

LICENSEE PERFORMANCE REVIEW FOR WESTINGHOUSE
ASSESSMENT PERIOD: January 9, 2000 to December 29, 2001

A. SAFETY OPERATIONS (Comprised of Chemical Safety, Criticality Safety, Plant Operations, Fire Safety, and Management Controls)

Safety Operations Program Strengths

- None

Safety Operations Needing Improvement

- Effective implementation of safety controls, particularly safety significant administrative controls in procedures and postings
 - Six apparent violations were identified as part of a Special Team Inspection to investigate the common mode failure of multiple criticality safety controls in the ADU process lines due to errors in the configuration of a system of programmable logic controllers. Five violations were cited in the subsequent NOV. One of these cited violations involved failure to follow procedures. *EA#01-174, IR 01-202 & PIM Item #292*

Section 2.0 of licensee procedure RA-107, Revision 10 (dated March 29, 2001), titled "Internal Reporting, and NRC Notification of Unusual Occurrences", states, in part, "...safety-significant events involving an inability to follow a procedure, or a process upset, shall be reported immediately to team managers and to Regulatory Affairs." Contrary to the above, on May 21, 2001, a process upset was not immediately reported by employees to the licensee Regulatory Affairs (renamed Environment, Health and Safety). The PLC on ADU Conversion Line 4 faulted at approximately 8:00 am, causing an upset of the ADU conversion process. At approximately 8:30 am, Conversion Line 4 was restarted and the Environment, Health and Safety section had not been notified of the process upset.

- Container spacing in the uranium powder mixing hoods was not adequate to meet criticality safety requirements and was identified as VIO 01-03-01. *IR 01-03*

**** NOTICE OF VIOLATION** The inspector observed that specific operations were typically being performed safely and in accordance with approved plant procedures and postings. However, on May 8, the inspector observed the improper spacing of containers in the uranium powder mixing hoods. The criticality safety postings for these hoods required that containers with more than a 4.5 inch depth be spaced at least 12 inches from any other container. The inspector observed that in three of the five process lines, polypaks containing Special Nuclear Material (SNM) were being stored in a configuration that was less than 12 inches from the nearest container of SNM. The inspector observed that the licensee's nuclear criticality safety analysis was based on mass and moderation control, and not on container spacing. However, the mass limit was implemented through the spacing requirements such that, if followed, an unsafe mass could not be accumulated in the hoods. The actual amount of material involved in any of the spacing violations did not approach the mass limits of the station, but the failure to follow the spacing limits created the potential for mass limits to be exceeded. These examples of the failure to follow posted safety requirements were identified as Violation (VIO) 01-03-01. This violation is similar to a violation cited in NRC Inspection Report 70-1151/2001-02. For that violation the licensee took short-term corrective actions described in a letter to the NRC dated April 30, 2001 that should have been adequate to prevent recurrence. The corrective action, however, was not adequate to prevent recurrence in that the current violation occurred. A notice of violation is therefore being issued for this violation.

- A container of contaminated incinerator ash was improperly stored and posed a potential for airborne contamination. *IR 01-02*

**** NEGATIVE FINDING** the inspector toured the LLRW processing and storage facilities (Southwest Expansion Area/Drum Storage Area) and observed a polypak container (number A90238) on a carrier (number 117) in the upright condition which appeared to be partially open. The licensee

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investigated this condition and noted that the polypak contained incinerator ash with approximately 19 grams U-235 content. In addition, the licensee stated that the incinerator ash was contained in plastic wrapping material. The inspector noted that the improper storage of this radiological material was not consistent with good radiological control practices which the licensee acknowledged and issued an Unusual Occurrence Report (Redbook Item). The polypak contents were then properly dispositioned. 02/16/2001

- Container spacing in the uranium recovery dissolver area elevator was not adequate to meet criticality safety requirements and was identified as Violation 01-02-01. *IR 01-02*

**** NOTICE OF VIOLATION** On February 27, the inspectors observed the improper spacing of containers in the uranium recovery dissolver area elevator. The elevator's criticality safety posting required that containers (or stacks of containers) be spaced at least 12 inches apart. The inspectors found that the spacing was easily achievable by placing containers in each corner of the elevator. The inspectors observed that one container placed in the center of the elevator was within six to eight inches of containers stored in the corners of the elevator. Although the container in the center of the elevator was found to be empty, the criticality control for that area relied on container spacing, so that mass controls were not necessary. The inspectors discussed this situation with licensee management for corrective action. On March 1, 2001, the inspectors observed similar improper container spacing in the uranium recovery dissolver area elevator. This time, two containers had been placed in the center of the elevator, but the spacing between containers was only about two inches and the containers in the center of the elevator were not empty. These two examples of the failure to follow posted safety requirements were identified as Violation (VIO) 01-02-01. 03/02/2001

