

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-285/87-13

License: DPR-40

Docket: 50-285

Licensee: Omaha Public Power District (OPPD)
1623 Harney Street
Omaha, Nebraska 68102

Facility Name: Fort Calhoun Station (FC)

Inspection At: Fort Calhoun Station, Blair, Nebraska

Inspection Conducted: May 1-31, 1987

Inspectors: *for* R. P. Mullikin 6/18/87
P. H. Harrell, Senior Resident Reactor Date
Inspector

R. P. Mullikin 6/18/87
R. P. Mullikin, Project Inspector, Reactor Date
Project Section B

L. D. Gilbert 6/18/87
L. D. Gilbert, Reactor Inspector, Engineering Date
Section

Other
Accompanying
Personnel: V. Ferranini, NRC Consultant

Approved: *for* L. M. Hennicutt 6/18/87
R. E. Ireland, Chief, Engineering Section Date
Reactor Safety Branch

D. R. Hunter 6/30/87
D. R. Hunter, Chief, Reactor Project Date
Section B, Reactor Projects Branch

Inspection SummaryInspection Conducted May 1-31, 1987 (Report 50-285/87-13)

Areas Inspected: Routine, unannounced inspection including operational safety verification, maintenance, surveillance, plant tours, safety-related system walkdown, security observations, radiological protection observations, in-office review of periodic and special reports, followup on previously identified items, followup on allegations related to welding, review of the program for installation of heat-shrinkable tubing, review of licensee actions related to reactor vessel transient protection, verification of containment integrity, review of modification testing for a containment equipment storage platform, review of the licensed operator training program, and containment local leak rate testing.

Results: Within the 16 areas inspected, 1 violation (failure to control special processes during installation of seismic wall supports, paragraph 11) was identified.

DETAILS1. Persons Contacted

- *+°W. Gates, Plant Manager
- *+°C. Brunnert, Supervisor, Operations Quality Assurance
- M. Butt, Electrical Engineer
- °M. Core, Supervisor, Maintenance
- +D. Dale, Quality Control Inspector
- T. Dexter, Supervisor, Security
- #J. Fluehr, Supervisor, Station Training
- *J. Foley, Supervisor, I&C and Electrical Field Maintenance
- #J. Gasper, Manager, Administrative and Training Services
- J. Key, Acting Reactor Engineer
- +R. Kotan, Engineer, Generating Station Engineering
- °L. Kusek, Supervisor, Operations
- *+#°D. Munderloh, Plant Licensing Engineer
- *+°T. McIvor, Supervisor, Technical
- *+R. Mueller, Plant Engineer
- °G. Roach, Supervisor, Chemical and Radiation Protection
- +J. Skiles, Contract Welding Engineer, Sargeant and Lundy
- S. Willrett, Supervisor, Administrative Services and Security

The NRC inspector also contacted other plant personnel, including operators, technicians, and administrative personnel.

*Denotes attendance at an exit interview given in the areas of low-temperature overpressure protection and installation of heat-shrinkable tubing by R. Mullikin on May 8, 1987.

+Denotes attendance at an exit interview given in the area of followup on welding allegations by L. Gilbert on May 29, 1987.

#Denotes attendance at an exit interview given in the area of licensed-operator training by P. Harrell on May 30, 1987.

°Denotes attendance at the monthly exit interview given by P. Harrell on June 1, 1987.

2. Followup on Previously Identified Items

- a. (Open) Unresolved Item 285/8624-03: Failure to provide a preplanned lecture series on emergency operating procedures (EOP).

The NRC inspector reviewed the schedule of the lectures given by the licensee's training department to determine if a lecture series was given on EOPs in 1985 or 1986. The schedule indicated that no lecture series had been given.

Subsequent to the issuance of this unresolved item, the licensee provided lectures on some, but not all EOPs, during simulator training given in the early part of 1987. During discussion of this item with licensee personnel, they stated that a series of lectures would be given during the next training rotation.

This item remains open pending completion of a series of lectures on EOPs and the establishment of a program by the licensee to ensure that EOP lectures are given in each 2-year requalification training cycle.

- b. (Closed) Unresolved Item 285/8624-04: Remedial training not given for licensed operators failing weekly quizzes.

The NRC inspector reviewed selected weekly quizzes given during 1986 to identify any individuals failing to pass a quiz. During the review, two individuals were identified. In both cases, the licensee provided objective evidence that the individuals had been given remedial training. Discussions by the NRC inspector with the individuals involved confirmed that they had received the remedial training.

- c. (Open) Deviation 285/8702-01: Administrative control of containment isolation valves.

A review was performed to verify that the valves (MS-101, MS-103, CH-517, CH-518, CH-535, SI-375, AC-1133, AC-1134, AC-857, and AC-858) identified in NRC Inspection Report 50-285/87-02 were placed under administrative control. In addition to the valves listed above, the NRC inspector also identified, in subsequent reviews after issuance of NRC Inspection Report 50-285/87-02, additional valves (VD-504, VD-505, WD-1060, and SI-185) that provided containment isolation and should also be placed under administrative controls.

To ensure that the valves had been physically locked or seal-wired shut prior to plant startup, the NRC inspector performed a walk down to determine the status of all the valves. The results of the walkdown confirmed that the valves were either locked or seal-wired shut.

The NRC inspector reviewed various procedures and drawings to verify that the valve status (i.e., locked or seal-wired shut) had been correctly provided in the appropriate documentation. A list of the documentation reviewed is provided below.

