



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET SW SUITE 23T85  
ATLANTA, GEORGIA 30303-8931**

July 19, 2002

NMED Nos. 020224, 020285, 020567

Westinghouse Electric Company  
ATTN: Mr. M. Fecteau, Manager  
Columbia Plant  
Commercial Nuclear Fuel Division  
Drawer R  
Columbia, SC 29250

SUBJECT: NRC INSPECTION REPORT NO. 70-1151/2002-006

Dear Mr. Fecteau:

This refers to the inspections conducted on June 3-6, 2002, June 10-14, 2002, and June 17-20, 2002, at the Columbia Nuclear Fuel Plant. The purpose of these inspections was to determine whether activities authorized by the licensee were conducted safely and in accordance with NRC requirements. At the conclusion of each of these inspections, 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.

Based on the results of the inspection, no violations or deviations were identified.

In accordance with 10 CFR 2.790 of NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in NRC's Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/ADAMS.html> (the Public Electronic Reading Room).

Should you have any questions concerning this letter, please contact us.

Sincerely,

**/RA/**

David Ayres, Chief  
Fuel Facilities Branch  
Division of Nuclear Materials Safety

Docket No. 70-1151  
License No. SNM-1107

Enclosure: (See Page 2)

Enclosure: NRC Inspection Report

cc w/encl:

Sam McDonald, Manager  
Environment, Health and Safety  
Commercial Nuclear Fuel Division  
Westinghouse Electric Corporation  
P. O. Box R  
Columbia, SC 29250

Henry J. Porter, Assistant Director  
Div. of Radioactive Waste Mgmt.  
Dept. of Health and Environmental  
Control  
Electronic Mail Distribution

R. Mike Gandy  
Division of Radioactive Waste Mgmt.  
S. C. Department of Health and  
Environmental Control  
Electronic Mail Distribution

Distribution w/encl:

D. Ayres, RII  
M. Crespo, RII  
W. Gloersen, RII  
A. Gooden, RII  
O. Lopez, RII  
L. Roche, NMSS  
J. Muszkiewicz, NMSS  
P. Hiland, RIII  
W. Britz, RIV  
B. Spitzberg, RIV  
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| NAME      | AGooden     | WGloersen            | MCrespo              |           |
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-1151

License No.: SNM-1107

Report No.: 70-1151/2002-06

Licensee: Westinghouse Electric Corporation

Facility: Commercial Nuclear Fuel Division

Location: Columbia, South Carolina

Dates: June 3 - 7, 2002  
June 10 - 14, 2002  
June 17 - 20, 2002

Inspector: W. Gloersen, Senior Fuel Facility Inspector  
M. Crespo, Fuel Facility Inspector  
O. Lopez, Fuel Facility Inspector  
A. Gooden, Health Physicist

Approved By: D. Ayres, Chief  
Fuel Facilities Branch  
Division of Nuclear Materials Safety

Enclosure

## EXECUTIVE SUMMARY

### Commercial Nuclear Fuel Division NRC Inspection Report 70-1151/2002-06

These routine unannounced inspections were conducted in the areas of emergency preparedness, environmental protection, waste management, plant operations, and management organization and controls. The inspection identified the following aspects of the licensee programs as outlined below:

#### **Emergency Preparedness**

- The independent audit provided a candid assessment of the maintenance of key programmatic areas of the emergency preparedness program (Paragraph 2.a).
- The site pre-fire plan require updating based on site physical changes and hazards (Paragraph 2.a).
- The emergency preparedness program lacked a formal procedure delineating the responsibility and required actions governing the review, approval, and distribution of changes to the Site Emergency Plan and emergency procedures (Paragraph 2.b).
- The offsite interface was properly maintained (Paragraph 2.d).
- The licensee's drill and exercise program was considered a program strength due to the kinds of scenarios postulated and the frequency at which drills were being conducted (Paragraph 2.e).
- The Emergency Operations Center was maintained in a state of readiness for staffing and activation, and the emergency equipment was properly maintained (Paragraph 2.f).

#### **Environmental Protection**

- The environmental monitoring program was implemented in accordance with the requirements of License SNM-1107 (Paragraph 3.a).
- The chain of custody control program relied on the services provided by its environmental sample analysis vendor. The lack of an internal procedure for chain of custody of environmental samples was a potential program weakness (Paragraph 3.b).
- The licensee's responses to contain and cleanup the spills associated with the T-1148 tank and the hydrogen fluoride spiking station were prompt. Corrective actions to repair the equipment and associated dikes were acceptable (Paragraph 3.c).
- The environmental and effluent discharge control program audits were thorough, well documented, and properly identified performance issues (Paragraph 3.d).

**Waste Management**

- The licensee met the performance and release criteria requirements for liquid effluents in 10 CFR Part 20 and SNM-1107. The Liquid Effluent Action Plan-2000 had effectively reduced the radioactivity released into the liquid effluent (Paragraph 4.a).
- The licensee had implemented the airborne effluents monitoring program in accordance with license SNM-1107. The representativeness of three stack samples with regard to the guidance specified in ANSI N13.1 needed evaluation (Paragraph 4.b).
- The contaminated material storage drums and poly-packs were stored in an environmentally acceptable covered storage area of the Southwest Expansion Area of the plant. The licensee maintained an accurate inventory of the waste and recoverable uranium materials (Paragraph 4.c).