- A violation of Section 3.4.1 of the License Application occurred for the failure to conduct radioactive materials package unloading activities in accordance with the requirements of chemical operating procedure COP-836041. The licensee's root cause determination and corrective actions to prevent recurrence were acceptable. *IR 00-03*

**** NOTICE OF VIOLATION** On May 2, 2000, the inspector observed the licensee perform incoming receipt surveys of 71 drums containing UNH crystals. The UNH crystals were received from the BWXT facility located in Lynchburg, VA on May 1, 2000, at approximately 10:45 p.m. Upon receipt, the licensee performed both direct radiation surveys and surface contamination surveys of the transport trailer containing the 71 drums of UNH crystals. The trailer was secured with a tamper safe seal which was not removed until May 2 at approximately 1:00 p.m. when the licensee began to perform individual surveys of the 71 drums containing the UNH crystals. The inspector observed the licensee perform direct surveys for alpha and beta/gamma radiation and surveys for removable surface contamination of five drums in accordance with regulatory operations procedure ROP-02-008, Surveys of Incoming Shipment of Radioactive Materials, Rev. 7, dated March 2, 2000. The licensee used appropriate instrumentation and survey techniques. Sufficient smears and measurements were taken in the most appropriate locations to yield a representative assessment of the non-fixed contamination levels. From a review of the records, none of the receipt survey results indicated that the limits specified in 49 CFR 173.441 or 173.443 were exceeded.

On May 3, 2000, the inspector observed licensee operators perform the opening of the package and removal of the UNH crystals from the inner packaging. This process was controlled by chemical operating procedure COP-836041, Receipt of Uranium Scrap Shipments from Outside Sources, Rev. 1, dated February 22, 2000. The inspector noted that an operator did not follow step 8 of COP-836041, which required placing the pail of UNH crystals on a clean piece of paper inside the UNH crystal enclosure hood. The purpose of placing the material inside the hood was to reduce the potential airborne radioactivity concentrations in the work area and contamination control. Instead, the operator opened the pail on the floor outside of the UNH crystal enclosure hood, removed the opened plastic bag of UNH crystals, and then placed the opened plastic bag of UNH crystals in the enclosure. The inspector noted that the COP-836041 was not available at the job location. Upon discovery of the procedural violation, a licensee representative immediately notified the area supervisor who temporarily ceased operations until corrective actions could be implemented. During the licensee's review, it appeared that not all of the operators were aware of Step 8 requirements.

After a review of the problem, the licensee determined that the primary root cause was that the processing of incoming scrap material was not a continuous operation. The operation was performed as

the material was received. The receipt of this material had been discontinued for several weeks due to the plant being shutdown for maintenance and inventory. Although the operator initially reviewed the chemical operating procedure, the operator did not review the procedure after the several weeks of not performing the operation. Part of the corrective action taken was counseling the operator about his actions and the necessity of following the procedures. In addition, all of the URRS operators were retrained on the procedure and on the importance of following all procedures. A secondary cause was the procedure had some sections which could be confusing. To prevent recurrence, the licensee had initiated the revision of COP-836041 so that the requirements for opening the packages were delineated in a clearer manner. All procedures are currently being revised by an outside professional procedure writing group. This procedure has been given a priority status for revision. The inspector determined that the information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence was adequately addressed. The inspector discussed the event with licensee representatives, and indicated that a violation of Section 3.4.1 of the License Application occurred (VIO: 70-1151/00-03-01: Failure to conduct radioactive materials package unloading activities in accordance with the requirements of COP-836041).
05/04/2000

- Consistency and clarity of procedures for safety related operations and functions

- The licensee's process support procedures adequately covered the steps to take during off-normal conditions or loss of utilities. However, the procedures for sampling recycled material from the erbia process for moisture was not consistent with the licensee's safety analyses. The inspectors informed the licensee that prior to introducing uranium recycle material generated from the erbia process to the blender, this discrepancy must be corrected. *IR 01-07*

**** NEGATIVE FINDING** The inspectors reviewed the licensee's general support procedures for the erbia process operations. This included procedures for safety significant laboratory analyses, operation of utility systems, and performing functional verifications of safety controls. The inspectors also reviewed procedures for the operation of nearby equipment that used flammable gases. The inspectors found that the procedures for utilities adequately covered the steps to take during off-normal conditions or loss of utilities. The inspectors found that the procedures for performing functional verifications of safety provided adequate instructions for testing the functionality of safety controls, and that all engineered safety controls identified in the licensee's safety analyses were covered by the procedures. The inspectors observed portions of the functional tests being performed and found them to be well planned and adequate to verify the functionality of the safety controls.

