

ENCLOSURE 1

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-285/95-23

License: DPR-40

Licensee: Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
P.O. Box 399, Hwy. 75 - North of Fort Calhoun
Fort Calhoun, Nebraska

Facility Name: Fort Calhoun Station

Inspection At: Fort Calhoun, Nebraska

Inspection Conducted: December 18-21, 1995

Inspectors: Arthur D. McQueen, Emergency Preparedness Analyst
Ryan E. Lantz, Reactor Inspector

Approved:

Blaine Murray
Blaine Murray, Chief, Plant Support Branch
Division of Reactor Safety

1/11/96
Date

Inspection Summary

Areas Inspected: Routine, announced inspection of the operational status of the emergency preparedness program including changes to the emergency plan and implementing procedures; emergency facilities, equipment, and supplies; organization and management control; training; internal reviews and audits; effectiveness of licensee controls; emergency event reports; and follow-up on previous inspection findings.

Results:

Plant Support

- The licensee had properly reviewed and properly submitted to NRC changes to the emergency plan and implementing procedures (Section 1).
- The licensee had maintained an effective relationship with offsite emergency response organizations (Section 1).
- Emergency facilities, equipment, and supplies had been maintained in a proper state of operational readiness (Section 2).

- Emergency response organization members were adequately trained to successfully perform their emergency functions. A formal electronic tracking system accurately and reliably maintained a current qualified list of site emergency responders (Section 4.1).
- The performance of operating crews in implementing emergency response actions during walkthrough evaluations was generally good. Training on the indications and significance of loss of a reactor coolant pump at power was identified as an area for improvement (Section 4.2).
- An exercise weakness was identified during the walkthrough evaluations involving one crew that failed to notify state/county agencies of the declaration of an alert within the required 15 minutes (Section 4.2).
- Quality assurance audits and performance observations of emergency preparedness and planning activities had been performed by qualified personnel and were of proper scope, depth, and effectiveness (Section 5).
- An effective system of controls had been maintained regarding safety issues, events, or problems which emphasized early detection and elevation to an appropriate management level, and timely, effective implementation of corrective actions (Section 6).
- Three unusual events had been declared at the site and reported to the NRC Headquarters Operations Officer since the last routine emergency preparedness inspection. With one minor exception beyond the licensee's control, timely required notifications were made to the appropriate local and state agencies and to the NRC (Section 8).

Summary of Inspection Findings:

- Violation 285/9420-03 was closed (Section 7).
- Weakness 285/9523-01 was opened (Section 4).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Emergency Preparedness Inspection Scenario Narrative Summary

DETAILS

1 EMERGENCY PLAN AND IMPLEMENTING PROCEDURES (82701-02.01)

The inspectors reviewed changes in the licensee's emergency plan and implementing procedures to verify that these changes had not decreased the effectiveness of emergency planning and that the changes had been reviewed properly and submitted to NRC.

Since the previous inspection, twelve emergency plan revisions had been implemented. These were submitted to NRC for review and were found acceptable by NRC. For each emergency plan revision, the licensee had performed a documented review in accordance with 10 CFR 50.54(q) to determine that the revisions did not decrease the effectiveness of emergency preparedness.

The inspectors also reviewed documentation pertaining to selected emergency plan implementing procedure changes of the 59 revisions implemented since the last routine inspection. The inspectors reviewed selected changes in procedures and noted that marked changes appeared consistent with regulatory requirements and the licensee's commitments. Review, approval, and distribution of the plan and procedure changes were conducted in accordance with licensee Emergency Planning Department Manual EPDM-6, titled "10 CFR 50-54(q) Review of Procedure Changes," and Standing Order 50-G-30, titled "Procedure Changes and Generation." All changes had been submitted to the NRC on a timely basis.

The licensee maintained an effective relationship with offsite agencies and coordinated changes in emergency action levels in writing with those agencies annually or as appropriate. Coordination with offsite agencies occurred on virtually a weekly basis. The inspectors reviewed letters of agreement established with support agencies and determined that they had been reviewed annually and were updated as required.

