The inspectors noted that an industrial safety program audit indicated that "no violations" of SFC's license were identified; however, several audit findings did constitute violations of SFC's license. (These findings involved issues which would normally be categorized as Severity Level V violations under NRC's Enforcement Policy; therefore, a formal citation is not being issued at this time. The licensee had implemented corrective actions.) Additionally, some of the findings involved issues which may constitute violations of the Occupational Health and Safety Administration's regulations; however, this was not clearly identified in the audit report because the auditor had focused on SFC's procedures and source material license. These examples were discussed with licensee management and were noted as issues requiring further review to ensure that potential violations of federal regulations were properly identified and promptly corrected.

In addition to improving the quality and depth of quality assurance audits, the quality assurance manager had established a tracking system for following quality assurance findings. The quality assurance manager plans to conduct subsequent audits to confirm that corrective actions have been completed. Although this practice is an improvement over the previous system, inspectors noted that it may not ensure that violations of SFC's license or conditions requiring prompt notification to NRC would be handled expeditiously. This observation was discussed with the quality assurance manager and Vice President, Regulatory Affairs, who planned to correct this potential weakness.

The inspector concluded that several of the audits were comprehensive and provided sound basis for the recommendations proposed by the auditor.

SFC had made substantial progress in developing its commitment tracking system. In particular, the program had expanded to include commitments resulting from condition reports, NRC observations and violations, and other internal and regulatory commitments. Additionally, the individual assigned to this program was aggressive in ensuring that commitments were met and had verified that the corrective actions entered in the system were implemented in the field as described. At the time of this inspection, the licensee was in the process of developing procedures to govern the commitment tracking system to formalize the process.

SFC assigned the responsibility for root cause analysis and incident investigation to the quality assurance staff. This was done because the contract quality assurance staff had expertise and formal training in incident analysis. NRC inspectors observed that the licensee's ability in this area had improved.

In addition to assigning experienced personnel to perform incident investigations, SFC formalized the process and incorporated investigation assignment responsibility into the condition report system. The condition reporting system is currently supervised by a licensing engineer who is responsible for determining which condition reports warrant further investigation or root cause analysis. Inspectors noted that determination of which incidents warranted root cause analysis had improved during recent months; however, the licensee had not fully developed consistent guidelines to make this determination.

One notable improvement was to require that root cause analyses be completed within a specified period and that the resulting recommendations be provided to the appropriate area manager for consideration in developing corrective actions for condition reports. The manager would have to provide a formal response including the basis for rejecting any recommendation resulting from the root cause analysis.

In summary, the team concluded that SFC had substantially improved its systems for auditing plant activities and for tracking and resolving deficient conditions. Although the systems are still developing, the licensee had improved the quality of its self assessments, investigations, and program audits. However, further attention to the depth of quality assurance audits and communication of the related findings appears warranted.

4.5 Conclusions

The team concluded that SFC management has made progress in implementing measures to achieve the eight objectives identified in its "Plan for Achieving and Maintaining High Performance Standards" (Plan). Based on the team's review of the actions and programs implemented to date and interviews of SFC staff and managers, the team has concluded that SFC has made notable progress in improving the effectiveness of its management oversight and program controls.

In particular, senior SFC managers have demonstrated a commitment to achieving the objectives described in the plan and appear to have been effective in communicating these goals to their staff.

However, SFC was in the initial stages of implementing its long-term improvement program, and the findings of the inspection clearly illustrate the need for SFC management to continue to reinforce its objectives and goals and to institutionalize them within the organization.

The team concluded that SFC has made progress in supplementing its management staff with individuals experienced in the nuclear regulatory environment. Additionally, SFC has undertaken some initiatives in improving the overall effectiveness of its managers; however, several planned actions have not yet been implemented.

The most notable improvements in the management organization were the efforts taken by senior SFC management in becoming further involved in plant activities and the improvement in communications with all levels of the staff. Employees agreed that communication with senior plant management had improved substantially and were aware of the frequent tours that the senior vice resident and president conducted in the plant. Additionally, the meetings that senior management held with employees appeared effective in communicating the objectives, performance standards, and corporate goals established by SFC.

Although this effort appeared effective with the senior managers, it was found to be less effective with mid-level managers. While department managers had complied with the requirement to conduct periodic meetings with their employees, they were less successful in sustaining visibility within the plant.

This observation was an item of concern because the failure of management awareness of plant activities was viewed by the team as a contributing factor to the problems previously identified in SFC's former management organization.

The team concluded that SFC has made progress in developing and implementing the majority of the specific programs described in its improvement plan.

The conduct of operations program has been implemented in an incremental fashion and was currently being formalized through operating procedures. However, the licensee needs to continue its efforts to develop those elements of the program which have been implemented and, in particular, to improve the detail of communications in shift and operator turnover sessions and in written communications found in operations logs.

The business plan appeared to be a useful management tool. SFC has continued to give priority to projects which have a direct impact on health and safety and the environment.

Programs identified in the licensee's plan which have not progressed significantly at this time included the establishment of a corporate policy on procedures and development of a hierarchy for existing procedures.

SFC has met several of its objectives in regard to organization and staffing goals. In particular, the addition of several individuals to the engineering staff, the continued use of supplemental health and safety and quality assurance staff, and the planned addition of several shift managers to the operations department were noted as positive factors in achieving SFC's objectives.

A substantial amount of work will be required to achieve SFC's objectives for its training program in general. In particular, developments were warranted in the area of operator recertification training and in evaluating the effectiveness of the "read-and-sign" method of familiarizing the staff with procedure changes and new procedures. This method of training may be employed too broadly and has not been effective in ensuring that individuals understand procedure requirements.

SFC has substantially improved its systems for auditing plant activities and for tracking and resolving deficient conditions. Although the systems were still developing, the licensee has improved the quality of its self assessments, investigations, and program audits. However, further attention to the depth of quality assurance audits and communication of the related findings appears warranted.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

Ron Adkisson, Vice President
Gary Barrett, Safety Engineer
Robert Benham, Senior Analytical Chemist
Pam Bennett, Corporate Communications
Tom Blachly, Environmental Manager
Joe Bohannon, Quality Assurance Manager
Ronald Bott, General Atomics, Safety and Health
Dixie Burnett, Chemical Operator
Thomas Cox, Accountability Manager
Robert Davis, Environmental Engineer
Robert Dykes, Sequoyah Oversight Team
John Ellis, Senior Vice President
Rick Ferguson, Licensing Engineer
Ron Fine, Staff Health Physicist
Philip Frost, Manager, Waste Management
Craig Harlin, Licensing Manager
Jim Hays, Training Supervisor
Jim Henderson, Assistant Manager, Health and Safety
Don Knoke, Manager, Laboratory
Tom Kruppa, UO₂ Area Manager
Steve Lambson, DUF₄ Area Manager
Jennifer Loyd, Waste Management Clerk
Scott Munson, Manager, Health and Safety
Robert Paredy, Quality Assurance Auditor
Richard Parker, Operations Manager
R. Roberts, Material Manager
Kenny Schlag, Hydrogeologist
James J. Sheppard, President
Larry Silverstein, Maintenance Manager
Frank Warner, Manager Engineering

1.2 NRC Personnel

Johns Jaudon, Deputy Director, Division of Radiation Safety and Safeguards,
Region IV
John Hickey, Chief, Fuel Cycle Safety Branch, NMSS
Elmo Collins, Team Leader, Region IV
Linda Kasner, Senior Radiation Specialist, Region IV
G. Michael Vasquez, Senior Radiation Specialist, Region IV
Gary Konwinski, Project Manager, URFO
Joe Gilliland, Public Affairs Officer, Region IV

The personnel listed above attended the exit meeting. In addition to the personnel listed above, the inspectors contacted other personnel during this inspection period.

2 EXIT MEETING

A public exit meeting was conducted on October 23, 1992. During this meeting, the inspectors reviewed the scope and findings of the report.

FORD 1

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 CALLAN,L.J. Uranium Recovery Field Ofc, R4
 RECIP.NAME RECIPIENT AFFILIATION
 SHEPPARD,J.J. Sequoyah Fuels Corp.

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

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

DEC 3 1992

Sequoyah Fuels Corporation
(Subsidiary of General Atomics)
ATTN: James J. Sheppard, President
P. O. Box 610
Gore, Oklahoma 74435

Gentlemen:

SUBJECT: INSPECTION REPORT NO. 40-8027/92-29

This refers to the special, announced inspection performed by Mr. G. Michael Vasquez, from the NRC Region IV office, on November 9-10, 1992. The inspection consisted of a review of activities authorized by Source Materials License No. SUB-1010. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.


Within the scope of this inspection, no violations or deviations were identified.

This brief inspection was conducted to observe operational activities at the site. The inspector noted that all major portions of the facility were in operation and facility managers were evaluating maintenance, health and safety, and environmental issues.

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 Public Document Room.

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

Sincerely,


L. J. Callan, Director
Division of Radiation Safety
and Safeguards

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Sequoyah Fuels Corporation

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Enclosure:

Appendix - NRC Inspection Report
40-8027/92-29 with attachment

cc:

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LJCallan

JPJaudon

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*GMVasquez

*LLKasner

*NMIS

*MIS System

*RIV Files (2)

*RSTS Operator

*REHall, URFO

JTGreeves, IMNS/NMSS (6 H3)

JWNHickey, IMNS/NMSS (6 H3)

MTokar, IMNS/NMSS (6 H3)

MLHorn, IMNS/NMSS (6 H3)

SLuttal, OGC (15 B18)

JGilliland

TRCombs, OCA (17 A3)

*W/IFS Form

RIV:NMIS:clc	C:NMIS <i>mc</i>	D:DRSS <i>mc</i>		
GMVasquez <i>mc</i>	CLCain	LJCallan		
12/2/92	12/2/92	12/3/92		

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 40-8027/92-29

License: SUB-1010

Licensee: Sequoyah Fuels Corporation (SFC)
P. O. Box 610
Gore, Oklahoma 74435

Facility Name: Sequoyah Facility

Inspection At: Gore, Oklahoma

Inspection Conducted: November 9-10, 1992

Inspectors: G. Michael Vasquez, Senior Health Physicist

Approved: Charles L. Cain 12/2/92
Charles L. Cain, Chief, Nuclear Materials Date
Inspection Section

Inspection Summary

Areas Inspected: Special, unannounced inspection of operational activities.