**Plant Operations**

- The safety analysis for the solvent extraction area and the erbia area adequately identified safety controls (Paragraph 5.a).
- Housekeeping of the facility was adequate. The active engineered and administrative controls in place for the erbia area were adequately maintained (Paragraph 5.b).
- The system drawings and configuration control in the solvent extraction area were being adequately controlled (Paragraph 5.c).
- The training of operators were adequately documented and control over procedure revisions present in the erbia process area were properly maintained (Paragraph 5.d).
- The installation and modification of equipment in the process area was adequately controlled (Paragraph 5.e).
- Appropriate functional tests were being performed on calciner nuclear criticality safety controls but test failures were not always being properly communicated and was considered a program weakness (Paragraph 5.e).
- The internal reviews of the criticality program and detailed inspections of the process areas were performed adequately (Paragraph 5.f).
- Criticality alarm coverage and control was adequately implemented (Paragraph 5.g).

**Management Organization and Controls**

- The new plant manager and operations managers met the education and experience requirements for their positions (Paragraph 6.a).
- The Regulatory Compliance Committee meetings met at the proper frequencies and adequately communicated safety issues to management (Paragraph 6.b).

## REPORT DETAILS

### **1. Summary of Plant Status**

This report covered the periods of June 3-6, 2002, June 10-14, 2002, and June 17-20, 2002. Powder, pellet, and fuel assembly production proceeded at normal rates. There were no unusual plant operational occurrences during the onsite inspection. During the June 10-14, 2002 period, the erbia area was on a standby state for retraining purposes.

### **2. Emergency Preparedness (88050) (F3)**

#### **a. Review of Program Changes (F3.01)**

##### **(1) Inspection Scope**

Changes to the licensee's Site Emergency Plan (SEP), procedures, organization, facilities, and equipment were reviewed to assess the impact on the effectiveness of the program. The adequacy of the emergency preparedness audit required by Section 7.8 of the SEP was also evaluated.

##### **(2) Observations and Findings**

Key management changes were made since the last inspection resulting in the assignment of newly appointed individuals to the emergency staff. The changes did not appear to reduce the effectiveness of the emergency organization in that personnel were provided position specific training in addition to participating in drills and tabletop exercises. The inspector reviewed the licensee's corrections to the SEP made in response to inconsistencies (with Regulatory Guide 3.67 and the previous version of the SEP) identified through a previous NRC review of the plan. The inspector determined that with one exception, actions taken by the licensee to resolve the inconsistencies were in accordance with NRC concerns. The one exception was failure to include a time limit for notification to the State of South Carolina and Richland County following an Alert or Site Area Emergency classification. In response to the inspector's observation, the licensee took prompt actions to include the notification time limit.

The inspector examined the site pre-fire plan to determine if current information was available to assist onsite and/or offsite fire brigade personnel in responding to incidents. The inspector noted examples where the site physical layout had changed (e.g. Erbium facility) as well as potential new hazards, but changes were not reflected in the pre-fire plan. The licensee acknowledged the need for updating and indicated that the pre-fire plan would be revised and updated by October 2002. The inspector informed the licensee that corrective actions to update the pre-fire plan was considered an inspection follow up item (IFI) 70-1151/2002-06-01.

The independent audit included both performance and compliance based assessments to determine if the program was properly implemented. Based on audit documentation and interviews, the inspector considered the audit as a detailed, comprehensive assessment of the emergency preparedness program.

(3) Conclusions

Organizational changes since the last inspection did not appear to have any impact on program effectiveness. Corrections were made to the Site Emergency Plan (SEP) changes to ensure consistency with Regulatory Guide 3.67 and the previous SEP. The independent audit provided a candid assessment of the maintenance of key programmatic areas of the emergency preparedness program.

b. Implementing Procedures (F3.02)

(1) Inspection Scope

Changes to the SEP implementing procedures (referred to as emergency procedures (EPs)) were reviewed to assess the impact on the effectiveness of the program and verify that the revised EPs continue to implement the SEP. The adequacy of the administrative system for review, approval, and distribution of EP changes was evaluated.

(2) Observations and Findings

Since the last inspection, several EPs were revised. The revisions were primarily administrative and had minimal impact on emergency preparedness. The revised procedures continued to implement the SEP. A formalized procedure delineating responsibility and required actions governing the formal review, approval, and distribution of the SEP and EPs did not exist. As a result, the licensee failed to provide the appropriate review opportunity to offsite authorities as discussed in Section 7.5 of the SEP. In response, the licensee discussed plans to contact offsite authorities and determine if authorities have comments on the revised SEP. The licensee acknowledged that the development and implementation of a procedure governing the review, approval, and distribution of changes to the SEP and EPs would ensure that changes were made in accordance with Section 7.5 of the SEP.

(3) Conclusions

A formal procedure delineating the responsibility and required actions governing the review, approval, and distribution of changes to the SEP and EPs was needed to provide appropriate review by offsite authorities. The revised EPs continue to implement the SEP.

c. Training and Staffing of Emergency Organization (F3.03)

(1) Inspection Scope

Emergency response training was reviewed to determine if it was provided to key emergency response organization (ERO) personnel in accordance with Section 7.2 of the SEP. The licensee's notification system was examined for adequacy in activation and staffing of the Emergency Operations Center (EOC) during off-hours.

(2) Observations and Findings

Several members of the emergency organization were interviewed regarding their roles and responsibilities. Interviewees demonstrated good knowledge and familiarity with implementation of the SEP and EPs in response to an incident. The inspector reviewed training documentation for personnel assigned as members of the EOC staff, and the Emergency Brigade. No problems were noted. The inspector determined from interviews and a review of records that both the quantity and quality of the hands-on emergency response training was a program strength.

The inspector examined documentation from a recent notification drill demonstrating the estimated time of arrival by emergency response personnel to the EOC in the event of an emergency during back shifts and off-hours. No problems were noted. The results indicated that the notification system was adequate for contacting personnel during off hours and key positions could be filled in a timely manner.