- . Reactor Startup Locked Valves (Procedure OI-RC-2B-CL-D, Revision 47)
- . High-Pressure Safety Injection System Startup Valve Checklist (Procedure OI-SI-1-CL-B, Procedure Change 20432)

- . Component Cooling Water Valve Lineup (Procedure OI-CC-1-CL-A, Revision 21)
- . Chemical and Volume Control System Valve Lineup (Procedure OI-CH-1-CL-A, Revision 29)
- . Main Steam System Valve Lineup (Procedure OI-MS-1-CL-A, Revision 12)
- . Waste Disposal System Startup Valve Checklist (Procedure OI-WDL-1-CL-G, Procedure Change 20434)
- . Safety Injection and Containment Spray System (Drawing E-23866-210-130, Sheet 1, Revision 40)
- . Steam Flow Diagram (Drawing M-252, Revision 46)
- . Chemical and Volume Control System Diagram (Drawing E-23866-210-120, Sheet 2, Revision 21)
- . Waste Disposal System Flow Diagram (Drawing M-6, Revision 29)
- . Auxiliary Coolant Component Cooling System Diagram (Drawing M-40, Sheet 1, Revision 18)

During review of the documentation listed above, the NRC inspector noted that the licensee had not completed procedure and/or drawing changes to reflect the required locked or seal-wired shut position for all the valves identified above prior to the end of this inspection period. Licensee personnel stated that the documentation changes would be made in the near future.

This item remains open pending completion of documentation changes.

- d. (Closed) Open Item 285/8702-04: Ultrasonic testing (UT) of balance-of-plant (BOP) piping.

The licensee established an aggressive program for performance of UT on the BOP piping for detection of pipe wall thinning. The program requirements were provided in Procedure PM-PIPE-1, "Ultrasonic Inspection of Station Piping," which specified that a total of 186 locations be inspected. The locations were selected by engineering personnel in single- and two-phase system piping where thinning would most likely occur.

The results of the UT performed by the licensee indicated that 15 locations were identified where the pipe wall had thinned below the minimum acceptable wall thickness. In addition, the licensee also identified three additional locations where the licensee opted to

replace the piping even though the piping was not below the minimum acceptable wall thickness. The licensee replaced the piping at the 18 locations during the current refueling outage.

The areas identified were located in the feedwater pump discharge and recirculation piping, heater drain pump discharge piping, feedwater heater drain and vent piping, and steam extraction piping. The thinning occurred in straight pipe runs and in piping elbows, and in single- and two-phase systems. There did not appear to be a common set of plant operating conditions or a pipe configuration that would pinpoint where pipe thinning might occur.

By performance of this testing, the licensee established a baseline for the pipe thickness at the various locations inspected. By establishing a baseline, the licensee will be able to determine the actual thinning rate when the locations are retested during the next refueling outage. This information will enable the licensee to more accurately predict which piping will require replacement.

The NRC inspector reviewed the results of the UT inspections performed by the licensee. It appeared that the licensee had performed an inspection that identified piping where excessive thinning had occurred.

- e. (Closed) Open Item 285/8703-02: Licensed operators not reviewing licensee event reports (LER) in a timely manner.

The licensee established a program to ensure that LERs are reviewed by licensed operators in a timely manner. This program required that LERs related to plant operations be distributed to all licensed operators upon receipt in the training department by using the established training hot-line system. Each operator receives a copy of the LER, reads it, signs the hot-line form, and then returns the form to the training department. The training department records the receipt of the hot-line form for verification that the LER was reviewed by each operator.

The NRC inspector reviewed the status of the hot lines issued and returned for selected LERs to verify that the LERs were being reviewed by the operators in a timely manner. No problems were noted.

- f. (Closed) Unresolved Item 285/8710-04: The surveillance test performed on the trisodium phosphate dodecahydrate (TSP) did not meet the requirements stated in the Technical Specifications (TS).

The licensee performed another test of the TSP in the containment baskets. The test was performed on May 31, 1987, using a new revision to Procedure ST-CHEM-2-F.3, "Phosphate Basket Inspection." The results of the retest indicated that the TSP was chemically capable of performing its intended safety function.

As mentioned above, the licensee revised Procedure ST-CHEM-2-F.3 to provide additional clarification on how to properly test the TSP. The clarifications provided specific step-by-step instructions to ensure that the variables used in performing future tests are within the allowable limits provided in the TS.

The NRC inspector reviewed the results of the retest and the procedural changes made by the licensee. Based on this review, it appeared that the licensee had established a program for testing of TSP that would ensure future testing activities will be performed in accordance with TS requirements.

- g. (Open) Unresolved Item 285/8710-05: Apparent discrepancy between the TS and the Updated Safety Analysis Report (USAR) regarding the amount of TSP to be stored in containment.

The licensee performed a preliminary calculation prior to plant startup from the current refueling outage to determine the amount of TSP that was required to be stored in containment. The calculation was based on the volume of borated water used if the injection system was placed in the recirculation mode. The results of the calculation indicated that the minimum amount of TSP needed in containment was 3000 pounds. This was the value specified in the USAR.

TS 3.6(2).d.(ii) states that the minimum amount of TSP required in containment is 40 cubic feet. Based on the preliminary calculation performed by the licensee, it appeared that 40 cubic is nonconservative. The licensee determined that a volume of 50 cubic feet would be required to provide approximately 3000 pounds of TSP. The determination of the conversion factor for cubic feet of TSP to pounds of TSP was based on field measurements of the TSP contained in the containment baskets. The conversion factor was empirically determined to be approximately 60 pounds per cubic foot. The licensee measured the amount of TSP currently stored in containment and determined the value to be approximately 61 cubic feet.

The NRC inspector reviewed the preliminary calculation performed by the licensee and determined that the calculation properly concluded the amount of TSP presently stored in containment was adequate.

Licensee personnel stated that the final calculation package, complete with supporting material, would be completed in the near future. In addition, licensee personnel stated that an amendment to the TS would be submitted to correct the TSP volume requirements presently provided in TS 3.6(2).d.(ii).

This item will remain open pending completion of the final calculation package and approval of a TS amendment by NRC Headquarters to clarify the requirements related to storage of TSP in containment.

3. Operational Safety Verification

The NRC inspector conducted reviews and observations of selected activities to verify that facility operations were performed in conformance with the requirements established under 10 CFR, administrative procedures, and the TS. The NRC inspector made several control room observations to verify the following:

- . Proper shift staffing
- . Operator adherence to approved procedures and TS requirements
- . Operability of reactor protective system and engineered safeguards equipment
- . Logs, records, recorder traces, annunciators, panel indications, and switch positions complied with the appropriate requirements
- . Proper return to service of components
- . Maintenance orders (MO) initiated for equipment in need of maintenance
- . Appropriate conduct of control room and other licensed operators
- . Management personnel toured the control room on a regular basis

No violations or deviations were identified.

