

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

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12/9/92
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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 (UF₄) ash. This system would eliminate manual changeout of the ash receivers.

2.4 N-280-6, "UF₄ 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 H-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 Fire, Staff Health Physicist
Philip G. - Manager, Waste Management
Craig Harrison, 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.