



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

Report Nos.: 50-327/88-06 and 50-328/88-06

Licensee: Tennessee Valley Authority
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License Nos.: DPR-77 and DPR-79

Facility Name: Sequoyah 1 and 2

Inspection Conducted: January 4-8, 1988 and January 19, 1988

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SUMMARY

Scope: This special, announced inspection was conducted in the area of system alignment verification for Unit 2 heatup. The inspection consisted of review of administrative procedures and personnel qualifications, observation of the licensee's accomplishment of the System Operating Instruction (SOI) checklists, and independent verification of system alignment.

Conclusions: The team determined that the licensee's configuration control program (completed SOI checklists combined with configuration control log entries) was adequate to support heatup.

Violations identified during this inspection include:

Violation 327,328/88-06-01, which is a violation of Technical Specification (TS) 6.8.1 for failure to adequately establish, implement, and maintain written procedures for configuration control. Examples include:

- 1) Failure to specify in AI-58 the qualification criteria for individuals performing independent verification of SOI checklists (paragraph 4.a).
- 2) Failure to record the position changes in the configuration log for Post Accident Sampling System (PASS) valve breakers and instrument root valve 1-268A (paragraphs 6.b.3 and 6.a).

Violation 327,328/88-06-02, which is a violation of 10 CFR 50, Appendix B, Criterion XVI for failure of the system alignment corrective action program to eliminate SOI checklist inadequacies prior to restarting the system alignment process (paragraph 6.b.4).

Violation 327,328/88-06-03, which is a violation of 10 CFR 50, Appendix B, Criterion V for failure to establish and implement adequate procedures and/or practices to prevent storage of loose conductive material in safety-related electrical boards (paragraph 6.b.5).

REPORT DETAILS

1. Licensee Employees Contacted

- *J. Anthony, Operations Group Manager
- *R. Buchholz, Sequoyah Site Representative
- *J. Bynum, Assistant Manager of Nuclear Power
- **S. Childers, Procedures
- *W. Gamble, Instrument Maintenance General Foreman
- #*T. Howard, Division of Nuclear Quality Assurance
- **G. Kirk, Compliance Licensing Manager
- *R. Loverne, Compliance Licensing Engineer
- *J. Patrick, Shift Supervisor
- S. Smith, Plant Manager
- **H. Tirey, Operations System Alignment Team Leader
- J. Walker, Assistant Operations Group Manager
- **B. Willis, Operations Plant Superintendent
- *G. Wilson, Assistant Operations Group Manager

Other licensee employees contacted included technicians, operators, shift engineers, and engineers.

- *Attended January 8 exit interview
- #Attended January 19 exit interview
- **Attended both exit interviews

2. Exit Interview

The inspection scope and findings were summarized with the Operations Superintendent and members of his staff on January 8 and January 19, 1988. The licensee acknowledged the inspection findings and did not identify as proprietary any of the material reviewed by the inspectors during this inspection. During the inspection, frequent discussions were held with the Plant Manager, Operations Superintendent, and other managers concerning inspection findings.

3. Licensee Action on Previous Enforcement Matters (92702)

(Open) VIO 327, 328/87-66-01; Failure to Establish, Implement, and Maintain Procedures for System Alignment. The licensee upgraded system alignment procedure OSLA-58 to Administrative Instruction AI-58 and corrected inadequacies in the instruction. Configuration control was specifically identified to begin when checklist performance begins. A form was added to provide the proper method for deviating from SOI checklists to conform with TS requirements for procedure changes (Appendix B). Additional comments on the review of AI-58 are contained in paragraph 4 below. This item is considered acceptable for heatup based on the licensee's corrective action but remains open pending review of the licensee's formal response.

(Open) VIO 327,328/87-66-02; Failure to Have an Adequate SOI for the Emergency Core Cooling System. The Emergency Core Cooling System checklists were reviewed to verify that the equipment identified in the violation had been added to the SOI checklists. Prior to restarting the system alignment program the licensee had considered the generic significance of this violation and performed a verification per OSLA 107 Appendix B of all system alignment checklists. The checklists were verified against the plant and against the drawings to ensure that all necessary equipment was included on the checklists. Discrepancies from the OSLA 107 Appendix B review that required corrections to the SOI checklists were accomplished by the licensee prior to reperformance of any checklist. This item is considered acceptable for heatup based on the licensee's corrective action, but remains open pending review of the licensee's formal response.

4. Administrative Controls

The inspectors reviewed the adequacy of the administrative procedures controlling system alignment verifications. In response to findings of NRC Inspection 50-327,328/87-66, the licensee upgraded Operations Section Letter OSLA-58 to an Administrative Instruction, AI-58, "Maintaining Cognizance of Operational Status - Configuration Status Control".