(3) Conclusions

Classroom training to fully qualify Emergency Brigade members in accordance with Section 7.2 of the SEP was effectively implemented, as evidenced by the number of individuals assigned to back-shifts as brigade members who were fully qualified. Based on results from the recent off-hours notification drill, the notification system was adequate for contacting personnel during off-hours and key positions could be filled in a timely manner.

d. Offsite Support (F3.04)

(1) Inspection Scope

Licensee activities in the areas of training, agreements, and exercises were reviewed to determine if the licensee was periodically involving offsite support groups.

(2) Observations and Findings

The inspector reviewed documentation to show that the offsite authorities were being contacted for participation in drills/exercises, periodic site familiarization tours, and licensee representatives met with offsite authorities to discuss lines of communications and misunderstandings which resulted from the October 2001 biennial exercise.

(3) Conclusions

Based on a licensee interview and records reviewed, the inspector determined that the offsite interface was properly maintained.



e. Drills and Exercises (F3.05)

(1) Inspection Scope

Section 7.4 of the SEP required a biennial exercise be performed involving the onsite emergency response organization and many of the offsite support agencies. This area was reviewed for adequacy in testing both onsite and offsite emergency response capability.

(2) Observations and Findings

The biennial exercise conducted on October 10, 2001 included participation by State and local support agencies. Since the last routine inspection, the licensee had conducted numerous drills (both table-top and actual field exercises). An Emergency Brigade member indicated that numerous unannounced hands-on drills were conducted and provided participants with a sense of confidence in performing their assigned duties. The accident scenarios that were postulated posed sufficient challenges to test the adequacy of training. During an April 2002 drill, offsite support groups participated with the licensee.

(3) Conclusions

The licensee's drill and exercise program was considered a program strength due to the kinds of scenarios postulated and the frequency at which drills were being conducted.

f. Emergency Equipment and Facilities (F3.06)

(1) Inspection Scope

The Emergency Operations Center (EOC) and equipment were inspected to determine whether the licensee's facilities, emergency response equipment, instrumentation, and supplies were maintained in a state of operational readiness.

(2) Observations and Findings

The inspector reviewed periodic surveillance sheets and observed an inventory and operability check of emergency equipment at several locations. In addition, an operability check was performed on the primary staging area card reader. No problems were noted. The equipment selected for operational test performed the intended safety function.

(3) Conclusions

The EOC was maintained in a state of readiness for staffing and activation, and the emergency equipment was properly maintained to perform the intended safety function in a reliable manner.

g. Follow up On Previously Identified Issues (F3.07)

- (1) (Closed) Violation 70-1151/2001-06-01: Failure to maintain the Plan in accordance with Section 7.5 of the SEP.

By letter dated July 27, 2001, the licensee submitted to NRC a complete rewrite to the SEP. Several aspects of the revised Plan was considered inconsistent with NRC Regulatory Guide 3.67 (Standard Format and Content For Emergency Plans For Fuel Cycle and Material Facilities), and required corrective actions to maintain the effectiveness of the Plan. The inspector reviewed the corrected pages and informed the licensee that the final determination and correspondence associated with the SEP revision would be via the Nuclear Materials Safety and Safeguards Licensing Branch. The licensee's revised SEP incorporated changes resulting from reviews performed in calendar year 2001 and thus far in 2002.

- (2) (Closed) IFI 70-1151/2001-06-02: Review the adequacy of the licensee's corrective actions for the independent audit.

A contract was executed with a consulting firm to perform an annual independent audit of the emergency preparedness program. The contract included the scope of work and responsibility in the performance of the audit. The inspector reviewed documentation for an audit conducted October 8-11, 2001. The audit was a detailed, comprehensive assessment of the licensee's emergency preparedness program.

- (3) (Closed) IFI 70-1151/2001-06-03: Verify the licensee's corrective actions to fully qualify and maintain 50 percent of Emergency Brigade members on each shift as fully qualified.

The inspector reviewed training records, interviewed personnel with the responsibility for tracking training and reviewed the shift training matrix for determining the adequacy of corrective actions. Based on interviews and documentation, the fully qualified brigade members assigned to first shift were 100 percent, and 86 percent of the second and third shifts were fully qualified members.

- (4) (Open) IFI 70-1151/2001-09-01: Verify the adequacy of the licensee's corrective actions to resolve the weaknesses identified during the exercise.

The inspector reviewed documentation to show that procedures were revised and a meeting was held with offsite authorities to discuss lines of communications, and misunderstandings resulting from the 2001 biennial exercise. However, this item remains open pending performance demonstration to indicate effective corrective actions.

### **3. Environmental Protection (IP 88045)**

#### **a. Monitoring Program Implementation and Monitoring Program Results**

##### **(1) Inspection Scope**

The licensee's environmental program was reviewed to verify that environmental monitoring was implemented in accordance with the requirements of License SNM-1107 and to verify the licensee's capabilities to measure and assess environmental radiological contamination as a result of plant operations.

##### **(2) Observations and Findings**

The inspector reviewed selected environmental sampling results for the years 2000-2001. The inspector observed that semiannual soil, vegetation, fish, and Congaree River sediment and surface water sample analyses had either gross alpha or isotopic uranium concentrations that were consistently well below the licensee's action levels specified in the site's environmental operating procedures. In addition, ambient environmental air sampling data consistently showed that weekly activity concentrations were less than the licensee's action level of 5.00E-15 microcurie per milliliter ( $\mu\text{Ci/ml}$ ).