4. Plant Tours

The NRC inspector conducted plant tours at various times to assess plant and equipment conditions. The following items were observed during the tours:

- . General plant conditions, including operability of standby equipment, were satisfactory.
- . Equipment was being maintained in proper condition, without fluid leaks and excessive vibration.
- . Plant housekeeping and cleanliness practices were observed, including no fire hazards and the control of combustible material.
- . Performance of work activities was in accordance with approved procedures.
- . Portable gas cylinders were properly stored to prevent possible missile hazards.

- . Tag out of equipment was performed properly.

- . Management personnel toured the operating spaces on a regular basis.

The NRC inspector toured the containment building just prior to closing the building in preparation for plant startup from a refueling outage. No problems were noted during the tour.

No violations or deviations were identified.

5. Safety-Related System Walkdown

The NRC inspector walked down accessible portions of the following safety-related system to verify system operability. Operability was determined by verification of selected valve and switch positions. The system was walked down using the procedure noted.

- . Reactor startup locked valves (OI-RC-2B-CL-D, Revision 47)

During the walkdown, the NRC inspector noted no problems between the procedure and plant as-built conditions for the selected areas checked.

No violations or deviations were identified.

6. Monthly Maintenance Observations

The NRC inspector reviewed and/or observed selected station maintenance activities on safety-related systems and components to verify the maintenance was conducted in accordance with approved procedures, regulatory requirements, and the TS. The following items were considered during the reviews and/or observations:

- . The TS limiting conditions for operation were met while systems or components were removed from service.
- . Approvals were obtained prior to initiating the work.
- . Activities were accomplished using approved MOs and were inspected, as applicable.
- . Functional testing and/or calibrations were performed prior to returning components or systems to service.
- . Quality control records were maintained.
- . Activities were accomplished by qualified personnel.
- . Parts and materials used were properly certified.
- . Radiological and fire prevention controls were implemented.

The NRC inspector reviewed and/or observed the following maintenance activities:

- . Inspection of Raychem splices (MO 870154)
- . Repair of a 480-volt breaker trip device (MO 870974)
- . Repair of a heat tracing recorder (MO 872317)
- . Repair of a packing leak on a component cooling water valve (MO 870979)
- . Repair of a toxic gas monitor (MO 870080)
- . Inspection of the emergency diesel generator fuel oil storage tank (MO 870462)
- . Trouble shooting of an inverter (MO 872768)

No violations or deviations were identified.

7. Monthly Surveillance Observations

The NRC inspector observed selected portions of the performance of and/or reviewed completed documentation for the TS-required surveillance testing on safety-related systems and components. The NRC inspector verified the following items during the testing:

- . Testing was performed by qualified personnel using approved procedures.
- . Test instrumentation was calibrated.
- . The TS limiting conditions for operation were met.
- . Removal and restoration of the affected system and/or component were accomplished.
- . Test results conformed with TS and procedure requirements.
- . Test results were reviewed by personnel other than the individual directing the test.
- . Deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The NRC inspector observed and/or reviewed the documentation for the following surveillance test activities. The procedures used for the test activities are noted in parenthesis.

- . Emergency diesel generator annual overhaul (ST-ESF-6-F.5)

- . Fuel transfer tube leak rate determination (ST-CONT-2-F.4)
- . Containment pressure channel check (ST-ESF-3-F.2)
- . Containment air cooling and filtering system circuit operation (ST-VA-1-F.2)

No violations or deviations were identified.

8. Security Observations

The NRC inspector verified the physical security plan was being implemented by selected observation of the following items.

- . The security organization was properly manned.
- . Personnel within the protected area (PA) displayed their identification badges.
- . Vehicles were properly authorized, searched, and escorted or controlled within the PA.
- . Persons and packages were properly cleared and checked before entry into the PA was permitted.
- . The effectiveness of the security program was maintained when security equipment failure or impairment required compensatory measures to be employed.
- . The PA barrier was maintained and the isolation zone kept free of transient material.
- . The vital area barriers were maintained and not compromised by breaches or weaknesses.
- . Illumination in the PA was adequate to observe the appropriate areas at night.
- . Security monitors at the secondary and central alarm stations were functioning properly for assessment of possible intrusions.

No violations or deviations were identified.

9. Radiological Protection Observations

The NRC inspector verified that selected activities of the licensee's radiological protection program were implemented in conformance with the facility policies and procedures and in compliance with regulatory requirements. The activities listed below were observed and/or reviewed:

- . Health physics (HP) supervisory personnel conducted plant tours to check on activities in progress.
- . Radiation work permits contained the appropriate information to ensure work was performed in a safe and controlled manner.
- . Personnel in radiation controlled areas (RCA) were wearing the required personnel monitoring equipment and protective clothing.
- . Radiation and/or contaminated areas were properly posted and controlled based on the activity levels within the area.
- . Personnel properly frisked prior to exiting an RCA.

No violations or deviations were identified.

10. In-office Review of Periodic and Special Reports

In-office review of periodic and special reports was performed by the NRC resident inspector and/or the Fort Calhoun project inspector to verify the following, as appropriate:

- . Reports included the information required by appropriate NRC requirements.
- . Test results and supporting information were consistent with design predictions and specifications.
- . Determination that planned corrective actions were adequate for resolution of identified problems.
- . Determination as to whether any information contained in the report should be classified as an abnormal occurrence.

The following reports were reviewed:

- . April monthly operating report, dated May 13, 1987
- . Monthly operations report for April, undated
- . Additional information on Auxiliary Feedwater System reliability analysis, dated May 18, 1987

During review of reports, NRC personnel identified 10 CFR Part 21 reports submitted by suppliers or vendors that appeared applicable to the licensee's facility. The NRC resident inspector provided copies of these reports to the plant licensing engineer for review of applicability by the licensee. The reports provided are listed below.