Since moderation control in the unfavorable geometry blender was the sole method for ensuring criticality safety of the blender, the inspectors reviewed the procedures for sampling and analyzing materials added to the blender. This included procedures for sampling recycled uranium oxide powder from the erbia process that did not previously meet specification. The inspectors found that the procedures for sampling this recycled material was not consistent with the licensee's safety analyses. The inspectors found that the ISA used to approve the license amendment required that all powder added to the blender be confirmed to be less than a prescribed moisture limit by two independent laboratory analyses. However, the sampling procedures involved performing composite sampling of multiple containers of recycle material for the first analysis, and randomly sampling a small number of these containers for the second moisture overcheck analyses. The inspectors pointed out that these sampling methods were not adequate to confirm that all powder added to the blender was less than the moisture limit. The inspectors discussed the situation with the NRC license reviewer and subsequently informed the licensee that prior to introducing uranium recycle material generated from the erbia process to the blender, this discrepancy must be corrected. This would involve either changing the sampling procedure to match the safety analysis or revising the safety analysis and obtaining approval of the revision from the NRC licensing function. The licensee stated that the erbia blending process would have to be operated a considerable time before it generated enough recycle material to add back to the process. Thus, the correction of this discrepancy did not affect the initial start-up of the blending process. 10/12/2001

- Four examples were found where control documents were not maintained current and up-to-date. A formal procedure delineating the responsibility and required actions governing the formal review and approval of changes to the SEP and Emergency Procedures (EPs) did not exist. *IR 01-06*

**** NEGATIVE FINDING** No procedure changes were made since the last inspection. The licensee discussed during the inspection intentions to completely rewrite the procedures after Plan changes were approved. Control copies of procedures were checked at several different locations and four examples were noted where a procedure may have been revised, but had not been replaced. The licensee took immediate action to replace any superceded copy with the current version. Regarding the administrative system for the review and approval of changes to the SEP and EPs, the inspector was informed that a procedure delineating responsibility and required actions governing the formal review and approval of the SEP and EP's did not exist. The licensee acknowledged the need for such procedure and committed to the development and implementation of a procedure governing the review and approval of changes to the SEP and EPs. 07/13/2001

- Revisions to safety requirements for storage of waste drums were not posted in a timely manner. *IR 00-06*

**** NEGATIVE FINDING** The inspector observed the storage of licensed material throughout the facility. The inspector observed that waste drums were being stored in arrays and racks in the southwest expansion area of the facility. The inspector observed three different criticality safety postings in the area, each with differing (and sometimes conflicting) requirements for the same storage containers. The inspector discussed the inconsistencies with the area safety engineer and found that the postings had been recently revised to accommodate storage of containers moved from the southeast expansion area to make space for the BAES project (see Section 2.a). However, the licensee had not completed replacing the postings prior to relocating the containers. The inspector found that the containers were being stored in accordance with the revised posting. The licensee completed replacing the postings before the end of this inspection. 11/17/2000

- Operating procedure for handling and shredding contaminated HEPA filters instructed workers contrary to the approved Criticality Safety Evaluation. *EN#37189*

**** LICENSEE EVENT REPORTS** The licensee discovered an inadequate procedure during a routine audit when it was found that an administrative safety control identified in a Criticality Safety Evaluation (CSE) was not properly proceduralized. The inadequacy occurred in the method for handling and disposing of used HEPA filters. Typically, used HEPA filters are scanned upon removal from process. If the scan value is less than 5 grams U235 per 10 liters, the filter media is removed from the filter frame, shredded, and sent to an incinerator. According to the CSE, if the scan value is greater than 5 grams U235 per 10 liters, the filter media is to be bagged and sent directly to the incinerator without shredding. The shredding process evidently aids in the combustion of the filters. Filters that have a high scan value are not to be processed through the shredding system because the shredder - hopper and receiving barrel are of unfavorable geometry. The procedure for processing filter media with high scan values instructed the operators to "place paper filter media into a 30-gal paper bag for shredding", which is contrary to the CSE assumptions that high scan media is not to be shredded. This operation was being performed per the approved operating procedure, and high scan media was being shredded prior to incineration. The CSE documented the prevention of shredding the high scan filter media as an administrative criticality safety mass control. Thus when it was discovered that the operating procedure instructed operators to shred the high scan filter media, the licensee determined that this constituted a loss of one criticality control. 07/26/2000