The inspector reviewed the licensee's 2001 quarterly groundwater sampling results and observed that the average gross beta activity levels for two monitoring wells exceeded the licensee's action level. Previous NRC inspection reports (see reports 70-1151/98-01, 99-01, 00-01, and 01-02) identified that elevated activity in these wells was due to a technetium source term originating from the vicinity of the cylinder recertification building (CRB). The results from 2001 showed that the activity had stabilized, indicating that the licensee's corrective actions (i.e. sealing of cracks in CRB floor trenches and eliminating the sump in the CRB) had effectively contained the technetium source term. In addition, the inspector noted minimal down-gradient migration of the technetium-99 contaminated groundwater plume.

In addition, the inspector reviewed gross alpha results for the ten (NRC) groundwater sampling locations specified in the SNM-1107 license. The licensee performed isotopic uranium analyses as required by the license. The total uranium concentration was well below the licensee's total uranium concentration action limit.

##### **(3) Conclusions**

The licensee's environmental monitoring program was implemented in accordance with the requirements of License SNM-1107. Environmental sampling results for vegetation, fish, soil, and sediment showed uranium activity at near background levels in the environment and represented minimal impact from the facility's operations. Technetium activity levels in groundwater monitoring wells for 2001 were stabilized and remained consistent with the levels observed in 2000. No further significant down-gradient migration of the technetium contaminated groundwater plume was evident.

b. Chain of Custody Controls

(1) Inspection Scope

The inspector reviewed the licensee's chain of custody control program for environmental samples.

(2) Observations and Findings

The inspector observed that the licensee relies on the services of its environmental sample analysis vendor for providing chain of custody controls for its environmental samples. Basically, the licensee would develop a packing list identifying the environmental samples to be analyzed by the vendor. The vendor provides a courier service to pick up the environmental samples on a weekly basis. The vendor's chain of custody control program is implemented when the samples are provided to the courier. The licensee has no formal chain of custody control program for environmental samples from the time they are collected in the field until the samples are provided to the courier. The licensee does, however, perform periodic audits of the vendor's quality assurance and quality control programs, which includes a review of sample chain of custody controls.

(3) Conclusions

The licensee's chain of custody control program relied on the services provided by its environmental sample analysis vendor. The lack of an internal procedure for chain of custody of environmental samples was a potential program weakness.

c. Environmental Event Review

(1) Inspection Scope

The inspector reviewed the licensee's environmental events records covering the last 12 months.

(2) Observations and Findings

Licensee events are normally documented as Unusual Occurrence Reports ("Red book" items) or as a British Nuclear Fuels (BNFL) Initial Event Report for more significant events. The inspector reviewed two environmental events that occurred during the last 12 months. On 06/02/02, a spill of solution occurred from a leaking pump on the T-1148 tank. Approximately 20 gallons of solution accumulated within the diked area and an additional 10 gallons spilled on to the road surface and surrounding dirt. The leak was terminated, the area was roped off and decontaminated. Decontamination efforts included excavating the contaminated dirt and mopping up the road surface. The solution within the diked area was transferred to the East lagoon. At the time of this inspection the licensee had not completed the post decontamination sample collection or event documentation. The licensee indicated that after the event documentation is complete, the records will be placed into the facility's decommissioning file.

The inspector also reviewed the uranyl nitrate/hydrogen fluoride (UNH/HF) spiking station No. 1 spill that occurred on 10/28/01. The licensee had identified a spill in the UF<sub>6</sub> Bay UNH HF spiking Station No. 1 dike. Some material had leaked from the dike through the foundation onto a concrete pad outside of the facility. Production was temporarily terminated and the diked area cleaned. Approximately 61 gallons of UNH liquid leaked from the diked area through the building foundation onto the concrete pad. Soil beneath the dike was contaminated. The maximum pre and post decontamination soil sample results were as follows:

- Pre-decontamination soil sample results: 12,720 pCi/gram
- Post-decontamination soil sample results: 770 pCi/gram

Licensee corrective actions included leak repairs, dike repairs, assessment of sub-flooring contamination levels, development of a remediation action plan, and long term corrective actions to repair the HF spiking station and dike. The inspector verified that the event was captured in the licensee's decommissioning file system.

For both events, the licensee's prompt response to contain and cleanup the spills was acceptable. The inspector did not note any additional issues with regard to these events.

(3) Conclusions

The licensee's response to contain and cleanup the spills associated with the T-1148 tank and the UNH/HF spiking station was prompt. Corrective actions to repair the equipment and associated dikes were acceptable.

d. Environmental Audits

(1) Inspection Scope

The inspector reviewed audits and self-assessments of the environmental and effluent monitoring programs conducted by the licensee during the last 12 months.

(2) Observations and Findings

The inspector reviewed two licensee audits conducted in April 2002 of both the effluent discharge control program and environmental monitoring program. The audits were performed by a Senior Environmental Health and Safety (EHS) Engineer. Although the audits represented a self-assessment of the programs, the inspector noted that the audits were thorough, well documented, and identified issues. The inspector also noted that the audit report did not have a formal distribution list to ensure that it would receive the appropriate management review, nor did the identified issues have tracking mechanisms to ensure proper resolution. The licensee indicated that the audits were intended to be reviewed by EHS management. In addition, the licensee indicated that plans were in place to have several of the facility program areas, including the environmental and effluent discharge control programs, audited by an independent entity.

(3) Conclusions

The environmental and effluent discharge control program audits were thorough, well documented, and properly identified performance issues.