- . A letter dated February 10, 1987, from the Sacramento Municipal Utility District regarding warped gear limit switch rotors in Limitorque valves
- . A letter dated February 17, 1987, from the Foxboro Company related to problems identified in Spec 200 current-to-voltage cards stored in a high moisture environment
- . A letter dated January 28, 1987, from Virginia Electric and Power Company regarding defective steel columns provided by the Rockwell Engineering Company
- . A letter dated January 13, 1987, from the Morrison-Knudsen Company regarding the failure of a 130-Vdc relay in an emergency diesel generator control circuit
- . A letter dated March 30, 1987, from Isomedix related to the measurement tolerance associated with the dose and dose rate values certified in test reports
- . A letter dated March 2, 1987, from the Arizona Nuclear Power Project regarding a fire in the emergency diesel generator injection tube
- . A letter dated November 25, 1986, from Basler Electric related to cracking of O-rings on the latch mechanism on the emergency diesel generator contactors
- . A letter dated January 12, 1987, from Cooper-Bessemer regarding a failure of the master power rod in the emergency diesel generator

No violations or deviations were identified.

11. Followup on Allegations Related to Welding by a Contractor
(Reference 4-87-A-012 and 4-87-A-018)

NRC inspectors performed a followup on allegations related to welding performed on safety-related seismic supports for masonry walls in the auxiliary building and on a containment storage platform. The welding was performed by a licensee contractor, Fuel Economy Company.

During performance of the followup, the NRC inspectors reviewed documentation for installation of the containment platform and the seismic wall supports. The documentation reviewed by the NRC inspectors are listed below.

- . Modification Request (MR) FC-81-180, "Structural Modification of Concrete Masonry Walls in the Auxiliary Building"
- . MR-FC-83-05, "Storage of Equipment in Containment"

- . Welder qualification records for welders employed by the Fuel Economy Company
- . Weld inspection records for welds associated with MR-FC-81-180 and MR-FC-83-05
- . Anchor support data sheets completed for installation of concrete anchors for MR-FC-81-180
- . Safety-Related Design Change Order (SRDCO) 84-73 and SRDCO-85-41, installation instructions for MR-FC-81-180
- . Purchase Order (PO) 70639, for the purchase of hex-head bolts used for installation of the seismic wall supports
- . SRDCO-87-25, installation instructions for MR-FC-83-05

The allegations reviewed by the NRC inspectors are discussed below. This inspection was performed to establish the validity of the allegations, and to take enforcement actions, if appropriate. This inspection considered only the technical aspects for the items reviewed. No other aspects were considered during the inspection.

- . An unqualified welder dressed up or rewelded field welds performed by qualified welders on the seismic wall supports so the welds would pass a quality control (QC) inspection.

This item was not substantiated due to a lack of specific information as to the location of the welds. However, the NRC inspectors verified that the welder redoing the field welds was qualified to perform the welding. Therefore, the dressing up or rewelding of the welds, if it occurred, would be technically acceptable.

- . Welds installed on the seismic wall supports did not meet the requirements stated in the design installation instructions.

In an inspection performed in March 1987 the NRC inspector verified that welding on the seismic wall supports was not being performed in accordance with documented instructions. An apparent violation was identified in NRC Inspection Report 50-285/87-08.

During this inspection, the NRC inspectors examined the butt welds used for installation of portions of the seismic wall supports. During examination of the welds, the NRC inspectors noted that four square-butt welded joints did not exhibit full-thickness penetration as required by the weld symbol on the design drawing. The four butt welds were installed to connect Support Members CORR-NS-1 to CORR-NS-2, CORR-NS-2 to CORR-NS-3, CORR-NS-3 to CORR-NS-4, and CORR-NS-4 to CORR-NS-5.

In addition to the inadequate weld penetration, the design installation requirements provided in Design Document MR-FC-81-180 stated that welding shall be accomplished in accordance with AWS D1.1-83. The welding procedure used for installation of the square butt welds was not qualified to AWS D1.1-83. The use of a welding procedure that was not qualified to the requirements stated in the design document is a failure to control the special processes used for installation of safety-related structures. This is an apparent violation. (285/8713-01)

The licensee performed an engineering evaluation on the butt-welded joints, as installed, and determined that the joints would perform their intended safety function. Based on the results of the evaluation, no reinspection or weld repairs were to be performed by the licensee.

When incorrect (i.e., didn't meet design installation requirements) welds were installed on seismic wall supports, the engineer would change the requirements in the design documentation so the welds would be acceptable.

This item was substantiated. The engineer changed the original requirements so that welds would be acceptable. Since the engineer used the established design change control procedure to change the weld acceptance criteria, this method of changing design requirements is considered technically acceptable.

A seismic support for a safety-related cable tray was notched during installation to avoid an existing obstruction. Notching of the support was contrary to the design installation instructions.

Due to the lack of specific information related to this item as to the location of the tray support, no resolution of this item could be determined.

However, during review of supports in the field, the NRC inspectors noted five areas where cable tray supports had been notched. One notch extended approximately 50 percent into the support. In discussions with a licensee engineer, it was determined that the supports were not installed by instructions provided in MR-FC-81-180.

The engineer stated that a review of the appropriate documentation would be performed to verify that the notches identified were authorized by the installation instructions. This item remains open pending the resolution of the identified concerns related to notching of supports and a review of the resolution by an NRC inspector. (285/8713-02)

Bolts were used for installation of seismic tie-back braces that were not verified to be critical quality equipment (CQE) material.

No specific information was provided as to the exact location of the non-CQE bolts. For this reason, this item could not be substantiated as being done during installation of the supports.

The NRC inspectors examined bolts that had been used for installation of the supports in the general area identified in the allegation. This review confirmed that the material (A-325) of the installed bolts was the same material as was specified by PO 70639. The bolts were not marked to identify them as CQE material; therefore, no determination could be made to verify that the bolts had been receipt inspected by the quality assurance (QA) organization. The licensee's QA program does not require the marking of each bolt after receipt inspection.

While drilling holes for installation of seismic wall support anchors, rebar would be hit inside the concrete. The installation documentation required that the hole be filled if rebar was encountered and another hole drilled.