Results:

- All major plant areas were operational and the licensee was evaluating maintenance, health and safety, and environmental issues.

Summary of Inspection Findings

No violations or deviations were identified.

Attachments

Attachment 1 - Persons Contacted and Exit Meeting

DETAILS

1. Plant Operations (88020)

During the inspection, major areas of the plant were operating and some maintenance activities were ongoing. In the uranium trioxide (UO₃) area, the licensee was replacing a steam coil in the No. 3 digester (an agitator had previously been changed) and the No. 4 denitrator was also down for maintenance.

In the uranium hexafluoride (UF₆) area, both A and B lines of reduction and hydrofluorination systems were operating. Further, SFC was operating four of its five fluorination towers (the No. 2 tower had been shut down for an ash receiver change-out on November 9) and one cleanup reactor was in operation.

SFC supervisors informed the inspector that during the evening of November 9, while placing an empty drum in ash receiver (AR) enclosure No. 3, the empty drum tipped over due to a warped metal floor. While warping in metal floors also occurs in other AR enclosures, the warping in AR No. 3 is worse. Operations had completed a work order for fixing the floor in AR No. 3 and H&S was evaluating the situation.

In the depleted uranium tetrafluoride (dUF₄) facility, the inspector found that there were no problems affecting operations.

During an internal status meeting, SFC managers discussed that the uranium and nitrate values in the sub-floor process monitor were elevated over the past couple of days. SFC was reviewing operational activities to identify the reason for the increase and the environmental department was to evaluate the data. Also during the meeting, the inspector noted that SFC managers discussed the planned upgrades to SFC's airborne emissions monitoring program. The discussions indicated that SFC's plans were continuing to progress. Finally, the inspector noted that two representatives from General Atomics' Quality Assurance (QA) organization were in the process of auditing the SFC QA program.

In discussions with licensee representatives, the inspector noted that SFC was proceeding with initial design efforts to redesign the piping in the cylinder drain station to bypass the cylinder drain filters. SFC had concluded that the cylinder drain filters were essentially unnecessary in meeting specifications for the amount of impurities in the UF₆. The change would streamline the process and prevent radiation exposures to maintenance workers changing and rebuilding drain filters.

The inspector observed excavation activities in an unrestricted area adjacent to the (old) Administration Building, near the break room. Prior to placing a side walk just outside the break room, SFC sampled the soil and found uranium contamination levels up to 1220 micrograms of uranium per gram of soil. SFC plans included excavating the top 6 inches of soil, placing a layer of mesh

material on the ground, placing 2 inches of rock/gravel, and then pouring 4 inches of concrete for the sidewalk. Contamination controls included barriers, monitoring of equipment and personnel, protective clothing, lapel sampling, and use of plastic for preventing the spread of contamination. The controls and the hazardous work permit appeared thorough and effective for the job.

The inspector also reviewed the status of SFC contracted health physics support. Licensee representatives stated that the two contract health physicists and the contract technicians associated with the unrestricted area survey program were expected to be terminated by November 20. These changes would leave SFC with about 33 technicians for restricted area and unrestricted area activities, plus an additional nine workers for the laundry and respirator maintenance areas. Of these 42 remaining technicians, 21 were contracted.

Lastly, the inspector noted that SFC had relocated the Personnel Contamination Monitors inside the mens change room into the buffer zone. Also, SFC had redesigned the mens change room to allow for enhanced contamination controls and a more logical flow of traffic. Appropriately, Procedure G-114, "Change Room Procedure" had been modified to reflect the changes.

ATTACHMENT 1

1 PERSONS CONTACTED

John Ellis, Senior Vice President
Scott Munson, Manager, Health and Safety (H&S)
*Craig Harlan, Manager, Licensing
Larry Tharp, Uranium Hexafluoride (UF6) Area Manager
Tom Kruppa, Uranium Trioxide (UO3) Area Manager
Dan Lewis, H&S Supervisor
Adrian Lucy, H&S Supervisor (Acting)

* Denotes individuals present at the briefing on November 10, 1992.

The inspectors also communicated with other site personnel during the course of the inspection.

2 EXIT

On November 10, 1992, the inspector conducted an exit briefing and discussed the scope and findings of the report.

FORD 1

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 AUTH. NAME AUTHOR AFFILIATION
 MILHOAN, J.L. Region 4 (Post 820201)
 RECIP. NAME RECIPIENT AFFILIATION
 SHEPPARD, J.J. Sequoyah Fuels Corp.

DOCKET #
 04008027

SUBJECT: Forwards insp rept 40-8027/92-30 on 921117-21 & 1124-25.
 No violations noted. Insp team dispatched to review 921117
 release of nitrogen dioxide. Team briefed media on event.

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NOTES: LPDR 1 cy. ; OGC/SUTTAL ; OCA/COMBS, T
 FAC TYPE: URANIUM HEXAFLUORIDE PRODUCTION

04008027

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NMSS/IMOB 6H3	1 1	[REDACTED]	[REDACTED]
NMSS/SGTB 4E4	1 1	NUDOCS-ABSTRACT	1 1
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UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

DEC 18 1992

Docket: 40-8027
License: SUB-1010

Sequoyah Fuels Corporation
(Subsidiary of General Atomics)
ATTN: James J. Sheppard, President
P.O. Box 610
Gore, Oklahoma 74435

Gentlemen:

SUBJECT: NRC INSPECTION REPORT NO. 40-8027/92-30

On November 17, 1992, an NRC Augmented Inspection Team (AIT) was dispatched from NRC Region IV to the Sequoyah Fuels Corporation (SFC) facility to review an event that had involved a release of nitrogen dioxide, a toxic gas, earlier that day. The subsequent AIT inspection on November 17-21, 24, and 25, 1992, considered the nature of the event, its cause and effects, and the actions of SFC personnel in responding to it.

The enclosed inspection report describes the tasks assigned to the AIT, the areas examined during the inspection, and the AIT's findings and conclusions.

On November 18, 1992, the AIT briefed the media on what was known about the event. On November 20, 1992, the AIT met publicly with SFC management to discuss the status of the inspection and to answer questions from the licensee and the public. Upon concluding the AIT inspection on November 25, 1992, the inspection findings were presented to SFC management during a public exit meeting.

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's Public Document Room.

We will be pleased to discuss any questions you have concerning this inspection

Sincerely,

James L. Milhoan
James L. Milhoan
Regional Administrator

~~9212300154~~ 921218
PDR ADOCK 04008027
C PDR

Enclosure:
Appendix - NRC Inspection Report
40-8027/92-30 w/attachments

JE07 11

Sequoyah Fuels Corporation

-2-

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DMB - Original (IE-07)

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JMMontgomery

RMBernero, NMSS (6 E6)

HRDenton, OIP (17 F2)

LJCallan

RECunningham, NMSS (6 H3)

JPJaudon

*WLFisher

*CLCain

*GMVasquez

*LLKasner

*CHRobinson, NMSS (6 H3)

JGilliland

GFSanborn

*NMLS

JTGreeves, NMSS (6 H3)

JWNHickey, NMSS (6 H3)

MTokar, NMSS (6 H3)

MLHorn, NMSS (6 H3)

SLuttal, OGC (15 B18)

JGoldberg, OGC (15 B18)

GMLongo, OGC (15 B18)

TRCombs, OCA (17 A3)

JLieberman, OE (7 H5)

WMTroskoski, OE (7 H5)

MRodriguez, OC/LFDCB (4503)

*NMIS

*MIS System

*RIV Files (1)

*REHall, URFO

*W/IFS Form

RIV:NMIS	NMIS	NMSS/IMSB	C:NMLS	D:DRSS
GMVasquez	LLKasner	CHRobinson	WLFisher	LJCallan
12/18/92	12/18/92	12/18/92	12/18/92	12/18/92

DRA	RA			
JMMontgomery	JLMilhoan			
12/17/92	12/17/92			

bcc:

DMB - Original (IE-07)

JLMilhoan

JMMontgomery

RMBernero, NMSS (6 E6)

HRDenton, OIP (17 F2)

LJCallan

RECunningham, NMSS (6 H3)

JPJaudon

*WLFisher

*CLCain

*GMVasquez

*LLKasner

*CHRobinson, NMSS (6 H3)

JGilliland

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*NMLS

JTGreeves, NMSS (6 H3)

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MTokar, NMSS (6 H3)

MLHorn, NMSS (6 H3)

SLuttai, OGC (15 B18)

JGoldberg, OGC (15 B18)

GMLongo, OGC (15 B18)

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JLieberman, OE (7 H5)

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MRodriguez, OC/LFDCB (4503)

*NMIS

*MIS System

*RIV Files (1)

*REHall, URFO

*W/IFS Form

RIV:NMIS	NMIS	NMSS/IMSB	C:NMLS	D:DRSS
GMVasquez	LLKasner	CHRobinson	WLFisher	LJCallan
12/18/92	12/18/92	12/18/92	12/18/92	12/18/92

DRA	RA			
JMMontgomery	JLMilhoan			
12/17/92	12/14/92			

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 40-8027/92-30

License: SUB-1010

Licensee: Sequoyah Fuels Corporation
P.O. Box 610
Gore, Oklahoma 74435


Facility Name: Sequoyah Facility

Inspection At: Gore, Oklahoma

Inspection Conducted: November 17-21 and 24-25, 1992


Team Members: G. M. Vasquez, Senior Health Physicist, Division of
Radiation Safety and Safeguards
L. L. Kasner, Senior Radiation Specialist, Division of
Radiation Safety and Safeguards
C. H. Robinson, Chemical Engineer, Fuel Cycle Safety Branch,
Nuclear Material Safety and Safeguards

Team Leader:


W. L. Fisher, Chief, Nuclear Materials
Licensing Section
Division of Radiation Safety and Safeguards

12/18/92
Date

Approved:


L. J. Callan, Director, Division of Radiation
Safety and Safeguards

12/18/92
Date

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ATTACHMENT A - Augmented Inspection Team Charter
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DETAILS

1 INTRODUCTION (93800)

The Nuclear Regulatory Commission (NRC) has established a comprehensive program to provide for the timely, thorough, and systematic inspection of significant operational events at NRC-licensed facilities. This program includes the use of an Augmented Inspection Team (AIT) to determine the causes, conditions, and circumstances of an event and to communicate findings, safety concerns, and recommendations to NRC management and the licensee. In accordance with NRC Inspection Manual Chapter 0325, "Augmented Inspection Team," and Inspection Procedure 93800, "Augmented Inspection Team Implementing Procedure," on November 17, 1992, an AIT was sent to the Sequoyah Fuels Corporation facility (SFC) near Gore, Oklahoma, to review an event that had released a cloud of nitrogen dioxide gas to the environment earlier that day.

