



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

NOV 21 1990

Report No.: 70-1151/90-10

Licensee: Westinghouse Electric Corporation
Commercial Nuclear Fuel Division
Columbia, SC 29250

Docket No.: 70-1151 (Fuel Division)

License No.: SNM-1107

Facility Name: Westinghouse Electric Corporation - Columbia Plant

Inspection Conducted: October 29 - November 2, 1990

Inspector: James L. Kreh 19 Nov. 1990
J. L. Kreh Date Signed

Accompanying Personnel: W. S. Pennington, NRC HQ

Approved by: E. D. Foster for W. H. Rankin 11/19/90
W. H. Rankin, Chief Date Signed
Emergency Preparedness Section
Radiological Protection and Emergency
Preparedness Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection was conducted to assess the adequacy of the licensee's emergency preparedness program with respect to the following program elements: (1) Site Emergency Plan, implementing procedures, facilities, and equipment; (2) coordination of emergency planning with offsite support organizations; (3) fire protection; and (4) conduct of the annual emergency response exercise.

Results:

In the areas inspected, no violations or deviations were identified. The emergency preparedness program was found to be properly managed and maintained in compliance with license requirements. The licensee's annual exercise was an overall success in demonstrating the capability to protect the health and safety of the public as well as plant personnel.

REPORT DETAILS

1. Licensee Employees Contacted

J. Allen, Manager, Technical Services
R. Fischer, Senior Engineer, Regulatory Engineering (Site Emergency Plan Coordinator)
W. Goodwin, Manager, Regulatory Affairs
J. Heath, Manager, Regulatory Operations
J. Hooper, Regulatory Engineer
E. Keelen, Manager, Manufacturing
R. Koga, Plant Manager
B. Lewis, Lead Supervisor, Conversion Area
E. Reitler, Jr., Manager, Regulatory Engineering
E. Steck, Manager, Conversion
R. Williams, Fellow Engineer, Regulatory Engineering

All persons listed above attended the exit interview.

Other licensee employees contacted during this inspection included security force members, technicians, and administrative personnel.

2. Site Emergency Plan and Implementing Procedures (88050)

The Site Emergency Plan (SEP) and associated implementing procedures, which were known as the Columbia Site Emergency Procedures (CSEPs), were reviewed to determine whether changes had been made since the last routine inspection in the area of emergency preparedness (March 1990), and to observe how any such changes may have affected the licensee's emergency response capability.

Except for notification lists in CSEP-0013 which were updated quarterly (most recently on September 30, 1990), the SEP and CSEPs had not been revised since May 24, 1989, and have been reviewed in detail during previous inspections. On April 30, 1990, the licensee submitted a license renewal application which included a revision of the SEP to address the changes in emergency planning requirements as promulgated in 10 CFR Part 70, effective April 7, 1990. This proposed revision of the SEP has been reviewed by NRC Headquarters and Regional staff but not yet approved. An NRC letter of October 10, 1990 stated that the licensee needed to provide certain additional information before final action could be taken with regard to approval of the SEP revision of April 30, 1990.

During the March 1990 inspection, it was learned that the licensee had forwarded the draft SEP revision on February 28, 1990, to seven offsite support agencies for their comments, but had allowed those agencies only until April 2, 1990 (33 days) to respond. The inspector noted at that time that the new 10 CFR 70.22(i)(4) required the licensee to allow offsite response organizations 60 days to comment on SEP revisions before

submittal to the NRC. During the current inspection, it was verified that the licensee had informed each of the referenced agencies in writing that the comment period was being extended to April 30, 1990 (60 days total). This action fully resolved the previously expressed concern.

No violations or deviations were identified.

3. Emergency Facilities and Equipment (88050)

The inspector examined facilities, equipment, and supplies which were designated for emergency use, including the following: Health Physics emergency cabinets (2), Conversion Area emergency container, Emergency Vehicle (equipped for fire and rescue response), self-contained breathing apparatus (SCBA) at various locations, and the Emergency Control Center. Selected records of surveillance checks of the above were also reviewed. Except as discussed below, all equipment and supplies were found to be properly maintained, and radiological monitoring instruments were in current calibration.