Due to a lack of specific information as to where the holes were located, this allegation was not substantiated. The NRC inspectors reviewed selected anchor installation support data sheets to verify that a preload torque was applied to the anchors. By application of a preload torque, it can be verified that the anchor is properly installed in the hole. For the selected data sheets reviewed, no instances were noted where the preload torque was not properly applied. Based on this review, it appeared that the anchors were properly installed.

The NRC inspectors also reviewed MR-FC-81-180 for requirements associated with installation of the anchors. No requirement could be found that stated holes were to be filled if rebar was encountered when drilling.

Non-CQE filler material was used to fill abandoned bolt holes in structural seismic wall components.

Due to a lack of specific information, this allegation could not be substantiated. However, during field inspection of the supports, the NRC inspectors noted two unfilled bolt holes in a structural I-beam. A licensee engineer stated that an analysis had not been performed to determine the affect of the holes on the strength of the structural member. This item remains open pending a review of the licensee's completed evaluation by an NRC inspector. (285/8713-03)

Holes through concrete block walls were enlarged to allow alignment with holes in the seismic wall supports.

During field inspections performed by the NRC inspectors, enlarged holes in concrete blocks were identified in several locations. An evaluation of the affect of the holes on the structural integrity of

the wall was performed and it was determined that the enlarged holes did not affect the strength of the wall.

Angle iron used to firm the angle between the ceiling and the wall for seismic support was installed too low to provide proper support.

This allegation was not substantiated due to a lack of specific information as to the location of the angle iron. The NRC inspectors reviewed selected locations where angle iron had been installed to verify it had been installed in accordance with the design installation instructions. No problems were noted during this review.

Non-CQE material was used to plug abandoned holes in the base plates of the containment equipment storage platform.

This item was substantiated. A review of the use of the non-CQE material was performed by a licensee engineer and found to be technically adequate. A review of the design change that allowed use of non-CQE material was performed by the NRC inspectors. The review confirmed that the use of non-CQE material was technically appropriate.

Plug welds were performed on the containment structure using uncontrolled weld material.

This item was not substantiated. The NRC inspectors reviewed the records of weld material used on all containment platform welds. The review indicated that all weld material was traceable to a heat number.

The licensee issued three operations incident reports (OI 2811, 2812, and 2813) for the violation and two open items identified in this section of this report. By issuing the OIs, the licensee will ensure that the discrepancies identified by the NRC inspectors will receive timely review and closeout.

During review of the allegations listed above, the NRC inspectors identified concerns related to licensee activities involved with installation of design changes. Although not cited as violations or deviations, the licensee should strongly consider taking appropriate actions to address these apparent weaknesses.

Emphasis should be placed on meeting all the requirements of the fabrication code. Improper fabrication practices should not be tolerated and poor workmanship should be repaired to meet the intent of the fabrication code. Engineering evaluations should not be used as an alternative to compliance with a fabrication code.

The modification program should place more emphasis on the need for craftspersons to ensure quality work is performed at the time of

installation. The present program relies too much on QC inspections ensuring that quality was built into the installations. Emphasizing the need to build quality into the installation at the time of fabrication will eliminate unnecessary repairs when QC personnel perform inspections of the final product.

- . Design change installation packages issued to the craftspersons do not contain a sufficient level of detail to provide appropriate instructions as to what work the craftsperson should or should not perform.
- . The installation packages should contain a statement that no work may be performed if not specifically addressed in the installation instructions. The craftsperson should be directed to contact the engineer if any questions arise so a formal design change may be properly completed.
- . The installation packages should provide specific acceptance criteria in words that the craftsperson and QC inspector can easily understand.
- . The welder qualification process used by QC needs closer supervision to verify that welders are being qualified to established requirements and that the documentation of qualification is adequately maintained.
- . Contract QC personnel used during outages to support the licensee's normal QC staff should receive substantial indoctrination training to ensure that these contract personnel understand how the administrative controls used at the Fort Calhoun Station (FCS) work.

During the exit interview held on this portion of this inspection, the NRC inspectors discussed the concerns listed above with licensee management personnel. Management personnel stated that the items would be reviewed for possible inclusion in their current programs.

12. Review of the Program for Installation of Heat-Shrinkable Tubing

The NRC inspector reviewed the licensee's program for the installation and inspection of heat-shrinkable tubing used on electrical splice connections and terminations. This review was performed in response to the issuance of IE Information Notice (IEN) 86-53, "Improper Installation of Heat-Shrinkable Tubing," by the NRC on June 26, 1986. IEN 86-53 was issued to alert licensees to problems encountered at some plants with the installation of splice connections manufactured by Raychem.

The licensee established a program for inspection of Raychem splice connections based on the information provided in IEN 86-53 and implemented the program in MO 870154, "Inspection of Raychem Splices." The established program required that a 100 percent inspection of all safety-related splice connections in a harsh environment be performed

during the 1987 refueling outage. The program also required that all inspections be performed by a team of at least two individuals, one from engineering and one from QC.

Prior to initiating the inspection and repair of the Raychem splice connections, the licensee brought a Raychem representative onsite to instruct and train several licensee employees on how to properly inspect and install the splice connections. These licensee employees, in turn, trained all other remaining personnel involved in inspection and installation activities, on the proper methods to be used.

During inspection of the previously installed splices, the licensee inspection teams determined that approximately 245 splice connections had been improperly installed. All the splice connections were located in the flexible conduit attached to ASCO solenoid-operated valves. The major problem with these connections was that the minimum bend radius for the splices had been exceeded. The rejected splices were repaired using instructions provided in MO 871422, "Work Instructions for Raychem Splice Repair." The reinstallation of the splices was performed under full-time QC surveillance.

To ensure that Raychem splice connectors are properly installed during future activities, the licensee issued installation instructions in Technical Standard ETS-11, "Conductor Splice Installation Specification." This document incorporated information supplied by the Raychem representative, as well as the experience recently derived from inspection and repair of the splices.

The NRC inspector reviewed the documentation listed below in conjunction with the performance of this inspection. No problems were noted during the review.