In consultation with the Office of Nuclear Material Safety and Safeguards, Region IV dispatched the AIT to gather facts related to the cause of and the licensee's response to the event. Specifically, the AIT was instructed to:

- Determine and document plant conditions and the sequence of events.
- Assess the radiological and chemical consequences of the event.
- Assess the effect, if any, of maintenance, operational procedures, and training upon the event and upon the licensee's response to the event.

The tasks of the AIT were defined in a memorandum dated November 17, 1992, from J. L. Milhoan, Regional Administrator, to W. L. Fisher, AIT Team Leader. (See Attachment A to this report.)

2 EVENT DESCRIPTION

2.1 System Description

2.1.1 Digestion

The licensee uses digesters to dissolve "uranium concentrate" (uranium compounds, such as oxides and diuranates) for feed to the solvent extraction system. The batch dissolution process in the digesters reacts uranium concentrate with nitric acid to form uranyl nitrate. The operation typically charges 12,000 pounds of uranium concentrate to a mixture of 1500 gallons of 40 percent nitric acid and 500 gallons of 60% nitric acid. Screw-type feed conveyors transfer the uranium concentrate from digester feed hoppers to the digesters.

The exothermic reaction of the uranium concentrate with nitric acid evolves nitrogen oxides. The reaction is controlled primarily by adjusting the rate at which the uranium concentrate is added to the nitric acid. The composition

of the nitrogen oxides evolving from the reaction depends upon the nature of the uranium concentrate being fed and the molarity of the nitric acid.

2.1.2 Off-gas Handling

The digesters are ventilated through an off-gas wet scrub system, which includes a digester fume scrubber, a nitric acid recovery system, and a nitrogen oxide emission control (NOxEC) system.

Off-gases from the digesters are scrubbed in the digester fume scrubber, to remove particulates and a portion of the nitrogen oxides, before being processed through the nitric acid recovery system and the NOxEC system. This fume scrubber is equipped with an ejector to maintain a sufficient vacuum on the digesters. The vacuum sustained by the ejector is measured in the digesters.

Nitric acid recovery is accomplished with absorber towers. The NOxEC system prevents the evolution of noxious fumes into the atmosphere under normal operating conditions. A chemical scrubber uses sodium hydrosulfide to convert NOx gases to elemental nitrogen gas for unrestricted release. The vacuum sustained within the nitric acid recovery system is controlled and monitored from the control room.

2.2 Process Systems and Components

2.2.1 A screw-type feed transfer conveyor moves uranium concentrate from the feed hoppers to the digesters. The conveyor consists of a shaft-mounted helicoid that turns in a trough and that can operate in either direction. Power to convey is controlled from the control room board. Screw conveyors provide good control for feed applications where control of transport rate is required.

2.2.2 Sliding gate valves control the entry of uranium concentrate into the digesters. The gate valves allow selective discharge from the feed transfer conveyor to different digesters. Gate valves are used to stop the flow of uranium solids, not to regulate the flow.

2.2.3 A fume scrubber ejector creates a vacuum to remove gases generated in the digestion process. In the ejector, the kinetic energy of the scrubber fluid is used to create a vacuum for the digesters. The ejector consists of a nozzle which discharges a high velocity jet across a suction chamber connected to the digesters. Scrubbing fluid passing through a venturi develops a suction, causing digester off-gases to be entrained in the stream and passed through the scrubber system.

2.3 General Description of the Event

At 8:52 a.m., on November 17, 1992, a release of about 2700 pounds of nitrogen dioxide gas occurred in the digestion area of the main process building. The duration of the release was about 20 minutes.

The release resulted from an uncontrolled chemical reaction that occurred when nitric acid was added to a digester thought to be empty but which actually contained a significant quantity of uranium concentrate. The uncontrolled reaction between the uranium concentrate and the nitric acid released nitrogen oxide gases (NO_x), primarily nitrogen dioxide (NO₂).

The inadvertent addition of uranium concentrate into the digester before adding nitric acid eliminated the operator's ability to control the reaction. The resultant uncontrolled reaction forced the nitrogen oxide gases out of the digester and into the digester area of the main process building. The gas escaped the main process building and was carried by a southeasterly wind toward Gore, Oklahoma about 3 miles northwest of the plant.

On November 18, 1992, NRC Region IV issued a CONFIRMATORY ACTION LETTER to document the licensee's intent not to restart its uranium processes before investigating the event and obtaining NRC concurrence to restart. (See Attachment B to this report.)

2.4 Sequence of Events

The sequence of events was developed by the Augmented Inspection Team (AIT) from interviews with operators and from a review of the digest batch logs, the digest tank sample analysis logs, and the digest strip chart recorder.

2.4.1 Initial Operating Conditions

The AIT evaluated activities which established initial conditions before the event.

During the first shift (midnight to 8 a.m.) on November 17, 1992, operations was conducting routine dissolution. Uranium concentrate was being processed in digester No. 3 without any apparent abnormal conditions. After the shift turnover at 8:00 a.m., digester No. 2 was charged with approximately 1300 gallons of 40 percent nitric acid and 300 gallons of 60 percent nitric acid in accordance with operating procedures. This charging of nitric acid apparently initiated the reaction.

2.4.2 Chronology of Events

Date	Time(EDT)	Description of Events
<u>Initial Conditions</u>		
11/17	0:00 - 7:00 a.m.	Operator A charged 1500 gallons of 40 percent nitric acid and 500 gallons of 60 percent nitric acid into digester No. 3. Operator A removed 12,000 pounds of uranium concentrate from hoppers, of which about 3200 pounds was transported intentionally to digester No. 3 and about 8800 pounds was transported inadvertently

to digester No. 2. Operator A maintained temperature control and vacuum for digester No. 3.

11/17 8:00 a.m.

Shift turnover occurred.

11/17 8:00 - 8:50 a.m.

Operator B charged 1300 gallons of 40 percent HNO_3 and 300 gallons of 60 percent HNO_3 to digester No. 2.

Event

11/17 8:50 a.m.

Inadvertent and uncontrolled chemical reaction occurred in digester No. 2.

Follow-up Actions

11/17 1:13 p.m.

Digester No. 2 sample results indicated 418 grams of uranium per liter of solution (gU/l) and 3.54 molar (M).

11/17 2:20 p.m.

Digester No. 3 sample results indicated 268 gU/l and 5.30 M.

2.4.3 Process Conditions During Event

The strip chart recorder indicates that digester No. 2 was at ambient temperature until about 0800 hours, when a temperature drop occurred at the approximate time nitric acid was added. A rapid temperature increase occurred at approximately 8:50 a.m.

The strip chart recorder indicates that a steady vacuum was being maintained at 1.25 and 0.70 inches of water for digesters No. 2 and No. 3, respectively. (Note: Historical data show that the vacuum sustained on digester No. 3 was always less than that on digester No. 2.) Also, the vacuum data for both digesters paralleled one another.

At the time of the event, the strip chart recorder showed a vacuum of 0 inches of water for both digesters, indicating that positive pressure existed in both digesters.

2.4.4 Conditions Following Event

Samples from the digesters, which were under agitation to produce a homogeneous sample, showed the concentration and molarity to be 418 gU/l and 3.54 M for digester #2, and 268 gU/l and 5.3 M for digester No. 3. From these concentration values and the known amount of nitric acid

charged to the digesters, the mass of uranium concentrate inadvertently transported to digester No. 2 was determined and the amount of evolved NO_x gas was estimated.

3 RESPONSE

3.1 Background Information

The SFC emergency response program is described in several series of documents which provide instructions for plant personnel. The overall governing document is the Sequoyah Fuels Corporation Contingency Plan, which is incorporated by reference in Sequoyah Fuels' NRC license. The current version of the contingency plan is Revision 5, dated December 1988. SFC is permitted to modify the contingency plan without amending its NRC license, provided that the modification does not reduce the effectiveness of the plan. On September 24, 1992, the licensee modified the plan to document the relocation of emergency equipment within the plant, as discussed in Section 3.7 of this report. These modifications were approved by NRC, as documented by Amendment 17 of License SUB-1010, dated November 10, 1992.

The contingency plan is supplemented by facility procedures titled Contingency Plan Implementing Procedures (CPIPs). This group of procedures provides instructions to be used by the staff for classifying events, for responding to events, and for making required onsite and offsite notifications concerning events. The licensee maintains supplemental documents in the control room, including records of telephone numbers for all required contacts, to ensure prompt notification of local, state, and federal agencies, and local residents, when required.

The AIT review of the licensee's response to the November 17, 1992, event focused upon emergency response actions taken, relative to instructions provided in the contingency plan and CPIP procedures. The review also focused upon other actions taken by the SFC staff in assessing and responding to the onsite and offsite effects of the release of nitrogen dioxide gas (NO₂).

Although several concerns were identified with regard to the licensee's response to this event, the AIT was not chartered to determine whether the concerns involved enforcement issues. That aspect of the November 17, 1992, event will be considered during a future inspection.

3.2 Initial Observation and Notification

At approximately 8:50 a.m. on November 17, 1992, using the plant public address system, control room operators instructed plant personnel that nitric acid fumes had been released in the main process building, that they should evacuate the west portion of the building and that they should gather in the east portion of the building. This announcement, which applied only to personnel in the main process building, was based upon information provided by

several individuals who, having seen a dense, brown cloud near the digestion area and liquid spraying from a digestion tank, had reported their observations by radio to the control room.

