

April 27, 2001

Mr. Robert Monley, Plant Manager
Westinghouse Electric Corporation
Commercial Nuclear Fuel Division
Drawer R
Columbia, SC 29250

SUBJECT: NRC INSPECTION REPORT 70-1151/2001-201

Dear Mr. Monley:

The Nuclear Regulatory Commission (NRC) conducted an unannounced inspection of the chemical safety program at your facility in Columbia, South Carolina, from April 2-6, 2001.

At the conclusion of the inspection, the results were discussed with Mr. McDonald and other members of your staff. Within the scope of the inspection, the inspector concluded that Westinghouse has a program in place that can provide reasonable assurance of safety from the risks of highly hazardous chemicals during operations.

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

Sincerely,

/RA/

Walter S. Schwink
Chief of Inspections
Division of Fuel Cycle Safety
and Safeguards, NMSS

Docket 70-1151
License SNM-1097

Enclosure: NRC Inspection Report 70-1151/2001-201

cc w/enclosure: Don Goldbach, Manager
Environmental Health and Safety

cc w/o enclosure Max Batavia, P.E., Chief
Bureau of Radiological Health
South Carolina Department of Health
and Environmental Control

Mr. Robert Monley, Plant Manager
Westinghouse Electric Corporation
Commercial Nuclear Fuel Division
Drawer R
Columbia, SC 29250

SUBJECT: NRC INSPECTION REPORT 70-1151/2001-201

The Nuclear Regulatory Commission (NRC) conducted an unannounced inspection of the chemical safety program at your Columbia, South Carolina, facility from April 2-6, 2001.

At the conclusion of the inspection, the results were discussed with Mr. McDonald and other members of your staff. Within the scope of the inspection, the inspector concluded that Westinghouse has a program in place that can provide reasonable assurance of safety from the risks of highly hazardous chemicals during operations.

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Sincerely,

/RA/

Walter S. Schwink
Chief of Inspections
Division of Fuel Cycle Safety
and Safeguards, NMSS

Docket 70-1113
License SNM-1097

Enclosure: NRC Inspection Report 70-1113/2000-202

cc w/enclosure: Don Goldbach, Manager
Environmental Health and Safety

cc w/o enclosure Max Batavia, P.E., Chief
Bureau of Radiological Health
South Carolina Department of Health
and Environmental Control

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NAME	JMuszkiewicz		MBaker		YChen		WSchwink	
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**U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
CHEMICAL SAFETY INSPECTION REPORT**

Docket: 70-1151

License Number: SNM-1107

Report Number: 70-1151/2001-201

Licensee: Westinghouse Electric Corporation
Columbia Fuel Fabrication Facility

Location: Columbia, SC

Inspection Dates: April 2-6, 2001

Inspector: Yen-Ju Chen, SSSB

Assisting with Inspection: Merritt N. Baker, SSSB

Approved by: Walter S. Schwink
Chief of Inspections
Division of Fuel Cycle Safety
and Safeguards, NMSS

ENCLOSURE

**Westinghouse Electric Corporation
Columbia Fuel Fabrication Facility
NRC Inspection Report
70-1151/2001-201**

EXECUTIVE SUMMARY

Introduction

The NRC performed a routine unannounced chemical safety inspection at the Columbia Fuel Fabrication Facility from April 2-6, 2001. The objective of this inspection was to review the adequacy of the licensee's chemical safety program. The inspection focused on the bulk chemical storage tanks and Conversion areas with the highest risks, as determined by the licensee's Integrated Safety Assessment (ISA) program.

Results

- ISAs have been conducted and are being maintained for the most risk-significant plant areas and processes.
- "Safety Significant Controls" were clearly identified through the ISA process.
- The licensee is implementing an adequate maintenance program to assure the availability and reliability of risk-significant safety controls used to prevent or mitigate the consequences of process chemical safety hazards.
- Conduct of operations in the visited facility areas was controlled in an appropriate manner to ensure the safe operation of the process.
- The licensee has not demonstrated the effectiveness of a new program (an important management measure) to ensure that potential safety-significant findings are promptly evaluated, prioritized commensurate with their importance to safety, and tracked to completion. **Previously-issued Inspector Follow-up Item IFI-2000-204-02 will remain open.**
- The licensee has taken steps to maintain appropriate controls on bulk chemical storage facilities on-site.
- The licensee conducted a training exercise for new members of the emergency response brigade and the Emergency Operations Center. A few barriers to communication were encountered. Corrective actions will be tracked as **Inspector Follow-up Item 2001-201-01.**

REPORT DETAILS

1. Integrated Safety Analysis (ISA) (88056 and 88063)

A. Scope

The inspector reviewed the status of the licensee's ISAs for the most risk-significant activities at the facility, including the plans for completing and updating the analyses, and management measures to maintain the analyses current and promptly address any high risk recommendations.