- . MOs 870154 and 871422 to verify that appropriate instructions for inspection and repair of splices had been provided.
- . Technical Standard ETS-11 to verify that the newly issued procedure contained adequate installation instructions.
- . Training records for selected personnel involved in the inspection and repair program to verify that training had been received.
- . Selected evaluations performed in accordance with 10 CFR 50.59 to verify that the evaluations were properly completed.
- . The PO used for acquisition of the splice connectors to verify that the appropriate requirements were stated and to verify that the splice connectors were environmentally qualified.

The NRC inspector examined the installation of a sample of splice connectors that had been replaced as a result of the inspection program. It appeared that the splice connectors had been properly installed.

Based on a review of documentation related to and inspection of installed splice connectors by the NRC inspector, it appeared that the licensee had established a program that would ensure proper installation of Raychem splice connectors.

No violations or deviations were identified.

13. Followup on Licensee Actions Related to Reactor Vessel Pressure Transient Protection

The purpose of this portion of this inspection was to review what actions the licensee had taken to ensure that an effective mitigation system had been established for low-temperature overpressure (LTOP) conditions. The inspection was based on the response made by the licensee to Unresolved Safety Issue (USI) A-26, "Reactor Vessel Pressure Transient Protection for Pressurized Water Reactors."

During review of this issue, the NRC inspector determined that the licensee had established the measures listed below to prevent an LTOP transient.

- . A variable trip setpoint for the power-operated relief valves (PORV) and a pretrip annunciator in the control room had been installed.
- . Surveillance Procedure ST-PORV-1 was used for verification of the operability of the PORVs.
- . An operator was stationed at control room Panels CB-1/2/3 to continuously monitor and control reactor coolant system (RCS) pressure while the primary plant was in a solid-water condition.
- . Administrative controls were established to ensure the high-pressure safety injection and charging pumps were not started, manually or automatically, while the primary plant was in a solid-water condition.

The NRC inspector reviewed the documentation listed below to verify that the licensee performed an adequate assessment of an LTOP transient on the plant and had established the proper administrative and hardware controls discussed above.

- . MR-FC-79-81, "Variable Setpoint for PORV Actuation," including evaluations performed in accordance with the requirements of 10 CFR 50.59, wiring and logic diagrams, and seismic design criteria.
- . Requirements were issued that stated a reactor coolant pump shall not be started while the primary plant is in a solid-water condition unless a pressurizer steam space of 60 percent, by volume, or greater exists, or the delta temperature between the steam generator primary and secondary side is less than 50°F.

- . Caution tags were installed with the pressurizer heater control switches in the off position to prevent inadvertent heater energization while the primary plant is in a solid-water condition.
- . Procedure OI-RC-2B, "Reactor Coolant Vent and Leak Test Instruction"
- . Procedure OI-RC-3, "Reactor Coolant System Startup"
- . Procedure OI-RC-4, "Reactor Coolant System Normal Shutdown"
- . Procedure ST-PORV-1, "Low-Temperature, Low-Pressure Power-Operated Relief Valve System"
- . Setpoint curves (RCS pressure-temperature limits) for the PORVs
- . Applicable sections of the TS

In addition, the NRC inspector verified that the annunciator for PORV actuation and pretrip conditions were present in the control room. The NRC inspector interviewed a senior reactor operator on various aspects of LTOP operations and noted that the operator was very knowledgeable in the procedural requirements to mitigate an LTOP transient.

Based on the review performed by the NRC inspector, it appeared that the licensee had established an adequate program to minimize the affects of an LTOP transient. It also appeared that the licensee had adequately implemented LTOP controls as described in the licensee's response to USI A-26.

No violations or deviations were identified.

14. Verification of Containment Integrity

The NRC inspector performed a review to verify that the licensee had established containment integrity prior to commencing heatup of the RCS above 210°F. Verification of containment integrity was established by reviewing the items listed below:

- . Verification that selected electrical and mechanical barriers had been properly installed.
- . Containment isolation valves were properly positioned as required by the appropriate documentation.
- . Local leak rate tests were performed on the personnel airlock, equipment hatch, and fuel transfer tube.

Containment integrity was verified by performance of the items listed below:

- . Review of the local leak rate test performed on the personnel air lock in accordance with Procedure ST-CONT-2-F.2, the equipment hatch performed in accordance with Procedure ST-CONT-2-F.3, and the fuel transfer tube performed in accordance with Procedure ST-CONT-2-F.4.
- . Walk down and verification of selected valve positions related to containment integrity as provided in Procedure OI-CO-5, "Containment Integrity Checklist."
- . Walk down and verification of selected valve positions as provided in Procedure OI-RC-2B-CL-D. See paragraph 5 of this inspection report for additional information on the results of the walkdown.
- . Walk down and verification of selected valve positions performed during followup on Deviation 285/8702-01. See paragraph 2.c of this inspection report for details on this item.
- . Plant tours were performed to verify selected mechanical and electrical penetrations had been properly installed.

During performance of the activities listed above, no containment isolation valves or mechanical/electrical penetrations were found that were not in the proper position or properly installed. Problems were noted with the documentation related to administrative control of some containment isolation valves. See paragraph 2.c of this inspection report for a discussion of the items.

No violations or deviations were noted.

15. Review of Modification Testing for Installation of a Containment Equipment Storage Platform

The NRC inspector performed a review of the installation of an equipment storage platform in containment to verify the installation was accomplished in accordance with the applicable codes, standards, and regulations. The NRC inspector reviewed the signed-off copy of MR-FC-83-05, "Storage of Equipment in Containment," and performed a review of selected items on the installed platform to verify the installation conformed with the requirements stated in the modification request. This modification was installed to provide an area for storage of equipment during refueling shutdowns. During evaluation of the installation, the NRC inspector reviewed selected portions of supporting documentation associated with construction of the platform. The documentation reviewed is listed below:

- . Welder qualification records for each individual performing welding on the platform

- . Records of the results of visual weld inspections performed by QC
- . Anchor support data sheets completed for installation of concrete anchors
- . Weld verification forms used to document the individual making the weld and the type of weld rod used
- . SRDCO-87-25, installation instructions for MR-FC-83-05

The NRC inspector reviewed MR-FC-83-05 for the following:

- . Torque values had been specified, as appropriate, and QC verified the torque value on a sampling of fasteners.
- . The appropriate weld procedure was specified and used for installation of the welds.
- . Materials used in construction were receipt inspected prior to use and verified to meet limited-CQE requirements.
- . Design changes made to the MR were performed in accordance with established procedural requirements.
- . Drawings were changed to reflect the as-built conditions of the installed platform.
- . Changes to other procedures affected by the modification were made.
- . An evaluation of the affects of the installation on other plant systems was properly performed in accordance with the requirements of 10 CFR Part 50.59.
- . An as-low-as-reasonable-achievable (ALARA) checklist was performed prior to commencement of installation activities.