3.3 Declaration and Termination of the Emergency

Two shift supervisors in the area then confirmed the digestion area release and directed the control room operators to declare an "Unusual Event." At 8:54 a.m., control room operators declared an unusual event over the facility public address system and instructed plant personnel in the main process building to evacuate to the south guardhouse. The announcement indicated that "nitric acid fumes" had been released in the main process building. The licensee did not activate the site alarm horn at this time.

Initial classification as an unusual event was inconsistent with the contingency plan and CPIP procedures, which define unusual event as an event indicating potential degradation in the level of safety of the plant. By definition, an unusual event involves no release of hazardous materials requiring offsite response or offsite monitoring.

On the other hand, the "Alert" classification is defined as an event which indicates actual or potential substantial degradation in the level of safety of the plant. Under the alert classification, any release of radioactive or other hazardous material may be significant onsite, but is expected to be well below concentrations significant to the health and safety of the offsite public. From its inception, the November 17, 1992, event appears to have required an alert classification, because the release resulted in an immediate degradation in the level of safety within the plant.

Plant personnel had observed a plume of gas leaving the main process building and heading northwest over the restricted area of the SFC site. (The plant's records show that the wind was from 153 degrees at 10 mph with gusts to 25 mph.) However, because of problems encountered with radio communications during the event, the onsite emergency director, who was located in the control room, was unaware that the plume was moving out of the main process building and threatening to move offsite. The safety engineer, having determined that the plume was likely to move beyond the site boundary, entered the control room to notify the senior shift supervisor (the onsite emergency director at the time) that the event should be upgraded.

At approximately 9:10 a.m., the event was upgraded to a "Site Area Emergency." The site area emergency announcement, which included local site announcement over the public address system, activation of the site alarm horn, and notification of several local, state, and federal agencies by telephone, apparently stated that the material released was nitric oxide fumes.

The announcements first that the material released was nitric acid fumes and then later that it was nitric oxide fumes might have confused health and safety personnel who were not well informed about potential chemical releases. For example, health and safety technicians initially used the wrong Dräger

sampler tubes to sample air in the main processing building. Instead of using sampler tubes intended for nitrogen dioxide, the main component of the released gas, they used sampler tubes designed for nitric acid.

From about 9:10 a.m. to 9:20 a.m., plant personnel continued to implement the licensee's emergency response program and to establish onsite and offsite response organizations as specified in Section 3 of the licensee's contingency plan. Implementation of the emergency response program included the transfer of onsite emergency director responsibilities from the senior shift supervisor (control room operations staff) to the manager of operations.

The onsite emergency log documented that the health and safety staff within the plant had taken Drager tube samples from various areas within the plant and had cleared the engineering and office areas before 9:51 a.m., but had reported "problems" in the maintenance shop and digestion areas at that time. Minutes before the event was terminated, at approximately 9:47 a.m., control room operators reported to the onsite emergency response center that the plant appeared to be clearing.

The site area emergency was terminated at 9:51 a.m., at the direction of the onsite emergency director, with an announcement for "...all personnel (to) return to their work stations." Reviews of the onsite emergency log and discussions with emergency response team members indicated that the decision to terminate the site area emergency had been based on information provided by a health and safety technician assessing the hazards inside the main process building during the event. The hazards assessment and control coordinator, who according to CPIP-21 was responsible for determining the extent of the release and the attendant hazards within the plant, was not consulted in the final decision to terminate the Site Area Emergency.

A condition report submitted by a health and safety technician after the event stated that one individual had reentered an area which had not yet been checked by the health and safety staff, and in doing so inhaled residual gases unnecessarily.

Based upon the examples above, discussions held with licensee staff, and review of emergency logs, the AIT concluded that the licensee's classification and termination of the event lacked coordination between critical plant personnel and members of the onsite emergency response team.

3.4 Offsite Notification

The site area emergency announcement indicated that nitric oxide fumes had been released. Subsequent notifications to the public indicated that nitric acid fumes had been released during the event. Thus, the licensee's initial communications to the public did not properly characterize the effluent, which consisted primarily of nitrogen dioxide.

Between 9:00 and 9:15 a.m., two Sequoyah Fuels Vice Presidents left the site independently to determine the plume characteristics and the threat to the

general public. One vice president met with the Mayor of Gore, about 3 miles downwind from the plant. Both vice presidents reported that the plume appeared to be above ground such that personnel in its path might not have been exposed.

In addition to meeting with the Mayor of Gore, Sequoyah Fuels personnel also contacted the Mayor of Webbers Falls and other public officials regarding the release.

3.5 Offsite Monitoring

Noting that the plume was traveling offsite, approximately 10 minutes after the event began and before the declaration of a site area emergency, the manager, environmental, and an environmental engineer took NO₂ Drager tubes from the emergency kit at the south gatehouse, left the site, and drove to the town of Gore. They reported seeing a slight yellowish haze about 200-300 yards wide and 100-200 yards above the ground. They drove in front of the plume, as best they could determine, and took air measurements using the NO₂ Drager tubes. The Drager tube measurements showed no detectable NO₂, and the two individuals stated that they had not been able to smell or taste NO₂.

The licensee determined in retrospect that it had not been prudent for the environmental engineer to leave the site, because he held an alternate position on environmental assessment in the emergency response organization. However, since the individual designated as the primary was available, the environmental engineer's absence did not decrease the effectiveness of the emergency response organization.

The licensee also determined that an additional emergency kit had been needed at the south gatehouse for use by the environmental department. At the time of the event, the only emergency kit at the south gatehouse was intended for use by the health and safety department. The environmental department's designated emergency supplies were at the Carlisle training center.

Between 9:10 and 9:15 a.m., two Sequoyah Fuels senior health and safety technicians were dispatched to Gore to measure air concentrations. They reported that the plume was visible from Highway 64 on the way to Gore and that it appeared to be above the ground. The plume was not visible to them in Gore, but they estimated its location and obtained air samples, presumably near the plume centerline. The technicians took a 5-minute high volume air sample for uranium analysis and a Drager tube sample for NO₂ at three locations: near the Gore High School, at a convenience store near the intersection of Highways 100 and 64, and at the intersection of River Road and Highway 64. None of the samples indicated detectable NO₂ or uranium.

After the release had ended, the licensee analyzed an air sample from a fence-line air sampler which was believed to have been in the plume pathway. This air sample indicated 4 percent of the maximum permissible concentration (MPC) for uranium effluents to unrestricted areas.

Main process building roof vent samples indicated a maximum release concentration of 2 MPC by that path. This did not appear to be inconsistent with the fenceline air sample. Therefore, the team concluded that no measurable uranium had been released offsite during the event.

The licensee's documentation of surveys and air concentration measurements was weak, in that some technicians had not documented surveys as they occurred. As a result, the times that air samples had been taken were estimated only to within 10 minutes, sampling locations were not well known until the technicians were reinterviewed, and calculated results required clarification.

Emergency response procedure CIP-21, "Hazards Assessment and Projection," is used to assess offsite hazards in order to provide information to appropriate agencies regarding the potential offsite effects of hazardous chemical releases. The procedure provides a simplified method of estimating downwind concentration, using a straight-line Gaussian plume dispersion model. A note in Section 4.1.1 of that procedure states that the procedure applies specifically to hydrogen fluoride, ammonia, fluorine, and uranium hexafluoride, but does not mention NO_2 releases. Failure of the procedure to apply to NO_2 was a weakness in the licensee's response to this event.

Using a Gaussian plume model after the event, the licensee estimated an NO_2 plume concentration of about 50 parts per million (ppm) at the fenceline, 2 ppm at 1 mile, and 0.5 ppm at Gore. Recognizing the limitations of this simplified model, the licensee also was attempting a more rigorous calculation of downwind plume concentrations.

3.6 Response by Health and Safety Technicians

The AIT interviewed 12 health and safety technicians (5 of whom were contract technicians) regarding their response during and following the event. These interviews raised some concern about the judgment of certain health and safety technicians, who had entered or partially entered main process building rooms containing visibly hazy atmospheres. One junior health and safety technician, who had worked as an operator before becoming a health and safety technician in July 1992, stated that he had held his breath while entering the health and safety office to obtain some Drager tubes for measuring air concentrations of nitric acid. He turned on a fan to clear out the office, while another technician propped the door open. Since no measurement had been taken, the air concentration of NO_2 in the office was not known.

A second health and safety technician stated that he had taken one of the Drager samplers from the first technician and had reached into the in-plant reading room, which also had a visibly hazy atmosphere, to obtain an air measurement. The technician stated that in doing so he had held his breath and had placed much of his upper body into the room. The lead health and safety technician saw him do this and told him to get out of the area. The technician stated that he measured about 2 ppm in the room, using a Drager

tube sensitive for nitric acid. Later, the airborne concentration of NO_2 was measured at 60 ppm. A concentration of 50 ppm is considered immediately dangerous to life or health (IDLH).

Interviews indicated that initial measurements, such as the one described above, were made with Drager tubes intended for nitric acid, not for NO_2 . The lead health and safety technician, who had known that the release originated in the digestion area, had assumed that the gases were nitric acid. Although the lead health and safety technician had prior nuclear experience, he had worked at Sequoyah Fuels only since April 1992 and had been unaware that the gas was NO_2 . The acting health and safety supervisor knew that the release was composed of NO_2 , and soon obtained the correct Drager tubes from the onsite emergency response area.

After the event, the licensee determined by reviewing the manufacturer's literature that an NO_2 concentration of 50 ppm (i.e., IDLH) results in a reading of about 3 ppm when using a Drager tube intended for nitric acid. As a consequence of using the nitric acid Drager tubes, initial air concentration measurements were erroneously low.

The team also identified a concern regarding health and safety technicians who entered areas of the plant, where airborne concentrations were not known, with no respiratory protection. Health and safety technicians stated that, before the site area emergency had been declared, they could see that the main hallway of the main process building was clear and reentered the building through the west doors, with no respiratory protection. Also, after obtaining the (wrong) Drager tubes, the lead technician and a junior technician entered the digestion area and made airborne measurements on the second level, with no respiratory protection. In both cases, the airborne concentration of the areas entered was not known before entering without respiratory protection.

