UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-390/95-77 and 50-391/95-77

Applicant: Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Docket Nos.: 50-390 and 50-391

License No.: NPF-20 and Construction Permit No. CPPR-91

Facility Name: Watts Bar Units 1 and 2

Inspection Conducted: October 22 through November 18, 1995

Inspectors: G. A. Walton 12/6/95
G. A. Walton, Senior Resident Inspector Construction — Date Signed

W. Bearden, Resident Inspector, Watts Bar
J. Brady, Reactor Inspector, RII
P. Fillion, Reactor Inspector, RII
R. Gibbs, Reactor Inspector, RII
J. Lara, Resident Inspector, Watts Bar
N. Merriweather, Reactor Inspector, RII
R. Moore, Reactor Inspector, RII
C. Smith, Reactor Inspector, RII

Contractor: D. O. Myers (paragraphs 10.3, 10.11, 10.17, 10.18, and 10.20)

Approved by: for F. L. Fredrickson 12/6/95
F. L. Fredrickson, Chief — Date Signed
TVA Construction Branch
Division of Reactor Projects

SUMMARY

Scope:

This routine, resident inspection was conducted in the areas of construction work activities; cable issues corrective action program; electrical issues corrective action program; employee concerns special program; nuclear

Enclosure

performance plan commitments; vertical slice review; loose, damaged, and missing hardware walkdowns; fuel load certification plan; and open item status review.

Results:

In the areas inspected no violations or deviations were identified. This inspection report documents the completion of the construction inspection program for Watts Bar Unit 1. On November 9, 1995, the NRC issued a low power operating license to Watts Bar which authorized the loading of fuel and up to 5 percent power operation of Unit 1. This report documents the NRC's final review of several subissues related to the applicant's Cable Issues and Electrical Issues CAPs along with follow-up inspection of various open items which required closure prior to issuance of an operating license.

Additionally, this report documents the completion of a series of NRC walkthroughs of portions of the plant to assess the applicant's readiness for fuel loading. During these walkthroughs the inspectors identified a number of potential deficiencies which were identified to members of site management. The inspectors verified that all identified deficiencies were subsequently resolved or tracked by a work request prior to start of fuel loading. Each deficiency was evaluated by an inspector and no significant problems were identified which would have impacted the ability of plant staff to safely proceed with fuel loading.

The applicant's area turnover process has been going well. Although all plant areas necessary to support fuel loading have been turned over, the turnover process is continuing with additional areas which do not contain a significant amount of safety related components. Quality Control involvement in the process of identification of deficiencies has been acceptable. The ongoing walkdowns should identify damaged, loose, or missing hardware deficiencies in the areas prior to turnover.

REPORT DETAILS

1.0 PERSONS CONTACTED

1.1 Applicant Employees:

*R. Baron, Acting Nuclear Assurance and Licensing Manager
*R. Beecken, Maintenance and Modifications Manager
*R. Brown, Licensing Engineer
*J. Bushnell, Licensing Engineer
*A. Capozzi, Concerns Resolution Staff Site Representative
*S. Casteel, Independent Review and Assurance Manager
*J. Cofield, Modifications Shift Manager
*J. Cox, Radiological/Chemistry Control Manager
*S. Cutts, Instrumentation and Calibration Engineer
*T. Davis, Fire Protection Manager
W. Elliott, Engineering and Modifications Manager
*J. Guyer, Operation Support Manager
*O. Hickman, Jr., Radiological Protection Supervisor
*R. Johnson, Nuclear Engineer
*D. Kehoe, Site Quality Manager
*D. Koehl, Assistant Plant Manager
*D. Kulisck, Technical Support Manager
*D. Malone, Audits and Assessment Manager
*R. Mays, Licensing Engineer
*R. Mende, Operations Manager
P. Pace, Compliance Licensing Manager
*J. Pierce, Fire Protection Engineering Specialist
*R. Purcell, Plant Manager
*J. Scalice, Site Vice President
*B. Schofield, Site Licensing Manager
*W. Skiba, Trending/Human Performance Indicator
*V. Smith, Project Manager
*S. Spencer, Nuclear Assurance Manager
*R. Stockton, Licensing Engineer
*S. Tanner, Quality Completions Manager
*J. Vorees, Regulatory Licensing Manager
*O. Zeringue, Senior Vice President of Nuclear Operations

Other applicant employees contacted included engineers, technicians, nuclear power supervisors, and construction supervisors.