The inspectors reviewed the adequacy of AI-58, Revision 0, for controlling system alignment verifications.

a. Personnel Qualifications and Certification

The inspectors reviewed the adequacy and the implementation of procedural requirements for the qualifications of personnel. Qualifications for personnel performing valve alignment and power availability checklists were not adequately specified in plant procedures. Procedure AI-37, "Independent Verification", required in Section 4.1.8 that each plant section establish a minimum qualification level for individuals performing independent verification. The previous instruction, OSLA-58, had given specific requirements for the qualifications of personnel performing checklists, stating:

Licensed Operations personnel (i.e., Group Managers, SEs, ASEs, UOs), non-licensed UOs, AUOs, and C-4 SROs may perform verifications on valve checklists or power availability checklists.

These requirements had been deleted in Revision 0 of AI-58.

The inspector identified through conversations with licensee management that the minimum acceptable qualification level for persons performing system alignment verifications was still considered to be certification as an Auxiliary Unit Operator (AUO) plus additional training on all relevant procedures.

The licensee stated that all of the system alignment personnel were certified AUOs at either Sequoyah, Watts Bar, or Bellefonte. During NRC inspection 50-327,328/87-66, it was determined that if AUOs from a plant other than Sequoyah were to perform system alignment verifications, then a formal certification would be required that they had received plant-specific training which qualified them to perform that job. During Inspection 87-66, such certification sheets were generated by the licensee for each individual. The inspector determined that additional non-Sequoyah AUOs had joined the system alignment team subsequent to Inspection 87-66, but the agreed-upon certification sheets were not available. In addition, the previously inspected certifications could not be located when requested by the inspector. Thus there was no written certification that the alignment personnel were qualified.

The inspector was provided with attendance sheets for a number of procedure training sessions which had been conducted. All but one of the persons performing the alignment checklists had attended one or more training sessions on AI-16, AI-58, AI-37, AI-25, and AI-30. This procedure training was assumed by the inspector to define the established minimum training as required by AI-37. The individual who did not receive this training was a certified Sequoyah AUO. Licensee management stated that they believe him to possess sufficient knowledge to have satisfactorily performed the checklists. However, the licensee had not waived the procedure training for any other Sequoyah AUO. Because not all of the other individuals attended the same number of sessions or sessions of approximately the same length, it was difficult for the inspector to assess exactly what amount of training was considered necessary.

The inspector noted that no formal training was conducted on GOI-6, "Apparatus Operations", which provides guidance for operating and verifying the position of plant equipment including valves and electrical components. The previous certification sheets had stated that the individuals had been formally trained on GOI-6. The licensee stated that the alignment personnel had been instructed to read GOI-6, and that the requirements of the procedure were frequently covered in the regular shift briefing sessions. The inspector questioned several of the alignment team members and determined that at least two persons appeared not to be aware of the requirement of GOI-6 that each person physically verify the position of each manually operated valve not locked in position. These individuals stated that the second verifier must only be in close proximity as the first person verifies the valve position, and they each quoted the example from AI-37 that both persons must climb the ladder if this is required to get to a valve. The inspector concluded that training on GOI-6 had not been adequate in all cases.

The licensee was informed of the statements made to the inspector that physical verification of valve positions was not required by both independent verifiers. It was then learned from the licensee

that permission had been given to one AUO, due to lack of physical strength, not to independently physically verify valve positions as required by GOI-6 as long as the partner's verification was closely witnessed. This particular AUO was not one of the individuals questioned earlier by the inspector, so the problem was not limited to that one special case. Licensee management, when informed, agreed to question all their alignment personnel and to reverify the position of any components which had not been physically verified by two individuals in accordance with the requirements of AI-37 and GOI-6.

The failure to adequately specify the qualifications for personnel performing system alignment verifications, and the resulting failure to train and formally certify these personnel, are considered a violation of TS 6.8.1 for failure to establish, implement, and maintain written procedures for configuration control and is identified as Violation 327,328/88-06-01.

b. Configuration Control

The inspector assessed the adequacy of the configuration control provisions of AI-58 by interviewing personnel and witnessing how the procedure was being used. The licensee showed the inspector how each of the major procedural requirements were being implemented, including maintaining the Status Notebooks, Test Awareness Log, and Configuration Log, processing checklist deviations; and holding checklists open until all items were cleared. The inspector also discussed with licensee personnel the criteria and the process for making configuration log entries and using drop sheets. Interactions between the unit operators and the system alignment team were closely observed to assess the level of effective communication.

The inspector concluded that an adequate awareness of the plant configuration was being maintained and the checklist performance was being well controlled. AI-58, as the inspector witnessed it being implemented, provided an adequate method for controlling system configuration. All personnel interviewed had an adequate and uniform understanding of the requirements of the procedure.

Configuration log entries were not required by AI-58 for activities controlled by approved procedures which provide configuration control and return to normal within the procedure. The lead operator is responsible for ensuring that these procedures do provide control and appropriate return to normal. AI-58 does not provide guidance for those occasions when a test is interrupted for long periods of time. The inspector determined from personnel interviews that the lead operator might enter an interrupted test into the configuration log if he considered it advisable.