During the March 1990 inspection, it was noted that the field emergency meteorological equipment in the office area Health Physics emergency cabinet was not carried on a maintenance or calibration program, in spite of the statement in Section 6.5.1 of the SEP that this equipment would be maintained. This situation was corrected through establishment of procedure MCP-202080, "Calibrating Young Wind Vane and Anemometer," Revision 0, dated September 17, 1990. The subject equipment underwent maintenance and calibration on May 1, 1990, and MCP-202080 was designated to be performed annually henceforth. This action fully resolved the previously expressed concern.

Two equipment problems were noted in the Conversion Area emergency equipment storage container, a modular "box" about 6 ft. by 12 ft. which was located at the South Assembly Area. The installed lighting in this container did not function, a possible impediment to an emergency response occurring at a time of darkness. The licensee began corrective action immediately upon identification of this discrepancy. It was also noted that, fully 24 hours after the termination of the exercise, the two SCBAs specified for the subject container had not yet been returned to standby availability. This equipment was back in place in the emergency container on the following day (i.e., the second day after the exercise).

No violations or deviations were identified.

4. Coordination with Offsite Support Agencies (88050)

The inspector held discussions with licensee representatives regarding the coordination of emergency planning with offsite support agencies. Written agreements, all updated since 1989, existed with the State of South Carolina, Columbia Fire Department, Richland County Sheriff's Office, Richland County Emergency Medical Services, Richland Memorial Hospital, and the Department of Energy/Savannah River Operations. The inspector

verified through these discussions and a review of records that the licensee was periodically contacting local support agencies for purposes of offering training and maintaining familiarization with emergency response roles. The most recent training given to offsite support groups was an orientation course at the licensee's facility on October 23, 1990, with participation by representatives of South Carolina Department of Health and Environmental Control, South Carolina Emergency Preparedness Division, Richland County Emergency Preparedness Agency, Richland County Emergency Medical Services, and Columbia Fire Department.

No violations or deviations were identified.

5. Fire Protection Program (88050)

The inspector discussed this area with a cognizant licensee representative, reviewed applicable documentation, and inspected selected equipment. An upgrade in this program occurred since the March 1990 inspection with the completion of detailed prefire plans for the various sections of the main plant as well as outlying structures. The licensee was using the prefire plans in Emergency Brigade training, in responding to any fire that might occur, and in identifying possible improvements in the fire protection methodology for a given area of the plant.

The inspector reviewed the report of an April 1990 audit of the fire protection program by American Nuclear Insurers (ANI). The licensee appeared to be reasonably responsive to ANI suggestions for improvement.

The inspector reviewed records generated since March 1, 1990 for the surveillance tests of portable fire extinguishers, sprinkler systems, and fire pump diesel engines. The review disclosed that start-up tests of the diesel engines for the licensee's two fire pumps were not being conducted on a weekly basis as specified by the National Fire Protection Administration (NFPA) code (viz., Chapter 8, "Diesel Engine Drive", of NFPA 20 [1990 edition]). Licensee management committed to corrective action to assure conformance to the cited NFPA code.

The licensee's Emergency Brigade consisted of 76 persons. The 1990 training program for the Emergency Brigade included five onsite training sessions plus a one-day session at the South Carolina Fire Academy. The required annual fire drill was conducted during March for the first and second shifts, and was scheduled to be held in November for the third shift.

No violations or deviations were identified.

6. Radiological Emergency Response Drill (88050)

The licensee was required by Section 7.3 of the SEP to conduct an annual radiological emergency drill, to include the active participation of offsite groups, for the purposes of: (1) testing the adequacy of the timing and content of the emergency procedures, (2) testing emergency

equipment, (3) keeping personnel aware of their emergency responsibilities, (4) testing communications networks, and (5) mobilizing the emergency organization.

The following discussion makes reference to accident/casualty conditions which were postulated to have occurred in order to effect activation of the licensee's emergency response organization. All such conditions referenced herein were simulated, although the licensee's responses actually occurred (to the extent practicable) and were evaluated.

The annual drill for 1990 was conducted on October 20, commencing at 9:00 a.m. and terminating at 10:45 a.m. The scenario involved a major release of uranium hexafluoride (UF₆) within the facility with one contaminated injured person. The emergency response effort was complicated by an unrelated fire in an outlying building. Further information on the scenario is available in the attachment to this report.