Procedure HS-503, "Selection of Respiratory Protection Equipment," lists a Permissible Exposure Limit/Threshold Limit Value (PEL/TLV) of 1 ppm for NO_2 gas and an IDLH value of 50 ppm. (IDLH is defined as the maximum concentration from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects.) According to Section 4.5 of Procedure HS-503, respiratory protection equipment shall be required for chemical gases and vapors when the concentration of any hazard exceeds the PEL/TLV. The concern about entering areas that previously had been filled with NO_2 gas arose when licensee representatives did not know whether NO_2 gas was visible at 1 ppm (because above values of 1 ppm, respiratory protection equipment is required).

Health and safety technicians stated that during normal emergency drills the workers report to the emergency equipment storage room, which is located at the No. 3 motor control center. However, during this event the area around the motor control center was filled with NO_2 and was thus inaccessible. As a result, the technicians had access to very little equipment for assessing air concentrations and contamination levels, for posting areas, and for performing other essential tasks. Further, since the in-plant health and safety office

was filled with NO₂, technicians could not reach equipment in that location until the building atmosphere had cleared. The location of the emergency equipment storage room and of emergency equipment hindered the licensee's ability to respond to this emergency.

During the interviews, most contract health and safety technicians stated that they were uncomfortable with their level of knowledge of the Sequoyah Fuels contingency plan and felt unprepared to respond to a chemical release. Some stated they had not read the plan or its implementing procedures. As a result, when the site area emergency was declared and "nonessential personnel" were instructed to evacuate to the south gatehouse, the contract technicians had evacuated the plant as instructed.

Although the senior health and safety technicians who had been employed for several years felt confident in responding to the event, newer employees expressed concern about the training in the emergency response program. Several technicians expressed a concern that drills did not adequately prepare the staff. The technicians stated that drills were often similar and that no provisions had been made for alternate emergency equipment storage rooms. This posed a problem when that storage room became inaccessible due to the release.

3.7 General Response

At 8:50 a.m., control room operators announced that personnel in the main process building should evacuate the west side of the building and move to the east hallway. At this time, several individuals were present in the west hallway near the Laboratory and women's change room, the digestion area, the in-plant health and safety office, and the in-plant maintenance office. Interviews of operations, health and safety, and maintenance personnel who had been present in the area determined their route of evacuation and a sequence of actions taken within the plant as the release occurred. Several evacuation problems were identified.

Implementation of the evacuation procedure apparently failed to account for workers who had remained in the plant to make measurements, implement controls, and post areas. The health and safety technicians stated that they and several workers from other departments had not reported to responsible personnel for some time. This, along with other accountability problems, contributed to the licensee's inability to identify any workers who might have required rescue.

One individual, who had been in the maintenance office on the second level adjacent to the digestion area at the time of the release, failed to leave the area promptly when the initial evacuation notice was announced. The individual had observed the release through a window in the office and had contacted other maintenance personnel by telephone for instruction. The individual, a relatively new employee, was uncertain about the appropriate route of evacuation. Another maintenance person was sent to assist this employee. Both left the area as the unusual event was announced. This

incident suggests that initial training for plant employees had not provided sufficient instruction in plant evacuation and emergency response.

An operator in the digestion area hallway at the time of the release had observed liquid spraying into the air from a digestion tank and a thick cloud of gas coming from the digestion area. The operator promptly notified two individuals, who were nearby at the process laboratory door, of the need to evacuate the area. The two employees walked to the step-off pad at the entrance to the digestion area and stopped to radio the control room before evacuating the area. Nitrogen dioxide and nitric oxide gas had filled the area, and the two individuals were sprayed with liquid (nitric acid solution) coming from the digestion tank. The individuals left the area and entered the women's change room to wash the acid from their skin. They remained in the change room until gases started to enter the room through the door. This sequence of actions may have resulted in unnecessary exposure of both individuals.

Employees working at the raffinate pond area at the time of the release were unaware that an unusual event had been announced, because no public address system was located at the centrifuge building. About 15 minutes after the release and after the staff had been instructed to gather at the south gatehouse, these employees were contacted by radio and instructed to report to the onsite accountability center. Had the wind been more easterly, this group of employees might have been exposed to the plume without proper warning.

Several individuals had evacuated the main process building through the plant warehouse in order to leave the plant area through the east gate. A health and safety technician posted at the gate directed these individuals to reenter the main process building so they could monitor themselves on change room contamination monitors before leaving the building. The women's change room is adjacent to the digestion area, where the release occurred. The individuals reentered an area containing unknown concentrations of nitrogen dioxide, indicating a lack of sensitivity by the health and safety technician to the potential chemical hazards present at the time.

One individual remained in the main process building, near the digestion area and the nitric oxide scrubber area, throughout the event without respiratory protection equipment. The individual, who was attempting to assist the operations staff in improving vacuum to the off-gas system serving digester No. 2, was not accounted for and did not use respiratory protection equipment while remaining in the area.

Personnel accountability had not been completed by the time the site area emergency was terminated, nor had plant medical personnel finished determining whether any injuries or medical problems had occurred. Also, the health and safety staff had not been given sufficient time to complete personal contamination surveys before the staff was instructed to return to their work stations.

Interviews of health and safety technicians indicated that, overall, evacuation to the south gatehouse had been orderly, including: accounting for, instructing, and assisting delivery drivers during evacuation; frisking individuals leaving the restricted area gate; and instructing certain workers on precautions.

Several workers who had been in the laundry/mask wash building came through "crash gates" and did not monitor themselves when leaving the restricted area, in order to avoid entering the plume. Under the circumstances, this appears to have been appropriate. However, such workers who came from the restricted area to the unrestricted area without monitoring themselves intermingled with other workers who had monitored themselves upon leaving the restricted area. Recognizing this problem, some contract health and safety technicians attempted to implement contamination controls. However, the accountability process, which was somewhat disorganized, appeared to take precedence. As a result, the technicians began to spot-check workers by surveying their hands and feet. The technicians reported that they had surveyed only about half of the workers by the time the site area emergency was terminated and everybody was instructed to return to their work stations. Later, however, the licensee announced that persons who had not been monitored when leaving the restricted area during the event should return to a change room to monitor themselves.

Some contract technicians expressed concern that the security force had allowed vehicles to enter and leave the site with no restrictions. Being concerned about the contamination controls, two contract technicians stated that they had generally frisked the tires of vehicles that had left the site.

The licensee recently had notified NRC of the relocation of certain emergency response equipment within the plant. This change involved the relocation of several pieces of emergency response equipment, including self-contained breathing apparatus (SCBA) units which had been located at the depleted uranium tetrafluoride (DUF₄) building and at the in-plant health and safety office. These units were to have been relocated to motor control center #3, which is located in the west side of the main process building. At the time of the event, the licensee had continued to store some SCBA units in the DUF₄ building and had temporarily stored several new SCBA units in the in-plant health and safety office.

Only two SCBA units were located in the control room for the four individuals needed there during the event. This was a problem, because the control room filled quickly with gas, due to the ventilation problems described in Section 5. In order to provide sufficient respiratory protection equipment to the control room staff, operations personnel had to retrieve the needed equipment from the DUF₄ building and from the north guard house, because motor control center #3 was engulfed in the plume and could not be reached. This resulted in a delay in providing needed safety equipment to the control room staff.

4 EFFECTS

AIT inspectors interviewed a number of individuals who believed they had been exposed offsite to the nitrogen dioxide plume and several Sequoyah Fuels employees who exhibited symptoms believed to be related to exposure to nitrogen dioxide gas. An AIT inspector met with the licensee's company physician to discuss the nature of symptoms exhibited by plant personnel and by members of the public during examinations performed throughout the week following the release. The inspector also met with a local physician, who had examined several members of the general public who might have been exposed to the plume.

NRC obtained the services of two expert consultants, a physician specializing in occupational medicine and a toxicologist, to review the observations of the examining physicians.

The apparent effects of exposure to the nitrogen dioxide, as related to the AIT by potentially exposed personnel and by medical personnel, are summarized below.

4.1 Onsite Effects

Several Sequoyah Fuels employees were exposed to nitrogen dioxide either because they were located near the digesters, where the release occurred, or because they were exposed to nitrogen dioxide which had entered the control room ventilation system.

Two individuals were provided medical attention during the release, one for hyperventilation and the other for upper respiratory irritation and coughing. Both individuals were examined by the company physician on November 18, 1992. One individual's symptoms were determined to be due to emotional stress experienced during the event. The second individual, a control room operator who had been in the control room during the release and for a short period thereafter, had persistent upper respiratory and eye irritation but did not evidence any abnormalities on a chest radiograph taken the following day. The company physician stated that he did not expect this individual to have any chronic effects and did not recommend further follow-up. However, 3 days after the event, the individual was examined by his personal physician because of complaints of chest "tightness" and problems with deep inspiration. His personal physician prescribed steroid therapy over a course of 2-3 days to relieve any inflammatory effects.

Another control room operator, who experienced respiratory complaints approximately 12-14 hours after the event, contacted the company nurse, but did not receive further examination because he left the area on vacation the following day.

Three other control room operators were examined by the company physician on the day of the event, due to upper respiratory irritation and eye irritation. The initial examinations revealed no significant acute effects, although each

complained of persistent irritation for 1-2 days. One of these individuals, who developed chest tightness and difficulty in inspiration 2 days later, returned to the company physician and was given a breathing treatment (bronchodilator) and intravenous steroid medication to relieve any inflammatory effects. This individual was to be reexamined in 2-3 weeks to determine any effects on his baseline pulmonary function tests.

An operator who had not been present in the control room complained of chest tightness 6 days later and was sent for examination by the company physician. According to the company nurse, the individual was asymptomatic by the 7th day following the event.

Several other employees complained of persistent eye and throat irritation, some of which was aggravated by preexisting colds and sinus inflammation. One individual complained of persistent nausea and vomiting over a period of 2-3 days. According to the company nurse, the employees she was able to contact were asymptomatic 1 week following the event. (Some employees were on vacation and could not be reached, while others had been furloughed and were unavailable for contact.)