2 EMERGENCY FACILITIES, EQUIPMENT, INSTRUMENTATION, AND SUPPLIES (82701-02.02)

The inspectors toured onsite and offsite emergency facilities and reviewed the licensee's emergency equipment inventories and maintenance to verify that facilities and equipment had been maintained in a proper state of operational readiness.

A tour was made of each emergency response facility which included the inspection of various equipment items, instrumentation, and supplies. Facilities inspected were the control room, the technical support center, the operations support center, the emergency operations facility, and two of five medical kit locations. The facilities were observed to be well-maintained and ready for emergency use. No substantive changes had occurred at emergency response facilities since the last inspection. The emergency operations facility had been redesigned prior to the recent annual emergency exercise, which appeared to be an enhancement of the facility. Random inspections were

performed of radiation monitoring and respiratory equipment at each emergency response facility. All selected items were verified as being in calibration or had been appropriately inspected on a scheduled basis. Equipment and supplies placed in response facilities and in emergency equipment lockers matched scheduled inventories. Current copies of the implementing procedures and emergency telephone directories were maintained in all facilities. Primary and backup communications in each facility were as described in the emergency plan. The inspectors reviewed documentation pertaining to inventories, testing, and maintenance of emergency response facilities and noted that they had been performed as required by procedures.

3 ORGANIZATION AND MANAGEMENT CONTROL (82701-02.03)

The inspectors reviewed the emergency response organization staffing levels to determine whether sufficient personnel resources were available for emergency response. The emergency planning organization was reviewed to ensure that an effective programmatic management system was in place.

The emergency planning department was responsible for implementing the licensee's emergency preparedness program. The department was responsible for both onsite and offsite emergency planning and reports to the site emergency planning department manager, who reports to the Director, Nuclear Services. The department had five positions assigned to support emergency planning. Each position was staffed with a qualified person.

The site emergency response organization was made up of about 300 personnel. The primary call-out system for activating the emergency response organization was by auto-dialer and pagers for key position personnel. The callout system was tested quarterly, with the most recent test the week prior to this inspection. A list of personnel trained and experienced to function in emergency response organization positions was being maintained by emergency planning. At the time of the inspection, the organization had a depth of at least three qualified personnel per position and more for several positions. All personnel are called in the event of an emergency response organization activation, and a response organization is then staffed by those reporting to emergency response facilities. Unneeded responding personnel are released for subsequent shifts or other duties. Positions are designated for fill by a cognizant division in coordination with the emergency planning department. Upon transfer or departure of an incumbent, his/her replacement is designated by the cognizant manager. The managing directive for the emergency response organization staffing process is Nuclear Administrative Instruction NAI-10, titled "Emergency Response Organization Assignments," dated April 8, 1995. The licensee had trained and qualified an appropriate number of emergency response personnel to ensure a good depth in the organization.

No significant changes in offsite emergency response organizations have occurred since the last routine emergency preparedness inspection.

4 TRAINING (82701-02.04)

The inspectors reviewed the emergency response training program and interviewed selected individuals to determine whether emergency response personnel had received the required training and complied with the requirements of the Fort Calhoun Station administrative procedures and emergency plan, 10 CFR 50.47(b)(15), and 10 CFR Part 50, Appendix E.IV.F.

4.1 Training

The inspectors reviewed a sample of training records of emergency response organization members to verify that they had obtained the required training in accordance with the Fort Calhoun Emergency Preparedness, Training Plan Master Procedure (EP-TPMP). Training records were maintained in an electronic database, updated from class attendance records, drill critique records, and other documentation. The individual records reviewed included newly qualified members, members in initial training, temporarily disqualified members, and members who had been qualified and requalified for several years. Each record accurately reflected the current training status of the emergency response members.

4.2 Walkthroughs with Operating Crews

The inspectors conducted a series of emergency response walkthroughs with operating crews to evaluate the adequacy and retention of skills obtained from the emergency response training program. Two walkthrough scenarios were developed by the facility, slightly revised and approved by the NRC, and administered by the NRC to the crews to determine, through demonstrated performance, whether control room personnel were proficient in their duties and responsibilities as emergency responders during a simulated accident scenario. Attachment 2 to this inspection report contains a narrative summary of the walkthrough scenario provided by the licensee.