It was noted that a provision had been added to AI-58 so that no configuration log entry was required for out-of-position equipment if

it was controlled from the control room and had positive position indication (see paragraph 6.a for PASS valve example). It appeared that this provision was added to eliminate some configuration log entries for SIs lacking configuration control and adequate return to normal within the procedure. Several members of the system alignment team told the inspector that it was common practice for them to ask the control room to momentarily reposition valves so that the checklist entry could be signed off, then the valves were immediately returned to their off-normal position (see paragraph 6a). This was relayed to licensee management, who stressed that it is not the normal policy.

The inspectors reviewed AI-58 and discussed the following comments with the licensee:

- Section 3.2, Starting Checklist Performance, was discussed in detail with licensee personnel. Paragraph (f) specifically addresses when configuration control should begin, but was pointed out by the inspectors to be unclear. Since ensuring that configuration control begins when checklist performance starts is essential to having an adequate configuration control program, the licensee was encouraged to ensure that this paragraph be clarified. A revision was reviewed at the end of the inspection which appeared to be much clearer concerning this subject.
- Section 1.4 required clarification to differentiate between approvals for checklist deviations and normal configuration log entries.
- Specified approvals for checklist deviations and for normal configuration log entries should be expressed consistently throughout the procedure, and the titles for the approving individuals should be consistent with Technical Specifications. Whenever appropriate, it should be specified that the approving senior reactor operator (SRO) is the shift supervisor (SS) or assistant SS (ASS) on shift. Required approval by an independent Qualified Review (QR) trained individual should be specified in each applicable portion of AI-58.
- Section 2.2.2(c) stated that both the SS/SRO and ASS/SRO will approve configuration log entries "During initial or update checklist performance." This contradicted the practice observed by the inspector for configuration log entries made prior to checklist completion. Prior to checklist completion, Appendix B forms were approved only by a single SRO. Approval by both the SS and ASS was intended by the licensee only for actual checklist deviations made to close the checklist, not when using the Appendix B form as a tracking device during checklist performance. The AI-58 procedure should be revised to reflect the plant practice.

- Section 3.5(a) states that Appendix B will track the status of the deviated item(s) until placed in their normal checklist position(s). Appendix B has signoffs for independent verification when returning components to normal; however, the licensee stated that position changes will be made only in accordance with approved procedures. The Appendix B sheets are only for documentation of the change. AI-58 should explicitly state that Appendix B sheets should only be used in conjunction with a procedure for returning equipment to normal.
- Other items of an editorial nature were also brought to the attention of the licensee.

5. Observation Of The Licensee's System Alignment Process

a. Observation of Checklist Performance

To verify the adequacy and the implementation of the licensee's system alignment program, the inspectors accompanied licensee systems alignment teams in performing all or portions of the following SOI checklists:

<u>SOI Checklist No.</u>	<u>System Title</u>
70.1A-1, Rev. 40	Component Cooling
67.1A-9, Rev. 34	Essential Raw Cooling Water
67.1A-11, Rev. 34	Essential Raw Cooling Water

As the inspectors observed the performance of the licensee teams, they noted in particular whether they were able to adequately complete the checklists and whether the checklist adequately described the items, the item location, and the required position of the items on the checklist. Overall, the performance of the licensee's system alignment team appeared to be adequate.

b. Review of Completed Checklists

The inspectors reviewed selected completed valve alignment checklists for adherence to procedural requirements.

Procedure AI-58 allows deviations of items that will not be aligned normal and will not impact mode changes, system operability, or performance of other instructions. Licensee personnel told the inspector that as of the time of the inspection, only four SOI checklists had been deviated. Other checklists with outstanding items were being held open until the items could be completed. The inspector reviewed these deviations, which were to components in systems 15, 62, 78, and 82, and concurred with the licensee's determination that these items met the criteria in AI-58 and could be deviated.

When a checklist is deviated, Section 3.5 of AI-58 requires that the SS/SRO and the ASS/SRO initial and date the status file checklist in the margin beside the deviated item's signoff space. The inspector determined that deviated items in Valve Checklist 15-1, completed December 11, 1987, had not been initialed and dated by the SS/SRO as required by AI-58. This finding is similar to example 4 of Violation 327, 328/87-66-01, and was identified to the licensee as an additional example of that violation.

Licensee personnel told the inspector that certain out-of-position components in SOI checklists could not be placed in their normal at-power positions prior to entering Mode 4 but could not be deviated per AI-58 because they affected system operability or mode change. Most of these components were positioned for shutdown per GOI-3. Therefore, the licensee planned to enter Mode 4 with certain checklists open, then place the components in their normal position and close the checklists. The inspector requested that the licensee provide a list of all the checklist items which were to be cleared after entering Mode 4. A number of the items provided to the inspector were in the containment spray system, which is required by Technical Specifications to be operable prior to entering Mode 4. When this discrepancy was brought to the attention of licensee management, it was determined to be a misunderstanding between licensee management and operations personnel. Only items that were not required for mode change would be held open when changing modes. The licensee stated that they had always intended to clear all checklist items necessary for operability of containment spray prior to entering Mode 4.