1.2 NRC Personnel:

*W. Bearden, Resident Inspector
*S. Cahill, Resident Inspector
*R. Gibbs, Reactor Inspector, RII
*G. Kuzo, Reactor Inspector, RII
*C. Julian, Operations Branch Chief
*J. Lara, Resident Inspector

*P. Madden, Reactor Inspector, RII
N. Merriweather, Reactor Inspector, RII
R. Moore, Reactor Inspector, RII
C. Smith, Reactor Inspector, RII
*P. VanDoorn, Senior Resident Inspector, Operations
*G. Walton, Senior Resident Inspector, Construction

1.3 NRC Contractors:

D. Myers

*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2.0 CONSTRUCTION ACTIVITIES

Various construction activities were reviewed by the inspectors during the inspection period to evaluate the work effort to applicable procedures, codes, and standards. The results of the more significant inspection efforts are summarized as follows:

2.1 Boroscope Examination of Conduit

WO 92-05887-13 was performed to conduct boroscope inspection of portions of Conduit 1PV806E. The inspector observed the boroscope inspection which was conducted at a distance of four feet from both ends of the conduit section from Conduit Tee C5Q to Conduit Tee C6Q. No debris was present in the portions of conduit that was examined.

WO 92-05887-14 was intended to conduct boroscope inspection of the Conduit Cable Tray Jumper from Cable Tray Nodes 3N2155 and 3N2896. The applicant personnel were unable to complete this evolution due to the large number of cables present in the tray jumper which prevented the boroscope from entering the conduit. This issue is discussed in more detail in paragraph 10.14.

WO 92-05887-10 was performed to conduct boroscope inspection of several portions of Conduit PLR1383 on Elevation 692 of the auxiliary building. The inspector observed the boroscope inspection at each of the locations performed on this conduit section. No debris was present in the portions of the conduit that was examined.

The inspector reviewed the above WOs and determined that the work instructions provided sufficient information and guidance to allow for acceptable completion of the intended work activity. For those portions of conduit examined, the internal surfaces were free of debris and no cable damage was observed. No problems were identified.

Within the areas reviewed, no violations or deviations were identified.

3.0 CABLE ISSUES CAP (2512/16)

The Cable Issues CAP is described in the applicant's Nuclear Performance Plan, Volume 4. The NRC previously reviewed the implementation of the Cable CAP at the 75 percent complete stage as documented in IR 50-390/94-53. During this inspection period, the applicant notified the NRC that the Cable Issues CAP technical subissues of cable support in vertical conduits and trays and computerized cable routing system database and software verification, and validation had been completed. The purpose of this inspection was to determine whether the applicant's implementation of the Cable Issues CAP was complete for these issues. The NRC requested, by letter dated November 12, 1992, that the applicant provide a Cable Issues CAP closure package at the 100 percent completion stage documenting the basis for concluding that the CAP was sufficiently implemented to support an NRC inspection. This CAP closure documentation was also reviewed during this inspection.

3.1 Cable Support In Vertical Conduits and Trays

NRC TER-C5506-649, Technical Evaluation of Watts Bar Units 1 and 2 Cable Pulling and Cable Bend Radii Concerns, issued March 10, 1987, alerted the applicant to the fact that Class 1E cables could fail during operational conditions due to exceeding the threshold of one of the parameters that ensures the overall integrity and makeup of all cables, but especially those in vertical runs. These parameters include allowable conductor tensile strengths, pullout strength of terminations, and sidewall bearing pressures for the insulation of individual conductors. The root cause of the applicant's failure to take the proper action for support of cables in vertical conduits and trays was that the applicant did not consider it a requirement and, therefore, did not address the topic in its existing engineering specifications and craft instructions for cable installations.