**4. Waste Management (IPs 88035, 84900)**

a. Liquid Effluent Monitoring Results

(1) Inspection Scope

The inspector reviewed the licensee's liquid effluents monitoring program to verify that the program was implemented in accordance with License SNM-1107 requirements and to insure that liquid radiological releases were well below the limits specified in 10 CFR Part 20.

(2) Observations and Findings

The inspector reviewed the total quantities of radioactive materials in liquid effluents released for the years 2000 and 2001. The total activity released during 2001 (63.1 mCi) was approximately 49 percent less than the total activity levels observed during 2000 (124.0 mCi). The licensee indicated that the larger quantities of radioactive materials released in the liquid effluent during 2000 had predominantly occurred due to increases in the waste streams from plant inputs such as showers, sinks, drains, uranyl nitrate tank pad, etc., which were processed through holding tank 1187 prior to release to the east lagoon. The inspector noted that during 2000, the licensee implemented a liquid effluent action plan (LEAP-2000). Some of the licensee's actions in the LEAP-2000 included, regularly changing filters, closely monitoring the discharges from site laboratories, and monitoring the pH controls in the east waste treatment lagoon. The inspector noted that although the liquid effluent radiological discharge was greater during 2000 compared to 2001 levels, the calculated offsite doses as a result of radioactivity in liquid effluents was significantly below 10 CFR Part 20 criteria for doses attributable to liquid effluents.

(3) Conclusions

The licensee met the performance and release criteria requirements for liquid effluents in 10 CFR Part 20 and SNM-1107. Total radiological activity in liquid effluents had decreased by approximately 49 percent during 2001 as compared to 2000 levels. The licensee's self-initiated LEAP-2000 had effectively reduced the radioactivity released into the liquid effluent. Calculated offsite doses as a result of radioactivity in liquid effluents was significantly below 10 CFR 20 criteria.

b. Airborne Effluents Control, Procedures, Equipment, and Results

(1) Inspection Scope

The licensee's airborne effluents monitoring program was reviewed to verify that the program was implemented in accordance with License SNM-1107 requirements and to verify that airborne radiological releases met the requirements of 10 CFR 20 criteria.

(2) Observations and Findings

The inspector reviewed the total quantities of radioactive materials in airborne effluents released for the years 2000 and 2001. The inspector observed that the licensee had experienced an 11 percent increase in airborne effluent activity reported for 2001 (558  $\mu\text{Ci}$ ) in comparison with total uranium (gross alpha) values reported for 2000 (502  $\mu\text{Ci}$ ). This increase was attributable to an increase in processing operations. Since 1997, the inspector had not noted any cumulative trends. The licensee had added new stacks due to the addition of the Erbia processing area. The total effective dose equivalent (TEDE) to an individual at the site boundary was well below the 10 CFR 20 limit for doses due to airborne effluents. The inspector also observed the acquisition of airborne effluent particulate samples at several of the exhaust stack sampling stations and noted no items which would compromise sample integrity. In general, the sampling equipment was in good condition. The inspector noted that the air sample locations for stack numbers 1220 and 1030 A and B were upstream and directly in front of the vent blower motor in the horizontal portion of the vent. The inspector questioned the representativeness of the air sample given that the location was not in accordance with the ideal sample location guidance specified in ANSI N 13.1. The licensee agreed to evaluate the present sample location and determine if a more representative sample location (in the vertical portion of the stack) could be identified.

(3) Conclusions

The licensee had implemented the airborne effluents monitoring program in accordance with license SNM-1107. Calculated offsite doses due to airborne radiological emissions were well within the criteria specified in 10 CFR Part 20. The licensee was to evaluate the representativeness of three stack samples with regard to the guidance specified in ANSI N13.1.

c. On Site Waste Storage

(1) Inspection Scope

The licensee's Low Level Radioactive Waste (LLRW) storage program was reviewed to determine if proper storage and inventory techniques were being used.

(2) Observations and Findings

The inspector toured the LLRW processing and storage facilities (Southwest Expansion Area/Drum Storage Area). The inspector noted that the licensee had stored uranium contaminated material in the Southwest Expansion Area until equipment modifications

were made to recover the uranium. The inspector observed that the contaminated material storage drums and poly-packs were stored in an environmentally acceptable covered storage area of the Southwest Expansion Area of the plant. The inspector also noted that the licensee maintained an accurate inventory of the waste and recoverable uranium materials.

(3) Conclusions

The contaminated material storage drums and poly-packs were stored in an environmentally acceptable covered storage area of the Southwest Expansion Area of the plant. The licensee maintained an accurate inventory of the waste and recoverable uranium materials.

d. Follow up on Previously Identified Issues

- (1) (Closed) IFI 70-1151/2001-05-05: Document a program to ensure proper classification and characterization of LLRW.

The inspector reviewed the licensee's actions in response to IFI 01-05-03 concerning the documentation of a program to ensure proper classification and characterization of low level radioactive waste (LLRW). The inspector reviewed RA-211, Low Level Radioactive Scrap, which was revised (revision 12) to specifically require that radioactive waste streams at the Columbia site be evaluated periodically (typically annually) and that LLRW is classified accordingly. References applicable to the regulatory requirements and guidance were also added to RA-211. COP-831010, Shipping Low Level Radioactive Waste, Rev. 21, 12/13/01, was also revised to require that LLRW shipments containing radioactive materials other than uranium be classified by EH&S representatives on a case-by-case basis. This item is closed.

**5. Plant Operations (O3) (IP 88020)**

a. Safety Function (O3.02)

(1) Inspection Scope

The inspector reviewed the safety analyses for the solvent extraction area and the erbia area identified safety controls, provided for double contingency, and specified limits for controlled parameters.