During review of MR-FC-83-05, the NRC inspector noted the following:

- . A change to the design installation package was not performed in accordance with established procedures. The change was instituted by issuance of a memo from the engineer to QC stating that use of non-CQE material was satisfactory. Non-CQE material was used to plug abandoned bolt holes in the platform base plates. This change made by the engineer was not performed in accordance with established design change control procedures. Subsequent to the review of the MR, the licensee processed a proper design change. The change determined that use of the non-CQE material was satisfactory. The NRC inspector reviewed the design change and determined that the change was properly made.

The installation drawing referenced the appropriate welding code as AWS D1.1-83; whereas, the installation instruction specified the appropriate code as AWS D1.1-85.

The as-built drawings did not show the location of the plug welds; PW-1, PW-2, PW-3, and PW-4, made in the structural members.

Prior to review of MR-FC-83-05 by the NRC inspector, the MR had been reviewed the day before by operations quality assurance (QA) personnel. In reviewing the discrepancies identified by QA, the NRC inspector noted that QA had identified the same concerns. To ensure that the concerns were properly addressed, QA issued a deficiency report (DR-FC-1-87-056) related to the changing of design documents without following established procedures. The DR was issued to ensure that the generic, as well as specific problems related to this design change were addressed. In addition, QA also verified that the other discrepancies discussed above were corrected. Since the discrepancies were identified by QA prior to the review performed by the NRC inspector, no violation of Criterion III of Appendix B to 10 CFR Part 50 for failure to properly process a design change was issued. The NRC inspector will review the actions taken by the QA department to verify the discrepancy is properly addressed. This item will remain open pending a review of the closed DR by an NRC inspector. (285/8713-04)

No violations or deviations were identified.

16. Licensed Operator Requalification Program

The NRC inspector continued a review of the licensee's requalification program initiated during the previous inspection period. The review was performed to verify that the licensee had implemented a program that complied with 10 CFR Part 55 and the licensee's NRC-approved training program.

A major portion of this area of inspection was performed to verify that the licensee had taken appropriate corrective actions on previously identified items. Previous items were identified during an inspection performed in August 1986, as detailed in NRC Inspection Report 50-285/86-24. The inspection report identified a total of six items that indicated weaknesses existed in the overall training program. Three of the items were found to be satisfactory and closed. However, the three items that remained open due to unsatisfactory corrective actions were related to the basic aspects of the training program. The items included the following:

Unresolved Item (URI) 285/8624-01 related to establishing an effective training records program to document completion of training activities. A discussion of the followup performed on URI 285/8624-01 was provided in paragraph 2 of NRC Inspection Report 50-285/87-10. The followup inspection indicated that the licensee had just recently initiated actions to establish an auditable records system.

URI 285/8624-02 related to not providing on-the-job training for all aspects of plant operations by failing to give classroom lectures for the loss of instrument air and the loss of shutdown cooling. A discussion of this item was provided in paragraph 2 of NRC Inspection Report 50-285/87-10. The followup inspection indicated that no corrective actions had been initiated in providing these classroom lectures since the problem was initially identified in August 1986.

URI 285/8624-03 related to providing a preplanned lecture series on EOPs. This item is discussed in paragraph 2 of this inspection report. The followup inspection indicated that some EOPs were discussed during simulator training given in the early part of 1987, but training on all EOPs had not been provided.

Based on the review performed on these items, it appeared that the licensee had not taken timely actions to correct the previously identified problem areas. Without an adequate level of performance in the areas identified by the three URIs, the licensee's operator training program is not currently at a level of proficiency that would ensure adequate training of licensed operators. For this reason, it is requested that the licensee provide a response to URIs 285/8624-01, 285/8624-02, and 285/8624-03. The response should include a discussion of the actions you plan to take to satisfactorily resolve the items and when the actions will be completed.

During this inspection, no additional unresolved items were identified. However, a number of concerns were identified by the NRC inspector. The concerns are listed below. The NRC inspector discussed each concern with licensee training management personnel.

- a. Approximately 75 percent of the training staff is composed of contractor personnel. These contractor personnel taught approximately 85 percent of the classes given from September 1986 through March 1987. Although most of the contractor personnel have received licenses as operators at other plants or have held instructor certifications; none of these instructors have had any operating experience at the FCS. Without actual operating experience at the FCS, the classroom lectures could not include a description of actual plant operating experiences. This type of information would enhance the overall knowledge level of the operators attending classroom lectures.

Licensee personnel stated that efforts were initiated in the recent past to add instructors to the training staff that currently hold operating licenses at the FCS. This effort will begin in July 1987.

- b. The licensee had not established a method for certification of contract instructors to teach plant systems. Without a certification program, the level of knowledge of contract instructors was not determined for a specific area prior to allowing the contractor to provide training in that area.

Licensee personnel stated that instructors were interviewed by the Supervisor-Station Training prior to being allowed to teach and have been evaluated for the technical content of their lectures twice each year. Based on the results of these evaluations, it was felt additional certification was not required. Licensee personnel stated that they would consider giving each instructor a check out on the individual systems they teach to verify their technical knowledge is adequate.

- c. A review of 15 lesson plans indicated that 9 of the lesson plans were prepared by a contractor and approved by a licensee employee with no operating experience at any nuclear plant. The review also indicated that no operating personnel at the FCS had reviewed the lesson plans.