- The Site Emergency Plan (SEP) and the Emergency Procedure governing evacuation and accountability were inconsistent regarding the location for evacuees to assemble. *IR 00-04*

**** NEGATIVE FINDING** Section 7.0 and Figure I of Emergency Procedure A-03 entitled "Evacuation and Accountability" was determined to be inconsistent with Section 5.4.1.2 and Figure 5.1 of the SEP. The inconsistency was associated with the assembly location following a plant evacuation. The referenced sections of the SEP reflected two locations (south gate near the guard shack, and the flagpole near administration building) whereas the procedure included only the flag pole. The licensee contact indicated that the procedure was correct and the SEP required a revision for consistency with the procedure and general employee training material. The inspector conducted interviews regarding evacuation and assembly locations with randomly selected employees and discovered that procedures and training discussed a single location (flag pole) and the SEP required updating as indicated by the licensee contact. The inspector informed the licensee of bulletin board locations where the evacuation

diagram posted was identical to the diagram in the SEP (showing two assembly points). In response the licensee expressed plans to conduct a site wide inspection to replace evacuation diagrams with the correct information and update the SEP information. Additional procedural reviews identified incorrect references that were discussed during a previous inspection but had not been resolved. Consequently, the inspector informed plant management during the exit interview that lack of attention may have resulted in repeat errors and management attention may be necessary to resolve the errors. 06/30/2000

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Projected Challenges to Performance in Safety Operations

- Continued improvement in corrective action program.

- Inadequacies in Corrective Action Program were identified in first half of LPR period.

The licensee identified two violations involving the package effectiveness for fuel assembly shipping containers during April 2000. The corrective actions for the administrative problem appeared to be adequate to prevent recurrence. However, a violation for the failure to assure prompt correction of identified shipping container non-conformances was identified. IR 00-03

Corrective actions to Violation 00-02-02 were not completed by the date committed to NRC. IR 00-06, VIO 00-02-02.

A violation was identified for the licensee's failure to complete corrective actions from the 1998 vaporizer level probe event and for the failure to conduct an adequate root cause analysis of the 2000 vaporizer level probe event. IR 00-204

- A formal Corrective Action Process (CAPs) was implemented in 2001 to better track and respond to issues requiring corrective actions.

Recommended NRC Effort in Safety Operations

- Continue increased inspection effort in criticality safety. Focus on the deficiencies in the

implementation of safety controls.

- Increase inspection effort in plant operations with emphasis on the deficiencies in the implementation of safety controls and the clarity of safety significant operating procedures.
- Maintain baseline inspection effort in management controls with emphasis on effectiveness of the corrective action program.
- Maintain the baseline inspection efforts in the areas of fire safety, chemical safety.

B. SAFEGUARDS (Comprised of Material Control and Accounting (MC&A) and Physical Protection)

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C. RADIOLOGICAL CONTROL (Comprised of Radiation Protection, Environmental Protection, Waste Management, and Transportation)