The inspectors observed three shift crews using the control room simulator in the dynamic mode. The scenario consisted of a sequence of events requiring an escalation of emergency classifications, culminating in a general emergency. The scenario was developed to run approximately 75 minutes. The inspectors observed the interaction of the response crews to verify that authorities and responsibilities were clearly defined and understood. The walkthroughs also allowed the evaluation of the crews' abilities to assess and classify accident conditions, utilize abnormal and emergency operating procedures, perform dose assessments, develop protective action recommendations, and make corresponding notifications to offsite authorities.

The performance of operating crews during walkthrough evaluations was generally good, with some exceptions. The following inspectors' observations were noted in communications, command and control, and operating procedure usage and general system knowledge:

- One crew did not recognize that the reactor protection system had failed to automatically trip the reactor following a locked rotor of one reactor coolant pump at 100 percent power. In the scenario, the crew manually tripped the reactor 8 seconds after the reactor coolant pump trip, but did not recognize that the reactor protection system had failed, and did not diagnose the failure of the reactor protection system after the successful manual trip. Post scenario review indicated that the reactor protection system initiated a low reactor coolant flow trip signal from all four channels less than 1 second after the reactor coolant pump trip.

The scenario continued with containment area radiation monitors reaching their alarm setpoints, with no other process radiation monitors in alarm. The crew did not consider these indications to be representative of a fuel clad failure, although they met the criteria of a loss of fuel clad barrier as described in Attachment 6.3 of EPIP-OSC-1, "Emergency Classification." The facility Updated Safety Evaluation Report, Section 14.6, described the locked reactor coolant pump rotor as an event that is expected to cause fuel damage. Additionally, the failure of the automatic reactor trip on all four channels of low reactor coolant flow indicated a violation of a limiting safety system setpoint as defined in Technical Specification 1.3 (2). The facility emergency plan required declaration of an alert when the barrier criteria of Attachment 6.3 of emergency plan implementing procedure EPIP-OSC-1 had been met; however, the crew only declared a notification of unusual event and did not recognize that the barrier criteria for fuel cladding had been met. The inspector identified the crew's actions to be indicative of a training area for improvement with respect to the significance of loss of reactor coolant pump events at power. The licensee had conducted remedial discussions with the crew involved during this inspection.

- One crew's communications were generally informal, with several instances of open loop and incomplete communications noted. These observations were discussed with operations management, who noted that the communications observed were not characteristic of that crew's normal performance, and agreed that it did not meet their expectations and were not in accordance with facility communication procedures. The other two crews' communications were formal, closed loop, and met management expectations.
- An area for improvement was observed regarding protective action recommendations. There was confusion in the recommendation made by one crew because the event notification form did not specify the sectors recommended for protective actions beyond the 2 mile zone. In Section 5 of the emergency notification form, a check mark was placed in the "Evacuate Sectors" column for the "0-2 miles" and check marks were placed in the "Shelter Sectors" column for the "2-5 miles" and "5-10 miles" categories. The checks were intended to apply to downwind sectors. The shift supervisor stated that he only checks these columns.

rather than specifying sectors, since the states and counties are able to derive the appropriate sectors with the wind direction and stability class data included on the form. The protective action recommendation as understood by the offsite player in the control booth was to "shelter all sectors from 2 to 10 miles." Procedures did not specify how the forms should be filled out.

- Dose calculations were made by protective measures personnel in a timely manner, as appropriate.

During the walkthroughs, the inspectors identified a weakness involving the notification of offsite authorities. A note in Attachment 6.1 of emergency plan implementing procedure EPIP-OSC-2, "Command and Control Position Actions/Notifications," states "State/County agencies must be notified within 15 minutes of the emergency declaration." However, one crew failed to make an emergency notification of the alert declaration to the states and counties within the 15 minute requirement. This was due to the upgrading of the event classification to a site area emergency about 4 minutes after declaration of the alert. As a result, the states and counties were never notified that an alert had been declared. The shift supervisor stated to the shift communicator the 15 minute notification time was to be computed from the upgrade of the event, instead of from the alert declaration. No specific guidance is provided in procedures except the statement "IF an upgrade or downgrade of the emergency classification occurs prior to completion of the checklist, THEN perform the following: 5.3.1 Complete the state/county agencies notifications for the former classification." The licensee subsequently determined that the shift supervisor had not yet initiated the checklist for alert response as of the time the upgrade occurred, therefore this guidance was not implemented. The notification to offsite agencies was initiated 14 minutes after the declaration of the site area emergency. The failure to notify the State/County agencies within 15 minutes of the alert declaration was identified as an exercise weakness. (285/9523-01)

The inspectors' observations were discussed with licensee training and operations personnel. The licensee stated that the observations would be evaluated and improvements would be made to the training program as appropriate.