6. Independent System Alignment Verification (71710)

The independent inspection was accomplished by comparing applicable portions of selected as-built reference drawings to the SOI checklists and the plant configurations. The comparison determined whether all equipment within a particular system was included on the SOI checklists and whether the drawings actually reflected the as-built configuration of the plant. After the checklists were verified, a comparison was made by the inspectors with the completed checklists in the main control room status files to ensure that any differences could be accounted for. In addition, the inspectors randomly selected various work requests that were observed on equipment from completed checklists and ensured that these work requests did not render the equipment inoperable.

a. Valve Checklists

The inspectors independently verified the alignment of all or portions of the following SOI valve checklists to assess checklist adequacy and implementation:

<u>SOI Checklist</u>	<u>System Title</u>
15-1	Steam Generator Blowdown
32.2-1	Auxiliary Air System
32.2-2	Auxiliary Air System
61.1A-1	Glycol System
62.4A-3	Chemical & Volume Control
62.4A-4	Chemical & Volume Control
62.2-1	Chemical & Volume Control
62.5-2	Chemical & Volume Control
62.5-4	Chemical & Volume Control
63.1A-1	Emergency Core Cooling
63.1A-3	Emergency Core Cooling
63.1A-4	Emergency Core Cooling
72.1A-1	Containment Spray
82.1F-1	Diesel Generator

The following findings pertain to specific items on the valve checklists:

- (1) On checklist 15-1, pages 42-49, valves that were not in their proper position were covered under test procedures or outstanding SOIs with the exception of valve 1-268A, root valve to FI-1-152, which was found closed. The inspector reviewed the main control room status file and the configuration log. The valve was neither shown as out of position on the master status file checklist nor logged in the configuration log. Discussions with operations personnel did not reveal a reason for the valve being out of position. This is considered as an additional example of Violation 327,328/88-06-01 for failure to establish, implement, and maintain configuration control procedures.
- (2) The inspector noted that the vent and fill valves for the chemical mixing tank were not on any checklist. These valves are, however, adequately controlled through SOI 62.3, SOI 62.3B1, and SOI 62.3C which pertain to chemical addition.
- (3) Two valves on checklist 61.1A-1 were found to be named incorrectly. Valve 61-1186 was named "glycol supply drain" on the nameplate while the checklist name was "test vent isolation". Similarly valve 61-1188 was named "glycol return drain" on the nameplate while the checklist name was "test vent isolation". The nameplate names were found to agree with the reference drawings. The licensee agreed to change the names on the checklist to agree with the valve nameplates and the drawings.
- (4) During the walkdown of valve checklists 32.2-1 and 32.2-2 for the auxiliary air system, the inspector noted hold order #2-88-050 located on auxiliary air compressor B-B. A semi-annual PM was in progress on the air compressor to disassemble,

inspect, and replace rings, gaskets, and oil. A check of the clearance log and configuration log revealed that both were properly documented for this work. In addition, a work request tag (#B275760) was found on control air header B train B pressure gauge #PI-32-89. According to the computer this work (calibrate and install gauge) had been completed on September 25, 1987.

- (5) During the walkdown of valve checklists 62.4A-3 and 62.4A-4 on the chemical and volume control system, two valves were found out of position from the checklists. Valves 62-901 and 62-902, the mixed bed demineralizer A inlet and outlet isolation valves, were found in the open position when the checklist identified their position as closed. A review of the main control room status file revealed that the checklist had been completed on December 28, 1987. There was no configuration log entry for these valves. Discussions with Unit 2 operators revealed that one mixed bed demineralizer is normally in service for primary coolant chemistry control; however, the checklist valve positions reflect all of these demineralizers in standby with none in service. AI-58 paragraph 2.2.2.1.b allows an exception to making configuration log entries if the operation is controlled by a category A or B SOI and is logged in the operator's journal at the commencement and completion of the operation. SOI 62.4A, revision 18, page 18, is the procedure used for placing mixed bed demineralizer A in service and is identified as a category A SOI. A review of the daily unit operation's log for 12/28/87 showed the following entries:

0950 CCS 2A demineralizer removed from service
1007 CCS 2A demineralizer placed in service

Operations personnel told the inspector that the Unit 2 mixed bed demineralizer A had been removed from service 17 minutes to accommodate completion of the SOI checklist and was then returned to service. Realigning components solely for the purpose of saying that a checklist is complete, and then returning the components to their previous position is not the intent of conducting the checklists. Although AI-58 does not specifically disallow this type of activity, AI-58 does provide a method for deviating from or temporarily changing a checklist (Appendix B form).