Radiological Control Program Strengths

- None

Radiological Control Needing Improvement

- Continuing problems with coordination and control of transportation program to assure the safety of shipped packages of radioactive materials.
 - Weld repairs to MCC-3 shipping containers were made by Westinghouse employees that had been trained by a contractor that was not on the Westinghouse Qualified Supplier List. In October 1999, it was determined that several Model MCC-3 shipping containers had an incorrect weld pattern on the top shell. At that time all containers with this weld pattern were taken out of service and a plan was developed to add welds to meet the licensed drawing requirement. The plan involved using Westinghouse welders who were certified to the requirements for welding safety related parts on shipping containers. However, the welders had received their training and certification from the same supplier that was already under contract to provide general welding services. This supplier was not on the Westinghouse Qualified Supplier List (QSL). Westinghouse issued a blanket purchase order to the supplier to provide the ASME code welding certification services. Blanket purchase orders with existing suppliers for maintenance services are not generally routed through Product Assurance. Had a separate purchase order been issued for shipping container welding, the Purchasing Department would have routed the requisition to Product Assurance for approval. Product Assurance would have denied the requisition because the requested supplier was not on the Westinghouse QSL (IR 00-03).
 - The bottom nozzle holddown assemblies for the MCC-5 shipping containers were found to not have been fabricated by a qualified vendor as required by the licensee's QA program. The bottom nozzle holddown assembly is used exclusively with the MCC-5 shipping container, to help secure the VVER- 1000 fuel assembly in the container. Neither the MCC-3 or MCC-4 containers are involved. All bottom nozzle holddown assemblies for these containers were fabricated by the same supplier in 1995. Fabrication records indicate that the assemblies were correctly manufactured in accordance with requirements for safety-related items. Westinghouse Product Assurance verified that the assemblies were manufactured in strict accordance to drawings and specifications. The criteria for Category A safety-related items and Category B safety-related items are essentially the same, a primary difference being that it is not necessary that Category B items be manufactured by a qualified supplier (non-cited violation IR 01-05).
 - Bolts missing from packages containing fissile material shipments (pellets) contrary to Certificate of Compliance. On or about July 9, 2000, it was determined that two Model DHTF packages that had been used for fissile material shipments from the Westinghouse Columbia facility to the Westinghouse Hematite facility did not meet the package description requirements contained in the NRC Certificate of Compliance Number USA/9203/AF. The certificate calls for eight bolts to be used to secure the lid to the containment vessel. While unloading the DHTF packages at the Westinghouse Hematite facility, it was discovered that drum 0108 and drum 0519 were missing two bolts adjacent to each other. In addition drum 0519 was missing a third bolt. It was subsequently determined that several DHTF packages that had been used for fissile material shipments between the Westinghouse Columbia facility and the General Electric, Wilmington NC, facility were also missing bolts. (LER dated 08/07/00)
 - A violation was identified for shipment of three uranium hexafluoride (UF₆) cylinders on December 7, 2000, with radiation levels in excess of the limits in 10 CFR Part 71.47 and 49 CFR Part 173.441 (IR 01-01).
 - The licensee inadvertently returned UNH crystals to BWXT in a container labeled as "empty", resulting in the failure to comply with hazard communication requirements, including those for shipping papers, shipper's certification, and package labeling; radiation survey requirements, licensed material control and storage requirements; and the package documentation requirements of 49 CFR 173.415(a) was identified as an apparent violation of 10 CFR 71.5; 49 CFR 170 through 189; and 10 CFR 20. (IR 01-08)

- The inadvertent shipment of the wrong fuel rod as part of a fuel assembly was determined to be a non-cited violation (NCV). (IR 01-203)

Projected Challenges to Performance in Radiological Control

● Maintaining contamination control and controlling exposures ALARA

- On February 7, 2000, a spill of uranyl nitrate solution resulted in a reportable event due to fixed contamination levels discovered on an outdoor concrete pad (70-1151/2000-02, Paragraph 2.c).
- The incinerator ash screening hood was in poor condition and susceptible to producing airborne activity problems (70-1151/2000-06, Paragraph 2.a).
- The inspector discussed numerous examples of poor housekeeping including visual, gross contamination that was observed during facility tours and the impact of poor housekeeping on exposures (70-1151/2001-03, Paragraph 4.b).
- Exposure results as of June 2000 were trending higher than CY 99 as evidenced by the maximally assigned total effective dose equivalent (TEDE) for CY 2000 exceeding the maximally assigned for CY 99 after only six months (70-1151/2000-04, Paragraph 3.b).
- During calendar year (CY) 2000, three (3) individuals exceeded the licensee's administrative dose limit of four (4) rem TEDE. The site collective exposure for CY 2000 increased more than 80 percent over CY 99, but no regulatory limits were exceeded. The maximum assigned TEDE in CY 2000 (4.18 rem) was the highest since CY 96 (3.41 rem) (70-1151/2001-03, Paragraph 4.a).
- The inspector discussed numerous examples of poor housekeeping including visual, gross contamination that was observed during facility tours and the impact of poor housekeeping on exposures (70-1151/2001-03, Paragraph 4.b).
- The maximum assigned TEDE in CY 2000 was the highest since CY 96 (70-1151/2001-03, Paragraph 4.a).
- During CY 99, the ALARA goal of two (2) rem was exceeded but no worker exceeded the TEDE administrative limit. In contrast, during CY 2000, both the ALARA goal and administrative limits were exceeded (70-1151/2001-03, Paragraph 4.a).
- The negative trend in exposure was evidenced by the increase in the maximum assigned CEDE (8 and 28 percent in CY 99 and 2000 respectively), and the site collective TEDE (48 and 82 percent) in CY 99 and 2000 (Paragraph 4.b).

● Maintain existing contaminated groundwater below licensee action levels.