Except for one of the above individuals, the company physician stated that in his opinion the symptoms were minor and acute in nature. The other individual was not expected to experience any chronic effects but was to return at a later date for pulmonary function tests.

As for radiological uptakes, bioassay results of all exposed individuals showed that results were less than the licensee's action level of 25 micrograms of uranium per liter of urine. Therefore, no radiological consequences were anticipated. This was consistent with the finding that the release was predominantly NO_2 .

4.2 Offsite Effects

From the media, the licensee, and concerned members of the public, the AIT learned that a number of individuals might have been exposed offsite to the plume of nitrogen dioxide. AIT inspectors contacted or attempted to contact each of these individuals.

A group of 24 individuals working at a tree farm across the river northwest of the Sequoyah facility apparently had been in the plume pathway at the time of the event. A group of three individuals had been fishing on the river in the plume pathway at the time of the event. Several other individuals reported that they had traveled in the vicinity of Sequoyah Fuels or Gore and had either heard about the plume or had observed it on November 17.

Promptly after the event, Sequoyah Fuels management acted to inform the public of the release by providing information sheets to local businesses and by issuing press statements. Although the statements indicated that the release had consisted of nitric acid fumes, rather than nitrogen dioxide, that error apparently did not cause or exacerbate any adverse effect upon the public.

Sequoyah Fuels management also discussed the event with the mayors of Gore and Webbers Falls and encouraged that questions be directed to appropriate plant personnel.

Sequoyah Fuels personnel contacted the tree farm management to arrange for medical examinations, after learning of the tree farm employees' apparent exposure. They also contacted the three apparently exposed fishermen.

During the afternoon of November 17, the Sequoyah Fuels company nurse went to the tree farm in response to a discussion between the senior vice president and a tree farm employee earlier that day. The nurse apparently spoke with only two individuals that afternoon, because the remainder of the nursery employees were unavailable. Sequoyah Fuels management later contacted the tree farm to offer to pay for medical examinations for the tree farm employees. The tree farm employees were examined either by a physician in Sallisaw, Oklahoma, or by other local physicians of their choice.

Inspectors interviewed the tree farm workers, who had been working in three groups in different areas of the tree farm at the time of the release. The workers reported that their first warning of the release had been observation of the plume as it moved from the Sequoyah Fuels facility toward the river. Although the workers heard an announcement coming from the plant, they were unable to understand the announcement, due to noise from equipment being operated at the time. The tree farm manager, who had been working with the group nearest the Sequoyah Fuels facility, stated that he had attempted to gather the workers as soon as he observed the release. However, he was unable to gather all the workers before the plume reached the tree farm. Because of the direction of the roads leaving the area, some of the workers drove back into the plume as they attempted to leave the area. Workers stated later that some individuals had been in the plume for 15 minutes and that the plume had been at ground level but dissipating as it passed them.

Tree farm workers reported tearing and irritated eyes, nausea and vomiting, headaches, upper respiratory tract irritation, and blisters in two individuals' mouths.

Twenty-one tree farm workers were examined by a physician in Sallisaw, Oklahoma, on November 19. The physician reportedly treated several individuals for corneal abrasions resulting from aggravated eye irritation, and reported that others exhibited nose and throat irritation. A few individuals exhibited cold and flu-like symptoms, including nausea and vomiting or persistent gastrointestinal complaints, and two individuals exhibited persistent complaints that were of minor concern.

One individual complained of nausea, vomiting, and anorexia, which later subsided. Another individual, who had upper respiratory complaints, was prescribed steroids by the physician and was referred later to a pulmonologist for further examination. Although this individual had complained of persistent respiratory difficulty, he had not kept a scheduled appointment

with the pulmonary specialist and had not returned to the physician in Sallisaw by December 4, 1992,

Several tree farm workers were prescribed antibiotics for bronchitis. Approximately 75 percent of the initial group examined by the physician had inflamed nasal passages and throats. According to the physician, the bronchitis was not attributed directly to exposure to the plume. The physician stated that one individual had throat lesions, but noted that these appeared to be due to a viral infection and not the result of exposure to the plume. As of December 3, 1992, the remainder of these tree farm workers' complaints apparently had subsided.

Two of the tree farm workers were seen by a Wagoner, Oklahoma, physician, who hospitalized them on November 30, 1992, with an initial diagnosis of chemical pneumonia. The physician stated to NRC's medical consultants that the individuals presented "vague" symptoms, including skin rashes, oral lesions, persistent headaches, and respiratory difficulties. The individuals were expected to be released after a short hospital stay. The AIT had not received any further report on their progress as of December 4, 1992.

The Sequoyah Fuels company physician examined one of the tree farm workers, who was a regular patient, soon after the event. During an interview on November 20, 1992, the physician reported that the individual's symptoms, eye and throat irritation, appeared consistent with exposure to nitrogen dioxide. This appeared to be consistent with the Sallisaw physician's initial statements that approximately 75 percent of the individuals initially examined had symptoms which could have resulted from exposure to a chemical release and did not appear to be the result of preexisting medical problems.

Three individuals had been fishing on the Illinois river in the plume pathway between the Sequoyah Fuels facility and the tree farm, during the release. The group reported that they detected an acrid smell as the yellowish-brown plume passed overhead at treetop level. Although the group experienced tearing, persistent burning sensations in their noses and throats, and nausea in one individual, they remained on the river for approximately 2 to 2.5 hours after the release.

Two of the fishermen were examined later, by their personal physicians, for persistent coughing and for eye and throat irritation. One individual was prescribed eyedrops to relieve the irritation, but neither was prescribed medication for respiratory problems. The third individual has emphysema, according to his wife, who told an AIT inspector that the individual had been coughing "more than normal" following the exposure but that he did not seek medical attention.

Three other individuals were seen by the physician in Sallisaw 4 or 5 days after the event. Two, who were employed at a sand and gravel facility in Gore, had been working near the river during the release. According to the physician, neither individual had symptoms, but had sought medical attention as a precautionary measure. The third individual had been driving on Highway

64, near Webbers Falls, at the time of the release. The physician later reported that this individual did not appear to have any symptoms consistent with exposure to the hazardous material released in the plume.

In summary, several members of the public reported that they had been in the plume pathway during the release. Based on information provided by the examining physicians, the symptoms and medical complaints of some of the individuals appeared consistent with classic symptoms resulting from exposure to nitrogen dioxide. Of the individuals known to the AIT, either by direct contact or by local physicians, two were hospitalized for possible chemical pneumonia and a third was referred to a pulmonary specialist. The remainder of the individuals were provided treatment for eye irritation and other symptoms believed by the physicians to have been the result of preexisting medical problems. Several individuals presented complaints of throat irritation, persistent coughing, and nausea, but were not prescribed medication by the physicians.

5 CONTROL ROOM AND PROCESS LABORATORY VENTILATION

5.1 Nitrogen Dioxide in the Control Room

Licensee personnel reported that during the event on November 17, 1992, the control room filled quickly with nitrogen dioxide gas. Control room operators complained that the gas was visible and that they experienced tearing, throat irritation, and coughing. The resulting atmosphere required that the control room operators wear self contained breathing apparatus (SCBA) for approximately 1 hour during the event.

This problem appears to be inconsistent with NRC's understanding of corrective measures, implemented after the 1986 accident, that would have isolated control room ventilation from other plant systems.

Soon after the site area emergency was terminated on November 17, 1992, the licensee initiated an investigation to determine how nitrogen dioxide gas had entered the control room. Nitrogen dioxide gas had been detected by smell and sight in the control room almost as soon as it had been observed in the process area. Also, after the event the control room atmosphere had not cleared as quickly as had other areas of the plant.

5.1.1 Background

On June 27, 1992, an event involving fluorine gas entering the control room had raised questions about control room ventilation. In that event, fluorine released from a fluorine cell room during valve maintenance had been detected quickly by smell in the control room. The incident raised questions about the isolation of the control room ventilation system.

A quality assurance engineer had submitted deficiency Report 92-6-193 documenting the incident. The deficiency report noted that "CR personnel indicated that the fluorine leak was from a lockout valve that was being used

while cell room recycle valve No. 700 was being repaired in the maintenance room." The deficiency report recommended that engineering determine the need to install an alarm system in the fluorine cell room, coupled with similar alarms in the control room, to indicate the release of hydrogen fluoride and fluorine gas. The report also recommended that engineering evaluate the need to modify the air supply system for the control room. The deficiency report was assigned to engineering for implementation of corrective measures.

The deficiency report was reviewed by engineering, which issued a formal response on July 27, 1992. The engineering investigation record described the problem, stating that HF released through a roof exhaust fan had been carried by a north wind to the front of the plant, where it was taken into the air makeup plenum.

The engineering response offered three recommendations.

- Ensure that isolation valves are fully closed and that the prevailing winds are not from the north before performing future such maintenance.
- Consider installing an air duct over the exhaust fan in the fluorine cell room.
- Consider installing a second air intake for the control room.

The engineering report did not suggest further investigation to review the adequacy of the control room air supply.

The quality assurance staff questioned this initial investigation and referred it back to engineering for further consideration. On October 2, 1992, the licensee initiated a maintenance work order request to install a hydrogen fluoride sensor in the air intake plenum which serves the main process building.

AIT inspectors reviewed the June 27, 1992, event, noting that the licensee's engineering study had considered only the obvious route of entry for control room air and had not included a detailed examination of the control room air supply system. Further, the proposed solution did not consider engineering controls to isolate the control room air supply to prevent exposure of control room operators to hazardous gases and vapors. This became of particular concern when operations staff stated that other gaseous releases also had been detected first in the control room.

5.1.2 Current Control Room Ventilation Investigation

The licensee's draft root cause analysis of the November 17, 1992, control room ventilation problem was reviewed with the manager of engineering by an AIT inspector on November 21, 1992. According to the engineering staff, the following problems had been identified:

- In expanding the Sequoyah facility in the early 1980's, an added third floor had walls which extended almost to the roof of the main process building. The air space above the third floor offices, between the drop ceiling and the roof, serves as a return air plenum for the HVAC system which serves not only the control room but also the second and third floor office spaces. Openings above and in the walls allow process area air to enter the system.
- During normal operation, this HVAC system provides 20 percent fresh air and 80 percent recirculated air. Recirculation creates a sufficiently negative pressure to draw process area air into the system for distribution to the control room and to the second and third floor office spaces.