In discussions with the licensee's Quality Assurance department concerning their review of the system alignment process, a QA inspector described a situation similar to the above. The QA inspector observed a situation where an Appendix B form had been filled out for a particular valve which had a hold order tag on it. Because the assistant SS and the SS were not qualified reviewers, a third individual's signature was required in order to complete the Appendix B form. The qualified reviewer would

not sign the Appendix B form. The QA inspector said that the assistant SS and SS in the process of clearing the hold order tag to reposition the valve so that the item could be signed off on the checklist when he interrupted them. They had intended to immediately reposition the valve back to its previous position and rehang the tag after the checklist signoff. He explained that they would be defeating both the intent and the purpose of performing the checklist by continuing down the path that they had chosen.

Although the activities described above did not appear to have put equipment in an unsafe condition, these activities are indicative of a lack of adequate operator training (paragraph 4a) and of checklists that were sent to the field which did not adequately address the required positions of equipment (see paragraph 6b for a further discussion of checklist adequacy).

b. Power Availability Checklists

The inspectors independently verified the alignment of all or portions of the following SOI power availability checklists:

<u>SOI Checklist</u>	<u>System Title</u>
1.1A-1	Main Steam
32.1A-2	Auxiliary Control Air
43.2A	Hydrogen Analyzer and Post Accident Sampling
62.5-2	Chemical & Volume Control
62.6A-1	Chemical & Volume Control
67.1E-2	Essential Raw Cooling Water
68.1A	Reactor Coolant System
82.3J	Diesel Generators
92.1	Nuclear Instrumentation

The following findings pertain to power availability checklist:

(1) Main Steam (System 30)

The inspector verified all of main steam checklist 1.1A1.

Work request B229966 was found on 125V Vital Battery Board III on breaker 210. The breaker was closed, which was correct according to the checklist. During subsequent investigation, the licensee reported to inspectors that the work request was complete and signed off.

The rear section of 125V DC Vital Battery Board III was dirty and contained cut tie wrap pieces and wire strip cutoffs.

The Auxiliary Control Room Control Transfer Switch XS-1-24B for PORV Loop 3, Train A, PCV-1-23 appeared to be mislabeled on Auxiliary Control Room Panel 2-L-11A. The switch was labeled "SG #3 Blowdown HDR Press" rather than "Main STM HDR Press". The labeling was not consistent with the checklist or nomenclature in AOI-27, Control Room Inaccessibility.

A valve position indicator light was burnt out on the 480V Reactor MOV Board 2A2-A, Compartment 2A (2-FCV-1-17).

A valve position indicator light was burnt out on the 480V Reactor MOV Board 2B2-B, compartment 2A (2-FCV-1-18).

(2) Auxiliary Control Air (System 32)

The inspector verified all of power availability checklist 32.1A-2.

The Unit 1 and Unit 2 Control Copies of SOI-32.1A were missing page 1 of 3 for Power Availability Checklist 32.1A-2. Subsequent licensee investigation revealed that the page was probably missed during reproduction and that no page verification was done when the revision was entered into the control room controlled document. NRC inspectors verified the status file copy of the completed checklist as having all pages.

Breaker labeling inconsistencies existed between the checklist and breaker label on 120V AC Vital Boards 1-I and 1-II for breaker 30. Consistent labeling facilitates equipment isolation in the event of equipment fault, personnel injury, or fire.

(3) Hydrogen Analyzer and Post Accident Sampling (System 43)

The inspector verified all of power availability checklist 43.2A.

The following two breakers were not in the position required by checklist 43.2A:

<u>Breaker</u>	<u>Required</u>	<u>As Verified</u>
120V AC Vital Instrument PWR BD 2-III, Breaker 17	Open	Closed
2-IV, Breaker 17	Open	Closed

Power Availability Checklist 43.2A was conducted and signed as complete on December 19, 1987. A review of the checklist indicated both breakers were verified open on that date. The configuration status log was reviewed by control room operators

and contained no entries to indicate a change in status for Breaker 17 on 120V AC Vital Instrument Boards 2-III and 2-IV.

Subsequent licensee investigation revealed that Surveillance Instruction (SI) 722, "QMDS Valve Stroking" and SI 166.1, "Full Stroking of Type A & B Valves", had been conducted. These surveillances would have required the breakers to be closed. The licensee's investigation and discussion with operators conducting the surveillance indicated that most probably the breakers were closed to conduct SI-722 on December 22, 1987, and were not repositioned after the SI. No configuration log entry was made, contrary to the requirements of Administrative Instruction AI-58.