The inspector observed most aspects of the drill, including on-scene management by the Emergency Coordinator (a position filled by the Lead Conversion Area Supervisor, in accordance with the SEP), overall response management by the Emergency Director and his staff at the Emergency Operations Center (EOC), notifications and communications, fire-fighting efforts by the Emergency Brigade and the Columbia Fire Department, search and rescue operations, handling and treatment of the contaminated injured person, health physics practices, and radiological monitoring. Activities not observed by the inspector were primarily those at Richland Memorial Hospital.

The onsite emergency response organization and the aforementioned offsite support groups responded adequately in general to the conditions postulated by the scenario. The most significant response problem was the entry of a Conversion Area operator into the UF₆ Bay using Level A personal protective equipment (i.e., SCBA with full acid protection suit), although the individual in question was not a member of the Emergency Brigade and had not been trained in the use of the acid protection suit. This situation arose when the equipment for the damage-control mission into the UF₆ Bay was upgraded during the preparatory phase from SCBA-only to Level A respiratory protection without considering the equipment qualifications of the Conversion Area operator. Complications arose during the entry into the UF₆ Bay which could have jeopardized the safety of the Conversion Area operator had the postulated conditions been real. The corrective action proposed by licensee management was to train Conversion Area operators in the use of Level A personal protective equipment. The inspector agreed that this approach would acceptably address the identified concern.

Section 5.4.1.2 of the SEP stated, "Following an evacuation, personnel accountability will be assured." CSEP-0005 was the implementing procedure related to this commitment. The inspector learned after the exercise that the Emergency Coordinator, as supervisor of the Conversion Area, had been apprised before the exercise of the identity of the operator who, as the

victim, would be incapacitated and would not report to the assembly area for personnel accountability. In addition, the Emergency Coordinator knew in advance which operators would be nonplayers (i.e., remain at their work stations during the exercise). These circumstances precluded any possibility of fairly testing the licensee's system for personnel accountability during an emergency. The inspector discussed with licensee management the practice of using a list (prepared in advance) of drill-exempt personnel so that the accountability process can be realistically conducted and its efficacy tested. The licensor agreed that this approach would improve the conduct of future exercises.

The inspector attended the postdrill critique, which included observations and findings from controllers, evaluators, and principal players. Most of the deficiencies identified during the critique were minor in nature and should be readily correctable. Some of the problems resulted from the artificiality of the drill situation, in which there is often a lack of attendant urgency on the part of the responders. The critique was considered thorough, and corrective actions implemented in response to the substantive findings will be reviewed during future inspections.

No violations or deviations were identified.

7. Exit Interview

The inspection scope and results were summarized on November 2, 1990, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results. Although proprietary information was reviewed during this inspection, none is contained in this report. Dissenting comments were not received from the licensee.

Attachment:
Scenario and Anticipated
Action Sequence for
October 30, 1990 Exercise

UF₆ RELEASE SCENARIO OCTOBER 30, 1990

INCIDENT OBJECTIVE

To test the complete functional capability of the Westinghouse response units and outside agencies relative to a UF₆ release, contaminated casualty transfer, and concurrent fire at an outside location using an unrehearsed scenario.

INCIDENT SUMMARY DESCRIPTION

A high conductivity alarm is noted in ADU vaporizer chest 1A. Evacuation occurs. The Emergency brigade forms at the assembly point. Health physics response team is activated. Emergency director/staff forms as required.

Major UF₆ release in progress in the 1A vaporizer in the UF₆ bay. Incident classified as an "Alert level" incident or greater. An operator is injured in the UF₆ bay and suffered exposure to UF₆ and gross chest contamination. Contaminated casualty procedure activated following the rescue. UF₆ release cannot be immediately terminated. Response team reenters the facility in level A protection suits and SCBAs. Fire noted in an outside contractor welding facility in an unassociated event. Columbia Fire Department called to assist with the firefighting effort. Richland County Emergency Medical Services responds to take the contaminated casualty to Richland Memorial Hospital.

Initial attempt unsuccessful in closing the valve externally. Vaporizer depressurized and lid opened to obtain direct access to the cylinder valve. Broken pigtail connection noted. Wrench used to close the valve and terminate incident. Patient treatment at Richland Memorial Hospital. Followup health physics response to UF₆ release. Decon effort begun. Environmental samples pulled and samples are low. Decon completed. Controller ends drill exercise.