5.2 Nitrogen Dioxide in the Process Laboratory

During the release in the digestion area, which is next to the process laboratory, nitrogen dioxide gas entered the process laboratory through the door and a through a window adjacent to the digestion area. After the event, the engineering staff determined that operation of the laboratory fume hood exhaust systems during the event had resulted in a negative pressure, drawing the nitrogen dioxide gas into the laboratory.

6 FINDINGS

6.1 Cause

The NOx release was caused by an uncontrolled exothermic chemical reaction between nitric acid and uranium concentrate that had been transferred inadvertently to digester No. 2. After inadvertently transferring uranium concentrate to digester No. 2, operators charged nitric acid to digester No. 2 in accordance with operating procedures. Normal operation requires charging of the acid first, so that the reaction rate can be controlled by adjusting the feed rate of uranium compounds. Charging the reactants in reverse order eliminated this ability to control the reaction rate.

Process records and analysis of the uranium concentration in digesters No. 2 and 3 following the incident verified the inadvertent transfer of uranium concentrate from the feed bin to digester No. 2. The test results showed concentrations of 418 and 268 gU/l for digesters No. 2 and 3, respectively.

The AIT concludes that approximately 8800 pounds of uranium concentrate intended to be fed to digester No. 3 was inadvertently transferred to digester No. 2. After the charging of approximately 1300 gallons of 40 percent nitric acid and 300 gallons of 60 percent nitric acid, an uncontrolled reaction produced NOx at a rate that exceeded the capacity of the off-gas handling system.

6.2 Root Cause

The AIT determined that the root cause of the event was an inoperable sliding gate valve combined with the inadvertent operation of a feed transfer conveyor in the opposite direction. Contributing factors included inadequacies in procedures, maintenance and surveillance, training, human factors, and management control, as discussed below.

6.3 Contributing Factors

The AIT considers as contributing factors those conditions that if eliminated would have prevented the event from occurring or would have significantly mitigated its consequences.

6.3.1 Procedures

Operators used an operating procedure step-by-step, but failed to heed a caution provided in the procedure. The procedure cautioned the operators to keep digesters isolated by ensuring that gate valves were closed when not being charged with uranium concentrate, but it provided no instructions on what to do if isolation was not possible. Procedure N-230-1, "Digestion of Yellowcake and Transfer of Slurry," Revision 11, November 1992, did not explicitly address notification of engineering or maintenance about dysfunctional equipment.

6.3.2 Equipment Problems

The AIT considered equipment that failed or was dysfunctional during the event and that had an impact on the sequence of events. The team determined that the inoperability of the fume scrubber ejector and the digester No. 2 sliding gate valve contributed to the event.

6.3.2.1 Sliding Gate Valve

The inability to close the gate valve between digester No. 2 and the feed transfer conveyor contributed to the condition which led to the uncontrolled chemical reaction. The AIT concluded that the sliding gate valve probably had been stuck open for several days before the November 17, 1992, event.

6.3.2.2 Fume Scrubber Ejector

The inability to maintain vacuum on the digesters, and the consequent need to start and stop the feed transfer conveyor, contributed to the inadvertent transfer of uranium concentrate to digester No. 2 on November 17. The AIT concluded that the fume scrubber ejector, which creates the vacuum, probably had been dysfunctional for some time. To compensate for the inadequate vacuum, operators had become accustomed to stopping the feed of uranium concentrate in order to decrease the reaction rate and the generation of nitrogen oxides that inhibited the vacuum capability. This stopping and starting of the feed transfer conveyor provided an opportunity to restart the

conveyor in the wrong direction, thus inadvertently transferring uranium concentrate to digester No. 2.

6.3.3 Training

The AIT determined that the licensee's training regarding the use of maintenance requests was less than effective. Based on interviews with operators, the team determined that operations are often conducted without consulting with maintenance and engineering when equipment is dysfunctional. The team determined that without appropriate training or clear procedural guidance on communicating with maintenance and engineering, the potential existed for operations to have been conducted with dysfunctional equipment.

The AIT also determined that training for operations personnel in the digestion area was lacking with respect to chemical process safety. The team determined that training for operators assigned to the digestion area was lacking with respect to recognition of the significance of nonoperational equipment, the importance of procedural cautions, and the consequence of improper handling/transfer of uranium concentrate.

6.3.4 Human Factors

Less than adequate man-machine interface in regards to the arrangement of controls contributed to the inadvertent transfer of uranium concentrate to digester No. 2. The AIT concluded that the licensee had not adequately addressed the human factors aspects of the proximity and marking of controls governing the feed of uranium concentrate to the digesters. The location and orientation of the controls ensured ease of operation but did not minimize the chances of operator error. Also, the function of the controls was not easily recognizable, in that the direction of motion of the feed transfer conveyor was not adequately marked.

6.3.5 Management Control

The AIT identified an apparent weakness in the licensee's ability to identify equipment problems needing correction in the plant. Operations personnel had worked around the sliding gate valve and vacuum problems, rather than requiring that the problems be fixed. Neither of the problems was being tracked by management for resolution.

6.4 Generic Implications

The team assessed the generic implications of the incident by analyzing the potential for NO_x releases from uncontrolled chemical reactions in other plant systems. As discussed below, no other opportunities for significant NO_x releases were identified.

6.4.1 Miscellaneous Digestion System

The use of a single dissolution tank in miscellaneous digestion eliminates the possibility of unknowingly charging reactants in reverse order, as occurred between digesters No. 2 and 3.

6.4.3 Uranyl Nitrate Hexahydrate (UNH) Boildown System

In the UNH boildown operation, UNH is concentrated by water evaporation. Being a physical transformation, this cannot result in an exothermic chemical reaction generating nitrogen oxides.

6.4.4 Denitration System

In denitration, uranyl nitrate is decomposed at elevated temperatures to produce uranium trioxide and nitrogen oxides. Thermal decomposition requires no other reactants, only elevated temperature, thus preventing charging multiple reactants in reverse order.

7 CONCLUSIONS

7.1 Cause of the Event

7.1.1 Major Conclusions

A sliding gate valve on digester #2 was stuck in the open position. Operations personnel had known for some time that the valve was stuck or at least that it had been sticking, but apparently had elected to work around it rather than repair it, thus violating a caution statement in an operating procedure.

Uranium concentrate feed material was transported erroneously to the stuck-open sliding gate valve by an improperly operated feed conveyor, thus allowing the concentrate to enter digester #2 without operator knowledge. No inherent mechanism existed to have prevented this error or to have warned the operator that this error had occurred.

7.1.2 Other Conclusions

The inability of the NOx gas treatment system to handle the rate of NOx produced during normal digestion caused an operator to start and stop the uranium concentrate feed conveyor repeatedly, resulting in the inadvertent reversal of the conveyor and the transport of concentrate to the stuck-open valve. The inadequate capacity of the NOx gas treatment system appears to have been known and accepted by operations personnel. However, neither operations nor maintenance nor engineering appears to have been aware that a deteriorated ejector was the cause of the inadequate vacuum.

7.2 Offsite Monitoring

7.2.1 Major Conclusion

No measurable uranium was released offsite.

7.2.2 Other Conclusions

Efforts to follow and attempt to measure the nitrogen dioxide plume offsite appear to have been reasonable.

There were some weaknesses in documenting offsite monitoring data.

7.3 Response by Health and Safety Technicians

7.3.1 Major Conclusion

At least one health and safety technician displayed poor judgment by entering a visibly hazy, unmeasured atmosphere in the main process building without wearing respiratory protection. One health and safety technician partly entered a visibly hazy area without wearing respiratory protection. Later measurements indicated that the airborne concentrations were IDLH.

7.3.2 Other Conclusions

At least two health and safety technicians and other workers failed to follow the established accountability and evacuation procedures by remaining in the main process building during the site area emergency evacuation and not reporting to responsible managers. This probably resulted from emergency drills having not considered scenarios making the emergency equipment storage area inaccessible.

Contamination controls at the south gatehouse were not entirely effective. For example, monitored and unmonitored personnel intermingled. Also, some employees were not surveyed before reentering the plant after the site area emergency had been terminated.

There appears to have been a training weakness in not adequately preparing health and safety technicians to assess the hazard of nonradiological releases. For example, one technician instructed workers who had already evacuated the main process building to reenter the building, which contained unknown concentrations of nitrogen dioxide, in order to exit through a change room.

Without first obtaining the approval of the responsible person, a health and safety technician had told some workers to return to their normal work stations, some of which had not been cleared for reentry.

7.4 Response (General)

7.4.1 Major Conclusion

The event was initially misclassified as an unusual event, rather than an alert.

7.4.2 Other Conclusions

The evacuation and accountability aspects of the emergency response were not carried out well enough to ensure that plant personnel had evacuated as instructed. In fact, some individuals did not evacuate as instructed.

The Sequoyah Fuels staff had not been prepared adequately to evacuate the facility. Routine drills apparently had involved scenarios that did not prepare the staff for such an event. Plant personnel did not understand the appropriate routes of evacuation. In-plant communications during the event did not adequately inform personnel of hazards within or ensure safe exit from the main process building.

The location and quantity of nonradiological emergency equipment were not entirely adequate.

7.5 Onsite and Offsite Effects

7.5.1 Major Conclusions

The control room ventilation system was not effective in protecting control room operators from toxic gas. This condition apparently resulted from inadequate design and modification of the control room ventilation system and other systems with which it interfaced. A fluorine release in the cell rooms in June 1992 appears to have been an inadequately studied precursor to the control room ventilation aspects of the November 17, 1992, event.

Bioassay data indicate that there were no significant intakes of uranium within the plant.

Approximately 27 persons were exposed offsite to the cloud of nitrogen dioxide. The cloud appears to have dispersed sufficiently to have prevented significant exposures in Gore, Oklahoma.