- The inspector reviewed the licensee's 2000 quarterly (first three quarters) groundwater sampling results and observed that the average gross beta activity levels for monitoring wells 7, 10, 15, and 32 exceeded the licensee's action level of 50 pCi/l with results of 403, 75, 155, and 1424 pCi/l respectively. Previous inspections (see reports 70-1151/98-01, 99-01, and 2000-01) 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 2000 showed that the activity had stabilized, indicating that the licensee's corrective actions (i.e. sealing of cracks in CRB floor trenches, etc.) had effectively neutralized the technetium source term. In addition, the inspector noted that the average 2000 gross beta activity levels for down-gradient groundwater monitoring wells 26 and 3A were approximately <2 pCi/l and 28 pCi/l respectively, which was consistent with 1999 data, indicating minimal down-gradient migration of the technetium-99 contaminated groundwater plume. The inspector also noted that average gross alpha and gross beta activity levels in groundwater monitoring well 30 (in the vicinity of the water treatment facilities (WTFs)) had exceeded the licensee action levels of 15 pCi/l (72 pCi/l gross alpha) and 50 pCi/l (110 pCi/l gross beta) during the first three quarters of 2000. Well 30 had historical contamination problems as observed in previous inspections (see reports 70-1151/98-01, 99-01, and 2000-01) due to leakages from the water treatment processing area. The inspector also observed the acquisition of surface water and environmental air samples and noted that representative samples were being obtained. 02/16/2001 (IR 01-02)
- A 50 gallon spill of uranyl nitrate solution occurred into a diked area at the HF spiking station on October 29th.

Before area operators could clean up the spill, it had seeped through a hole in the dike down into the concrete subflooring. The licensee plans to repair the dike and continue using the spiking station until an alternate spiking station can be brought on line at the end of November. The licensee will then remediate the concrete subflooring and any contaminated soil below it. (*One liners for 11/1/01*)

- Ensure the concentrations in liquid effluent releases to the Congaree River are at levels as low as reasonably achievable.

- Radiological activity in liquid effluents had increased approximately 21 percent during the first half of 1999 versus last half of 1998 levels. The licensee had formulated an action plan and had implemented corrective actions in order to reduce radioactivity in liquid effluents. Preliminary data indicated that activity concentrations had been reduced to acceptable levels by implementation of the licensee's corrective actions. (*IR 00-01*)

**** DESIGN ISSUES** The total activity released during the first half of 1999 had increased approximately 21 percent over last half of 1998 totals. In addition, the inspector noted that liquid effluent concentrations during the first three quarters of 1999 had averaged approximately $5.0 \text{ E-07 } (\mu\text{Ci/ml})$ in comparison to the unrestricted release limit goal of $3.0 \text{ E-07 } \mu\text{Ci/ml}$. The licensee stated that one major reason suspected for this increase in liquid effluent concentrations was increased solubility of uranium in effluents due to acidic conditions in the East Pond. The licensee had formulated an action plan to minimize uranium activity in liquid effluents and had instituted corrective actions. The inspector noted that the October liquid effluent activity concentration had decreased to approximately $2.6 \text{ E-07 } \mu\text{Ci/ml}$ after completion of the licensee's corrective action of neutralization of acidic drainage to the East Pond from the de-Ionized WTF cation regeneration process. 02/04/2000

- Total radiological activity in liquid effluents had increased approximately 243 percent during 2000 as compared to 1999 levels. (*IR 01-02*)

**** NEGATIVE FINDING** The total activity released during 2000 (124.0 mCi) had substantially increased (approximately 243 percent) over the total activity levels observed during 1999 (51 mCi). The licensee indicated that this increase 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 observed that the licensee's procedure (COP-831201, Revision 21) stated that if the tank solution radiological activity exceeded $3.0\text{E-06 } \mu\text{Ci/ml}$ (gross alpha), tank 1187 contents were to be treated with caustic (sodium hydroxide) to induce uranium precipitates which would then be removed by recirculation through a filtration unit. The process was to be repeated if additional sampling indicated that the radiological activity was still in excess of $3.0\text{E-06 } \mu\text{Ci/ml}$. The inspector reviewed data for several tank batches and observed that the first treatments did not sufficiently reduce the gross alpha activity concentration to less than $3.0\text{E-06 } \mu\text{Ci/ml}$. The inspector observed that there were no redundant tanks (or excess volume capability) and that if tank 1187 was filled close to the overflow level, the tank was released to the east lagoon even if the radioactivity level was still above the $3.0\text{E-06 } \mu\text{Ci/ml}$ administrative limit. The inspector noted that for the first three quarters of calendar year 2000, these releases above the administrative limit had caused several monthly effluent averages (process stream and miscellaneous stream (tank 1187 pathway)) to show an increase in gross alpha activity above the levels normally observed (approximately $5.0 \text{ E-07 } \mu\text{Ci/ml}$ in comparison to the unrestricted release limit goal of $3.0 \text{ E-07 } \mu\text{Ci/ml}$). The licensee had investigated the increase in radioactivity in liquid effluents and had formulated administrative actions to reduce radioactivity contributions to final liquid effluents via the miscellaneous (i.e. showers, etc.) stream pathways feeding tank 1187. The inspector observed that the administrative corrective actions instituted by the licensee had resulted in a reduction in liquid effluents to levels consistent with and below the unrestricted release limit goal of $3.0 \text{ E-07 } \mu\text{Ci/ml}$ during the last quarter of calendar year 2000. (02/16/2001)

- Re-certification of older transportation containers from the newly acquired Combustion Engineering Facility.