B. Observations and Findings

A total of six (6) ISAs have been completed: (1) Ventilation, (2) Uranyl Nitrate (UN) Bulk Storage, (3) Ammonium Diuranate (ADU) Conversion, (4) Uranium Recovery Recycling Systems (URRS) Safe Geometry Dissolver, (5) ADU Bulk Blending, and (6) Bulk Chemical Storage, Receipt, and Handling. Discussions with the licensee staff confirmed that the ISAs were maintained through the plant configuration control (Management of Change) process and a re-validation process is performed for each ISA on a five-year frequency. The remaining ISAs are scheduled to be completed before the date required by the new Part 70.

The inspector examined "Columbia Manufacturing Plant Configuration Control," procedure TA-500, Revision 10, dated September 10, 1998, including forms RAF-104-2, "Action Item Summary," and RAF-104-7, "Design Verification Checklist," to ensure that the management of change program is sufficient to evaluate any not-in-kind changes that can affect the risk-significant operations with highly hazardous chemicals at the facility.

Because the Management of Change (configuration management) process represents the primary management control for maintaining the ISA, the inspector reviewed and evaluated the documentation for two high consequence items: engineering packages for planned upgrades to the Hydrogen Fluoride (HF) storage tank area (docket 01-004) and Nitric Acid storage tank area (docket 01-005). A concern was noted because the bulk chemical ISA was not identified on the HF upgrade package. The licensee immediately corrected this omission, and reviewed other recent packages to verify that others had not been overlooked.

The inspector reviewed a number of configuration management packages in other plant areas:

- Install a bypass filter at pellet grinder for test only (docket 00-41)
- UF₆ line leak check engineered control (software change) (docket 00-065)
- Modify ADU line 5 for UF₆ gas (docket 00-101)
- Hydrolysis column pressure interlock (docket 00-158)
- Upgrade Safety Significant powder level switches (docket 00-194)

It was noted that although the ISA for the pellet area has not been completed, the configuration management package will carry references to the changes to be included therein.

The licensee explained the flow of information from the Area sketches, which identify the Passive Controls, Automatic Engineered Controls (AECs), and Administrative Controls (ADM).

C. Conclusions

The licensee is conducting appropriate ISAs for all high risk plant areas and processes. The ISAs are being maintained and revalidated on an appropriate frequency.

2. Safety Significant Controls (88056)

A. Scope

The inspector reviewed a sampling of the Sketches, listing Safety Significant Controls (SSCs) to identify the dominant hazards, dominant features for controlling those hazards, and major management measures that ensure that the controls are capable, available, and reliable. The inspector examined selected controls to determine their current status.

B. Observations and Findings

A "vertical slice" of passive and active safety-significant controls and management measures applied to high-risk operations in bulk chemical receipt, handling and storage, and the Conversion Process were selected for review from Chemical Operating Procedure Sketch 836038-1, Rev. 8, dated March 29, 2001. The inspector noted that each "sketch" of SSCs clearly identified the safeguards (e.g., controls) for all "important" (level B) and "safety margin improvement systems" (level C) levels of risks. There were no "crucial" (level A) SSCs listed. Other SSCs were reviewed in the Low Level Radioactive Waste (LLRW) area, draft sketch dated April 4, 2001. Once they are developed, the licensee maintains the "sketches" as current through the configuration control program.

The licensee stated that safety-significant interlocks are tested and verified to ensure that the hardware and software associated with automatic engineered controls function as described. Training is conducted for area personnel to ensure that they understand the operation of the safety significant equipment.

The inspector conducted system walkdowns of the highest risk areas: Hydrofluoric Acid (HF) storage tank(s), Anhydrous Ammonia tanks, Aqueous Ammonia tanks, and Nitric Acid storage tank and pump, including the newly-constructed Nitric Acid storage and pumping system.

C. Conclusions

Controls necessary to limit risks to an acceptable level were in place. The licensee's SSC development and verification is characterized as a program strength. The material conditions of safety significant control are adequate.

3. Maintenance (88062)

A. Scope

The inspector reviewed the preventive maintenance for several key safety controls related to the dominant chemical safety hazards identified in the ISAs. Implementation of those preventive maintenance requirements represents the principle management measure for ensuring the availability and reliability of important controls.

B. Observations and Findings

The inspector reviewed the status of preventive maintenance (PMs) performed to ensure that the safety significant controls are functioning satisfactorily. The licensee discussed the current 1-2 week backlog of maintenance activities and described the work planned for the upcoming inventory outage. Because functional tests represent a primary management method for ensuring that active engineered controls are capable, available, and reliable, the licensee's procedure for handling incomplete or failed tests includes an escalating scale of management involvement. There were no late or incomplete tests.