(2) Observations and Findings

The inspector noted that the safety analysis for the solvent extraction system stated that no nuclear criticality safety (NCS) controls were necessary for the area. The inspector questioned several process engineers and the criticality safety team to verify the assumptions that formed the conclusion that no NCS controls are necessary. The primary assumption for the system was that no credible means existed for the system to concentrate and precipitate out uranium.



The inspector noted that the safety analysis for the erbia area adequately identified safety controls, provided for double contingency, and specified limits for controlled parameters.

(3) Conclusions

The licensee's safety analysis for the solvent extraction area and the erbia area adequately identified safety controls.

b. Plant Activities (O3.03)

(1) Inspection Scope

The inspector verified that activities and housekeeping of the plant are performed according to approved plant procedures. The inspector also verified that active engineered safety controls in the erbia area are available and in an operable condition. The inspector also verified that administrative safety controls are in place and being performed.

(2) Observations and Findings

During the tour of the facility, the inspector noted that the housekeeping of the conversion area appeared worse than it did during the previous inspection in January. However, no unsafe conditions were noted.

The inspector was able to verify the presence and condition of several active engineered controls, such as the polypak elevator and the dumping hood mechanism for the bulk container, which only allow analyzed containers to pass. The inspector also verified the use of checklists for the bulk containers. The checklist required the signatures of two operators for the verification of its integrity and contents before it can be used.

(3) Conclusions

The licensee demonstrated adequate housekeeping of the facility. The licensee also maintained the appropriate active engineered and administrative controls in place for the erbia area.

c. Configuration Control

(1) Inspection Scope

The inspector verified that the approved configuration was being maintained in the solvent extraction area by comparing the existing layout with the licensee's drawings.

(2) Observations and Findings

The inspector noted that system drawings reviewed matched the existing layout in the process. The inspector noted no discrepancies.

(3) Conclusions

The licensee was adequately maintaining control of system drawings and configuration control for the solvent extraction area.

d. Operating Procedures (O3.06), NCS Training (O3.08)

(1) Inspection Scope

The inspector reviewed procedures for the erbia area and the training records for select operators in the erbia area to verify that they were properly trained for their position.

(2) Observations and Findings

The inspector noted that the operators' training checklists were complete and filled out. Therefore, the operators were considered "B" level, which signifies that they no longer require supervision to perform their job.

The inspector noted that the reviewed procedures adequately identified the administrative and active engineered controls for their respective areas. The procedures present in the process area were also the most current revision.

(3) Conclusions

The licensee adequately documented training of their operators and maintained control over procedure revisions present in the erbia process area.

e. Maintenance for NCS Controls (O3.07)

(1) Inspection Scope

The inspector reviewed test records and authorizations for functional tests following the replacement of NCS valves on the calciners in the conversion area to verify that they were adequately tested prior to restarting the equipment. The inspector also reviewed the authorization requests for the work.

(2) Observations and Findings

The inspector noted that the functional test records were adequate in demonstrating that the new calciner nitrogen purge valve worked correctly. The inspector reviewed the configuration control work requests for the new valves and determined they contained the appropriate signatures authorizing the valve change out. The inspector noted that the authorizations were received prior to starting the maintenance work. In addition to the valve change out, the programmable logic controller (PLC) logic and hardware were adjusted to match the valve change. The inspector noted that the functional tests were adequately performed prior to restarting the equipment. However, the licensee's maintenance crew had discovered that some of the other NCS valves on the calciners in the conversion area were not passing the new functional test. The results of this test were not noticed due to the results being input into a crowded data sheet. Nearly a year

after the discovery of the failed functional test, a criticality safety engineer discovered the failures and proceeded to correct the problem. The inspector noted two issues regarding this event. The first issue was that maintenance had no procedure to communicate finding such as this to the appropriate supervisors. To address this issue, the licensee decided to have a procedure written to ensure that information such as this gets relayed to the appropriate supervisors. The second issue was that, according to interviews with maintenance personnel, the results of the functional tests were circumspect. The functional test required the position of the valve to be known. The valve in place made determining its position difficult for any personal without extensive experience. The licensee was evaluating the need to install indication valves. The corrective actions to address these issues will be tracked as an IFI 2002-06-02.

(3) Conclusions

The licensee demonstrated adequate control over the installation and modification of equipment in the process area and performed the appropriate functional tests on the affected NCS controls. Communication of failed functional tests were considered a maintenance program weakness. The corrective actions to address the functional test failures for the NCS valve on the calciner will be tracked as an IFI 2002-06-02.

f. NCS Audits (O3.09)

(1) Inspection Scope

The inspector reviewed the May Regulatory Affairs Inspection report and the annual criticality program review report.

(2) Observations and Findings

The inspector noted that the Regulatory Affairs Inspection report, which covers NCS, safeguards, radiation protection, and industrial safety, had multiple findings in the Integrated Fuel Burnable Absorber (IFBA) and erbia areas. No NCS issues were discovered, most were industrial safety. The report contained sufficient detail on the findings and listed the corrective actions for each finding.

The annual criticality program review report lacked detail on the areas that were reviewed, however it did address all the appropriate sections of the program. The inspector also saw that all the subject areas for review for the criticality program were reviewed within the last three years, as required by the license.

(3) Conclusions

The licensee met the requirements for reviewing their criticality program and performed adequately detailed inspections of the process areas.

g. Criticality Alarm Systems (O3.10)

(1) Inspection Scope

The inspector reviewed the locations for several of the criticality alarm detectors and confirmed that access to alarm set points was controlled to prevent an unapproved change. The inspector also verified dual detector coverage and site coverage.