Licensee personnel stated that the lesson plans previously unreviewed by licensed personnel would be rereviewed by appropriate personnel in the near future.

- d. Lesson plans for Sections 1 and 2 (Safety Limits and Limiting Conditions for Operations) of the TS, the auxiliary feedwater system, and the EOPs were reviewed for technical content. The results of the review indicated that the lesson plans contained technically incorrect information, appropriate information had not been included, and typographical errors affecting the technical meaning of the information were not uncommon.

Licensee personnel stated that the lesson plans were in the process of being reviewed. No time frame was given as to when the reviews would be completed.

- e. Lesson plans had not been completed for Sections 4 and 5 (Design Features and Administrative Controls) of the TS. Without an approved lesson plan, no learning objectives were established and no assurance was made that the licensed operators received the in-depth instruction needed to perform their assigned duties.

Licensee personnel stated that the lecture given on Sections 4 and 5 of the TS was given using the TS manual as the lesson plan. These personnel stated that they felt lectures given from the TS manual were adequate.

- f. The licensee established a formal program for maintaining lesson plans up-to-date in April 1987. Prior to this time, it was the individual instructor's responsibility to ensure that the lesson plan contained the latest information. As discussed in paragraph 6.d above, a review performed on three lesson plans indicated that the information contained in the lesson plans was incomplete or inaccurate. These lesson plan inadequacies were due, in part, to the lesson plans not being updated with the latest information.

Licensee personnel stated that the lesson plans that had become out dated would be reviewed and brought up-to-date. No date was specified as to when the updating of the lesson plans would be completed.

- g. The licensee did not maintain an as-given training schedule. The schedule was issued at the beginning of the week to notify appropriate individuals of the classes to be taught. If, for some reason, the class was rescheduled or the class was cancelled, no changes were made to the schedule to reflect the actual as-given training. Without this information, the licensee can not establish that the training required by 10 CFR Part 55 and the licensee's NRC-approved training program was provided.

Licensee personnel stated that this concern would be reviewed and, if appropriate, actions would be taken to establish a program to maintain an as-given training schedule.

The NRC inspector interviewed onshift licensed operators to verify that the training records actually reflected the training received by each individual. During discussions with licensed personnel, it was determined that the classroom attendance sheets for a lecture given on special topics in March, April, and May 1987 had been completed, but approximately 1 month after the attendance sheet was signed, individuals received a letter stating that the individual had missed the classroom lecture. There appeared to be a discrepancy as to whether or not the training records correctly reflected the individual's attendance at the lecture on special topics. By the end of this inspection period, the licensee had not established the reason for the apparent discrepancy. This item remains open pending a review of the discrepancy by the licensee and a followup review by the NRC inspector. (285/8713-05)

The NRC inspector also interviewed onshift licensed operators to solicit comments regarding their perspective on the quality of the training being provided. The list of comments provided below were derived from interviews with shift supervisors, senior reactor operators, and reactor operators.

- . The drawings and diagrams given as training handouts during lectures were unreadable.
- . The reference material in the training library was out-of-date because the changes to the procedures were not incorporated in a timely manner.
- . The material presented in classroom lectures was not detailed enough to provide the instruction needed to operate the plant.
- . Instructors were late for class and not prepared due to last minute changes in the training schedule.

- . Training material did not contain plant operating experience.
- . Four instructors (licensee employees and contractors) were identified as being excellent; however, the overall knowledge level of the instructors in general was not too good.
- . Management has been told of concerns listed above but no apparent action has been taken.

In discussion with licensee personnel regarding the above items, licensee personnel stated that they thought the comments provided by the licensed operators were problems that existed in the past, but were not current problems. The NRC inspector noted to the licensee personnel that the operators that made the comments stated that the problems still existed. Licensee personnel stated that they would review the concerns of the operators and take actions, as appropriate.

The licensee received bids for installation of an onsite, plant specific simulator. It is anticipated that the contract for the simulator will be awarded in the near future. It is also currently anticipated that the simulator will be fully operational by late 1990 or early in 1991.

In February 1987, the licensee received accreditation from the Institute of Nuclear Power Operations for the three programs associated with licensed operator training. The three accredited programs are shift supervisor training, licensed-operator requalification training, and initial licensed-operator training.

No violations or deviations were identified.

17. Containment Local Leak Rate Testing

The NRC inspector performed this inspection to verify, through observation and records review, that the local leak rate test program for testing of the containment isolation valves and penetrations (mechanical and electrical) was performed in accordance with TS requirements.

Prior to startup from the current refueling outage, the licensee verified that all penetrations and isolation valves had been tested in accordance with approved procedures. For isolation valves and penetrations that were repaired, the licensee verified that the valve or penetration received posttesting to verify the leak rate was satisfactory. The licensee also verified that the total leak rate for all penetrations did not exceed 0.6 La, as required by the TS.

The NRC inspector reviewed the preliminary data available to verify the licensee had properly completed local leak rate testing of the appropriate penetrations and valves. Based on a review of the preliminary data, it appeared that the licensee had properly performed the required testing.

Since the final leak rate testing data was not available prior to the end of this inspection period, this portion of this inspection will be continued into the next inspection period.

No violations or deviations were identified.

18. Meetings

On May 14, 1987, an enforcement conference was held in the Region IV office. The conference was held to discuss apparent violations related to maintenance and welding inspections performed by Region IV personnel as detailed in NRC Inspection Reports 50-285/87-05 and 50-285/87-08, respectively. The attendees at the meeting included licensee personnel, NRC management personnel, senior resident inspector, Region IV enforcement officer, Region IV reactor inspectors, and a representative from the NRC's Office of Nuclear Reactor Regulation.

19. Exit Interview

The NRC senior resident inspector met with Mr. W. G. Gates (Plant Manager) and other members of the licensee staff on June 1, 1987. At this meeting, the NRC inspector summarized the scope of the inspection and the findings.

During this inspection period, three additional exit interviews were held related to items discussed in this inspection report. The details of the dates, attendees, and subject matter of these exit interviews are provided in paragraph 1.