The inspector reviewed the MAPCON (Maintenance Planning and Control) list of tasks scheduled for the upcoming inventory outage. There were no functional tests planned during the outage.

The inspector reviewed a number of in-process work orders. They were flagged for Safety Significant equipment where appropriate. Cautions for HF, UF₆, live steam, and electrical hazards were noted. There were turnover/turnback steps to coordinate the work between Operations and Maintenance and a post-maintenance verification step. No safety concerns were identified.

The inspector interviewed maintenance planning and Conversion control room personnel regarding work in progress. Adequate coordination of work activities was in evidence.

C. Conclusions

The licensee is implementing an adequate maintenance and functional testing program to assure the availability and reliability of risk-significant safety controls for preventing or mitigating the consequences of fire or chemical releases. Personnel responsible for the implementation and monitoring of these programs were knowledgeable of their current status and there was no backlog for safety-significant items.

4. Conduct of Operations (88100)

A. Scope

The inspector observed a wide range of plant operations in the Tank Farm and Conversion areas, as well as the Conversion and Uranium Recovery & Recycle Systems (URRS) control rooms, to ensure that the facility was being operated and maintained in a safe manner.

B. Observations and Findings

The inspector examined the tank farm, conversion, incinerator, vaporizers, solvent extraction, ceramic (furnaces and pellet grinders), and manufacturing areas. Housekeeping and fire protection in these areas, postings, use of procedures, logbooks and data sheets, lock & tag practices, and industrial safety were satisfactory. Safety showers and eyewash stations were in good condition, with all tests current.

The inspector interviewed operations personnel and examined procedures for ongoing activities. Compliance with procedures is expected. The licensee has undertaken a major effort to revise procedures to increase the responsibility and accountability of operations personnel. Approximately 800 out of 1200 procedures have been completely re-written.

The inspector interviewed operators regarding powder handling, tank farm operations, conversion operations, solvent exchange, ceramic (furnace) operations, and low level radioactive waste handling, as well as some contractor personnel. The operators and contractors demonstrated an appropriate working knowledge of the risk-significant hazards and dominant safety controls for those hazards. No safety concerns were identified.

The inspector attended the daily plan-of-the day meeting with production, engineering, and maintenance groups.

As part of the initial badging process, the inspector viewed the site general employee safety training and took the multi-media computerized test that accompanied it. The inspector determined that the training provided an adequate introduction to chemical hazards on-site, and that the test was a good method for reinforcing the knowledge gained from the training module.

C. Conclusions

Observed plant operations were conducted in a safe manner. Operators were appropriately trained and knowledgeable of the risk-significant process safety controls.

5. Chemical Storage

A. Scope

The inspector reviewed the equipment and practices for the highest-risk bulk chemical storage facilities on site.

B. Observations and Findings

The inspector reviewed the licensee's consequence analysis report (JBFA, November, 1998) regarding the highest risk bulk chemical storage equipment, practices and operations, and examined those outdoor areas.

The inspector examined chemical storage areas for Hydrogen Fluoride (HF) Anhydrous Ammonia, Sodium Hydroxide, Aqueous Ammonia, Nitric Acid, and Uranyl Nitrate. Housekeeping, postings, and fence/gate controls were observed to be generally satisfactory in these areas.

It was noted that the NFPA "diamonds" at the HF storage area were posted on three (3) different signs: one designating the personnel protective equipment (PPE), one listing general hazards, and one on the storage tanks themselves. Only one sign listed the correct level for "Health Hazard." The licensee stated that the signs are being updated as part of a plant-wide effort, and will be part of a major upgrade of the HF storage tank area.

C. Conclusions

The licensee has taken steps to maintain appropriate controls on bulk chemical storage facilities on-site.

6. Incident Investigations (88065)

A. Scope

The inspector reviewed the licensee's issue tracking system, Corrective Actions Program (CAPs), to determine if issues and concerns are addressed adequately and promptly, commensurate with their safety and safeguards significance.

B. Observations

The licensee began the plantwide implementation of the Corrective Actions Program (CAPs) on April 1, 2001. CAPs is currently available online to limited employees who have access to a computer. CAPs will replace the licensee's existing Commitment Tracking System (CTS) and the licensee does not plan to include legacy issues in CAPs. The program encourages employees to identify issues and concerns and enter them into CAPs. The CAPs process includes the following steps: (1) issue prioritization based on significance level; (2) weekly review of issues; (3) assigning issue owners; (4) apparent or root cause analysis and identification of corrective actions; and (5) implementation of corrective actions. The inspector determined that satisfactory implementation of CAPs should address the concerns raised by VIO-2000-204-01 and IFI-2000-204-02

regarding the timeliness of completing corrective actions and a robust commitment tracking system.