The applicant's programmatic corrective actions to resolve this issue have been previously reviewed by the NRC as documented in the following documents:

- Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 7, Appendix P, September 1991

- Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 9, Appendix Y, June 1992

The NRC has performed a review of the applicant's implementation of the corrective actions for the cable support in vertical conduits issue. The results of this inspection were documented in IR 50-390/94-53, paragraphs 3.3, Cable Support in vertical Conduits, and 3.4, Cable Support in Vertical Trays. Examples of violations and unresolved issues were identified during that inspection pertaining to both conduit and tray raceways. Overall, the inspection results indicated that the implementation of the approved CAP resolution method had been less than effective. Additional review, assessment, and verifications were necessary to provide assurance that the approved corrective actions had been fully implemented. The NRC has subsequently performed additional inspections of the implemented corrective

actions for the issued violations and unresolved issues. These additional inspection efforts were documented in IRs 50-390/95-45, paragraph 6.12 and 50-390/95-64, paragraph 2.1, and determined acceptable implementation of corrective actions for the issued violations and acceptable resolution of unresolved issues. Final closure of these subissues required completion of several licensing commitments including final closure of CAQ documents.

On October 16, 1995, the applicant informed the NRC resident inspector's office that the Cable Issues CAP subissue of cable support in vertical conduits and trays had been completed. This inspection focused on the review to verify that there was no outstanding work associated with cable SWBP. This was verified through the review of licensing commitments, CAQ documents, TROI data base and verification that associated DCNs were completed. These inspection attributes were performed during the review of the Cable Issues CAP Closure Package (paragraph 3.3 below).

3.2 Computerized Cable Routing System Database and Software Verification and Validation

The CCRS is an interactive computer program which serves the functions of cable scheduling and routing. The program performs several calculations related to meeting design criteria for cable routing such as raceway fill in terms of area and weight, redundant division routing, and voltage level segregation. The CCRS database, together with cable pull tickets and raceway installation records, forms the quality assurance records for the electric cable installation. The Cable Issues CAP was developed to address concerns regarding the adequacy of CCRS which was documented in various corrective actions documents and employee concerns. The applicant's approach to resolve the CCRS concerns was to qualify the computer software; verify the existing data; revise applicable procedures for controlling data entry, revision, and utilization; expand the database to support other activities; and validate the system.

Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 7, Appendix P, September 1991, documented the NRC staff's reviews of corrective actions related to this issue. The NRC has performed reviews of the applicant's implementation of the corrective actions for the CCRS issue. The results of this inspection were documented in IR 50-390/94-53, paragraph 3.11. As documented in IR 50-390/94-53, NRC inspections to verify adequate implementation of the approved corrective actions indicated adequate implementation. Final closure of this subissue required completion of several licensing commitments, completion of the corrective actions identified in the Cable Issues CAP, and closure of CAQ documents and construction deficiency reports.

The NRC has previously reviewed the applicant's implementation of the corrective actions for the CCRS issue. The results of this inspection were documented in IR 50-390/94-53, paragraphs 3.11, Computerized Cable Routing System Database and Software Verification and Validation. The inspection consisted of extensive reviews, verifications, and calculations to evaluate the adequacy of the implemented corrective actions. These activities included CCRS elements such as cable voltage levels, cable type and associated input

data, raceway fill and weight, raceway overfill and overweight, raceway cross-sectional area, field installations as compared to CCRS, and others. The inspection results indicated significant applicant progress in resolving and completing the CCRS issue. Although the NRC did not identify major programmatic deficiencies in implementation, additional review was determined warranted due to the complexity and large scope of work. Deficiencies identified and unresolved questions were documented in IR 50-390/94-53. The following open items were identified during the inspection pertaining to CCRS:

- VIO 50-390/94-53-01 identified deficiencies regarding spared/abandoned cables. This item has been subsequently reviewed by the NRC to evaluate corrective actions. This violation was closed as documented in paragraph 10.18 of this report.

- VIO 50-390/94-53-02 identified design control deficiencies regarding cable routing. This item has been subsequently reviewed by the NRC to evaluate corrective actions. This violation was closed as documented in paragraph 10.19 of this report.