The training organization has maintained an effective emergency response training program with minor challenges noted. All members of the emergency response organization designated as qualified had been trained in accordance with applicable station procedures. The performance of operating crews in implementing emergency response actions during walkthrough evaluations was generally good.

5 INDEPENDENT AND INTERNAL REVIEWS AND AUDITS (82701-02.05)

The inspectors met with quality assurance personnel and reviewed independent and internal audits of the emergency preparedness program performed since the last routine inspection to determine compliance with the requirements of 10 CFR 50.54(t).

The inspectors reviewed and discussed with the quality assurance manager, his staff, and the principle emergency preparedness auditor the two most recent annual audits (Audit Report 94-SARC-010 and 95-SARC-010) of the emergency preparedness program. The audit team members were well-qualified. All team members were certified auditors with current recertification as set forth in the licensee's Quality Assurance Manual QAM-13, "Training and Certification of Audit Personnel," dated February 8, 1991, which incorporates certification criteria to perform audits in accordance with ANSI Standard N45.2.12. The teams included personnel familiar with and experienced in emergency planning. The inspectors reviewed the 1995 audit plan, scope of the audit, and the audit check list. The audit was thorough and complete, with a particularly thorough and comprehensive check list.

The audit reports were issued to appropriate levels of management at the plant and to the corporate level. Licensee retention of the previous five annual audit reports was verified. Audit findings were documented and tracked in condition reports. This included a tracking system which established suspense dates for response by cognizant managers for items identified in a report that required correction or improvement. Follow-up corrective actions for audit findings were completed in a timely manner.

Since the last routine NRC inspection, the quality assurance organization had conducted about seven surveillances related to emergency preparedness. All surveillances were reviewed by the inspectors and were verified as being appropriate to observed activities and findings.

6 EFFECTIVENESS OF LICENSEE CONTROLS (82701-02.06)

The inspectors reviewed the adequacy of the licensee's controls systems pertaining to safety issues, events, or problems. The review included discussions with corrective actions group, quality assurance and emergency preparedness staff personnel and review of procedures and documentation of problem identification, root cause analysis, management review of problem identification and solution, and corrective actions.

The licensee's controls systems were effective in identifying, resolving, and preventing problems by providing for review of such areas as corrective action systems, root cause analyses, safety committees, and self-assessment in the area of emergency preparedness. The principle tool in managing corrective actions was the condition report. All personnel were trained in the use of the condition report system in their site general employee training. They were encouraged to initiate the appropriate documentation through their supervisors but were also instructed in how to submit the reports without

going through supervisors. This system was managed by a condition review group, chaired by the plant manager, which meets daily to perform review, assignment, tracking, and closure of reports/requests. The system was computer based and computer terminals were made available to all personnel. Personnel can also check at any time by computer, the status of their condition reports.

The licensee also maintained a nuclear safety concerns reporting system which includes a telephone "hot line." The program was established to help identify concerns related to safety and quality at Fort Calhoun.

Additionally, a tracking system was used by emergency planning for tracking problems, issues, etc., for follow-up by the emergency planning staff.

The inspectors reviewed sample condition reports and emergency planning items and determined that the corrective action program was properly implemented. The licensee had maintained an effective system of controls pertaining to safety issues, events, or problems which emphasized early detection and elevation by an appropriate management level, and effective implementation of corrective actions.