(2) Observations and Findings

The inspector noted that the criticality detectors were operable throughout the plant. The set points for the detectors were all controlled through individual locks to prevent tampering. The inspector also reviewed a the map indicating the placement of the detectors and noted site coverage was maintained. Several detectors were examined and each met the criteria for dual detector coverage.

(3) Conclusions

The licensee adequately implemented criticality alarm coverage and control.

h. Review of Previous Events (O3.12)

(1) Inspection Scope

Corrective actions for the following events were reviewed to determine the adequacy of licensee response actions:

- NRC Event No. 38767 (Nuclear Materials Event Database (NMED) No. 020285) in the erbia bulk blending area in which moderator was brought into the area without approval.
- NRC Event No. 38965 (NMED No. 020567) in which unanalyzed powder entered the moderation restricted area in the erbia area.
- NRC Event No. 38728 (NMED No. 020224) in which process instrument flowsheets (PIFs) were being used instead of procedures.

(2) Observations and Findings

The inspector reviewed the licensee's corrective actions for a reportable event in the erbia area (NRC Event No. 38767, NMED No. 020285) where an operator brought in a 1 liter can of oil into the moderation controlled area without authorization. The corrective actions consisted of extensive retraining of maintenance personnel, focusing on the philosophy that no action should be performed without a written procedure for it. The inspector noted that the corrective actions did not address the fact that an operator, not a maintenance worker, performed the action. The licensee stated that, once this was brought to their attention (which was done several weeks prior), operators for erbia were also retrained.

The inspector reviewed another reportable event in the erbia area (NRC Event No. 38965, NMED No. 020567) where 13 containers of material were brought into the moderation controlled area without documented moisture analysis results. The inspector found that the licensee placed the entire area on standby for retraining purposes (the standby condition lasted a full work week). The retraining focused on NCS controls and procedure compliance. The licensee was also conducting a root cause investigation, the results of which were still pending at the time of this inspection. The licensee's immediate correction actions for the situation were adequate to address the issue of procedural compliance for the area.

Since several active engineered controls were present as the second line of defense against the unauthorized moderator and unanalyzed powder, the safety significance of the events discussed above was considered minor. At no time was criticality possible because there was never sufficient moderator to cause a criticality, nor a path for the moderator to reach the material in the containers. Since the safety significance of these events was minor, the procedural non-compliances were considered to be minor violations not subject to NRC enforcement action. However, further problems with procedure non-compliances may warrant future enforcement action.

The inspector reviewed the licensee's corrective actions to address the fact that a PIF was used instead of a procedure (NRC Event No. 38728, NMED No. 020224). Upon discovery of the issue, the licensee had halted creation of PIFs for the time being to review all the PIFs used in the process area. Several recommendations were made by the reviewers to adjust certain PIFs. However, the inspector was unable to verify if the recommendations were acted upon. Also, engineers (which were the author of PIFs) were retrained to ensure that PIFs did not resemble procedures. The inspector also noted that the licensee had no system by which the PIFs that would be issued in the future could be audited. The licensee's corrective actions to address this issue will be tracked as IFI 2002-06-03.

### (3) Conclusions

The two events that occurred in the erbia area were adequately addressed and were considered to be minor violations. The licensee's corrective actions to address the PIF issue will be tracked as IFI 2002-06-03.

#### i. Follow up on Previously Identified Issues (O3.13)

#### (1) (Open) IFI 70-1151/2002-01-01: Corrective Actions for failure of HF spiking station dike.

To address the possibility of a dike failure, the licensee had written an annual functional test of the HF spiking stations' dikes (the functional test had yet to be performed). The inspector reviewed the functional test procedure and found the instructions to be vague. When the issue was brought to the attention of the licensee, the licensee agreed that more detail was necessary. The licensee stated that functional test would be rewritten to include more detailed procedures. This item remained open.

- (2) (Closed) Unresolved Item (URI) 70-1151/2002-02-01: Proximity Switch Defeated In Uranium Recovery System.

After a review by the NRC Office of Investigation, this URI was dispositioned as a willful violation of minor safety significance. In accordance with the NRC Enforcement Policy (NUREG-1600), this item was resolved as non-cited violation 70-1151/2002-02-01. Thus, this item was closed.

## **6. Management Organization and Controls (O4) (IP 88005)**

### **a. Organizational Structure (O5.01)**

#### **(1) Inspection Scope**

The inspector reviewed changes in personnel responsibilities and functions that had occurred for the past six months to verify that requirements in the license concerning personnel qualifications were being met.

#### **(2) Observations and Findings**

The inspector discussed with the licensee the organizational changes and changes in personnel responsibilities that occurred within the past six months. In May 2002, the licensee appointed a new plant manager. The previous plant manager assumed the position of Operations Manager. The inspector verified that the new plant manager and new operations manager met the education and experience requirements for their assigned responsibilities, functions, and authorities.

#### **(3) Conclusion**

The new plant manager and operations managers met the education and experience requirements specified in the license application.

### **b. Safety Committees (O5.04)**

#### **(1) Inspection Scope**

The inspector reviewed the last two Regulatory Compliance Committee (RCC) meeting minutes to verify that licensee management was informed of any safety issues discussed and that their meetings have been held at the appropriate frequencies.

#### **(2) Observations and Findings**

The inspector concluded that the RCC meetings have been held quarterly as required by the license. The inspector also verified that the appropriate members were in attendance for the meetings. The inspector discussed with the licensee personnel about how recommendations made in the RCC meetings were addressed. The licensee stated that recommendations made in the RCC meetings are input into the corrective actions program.