The lack of configuration control had potential safety significance because having power supplied to the Post Accident Sampling Valves would cause the unit to enter Limiting Condition for Operation (LCO) 3.6.1.1 in Modes 1, 2, 3, 4 and LCO 3.9.4 when in Mode 6. SI-14, "Verification of Containment Integrity", is conducted every 31 days in Modes 1, 2, 3, 4 and 5 should have caught and corrected the error. However, had the configuration error occurred after SI-14 performance, a mode change could have occurred, causing unknowing entry into an LCO.

SI-722 and SI-166.1 could also have prevented the occurrence if they had contained specific instructions concerning realignment status of the valves/breakers in question.

This is considered as an additional example of Violation 7,328/88-06-01 for failure to establish, implement, and maintain configuration control procedures.

(4) Chemical Volume and Control (System 62)

The inspector verified all of power availability checklists 62.5-2 and 62.6A-1 with the exception of 8 covered fuses in Panel O-L-206. No deficiencies were noted on power availability checklist 62.5-2.

Power Availability Checklist 62.6A-1 had one observed deficiency. The boric acid evaporator package "B" normal control power breaker (125-V dc Vital Battery BD IV Breaker 318) did not have a required position on Checklist 62.6A-1. The status file checklist had verified the breaker with no annotation on the completed checklist of breaker position.

The inspectors conducted a table top review of other power availability checklists to determine the scope of this problem. The inspectors identified that breaker positions were not specified for several breakers on checklist 61.1B-1 and 63.1D. Checklist 61.1A-1 had a column entitled

"Power Fuses Installed" and a column entitled "Fuses Installed". Under the column "Power Fuses Installed" were listed 125V Vital Battery Board breakers with no fuse descriptions. In addition, checklist 1.1A-2, page 8, was unclear in that it listed only one power supply position while nine valve identification line items are listed. No explanation was given on the checklist as to whether this one power supply item applied to all nine valve line items.

During the review the inspector noticed a number of inconsistencies in the description of breaker positions on power availability checklists. The breaker position descriptions included "closed", "connected", "bus energized and breaker connected", "bus energized and breaker closed", "board energized", "board energized and/or breaker connected", and "board energized and breaker connected". It was not clear to the inspectors what the person performing the checklist was supposed to check, or if the position specified for the item was actually a position the equipment could be in. During a telecon on January 12, 1988 licensee management was asked what the breaker position "connected" meant. It was explained that "connected" referred to a breaker that was racked-in. The inspector asked if a position in addition to "connected" needed to be specified to ensure that the equipment was in the proper position. Licensee management explained that breakers on the 6.9 KV shutdown boards and 480 V shutdown boards would have the breaker only connected (racked-in). The licensee explained that this was acceptable since this equipment is controlled by procedure, and repositioning the breaker starts or stops the equipment and does not just provide power availability. The inspector pointed out examples of reactor MOV board breakers that also had positions described as connected. The licensee acknowledged that these breakers do not rack in or out and that the position connected in this case was unclear.

The licensee initiated a review of the power availability checklists to assess whether or not the breaker position "connected" was appropriately used in all cases. On January 15 a telecon was conducted between the inspectors and licensee management. The licensee's evaluation had revealed that for various large breakers, "connected" was equivalent to "racked in" and adequately described the required configuration. However, for numerous other smaller breakers which do not rack in, the intended configuration was that these breakers be "closed". Examples of where "connected" and "closed" had not been properly used were identified by the licensee to exist in 27 checklists for 14 different SOIs. In addition, the licensee had reverified the positions for all affected equipment in these 27 checklists and found that none were out of position. The licensee stated, based on the above information, that they strongly believed the system alignment personnel knew based on their general plant knowledge that in these cases "connected" meant closed. They stated that none of these smaller breakers on the checklists were intended to be in the open position. The

inspectors noted that the licensee's review also found several instances where "closed" was the position specified on the checklist but "connected" should have been the proper position. The inspectors concluded that this problem was aggravated by the use of column headings on a checklist that listed the required position for numerous components on a single page, when the components listed included a mixture of breakers, fuses, power available lights, and disconnect switches.

On January 19, a second exit meeting was conducted on this issue. The inspectors emphasized to the licensee that the purpose of performing the checklists is to ensure that all hardware on the checklists are in the proper position for mode change. The licensee concurred with this statement. The licensee was asked, therefore, to ensure that for any other positions on the checklists which could in any way be misinterpreted, that they ensure that the actual hardware is properly positioned for mode change. The licensee committed to do this prior to changing modes.

The inspector sampled this review and found it to be adequate. Positions were reverified for all equipment that had descriptions which could have in any way been misinterpreted.

Several examples noted during the inspector's review of the reverification are provided for information. These examples supplement examples found by inspectors and further indicate the extent of the problem and the need for comprehensive review.