- URI 50-390/94-53-04 identified four issues with spare cables not reflected in CCRS. This item has been subsequently reviewed by the NRC to evaluate corrective actions. This URI was closed as documented in IR 50-390/94-75, paragraph 5.5.

IR 50-390/94-53 discussed the issue of raceways and cables identified in CCRS in unverified status. Eighty-eight cable tray sections were in a status other than verified. Verified status essentially means that all the data fields for a cable or raceway have been independently checked. In general, to have a cable or raceway that is installed in unverified status indicates that someone had intended to make a change to that cable or raceway. To have such entries remain in unverified status for an extended period of time raises the concern that possibly an intended design change should have been, but was not, implemented. This concern was discussed with the applicant, and this issue of raceways or cables being in a status other than "verified" in CCRS will be reviewed further prior to closure of this issue. The inspector reviewed the applicant's actions to evaluate the raceways and cables in unverified status. The applicant documented the evaluation in a report entitled A One Time Review of Open Records in the CCRS, (RIMS T24951029591), dated October 28, 1995. The report documented that no design changes were identified that were required to be but were not implemented. The open records were sometimes opened to prevent routing of cable due to potential impact of additional cables in the cable trays. No deficiencies were identified during the inspector's review of the CCRS report.

Pursuant to 10 CFR 50.55(e), in April 1995, the applicant submitted to the NRC reportable deficiency CDR 50-390/95-02, Cable Damage at Splices and Terminations. The CDR documented deficiencies associated with cable and splice damage. As part of the corrective actions, the applicant performed re-inspection of 10 CFR 50.49 cables and splices at end devices, electrical enclosures such as MOVs, junction and terminal boxes, and for damage and cable/conductor bend radius. The NRC performed extensive inspections of the applicant's implementation of corrective actions. During this inspection

effort, the NRC performed additional reviews regarding the routing of cables as reflected in CCRS. Inspection attributes included verification that each component, its related cables, and conduits were correctly tagged in accordance with the WO and the applicant's computerized cable and raceway routing schedule. Deficiencies were not identified regarding the accuracy of CCRS in reflecting the types and number of cables routed to the electrical enclosures. This inspection effort was documented in the following inspection reports:

- 50-390/95-17, paragraph 2.1, Cable and Splice Damage Inspections
- 50-390/95-24, paragraph 3.4, Cable and Splice Damage Inspections

As discussed in paragraph 10.16 of this report, the applicant performed walkdowns of installed cable trays to determine adequacy of various installation attributes. Attributes included raceway physical separation between trays and redundant division trays, conduits, and free-air cables. When adequate physical separation could not be maintained, the applicant installed cable tray covers to provide acceptable barriers between the raceways. The location of the tray covers was transmitted from the field installation WPs to engineering for incorporation into CCRS. This information in CCRS was then used to re-perform ampacity calculations considering derating of the cables.

The applicant documented the cable ampacity evaluation in Calculation WBPEVAR8909010, Cable Ampacity - NV4 and NV5 Cables in Class 1E Raceways, Revision 43. The calculation evaluated the adequacy of ampacity for all voltage level V4 and V5 power cables routed in Class 1E raceways. The calculation acceptance criterion was that the allowed cable ampacity shall be equal to or greater than the required cable load as adjusted for environmental conditions and installation configurations. Design input data included cable derating factors, cable depth in cable trays derived from the accumulated cable cross-sectional area listed in CCRS, cable insulation and ambient temperatures, load currents, and load multipliers. The calculation methodology consisted of accessing verified CCRS cable data, executing the ampacity calculation computer software, identifying cables requiring additional evaluations, and performing manual ampacity calculations required for cables with special conditions. Cables which failed the initial ampacity reviews were further evaluated using precise values, as-built raceway and design cable data, and reduced derating factors. For example, the initial cable evaluations derated for installed cable tray covers regardless of cover length. Those cables which failed ampacity evaluations were re-evaluated using precise cable tray cover lengths. If the installed cover was less than six feet in length, derating for covers was not required. The inspector performed a sample review of the design inputs and conclusions documented in the calculation.