(3) Conclusion

The RCC meetings met all the terms stipulated in the license and have been held at the frequencies required in the license.

**7. Exit Meetings**

The inspection scope and results were summarized on June 6, 2002, June 14, 2002, and June 20, 2002, with those persons indicated in the Attachment. The inspectors described the areas inspected and discussed in detail the inspection results. Although proprietary documents and processes were reviewed during this inspection, the proprietary nature of these documents or processes is not included in this report. No dissenting comments were received from the licensee.

## ATTACHMENT

### 1. LIST OF PERSONS CONTACTED

#### Licensee

#C. Aguilar, Engineer, Integrated Safety Engineering  
@D. Allison, Environmental Health and Safety  
#S. Carver, Safety Coordinator  
@M. Connelly, Nuclear Criticality Safety Engineer  
#@R. Ervin, Manager, Chemical Processing and Engineering  
#M. Fecteau, Plant Manger  
#R. Fischer, Senior Engineer, Regulatory Engineering and Operations  
\*M. Goddard, Team Manager, URRS  
#\*D. Graham, Technician, Environment, Health and Safety  
@\*J. Heath, Manager, Integrated Safety Engineering  
#\*S. McDonald, Manager, Environment, Health and Safety  
#R. Monley, Columbia Operations Manager  
@A. Morena, Acting Manager, Chemical Operations  
@N. Parr, Environmental Health and Safety  
@C. Perkins, Manager, Maintenance  
\*D. Precht, Manager, Chemical Operations  
\*T. Shannon, Manager, Health Physics Operations and Behavioral Safety  
@A. Speiran, Maintenance  
@C. Snyder, Nuclear Criticality Safety Engineer  
@D. Williams, Nuclear Criticality Safety Engineer

Other licensee employees contacted included engineers, technicians, production staff, security, and office personnel.

#### NRC Personnel

#W. Gloersen, Sr. Fuel Facility Inspector, Region II  
@M. Crespo, Fuel Facility Inspector, Region II  
@O. Lopez, Fuel Facility Inspector, Region II  
\*A. Gooden, Health Physicist, Region II

#Attended exit meeting on June 6, 2002  
@Attended exit meeting on June 14, 2002  
\*Attended exit meeting on June 20, 2002

#### Pinkerton Security

G. LeDell, Lieutenant, Assistant Shift Supervisor  
B. Mazyck, Lieutenant, Shift Supervisor  
L. Turner, Captain



## 2. INSPECTION PROCEDURES USED

|          |  |
|----------|--|
| IP 84900 | Low Level Radioactive Waste Storage                    |
| IP 88005 | Management Organization and Controls                   |
| IP 88020 | Regional Nuclear Criticality Safety Inspection Program |
| IP 88035 | Radioactive Waste Management                           |
| IP 88045 | Environmental Protection                               |
| IP 88050 | Emergency Preparedness                                 |

## 3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

|                    |     |  |
|--------------------|-----|--|
| 70-1151/2001-09-01 | IFI | Verify the adequacy of the licensee's corrective actions to resolve the weaknesses identified during the exercise (Paragraph 2.g). |
| 70-1151/2002-06-01 | IFI | Verify corrective actions to review and update the pre-fire plan (Paragraph 2.a).  |
| 70-1151/2002-06-02 | IFI | Corrective Actions for communication error on the functional test results on an NCS calciner valve (Paragraph 5.e).                |
| 70-1151/2002-06-03 | IFI | Corrective Actions for the use of PIFs instead of Procedures (Paragraph 5.h).  |

### Closed

|                    |     |   |
|--------------------|-----|---|
| 70-1151/2001-05-03 | IFI | Document a program to ensure the proper classification and characterization of low level radioactive waste (Paragraph 4.d)  |
| 70-1151/2001-06-01 | VIO | Failure to maintain the Plan in accordance with Section 7.5 of the SEP (Paragraph 2.g).   |
| 70-1151/2001-06-02 | IFI | Review the adequacy of the licensee's corrective actions for the independent audit (Paragraph 2.g).   |
| 70-1151/2001-06-03 | IFI | Verify the licensee's corrective actions to fully qualify and maintain 50 percent of each shift with fully qualified Emergency Brigade personnel (Paragraph 2.g). |
| 70-1151/2002-02-01 | URI | Proximity Switch Defeated In Uranium Recovery System (Paragraph 5.i).   |

Discussed

70-1151/2002-01-01

Discussed

IFI - Corrective Actions for failure of  
HF spiking station dike (Paragraph  
5.i).

**4. LIST OF ACRONYMS USED**

|      |                                   |
|------|-----------------------------------|
| BNFL | British Nuclear Fuels             |
| CFR  | Code of Federal Regulation        |
| CRB  | Cylinder Recertification Building |
| EHS  | Environmental Health and Safety   |
| EOC  | Emergency Operations Center       |
| EP   | Emergency Procedure               |
| ERO  | Emergency Response Organization   |
| HF   | Hydrogen Fluoride                 |
| IFBA | Integrated Fuel Burnable Absorber |
| IFI  | Inspection Follow up Item         |
| LEAP | Liquid Effluent Action Plan       |
| LLRW | Low Level Radioactive Waste       |
| NCS  | Nuclear Criticality Safety        |
| pCi  | picrocurie                        |
| PIF  | Process Instrument Flowsheets     |
| PLC  | Programmable Logic Controller     |
| RCC  | Regulatory Compliance Committee   |
| SEP  | Site Emergency Plan               |
| TEDE | Total Effective Dose Equivalent   |
| UNH  | Uranium Nitrate                   |
| URI  | Unresolved Item                   |
| VIO  | Violation                         |