- On Checklist 3.2A-1, page 3, "connected" was used to mean racked in.
- On Checklist 62.1B-1, pages 1-9, "energized" was used to mean breaker closed, and page 9 had 2 alarm breakers with no position listed.
- On Checklist 13.1, page 1, "normally closed" was used to mean closed.
- On Checklist 30.5E-1, page 1, three fuses, O-FU3-30-147-A, lacked information on required position.
- On Checklist 30.7, page 4 lacked fuse identification for fuses for FSV-31C-303 and FSV-31C-340.
- On Checklist 63.1D, page 6 had three breakers with no required position.
- On Checklist 70.1A-2, pages 1, 9, and 14 each had one breaker with no required position.
- On Checklist 77.1A1-1, page 2, RCDT to Sump 1-FCV-77-3, required breakers on 125 VDC vital battery boards I, II,

and III were not listed. The same problem was identified on page 3 with 1-LCV-77-415.

- On Checklist 82.2J, page 1, "column C energized" was used to mean breaker 212 closed.
- On Checklist 82.4J, page 2, three disconnect switches had no positions listed.
- On Checklist 90.1A, page 2, three breakers had no listed position.
- On Checklist 90.1A, page 3, one breaker had no position listed.

The failure of the corrective action program for Violation 327,328/87-66-02 to adequately eliminate SOI checklist inadequacies prior to restarting the system alignment process is considered a violation of 10 CFR 50, Appendix B, Criterion XVI for failure to take adequate corrective action and is designated Violation 327,328/88-06-02.

(5) Diesel Generator (System 82)

The inspector verified all of diesel generator power availability checklist 82.3J, Revision 32 "Diesel Generator 2A-A", except for the fuse sizes on six sets of fuses. Verification of those fuses required fuse removal which would have rendered the diesel generator inoperable. All breakers and fuses checked were found to be in accordance with the checklist. The following deficiencies with the electrical boards inspected were noted:

During the verification step on checklist page 1, for diesel generator 2A-A Controls Annunciator, the diesel generator distribution panel was noted to contain debris consisting of wire cutoffs, tie-wraps and dirt. This was considered to be a poor maintenance practice.

During the verification step for the Diesel Exhaust Monitor TC Alarm Relays and Diesel Generator Electric Governor Rheostat checklist page 4, a box of fuses was found lying in the lower area of the panel near all of the fuse clips. Licensee operations personnel stated that these were spare fuses. The inspectors had significant concerns that the storage or presence of conductive material in a panel might invalidate seismic qualification. Equipment or entire electrical boards could be rendered inoperable during a seismic event due to the acceleration of material (conductive or non-conductive) within

an electrical board. The potential for damage due to shorting and arcing in the area of fuse clips is high because the spacing between fuse clips is generally small.

During subsequent investigation by the licensee, it was determined that Administrative Instruction AI-3, Revision 37, "Clearances," Section 5.2.1.3 allowed storage of fuses removed from tagging for single circuit compartments and non-control circuits within the compartment. Non-control circuits were defined as bus potential transformers, voltage regulator potential transformers, metering transformers, etc. AI-3 was revised to prohibit fuses which were removed due to tagging for any fused circuit from being stored within a panel. All Shift Supervisors, Assistant Shift Supervisors, and Unit Operators received training on the change during shift turnover briefings. In addition, the Operations Superintendent issued an instruction letter to each of the same operators.

The inspector's concern about conductive material within seismic electrical boards was brought to the immediate attention of licensee management. Based on the concern, the licensee commenced a walkdown of all safety-related electrical boards to inspect for cleanliness, stored fuses, or other debris. As a result of the walkdown inspections, a large amount of conductive material and miscellaneous debris was discovered in numerous safety-related panels. A summary of the licensee's findings is presented below for information.

480 Volt Shutdown Board 2A2-A:

Five loose fuses in front side floor in compartment 6

Five loose bolts on back side floor compartment 5

Nine locknuts on back side floor compartment 4

Two unused loose bus tie bars, numerous small screws and washers on back side of compartment 3

Paper ball, metal ID tag and tiwrap (not removed during walkdown due to close proximity to hot bus)

Logic Panels:

Numerous small screws, light bulbs, pieces of wire, lead seals with wire, one 3" metal conduit plug.

480 Volt Shutdown Board 2A1-A:

Six fuses, two metal nameplates, screws, and several pieces of wire (wire not removed due to close proximity to power) in front of panel 6

Three unused bus tie bars and wire in back of panel 1

Washing and 3" bare wire in back of panel 3 (wire not removed due to close proximity to power)

One large nut in back of panel 5 (left - close to power)

One red-head, fastener, large nut, 2 large lockwashers in back of panel 6

Three unused bus tie bars loose in back of panel 8

480 Volt Shutdown Board 2B1-B:

Fourteen fuses and one metal ID tag in the front of panel 6

One large boxes filled with junk (TVA's words) in the front of panel 7

Three unused bus tie bars loose and a metal washer in the rear of panel 10

Three unused bus tie bars loose and a piece of large wire in the back of panel 8 (wire left due to close proximity to power)

Two rubber gloves and one large metal washer in the back of panel 6 (on glove was laying on buswork - now removed)