- Cables in conduits PP2794A and 1PLC881B failed the initial ampacity evaluation. Re-evaluation changed the derating factors for the installed Thermolag based on an installed length of less than six feet. The inspector performed a field inspection of the conduits and verified the length to be less than six feet.

- Cables PP350A, PP470A, PP590B, and PP710B failed the initial ampacity evaluation. Re-evaluation changed the derating factors for the installed cable tray cover lengths since the installed length was less than six feet. The inspector performed a field inspection of the applicable tray segments and verified the cover lengths to be less than six feet.

- Cables 1PL1062A and 1PL1082B are power cables for the redundant division hydrogen recombiner heaters. The calculation used an ambient temperature of 49 and 66 degrees Celsius for division A and B heater cables, respectively. The inspector questioned the basis for the difference. The inspector was informed and verified that cable 1PL1062A was embedded inside the containment crane wall and therefore, had a less ambient temperature. This information was verified through the review of as-constructed conduit and grounding drawings 45W862-17, 45N864-1, 45N864-2, 45N864-3, 45N866-1, 45N866-3, and 45N866-8.

- Cable 1PL1082B provides power to the division B hydrogen recombiner heaters. The initial calculation evaluation identified this cable as having inadequate ampacity. The cable re-evaluation revised the derating factor for conduit grouping based on the associated conduit being installed in a configuration other than a normal grouping. However, the inspector noted that the calculation did not include the reference documentation for this assumption. Subsequent engineering review determined that this assumption could not be supported. The applicant revised the ampacity calculation, Revision 44, to re-evaluate this cable. The inspector reviewed the applicant's ampacity calculation for this cable which included modified load multiplier and an assumed heater load of less than the heater full load of 75 kW. The applicant's evaluation considered that the heater operation during accident conditions was calculated to be 48 kW as documented in EQ binders WBNEQ-CABL-053 and WBNEQ-HTR-001. Additionally, surveillance testing of the heater during normal operations dictated a maximum load of 60 kW. The 60 kW load is energized for a short period of time and less than the eight-hour minimum operating time which is the basis for continuous loading for evaluation of cable ampacity. Therefore, a load value of 60 kW was used to determine a conservative full load amp value. A reduced load multiplier of 1.10 was also used in the ampacity calculation for the cable. The inspector determined that the applicant's re-evaluation of the cable ampacity was acceptable.

The inspector determined that the applicant's ampacity calculations for V4 and V5 cables considered appropriate inputs such as derating factors for cable tray fill, cable tray covers, and load currents. No violations or deviations were identified.

On October 26, 1995, the applicant informed the NRC resident inspector's office that the Cable Issues CAP subissue of CCRS had been completed. This inspection focused on the review to verify that there was no outstanding work associated with CCRS. This was verified through the review of licensing commitments, CAQ documents, and TROI data base. These inspection attributes

were performed during the review of the Cable Issues CAP Closure Package (paragraph 3.3 below).

3.3 Cable Issues CAP Closure Package

The inspector reviewed the closure package for the subissues of cable support in vertical conduits and trays and computerized cable routing system database and software verification and validation to evaluate the applicant's conclusion that the CAP implementation was complete. Discussed below are the documentation package attributes for the subissues.

- Verify that the FSAR/Code requirements have been approved and met.

  The Cable Issues CAP closure package identifies the Cable Issues CAP criteria issues which required NRC action for resolution such as FSAR changes. The closure report does not identify any required FSAR changes for the issues of cable support in vertical conduits and trays and CCRS.

- Verify that all SER open items have been resolved.

  The following SSERs documented the NRC's conclusion that the applicant had adequately resolved the issues of cable support in vertical conduits and trays and CCRS.

  Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 7, Appendix P, September 1991.

  Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 9, Appendix Y, June 1992.

- Verify that all commitments made by the CAP/SP have been adequately implemented.

  The respective closure reports identify the commitments which were related to the issues of cable support in vertical conduits and trays and CCRS. All of the identified commitments have been closed.

- Verify that the specific items which formed the basis for the CAP, identified in the applicant's matrix, dated July 13, 1989, have been resolved and field implemented.