7 FOLLOW-UP ON PREVIOUS INSPECTION FINDINGS (92904)

(Closed) Violation 285/9420-03: Failure to Classify Unusual Event in a Hydrazine Spill Incident

Contrary to a requirement in Fort Calhoun Emergency Action Level 11.6, on May 26, 1994, a Notification of Unusual Event was not declared at or about 3:25 a.m. following an event involving a toxic gas release in the turbine building such that a potential degradation of the level of safety of the plant existed, and which warranted increased awareness on the part of plant operating staff. Specifically, at about 12:40 a.m., a leak was identified on a concentrated hydrazine storage container located in the turbine building (within the protected area). At about 3:25 a.m., an attempt was made by the shift chemist to neutralize the hydrazine with concentrated hydrogen peroxide. A violent exothermic reaction occurred resulting in the release into the turbine building of a large cloud of reaction products. As a result of the reaction, the shift chemist was dazed, and received chemical burns to his arms. As a result of these events, toxic gases were present in the turbine building in concentrations that would not be measured for several hours. These conditions warranted increased awareness on the part of the plant operating staff and had the potential for degrading the level of safety of the plant by affecting operations personnel, or by restricting access to affected plant areas.

Corrective actions indicated in the Omaha Public Power District letter, dated November 7, 1994, responding to the NRC notice of violation, were verified as having been completed and appeared appropriate to prevent recurrence. Classification of emergency events was specifically observed during the

simulator walkthrough sessions with three control room crews and support personnel. With the exception of one crew in classifying the initial scenario event, classifications and declarations were generally timely and no confusion was indicated.

8 ONSITE FOLLOW-UP OF EVENTS AT OPERATING POWER REACTORS (93702)

Three emergency events had been declared at the site since the last routine emergency preparedness inspection.

8.1 Event

On November 11, 1994, the licensee notified the NRC Headquarters Operations Officer (Event 28029) by facsimile that an unusual event had been declared at 1:49 p.m. (CST) due to a Technical Specification shutdown based on potential inoperability of control room air conditioning. The facsimile indicated "A potential accident scenario has been identified that could result in inoperability of both control room air conditioners. A notification of unusual event was declared based on entry into TS 2.15(3)...." The notification of unusual event was exited at 7:03 p.m. (CST) due to compensatory actions being taken.

8.2 Event

On November 30, 1994, the licensee telephonically notified the NRC Headquarters Operations Officer (Event 28088) that an unusual event had been declared at 5:01 a.m. (CST) based on a Technical Specification required shutdown. The NRC Operations Officer was subsequently notified that the unusual event was terminated at 7:30 a.m. (EST).

8.3 Event

On January 27, 1995, the licensee telephonically notified the NRC Headquarters Operations Officer (Event 28300) that an unusual event had been declared at 6:06 p.m. (CST) due to entering a Technical Specification required shutdown because a non-vital instrumentation bus inverter was out-of-service beyond the allowable limiting condition for operation time. The unusual event was terminated at 6:48 p.m. (CST) when the inverter had been returned to service. During notification of this event to offsite agencies, the State of Iowa failed to answer the initial Conference Operations Network call answered by all other required notification parties. A second successful attempt to notify the State of Iowa was made at 6:24 p.m. (CST), 3 minutes beyond the required 15 minute notification initiation time. Continuing communication problems between Fort Calhoun Station and the State of Iowa's new Emergency Operations Center resulted in the initiation of Incident Report 950039 by the licensee. During the communications test conducted during this inspection, the State of Iowa initial communication attempt was successful.

8.4 Events Review

A review of these events verified that they were appropriately classified and declared in accordance with the site emergency classification procedure. With the exception of the 3-minute delay in notifying the State of Iowa in event 8.3 above, timely notifications were made to appropriate state and local emergency response agencies and the NRC in accordance with approved procedures.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

- *R. L. Andrews, Division Manager, Nuclear Services
- *G. Cavanaugh, Licensing
- J. W. Chase, Plant Manager
- *M. R. Christensen, Senior Emergency Planning Representative
- *O. J. Clayton, Manager, Emergency Planning
- *G. Cook, Supervisor, Station Licensing
- *B. A. Fried, Emergency Planning Representative
- J. K. Gasper, Manager, Training
- *R. Hankins, Emergency Planning Representative
- *T. J. Herman, Lead Auditor, Quality Assurance
- *R. G. Meng, Senior Emergency Planning Representative
- *W. W. Orr, Manager, Quality Assurance/Quality Control
- T. L. Patterson, Division Manager, Nuclear Operations
- *M. Reller, Emergency Planning Representative
- M. A. Tesar, Manager, Corrective Actions
- *J. W. Till, Assistant Plant Manager, Operations

The inspectors also held discussions with and observed the actions of other station and corporate personnel.