Recommended NRC Effort in Radiological Control

- Increase inspection effort in transportation to 2 per year with emphasis on the quality

control and quality assurance programs.

- Maintain baseline inspection effort in other Radiological Control areas with emphasis placed on maintaining personnel exposures and liquid waste releases as low as reasonably achievable.

D. FACILITY SUPPORT (Comprised of Maintenance and Surveillance, Training, and Emergency Preparedness)

Facility Support Program Strengths

- None

Facility Support Areas Needing Improvement

- Maintenance, surveillance and testing to prevent failures that cause degradation of radiological and criticality safety controls
 - A 50 gallon spill of uranyl nitrate solution occurred into a diked area at the HF spiking station on October 29th. Before area operators could clean up the spill, it had seeped through a hole in the dike down into the concrete subflooring. The licensee plans to repair the dike and continue using the spiking station until an alternate spiking station can be brought on line at the end of November. The licensee will then remediate the concrete subflooring and any contaminated soil below it. *One liners for 11/1/01*
 - Several safety controls associated with the ADU conversion process were found to be incapable of performing their intended function upon fault conditions from the programmable logic controllers. (*EN # 38020*). Several apparent violations were identified as part of a Special Team Inspection to investigate the common mode failure of multiple criticality safety controls in the ADU process lines due to errors in the configuration of a system of programmable logic controllers (*IR 01-202*). The violations were combined into a Severity Level III NOV.

**** ESCALATED ENFORCEMENT ISSUE** On May 21, 2001, a faulting of a programmable logic controller (PLC) caused the decanter portion of the ammonium diuranate conversion process (Line #4) to trip off line. The decanter tripping off line secured the uranium flow from the precipitation column to the decanter. Since the flow from the precipitation column had been secured, a high level interlock tied to the faulted PLC failed to isolate the precipitation column before feed overflowed onto the process floor. The conversion line was shut down while instrument technicians reset and tested the PLC. Upon completion of testing, Conversion Line #4 was restarted, and operated for more than 30 minutes before another process upset (i.e., plugged duplex valve) shut the process down again. At that time, the process engineer, who was in the area on unrelated activities, identified the safety significance of the earlier event, and contacted nuclear criticality safety. The nuclear criticality safety engineer determined that all active engineered controls on Conversion Line #4 were disabled for approximately six minutes.
 - The Incinerator Ash Screening Hood was in poor condition and susceptible to producing airborne activity problems. *IR 00-06*

**** NEGATIVE FINDING** The inspector observed that the Incinerator Ash Screening Hood was in poor condition, with its plexiglass window being held in place with duct tape. A note had been taped to the hood warning operators to keep the box clean because of past problems with airborne activity associated with that station. Although the airborne activity had recently been lowered due to improvements in ventilation, the licensee's management examined the hood, agreed that repairs were needed to the station, and initiated corrective action. 11/17/2000
 - On February 7, 2000, a spill of uranyl nitrate solution occurred in the UF6 bay near the HF Spiking Station. The solution seeped through a wall around piping penetrations and onto an outdoor concrete pad. Initial surveys of the pad showed contamination levels below reportable limits. However, a layer of soil was removed from the top of the pad during the cleanup operation, and subsequent surveys on 2/25/00 revealed a more significant amount of contamination in the concrete. Contamination levels averaged 133 dpm/100 cm² alpha removable and 6,000 dpm/100 cm² fixed alpha in the concrete. The licensee determined that the fixed contamination was reportable per 10 CFR 70.50(b)(1). The inspection found that the uranyl nitrate piping system was not adequately being maintained per the plant

configuration control program and was identified as part of Violation (VIO) 00-02-02. *EN #36727 & IR 00-02*