At least eight employees were exposed to nitrogen dioxide onsite.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

ATTACHMENT A

NOV 17 1992

MEMORANDUM FOR: William L. Fisher, Chief
Nuclear Materials Licensing Section

FROM: James L. Milhoan, Regional Administrator

SUBJECT: AUGMENTED INSPECTION TEAM AT SEQUOYAH FUELS CORPORATION SITE

This memorandum tasks you as the team leader for an Augmented Inspection Team (AIT) at the Sequoyah Fuels Corporation in Gore, Oklahoma, and it provides you with a charter by which to conduct the inspection.

On November 17, 1992, at approximately 9:10 am (CST), there was an unexpected reaction in a digester tank at the Sequoyah Fuels Corporation (SFC) Gore, Oklahoma facility. This reaction resulted in the release of nitric acid fumes and nitric oxide which formed a plume that was carried over the town of Gore. The licensee declared a site area emergency.

In order for the NRC to understand the event better and to assess the potential consequences and the safety significance of it, an AIT will be utilized. You are designated as the team leader. The team's charter is to:

1. Ascertain and document the plant conditions and the sequence of events during this occurrence. Specifically assess:
 - the cause (or causes) of the event;
 - the evacuation of the control room;
 - the operational response and the steps taken to mitigate the event; and
 - the execution of the emergency plan.
2. Assess the radiological and chemical consequences of the event in terms of what was released and where it was deposited.
3. Assess the effect, if any, of maintenance, operational procedures, and training upon the event and the licensee response to the event.

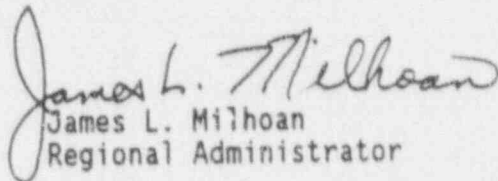
The team composition will be yourself, L. Kasner, M. Vasquez, and C. Robinson from NMSS. The AIT will be conducted in accordance with NRC Inspection Manual Chapter 93800, "Augmented Inspection Team Implementing Procedure."

The team is to emphasize fact finding in its review of this event and the related circumstances. The AIT is to determine the facts surrounding this

event, concentrating on what happened and being alert to identify safety issues.

The AIT should assemble onsite in Gore, Oklahoma by November 18, 1992. You should provide Region IV management with updates on the team's progress including a daily briefing at 4:00 pm (CST) daily for Region IV, NMSS, and other interested staff members.

You shall prepare a written report of you inspection so that it can be issued no later than 30 days after completion of the inspection.


James L. Milhoan
Regional Administrator

cc:

R. Bernero, NMSS (6 E6)
R. Cunningham, NMSS (6 H3)
E. Jordan, AEOD (3701)
L. Callan
AIT members



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
Arlington, Texas 76011-8064

NOV 18 1992

Docket No. 40-8027
License No. SUB-1010
CAL 92-11

Sequoyah Fuels Corporation
(Subsidiary of General Atomics)
ATTN: James J. Sheppard
President
P.O. Box 610
Gore, Oklahoma 74435

Dear Mr. Sheppard:

SUBJECT: CONFIRMATORY ACTION LETTER

On November 17, 1992, there was an unexpected chemical reaction in a digester at the Sequoyah Fuels Corporation Gore, Oklahoma plant. This resulted in the release of a plume of nitric acid fumes and nitric oxide and led the licensee to declare a site area emergency, which was in effect for approximately 40 minutes.

Pursuant to a telephone conversation between Mr. J. Ellis, Senior Vice President of Sequoyah Fuels Corporation, and myself on November 17, 1992, it is our understanding that you have committed not to restart your uranium processes before:

- you complete an investigation of the circumstances and causes of the event, and
- you brief the NRC staff on the findings and obtain our concurrence on the restart of the processes.

The actions described above do not preclude actions necessary to assure the safe shutdown of the process streams in accordance with good engineering and operational practices.

Pursuant to Section 182 of the Atomic Energy Act, 42 U.S.C. 2232, and 10 CFR 2.204, you are required to:

- 1) Notify me immediately if your understanding differs from that set forth above,

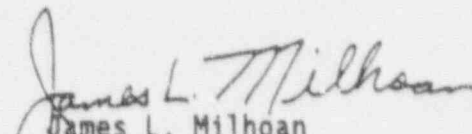
CERTIFIED MAIL - RETURN RECEIPT REQUESTED

- 2) Notify me if for any reason you cannot complete the actions, and

Issuance of the Confirmatory Action Letter does not preclude issuance of an order formalizing the above commitments or requiring other actions on the part of the licensee. Nor does it preclude the NRC from taking any action for violations of NRC requirements that may have prompted the actions addressed in this letter. In addition, failure to take actions addressed in this Confirmatory Action Letter may result in enforcement action.

The responses directed by this letter are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, Pub L. No. 96-511.

Sincerely,


James L. Milhoan
Regional Administrator

CC:
NRC Public Document Room
Oklahoma Rad Control Program Director

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General Atomics
ATTN: R. N. Rademacher

Sequoyah Fuels Corporation

-3-

General Atomics
ATTN: R. N. Rademacher
Vice President
Human Resources
P.O. Box 85608
San Diego, CA 92138

ATTACHMENT C

1 PERSONS CONTACTED

1.1 Licensee Personnel

- *R. Adkisson, Vice President, Business Development
- J. Barnes, Process Engineer
- G. Barrett, Safety Engineer
- J. Bohannon, Manager, Quality Assurance
- L. Boyer, R.N., Occupational Nurse
- R. Cook, Vice President, Administration
- J. Cottner, UO3 Area Maintenance Supervisor
- *J. Dietrich, Vice President, Regulatory Affairs
- *J. Ellis, Senior Vice President
- L. Franklin, Engineering
- J. Gilbreath, UO3 Shift Supervisor
- J. Habacher, H&S Technician
- C. Harlin, Manager, Licensing
- D. Howard, Control Room Operator
- J. Hummingbird, UF6 Shift Supervisor
- R. Jones, H&S Technician
- D. Knoke, Chemist
- S. Lampson, Engineer
- H. Leatherman, Engineer
- A. Lucy, Health and Safety Supervisor
- R. Mathews, Operator
- L. McCarty, UO3 Shift Supervisor
- S. Munson, Manager, Health and Safety (H&S)
- R. Parker, Manager, Operations
- J. Pulse, Control Room Operator
- T. Riggs, Chemical Engineer
- D. Scarborough, Operator
- W. Shell, UO3 Area Shift Supervisor
- *J. Sheppard, President
- L. Silverstein, Manager, Maintenance
- J. Sumpter, Control Room Operator
- C. Tisdale, Maintenance Scheduling and Planning
- C. Ubanowich, Maintenance Engineer
- F. Warner, Manager, Engineering (Acting)
- C. Watson, H&S Technician
- E. Watts, Control Room Operator

*Present during exit briefing on November 25, 1992.

Other licensee personnel contacted during the inspection included operators, foremen, security force members, technicians, and administrative personnel.

1.2 Offsite Contacts

Dr. W. Anderson
R. Bates, Sequoyah County Department of Health
J. B. Bennett
R. Coleman, Ph.D., NRC Consultant
J. Hardin, Ecology and Environment
L. Mitchell, M.D., NRC Consultant
J. Murphy, American Nursery Products
R. Smith
J. White, Oklahoma State Department of Health
Dr. M. Yancy

Other individuals also were contacted during the inspection.

2 EXIT BRIEFING

On November 25, 1992, W. L. Fisher and L. J. Callan briefed Sequoyah Fuels representatives on the findings of the AIT. The licensee did not contest any of the stated findings.

ATTACHMENT D

DOCUMENTS REVIEWED

Operating Procedures:

N-170-4, NOx Emission Control (Revision 8, 11/92)
M-230-1, Digestion of Yellowcake and Transfer of Slurry
(Revision 11, 11/92)
N-230-5 Miscellaneous Digestion
N-250-1 UNH Boildown (Revision 9, 7/92)
N-260-1 Denitration (Revision 14)
M-600-1 Nitric Acid Recovery (Revision 7, 08/92)
Process System Startup Checklists

Other Procedures:

G-004 Reporting Requirements for Abnormal Events
G 020 Sequoyah Facility Training System
G-021 Plant Operator Training and Qualification
G-190 Investigation and Reporting
HS-503, Selection of Respiratory Protection Equipment
HS-410, Operation of the Draeger Multigas Detector Model 21/31

Operating Logs:

Digest Batch Logs
Digest Tank Sample Analysis Computer Log
Strip Chart Recorder
UF6 Control Room Log
UF6 Shift Supervisor Log
UO3 Control Room Log
UO3 Shift Supervisor Log

Maintenance Document:

Work Order Computer Printout

P&IDs:

170-M-1003 NOxEC System
170-M-1005 NOxEC Flowsheet
230-M-101 Digestion Flowsheet
600-M-1001 Nitric Acid Recovery and Off Gas Treatment
600-M-101 Nitric Acid Recovery and Off Gas Treatment Flowsheet

SFC Contingency Plan, Revision 5

Contingency Personnel List

Control Room Emergency Contact Records

Contingency Plan Implementing Procedures:

CPIP-11, Recognition and Classification of an Emergency
CPIP-12, Unusual Event
CPIP-13, Alert
CPIP-14, Site Area Emergency
CPIP-16, Activation of Assembly and Support Center
CPIP-17, Offsite Response Center Activation and Operation
CPIP-21, Hazards Assessment and Projection
CPIP-22, Onsite Emergency Monitoring
CPIP-23, Offsite Environmental Monitoring
CPIP-31, Emergency Exposure Control and Respiratory Protection
CPIP-32, Emergency Contamination Control and Decontamination
CPIP-33, Emergency Monitoring of Personnel

Emergency Response Documents:

Environmental Response Log
Onsite Emergency Director Log
Offsite Emergency Director Log
Accountability Log
Event Announcement Records
Miscellaneous staff statements documenting the event and actions taken
Emergency Response Critique Records

Other Documents:

Condition Reports relative to the event
Personnel assignment records
Summary of In-Plant Drager Measurements
Manufacturer's Literature on Drager Tubes
Results of Off-Site Measurements
(In-Plant) Air Sampling Data (Radiological)
NOx Release Calculations
Bioassay Results
Hazard Communication Chemical List
Training Exams
MSDSs