*Denotes those present at the exit interview.

2 EXIT MEETING

An exit meeting was conducted on December 21, 1995. During this meeting, the inspectors reviewed the scope and findings of the inspection as presented in this report. The licensee did not identify as proprietary any of the materials provided to, or reviewed by, the inspectors during the inspection.

ATTACHMENT 2

SCENARIO NARRATIVE NO. 1

Simulation Facility: Fort Calhoun Station

Initial Conditions: The plant is operating at 100 percent power, middle of cycle during early summer. Meteorological conditions are overcast skies with a steady 4 mile per hour wind coming from the north.

Subsequent Events: A locked rotor event occurs on reactor coolant pump "D". The reactor does not trip automatically and must be manually tripped. Following the trip, radiation levels inside containment begin to increase. (Locked rotor anticipated transient without scram induced some departure from nucleate boiling related fuel damage.) It is expected that operators will request a chemistry sample to determine reactor coolant system activity. [Operators should declare an alert at this time based on EAL 1.10, Failure/Challenge to one Fission Product Barrier based on attachment 6.3, FC-4, "Failure of the reactor protective system to trip the reactor upon reaching a limiting safety system setpoint" or on Attachment 6.3, FC-9, "A" event has occurred which has a high probability of having damaged the Fuel Clad barrier, but time has not yet permitted verification.]

Condenser Vacuum will be lost when the reactor trips rendering the condenser dump and bypass valves inoperable. The isolation valve for HCV-1040, the atmospheric relief valve will not be able to be unisolated. MS-292, the pilot-operated safety valve on S/G "B", will not open. (Secondary heat removal can only be accomplished using S/A "A".)

A 900 gpm tube rupture occurs on S/G "A". [Operators should upgrade to at least a Site Area Emergency based on EAL 1.16, Failure/Challenge to two Fission Product Barriers based on attachment 6.3, FC-9 as discussed above and attachment 6.3, RCS-1, "Reactor Coolant System leak greater than 40 gpm." Operators may decide to upgrade to a General Emergency at this time based on EAL 1.20, "Failure/Challenge to three fission product barriers," depending on how they interpret Attachment 6.3, C-1, "Any failure of the containment ..."]

Chemistry reports that RCS Dose Equivalent Iodine-131 is 320 uCi/gm. [Operators should upgrade to a General Emergency based on EAL 2.9, "Ongoing steam release with > 40 gpm primary to secondary leak and Dose Equivalent Iodine > 300 (uCi/gm.]

SCENARIO NARRATIVE NO. 2

Initial Conditions: The plant is operating at 100% power, Middle of cycle during late spring. Meteorological conditions are overcast skies with a steady 3 mile per hour wind coming from the southwest. The ΔT between the 10 and 60 meter heights is +1.0°C. A containment pressure reduction is in progress.

Subsequent Events: A small RCS steam leak, less than 40 gpm, initiates a CRHS (Containment Radiation High Signal). The Containment pressure reduction valve does not isolate and can not be closed. [An **alert** should be declared based on EAL 1.10, " Failure/Challenge of one fission product barrier based on attachment 6.3, C-1 "Any failure of the containment ..."]

The RCS leak increases to 900 gpm. [A **Site Area Emergency** should be declared based on EAL 1.16, "Failure/Challenge to two fission product barriers based on attachment 6.3, C-1 and RCS-1, "Reactor Coolant System leak greater than 40 gpm."]

The RCS leak becomes a large LOCA. An inadvertent RAS (Recirculation Actuation Signal) and failure of the recirculation sump valves to open causes a total loss of ECCS flow. Reactor Vessel Level Indication decreases to 0% (0% is at the top of the fuel.) [A **General Emergency** should be declared based on EAL 1.20, Failure/Challenge to Three Fission Product Barriers based on attachment 6.3, C-1, RCS-1 and FC-6 "RVLMS indicates 0.0% level."]