The licensee discussed the current status of the CTS and backlog. There is one overdue item, which has a very low safety significance. The licensee has included this in an upgrade project for the solvent extraction area.

The inspector reviewed 2 event "data packs," including RAF-111-1, for an incident wherein a change was made to procedure COP-831019, adding HEPA filters to the filter disassembly process without undergoing a review by a criticality safety engineer. Appropriate root causes were listed in the data pack. The inspector verified that 3 of the 4 root causes had been addressed with proper corrective actions, and that the licensee concluded that these corrective actions would prevent a recurrence. Other root causes were addressed in procedure CA-002, Revision 18, dated January 31, 2001. This event is described in Inspection Report 2000-204.

C. Conclusions

The licensee has established a program to prioritize, analyze, and track potential safety and safeguards-significant issues. However, the licensee has not demonstrated the effectiveness of the program. Therefore, VIO-2000-204-01 and IFI-2000-204-02 will remain open.

7. Emergency Preparedness: Training Exercise (88064)

A. Scope

While the inspector was on site, the licensee conducted a training exercise for HAZMAT first responders and backup Emergency Operations Center (EOC) staff. The inspector observed activities in both the Command Post and EOC. The inspector attended a post-exercise debriefing with all participants.

B. Observations

The scenario for this exercise involved a discharge from a relief valve on an Anhydrous Ammonia storage tank with an injured individual nearby. Offsite support from the local fire department observed the exercise. A request for offsite emergency medical support was simulated. Notifications of offsite agencies (NRC and EPA) were simulated.

The inspector considered the training session to be well conducted. Participants were candid in bringing up issues and concerns during the post-exercise debriefing. The licensee identified both strengths and weaknesses in the emergency response area.

The licensee identified several lessons-learned from the training session. Three major issues identified were: (1) clear responsibilities for each responder, (2)

clear line of authority, and (3) communication. The licensee indicated that more training sessions will be conducted to address these issues. Further evaluation is also necessary to correct communication problems such as radio communication between responders and telephone communications for offsite responders and agencies.

C. Conclusions

The licensee is in the process of training all members of the onsite emergency response brigade. The licensee identified several issues related to communications. **These issues will be tracked as Inspector Follow-up Item IFI-1151/2001-201-01.**

8. Exit Meeting

The inspector met with Westinghouse management and staff throughout the inspection. The inspector presented inspection findings to members of the licensee's management and staff at an exit meeting on April 6, 2001. At the exit meeting, Westinghouse management and staff acknowledged the findings identified. No proprietary or classified material was discussed at the exit meeting.

ITEMS DISCUSSED

IFI-2000-204-02 During a previous inspection (see Inspection Report 2000-204), the inspector noted that the licensee acknowledged a concern and indicated that a new and more robust commitment tracking system would clarify corrective action responsibilities. The licensee has established a program to prioritize, analyze, and track potential safety and safeguards significant issues. However, the licensee has not demonstrated the effectiveness of the program. Therefore, this IFI remains open.

ITEMS OPENED

IFI-1151/2001-201-01 The de-briefing which followed the training exercise on April 5, 2001 identified some deficiencies in communication, such as: poor radio communication between the Incident Commander and Emergency Director, poor radio communication between the Incident Commander and some responders, and a telephone for contacting other off-site agencies which did not have an outside line. It is expected that resolution of these issues will be scheduled and tracked to completion.

LIST OF ACRONYMS AND ABBREVIATIONS

ADM	Administrative Control
ADU	Ammonium Diuranate
AEC	Automatic Engineered Control
CAPS	Corrective Actions Program
CCF	Configuration Control Form
EH&S	Environmental Health & Safety
EOC	Emergency Operations Center
ETAPS	Electronic Training & Procedure System
HAZOP	Hazard and Operability
HEPA	High Efficiency Particulate Air
HF	Hydrofluoric Acid
IH&S	Industrial Hygiene & Safety
ISA	Integrated Safety Analysis
LLRW	Low Level Radioactive Waste
NFPA	National Fire Protection Association
PPE	Personnel Protective Equipment
SSC	Safety Significant Control
URRS	Uranium Recovery & Recycle Systems

PARTIAL LIST OF PERSONS CONTACTED

C. Aguilar	ISE
R. Fischer	EH&S
D. Graham	EH&S
J. Heath	ISE
J. Hooper	ISE
J. Hranica	Product Assurance Engineering
S. McDonald	EH&S
J. Murrah	ETAPS Coordinator
A. Parker	Maintenance
C. Perkins	Maintenance
R. Williams	EH&S