**** NOTICE OF VIOLATION** The inspector reviewed the licensee's procedure for configuration control in the manufacturing plant. The inspector observed various areas of the licensee's uranyl nitrate piping system, including the area involved in a recent contamination event (see Section 2.c). The licensee indicated that the contamination event was due to the failure of a piece of threaded pipe on a uranyl nitrate sample port. The inspector reviewed the drawing referenced by the system's Integrated Safety Assessment (ISA) and noted that the drawing was last updated in April 1998. The drawing indicated a piping specification of welded construction, with the provision that threaded connections could be used when adequate work space was not available for welding, or when adapting to threaded instrumentation or equipment. Neither of these provisions applied to the failed piping that led to the contamination event. The inspector also found that drawing included a piping manifold with six valves that had been removed from the manufacturing area without being reviewed and approved through the configuration control program. Although the removed valves were no longer being used, this rendered the process information referenced by the ISA inaccurate. The inspector also observed the uranyl nitrate piping in several other areas of the plant and found places where threaded fittings had been used instead of the specified welded fittings. All of these findings are examples of failure to maintain safety-related operations per the plant configuration management program and are identified as Violation (VIO) 00-02-02.

- Ensuring operators, contractors, and emergency brigade members are given needed safety-related training.

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- Inspector Followup Item (IFI) No. 70-1151/2000-203-01 was opened to track the upgrading of electronic training records for SNM operators. *IR 00-203*

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**** NEGATIVE FINDING** During the item control performance test, the MC&A training records for

12 employees were selected for auditing. The inspectors could not verify that specific MC&A-related job capabilities, required by the operators' job descriptions, corresponded to the training records in the Electronic Training and Procedure System (ETAPS). ETAPS data also does not correspond to the hardcopy training records. Due to the inconsistent and confusing status of the licensee's electronic training records, operators could possibly miss required MC&A training. The associated risk is that untrained operators may incorrectly measure SNM or inaccurately record MC&A data, which could contribute to or mask an SNM loss. 10/20/2000

- IFI No. 70-1151/2000-203-02 was opened to track the conducting of required measurement control training by year's end, and the associated upgrade from written measurement control tests to computer-based training. *IR 00-203*

**** NEGATIVE FINDING** With regard to plant-wide measurement control training, the inspectors found that this has not been conducted since early 1999, although in Section 4.2.7(c) of the FNMCP the licensee has committed to conducting this training annually. Thus, it appears that at least 200 plant personnel may not have been trained in measurement control procedures and requirements for over 18 months. The delay is due to the licensee is moving from paper-based training to computer-based training on the internal website. This has not progressed according to plan. The licensee stated to the inspectors that measurement control training will therefore be conducted using written tests by the end of calendar year 2000. The inspectors opened IFI No. 70-1151/2000-203-02 to track this commitment. The associated risk is that new or transferred employees may fail to perform required standards measurements or otherwise incorrectly perform and/or record such measurements. There is also a risk that out-of-control standards measurements may not be investigated and resolved on a timely basis. This could adversely affect the variance components used to calculate the standard error of the inventory difference (SEID), a key performance indicator. 10/20/2000

- A violation was identified for failure to provide two (2) workers with radiological protection training and monitoring for internal exposure. *IR 01-03*

**** NOTICE OF VIOLATION** The implementation aspects of RCWP 99-001, dated January 31, 1999, entitled "Painting Walls for Chemical Area," was reviewed by the inspector. The qualifications for personnel performing work under the RCWP were reviewed and a violation was identified for failure to provide individuals Radiation Safety training and failure to perform baseline and/or termination bioassays. 05/11/2001

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- Contractor training for operator's in receiving area is informal compared to the that of licensee employees. *IR 01-08*

Since appropriately conducted training would provide assurance that personnel were aware of their safeguards duties, the inspectors reviewed training for personnel assigned to this SNM receipt area. The

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inspectors determined that documentation existed that indicated that contractor personnel in the area had reviewed and discussed the procedures that controlled their job duties. However, the inspectors noted that contractor staff had documented this activity in paper records instead of the on-line system used by Westinghouse personnel. Contractor and Westinghouse management had already noted this difference and were re-instructing personnel in procedural requirements and requiring procedural sign-offs in the on-line Westinghouse system.

- During a training exercise for HAZMAT first responders and backup EOC staff, the licensee identified the need for more training to clarify roles, responsibilities, and communications issues (70-1151/2001-201, Paragraph 7.b).

Projected Challenges to Performance in Facility Support

- None

Recommended NRC Effort in Facility Support

- Maintain baseline inspection effort in emergency preparedness and training with emphasis on methods for ensuring required training is received by licensee personnel.
- Increase inspection effort in maintenance to focus on surveillance of engineered radiation safety controls and electronic control systems.

E. SPECIAL TOPICS (Comprised of Licensing, the Fundamental Nuclear Material Control (FNMC) Plan, and Security Plan)

Special Topics Program Strengths

- None

Special Topics Needing Improvement

- None

Projected Challenges to Performance in Special Topics

- None