ACTION SEQUENCE

Estimated
Time

- 9:00 am 1. Chief operator reviewing TDC-2000 console notes high conductivity alarm in ADU vaporizer chest 1-A.
- 9:02 2. Operator inspects vaporizer in the UF₆ Bay and notes acrid smell and smoke when entering the bay. Operator promptly notifies supervisor who validates.
- 9:05 3. Second note card given indicating that vaporizer pressure relief valve has blown, permitting UF₆ to escape containment. Note card given to Emergency coordinator that white smoke is visible in the bay area.
- 9:06 4. Supervisor rings fire alarm and gives verbal announcement over the voice communication system for all employees to evacuate the Airborne Radioactivity Controlled Area due to UF₆ release in the bay. Blue lights actuated.
- 9:10 5. Employees evacuate area avoiding the UF₆ Bay.
- 9:11 6. Emergency brigade assembles. Health physics response team is activated.
- 9:15 7. Supervisors account for individual units as required.
- 9:20 8. Guard brings out 2-way radios to Emergency Coordinator. Communication network established. Call to Emergency Director if present to apprise him of situation.
- 9:21 10. Emergency Coordinator notifies Emergency Director that a major UF₆ release is in progress. Emergency Operations Center activated as determined by the Emergency Director.
- 9:28 11. A note card is given to the Emergency Coordinator that an operator in the UF₆ Bay needs to be rescued. He has suffered exposure to UF₆ and gross contamination across the chest. He also is experiencing severe respiratory problems, and needs medical attention. Activate contaminated casualty procedure and call Richland County EMS. Notify Richland Memorial Hospital, that a contaminated casualty is in transit.
- 9:35 11. Emergency Coordinator, E.D., and Emergency Staff classify the incident as an "Alert" and make appropriate notifications to SC-DHEC and the US-NRC.
- 9:40 12. Emergency Brigade Members in SCBA attempts to close the UF₆ cylinder valve using external operator. Note card given: External operator cannot close cylinder valve.
- 9:43 13. Effort successful in bringing the injured operator to safety.
- 9:45 14. Concurrent fire noted in the Daniels welding area south of the main plant within the controlled access area. Columbia Fire Department called to assist with the fire response. Update given to SC-DHEC and US NRC.
- 9:58 15. Note card given to Brigade that UF₆ release still cannot be terminated.
- 10:00 16. Emergency coordinator asks for Emergency Director/Regulatory Affairs to approve the re-entry plan.

- 10:05 • 17. Two Emergency Brigade Members respond in level A suits with a lifeline to terminate the incident.
- 10:10 18. Columbia Fire Department arrives to begin firefighting effort. Guard directs to fire scene
- 10:20 19. Vaporizer depressurized and the lid opened to obtain direct access to the cylinder valve. Broken copper pigtail connector noted. CO₂ cart brought to the area CO₂ sprayed on the valve area and attached to the vaporizer.
- 10:20 20. Richland County EMS arrives.
- 10:30 21. Wrench used to close cylinder valve. Release terminated. Notify Emergency Director.
- 10:30 22. Update regulatory agencies.
- 10:35 23. Richland County EMS departs -W-.
- 10:36 24. Emergency showers used on all emergency responders as is necessary. Medical attention given as required.
- 10:38 25. Emergency coordinator asks Regulatory Operations to analyze the stack samples.
- 10:50 26. Stack samples elevated. Request made to analyze environmental samples.
27. Environmental samples pulled and counted. Results low, less than 1×10^{-14} μ /ml.
28. Attempt made to assess reentry potential.
- 11:05 29. RMH contaminated casualty treatment begins.
- 11:10 30. Emergency coordinator requests Health Physics to pull impactor samples. Results greater than 1 MPC, i.e., 150% MPC.
- 11:20 31. Second in-plant air sample requested. Results less than 1 MPC, i.e., 35% MPC.
32. Area released for decon and SNM inventory loss.
33. Initiate cleaning of emergency equipment; complete decon; restock emergency supplies return to normal.
- 11:45 34. Close out with NRC and SC-DHEC.
- 11:50 35. Controller ends drill. Emergency coordinator gives a "All clear signal." Blue light terminated.

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