480 Volt Shutdown Board 2B2-B:

Loose bolts, lockwashers, and nuts in the rear of compartment 1

Six metal plates and 7 nuts in the rear of compartment B

Three large metal plates, 3 small metal plates, bolts, nuts, and washers in the rear of compartment 9

480 Volt Reactor MOV Board 2B1-B:

3" piece of copper wire in compartment 1A

Light socket hanging loose in compartment 3E

Loose metal clip in compartment 9F

Loose connector, wire and screws in compartment 11F

Loose connector in compartment 3F

480 Volt Reactor MOV Board 2B2-B:

Various loose screws, wires, and connectors in board

480 Volt Reactor MOV Board 1B2-B:

Six pieces of wire in compartment 11A

Two heater coils in compartment 9E

Loose board component below compartment 4E

480 Volt Reactor MOV Board 1B1-B:

Loose unused conduit above compartment 3A

6.9KV Shutdown Board 2B-B:

Loose fuse and wire tie in compartment 19

Clamp and Lung in compartment 18

Breaker dolly in compartment 7

Compartments 1, 3, 5, 6, 8, 10, 11, 13, 20 had a compartment slide door knob missing (door may fall)

6.9KV Shutdown Board 2A-A:

Loose washers, screws and wire tie in compartment 2

Loose screws, lug and cap in compartment 4

Compartments 1, 6, 10, 13, 15, 16, 18, 21, 22 missing compartment slide door knobs

In compartment 6, 2-HS-57-46C incorrectly labeled as going to 1A-A diesel generator

Discussions with the licensee indicated that loose material within the safety-related electrical board most probably resulted from a combination of maintenance and modification activities. The inspectors concluded that the discrepancies did not appear to be isolated cases, due to the large number of cases in numerous different electrical boards. The discrepancies indicate inadequate control of electrical maintenance and modifications on safety-related equipment and systems. The storage of spare fuses in safety-related electrical boards and the additional examples above are considered a violation of 10 CFR 50, Appendix B, Criterion V,

for failure to control activities affecting quality and are designated violation 327,328/88-06-03.

c. Alignment of Instrumentation Valves

The inspector reviewed the licensee's control of instrumentation to ensure operability. The licensee's calibration program for safety related instrumentation is controlled by the surveillance instruction program. The inspector verified for selected TS related instruments that the instruments were calibrated by the surveillance instruction program and that the applicable instrument maintenance instructions (IMI) independently verified the position of the instrument panel valves.

The inspector reviewed SI-604, "Essential Instrumentation Operability Verification". The purpose of this SI is to ensure that the essential surveillance instrumentation needed to monitor plant processes during normal operating conditions is verified operable. The inspector verified that for selected safety related systems, all essential safety related instruments were included in SI-604. As a result of NRC Inspection Report No. 327,328/87-52, the licensee committed to include all instrumentation in SI-604. This action will be completed sometime after Unit 2 restart.

The inspector also reviewed IMI-134, "Configuration Control of Instrument Maintenance Activities". IMI-134 provides configuration control during instrument maintenance activities affecting CSSC equipment. The inspector determined that the IMI provides adequate configuration control during maintenance activities.

The inspector walked down numerous instrument sense lines in the plant to verify proper valve position. The inspector found no instances where valves appeared to be out of position.

7. General Plant Condition

It was noted that there was a substantial amount of trash collection going on in the containment. This resulted in a lot of trash accumulating in bags or being stacked in the raceway. This is understandable as the unit is expected to begin heatup soon. However, inspectors noted a good deal of trash collecting at work sites in various rooms in containment. Fan room 1 demonstrated extremely poor housekeeping practices in the form of paint can lids, tape rolls, hardhats, tools, and tethers. Of concern to the inspectors was broken glass that was prevalent in the area, particularly on scaffolding above cooler A-A. The broken glass is drawn attention to for two reasons: 1) It could possibly puncture protective clothing and skin that could lead to undesirable contamination; and 2) It indicates that personnel are not observing the minimum housekeeping requirements. Equipment is available for cleaning up broken glass, and equipment and used containers should never be left around unless a work activity is continuous. Other discrepancies are noted below.

- The pointer was missing from the glycol mixing pump suction gage.
- A number of packing leaks were observed.
- Component Cooling System pump 1B-B discharge valve, 1-70-505B, was labeled as 2-70-505B.
- Component cooling system piping, welds, and flange bolts were found with moderately heavy rust on the piping to #1 RCP near check valve 70-628A in Unit 1 containment.
- A borated water leak was observed in Unit 1 containment which appeared to have been coming from valve FCV-62-69. Boron deposits were visible on beams, hangers, and piping, as well as on the floor.
- Several areas inside Unit 1 containment had water standing on the floor. In addition, housekeeping inside Unit 1 containment was considered in need of improvement (parts, tools, and trash scattered about).