  The source items in the July 1989 letter have been closed. This includes CATDs, CAQs, and NRC items.

- Verify that the items such as CAQs, CATDs, NRC commitments, etc., which were identified by the applicant after July 13, 1989, to be resolved by the CAP corrective actions, have been resolved and field implemented and the documentation adequately closed.

  NRC commitments are discussed above. CATDs are discussed below. The inspector performed a review of the applicant's TROI database and did

not identify any open CAQs related to the issues of cable support in vertical conduits and trays and CCRS.

- Verify that the corrective actions for all other open items, VIOs, URIs, and IFIs related to the specific CAP/SP, have been completed.

  The Cable Issues CAP closure package and the closure report identify that NRC open items such as VIOs, URIs, and IFIs associated with these issues are closed. The inspector verified, through a review of the NRC open item listing, that all NRC open items pertaining to the issues of cable support in vertical conduits and trays and CCRS were closed.

- Verify that all Sargent and Lundy VSR findings related to the CAP/SP are closed.

  The Cable Issues CAP closure report and certification letter documented that applicable VSR items pertaining to the issues of cable support in vertical conduits and trays and CCRS were closed. The inspector reviewed closure packages for VSR items 422 and 603 associated with cables and cable tray identifications. No deficiencies were identified within the package.

- Verify that all CATDs related to the CAP/SP are closed.

  The Cable Issues CAP closure report and certification letter documented that applicable CATDs pertaining to the issues of cable support in vertical conduits and trays and CCRS were closed. The inspector performed a review of the CATDs status and verified that all associated CATDs were closed.

- Verify that all CDRs related to the CAP/SP are closed.

  The inspector verified, through a review of the NRC open item listing, that applicable CDRs associated with the issues of cable support in vertical conduits and trays and CCRS have been closed.

- Verify that all of the NRC BUs, INs, and TIs related to the CAP/SP are closed.

  The Cable Issues CAP closure package and closure report did not identify any additional NRC open issues applicable to the issues of cable support in vertical conduits and trays and CCRS.

- Verify that all issues identified by previous applicant assessments, Black and Veatch, Nuclear Safety Review Staff, and other contractors, have been resolved.

  Assessments conducted at WBN as documented in the WBN Nuclear Performance Plan, Volume 4, include those by United Engineers and Constructors, Duke Power, Nuclear Safety Review Staff, Institute of Nuclear Power Operations, and Black and Veatch. The CAP closure package

did not identify any open, independent assessment items related to the issues of cable support in vertical conduits and trays and CCRS.

- Verify that all corrective actions related to the area identified by the applicant in the ECSP, and not a CATD, have either been implemented or other action taken to resolve the identified issue.

  The inspector performed a review of Lookback reviews performed for ECSP Class C concerns which were associated with cable installation concerns. No deficiencies were identified regarding the applicant's resolution of the concerns.

- Verify that all issues identified in NRR audits have been adequately resolved.

  All SER open items associated with these issues have been resolved. There are no other outstanding NRR issues for the issues of cable support in vertical conduits and trays and CCRS.

- Verify that all issues identified in the applicant's letter to the NRC, dated March 30, 1987, have been resolved.

  The inspector reviewed the applicant's review and resolution of the issues documented in the March 1987 letter which were applicable to cable installation practices. The issues reviewed were classified as complex electrical issues. No deficiencies were identified during this review.

- Verify that all employee concerns, post-ECSP, related to the area have been closed or evaluated for impact.

  None of the post-ECSP concerns were applicable to the above subissues. As a sample review, on November 2 the inspector reviewed a printout of concerns received pertaining to cable(s) for the applicant's CRS and Raytheon Constructors, Incorporated employee concerns office. No concerns were identified regarding the issues of cable support in vertical conduits and trays and CCRS.

- Verify that the Independent Verification Program is complete.

  The following IVP assessments for the issues of cable support in vertical conduits and trays and CCRS were completed:

  NA-WB-95-0096 Electrical and Cable Issues Corrective Action Program - Subissues: Physical Cable Separation and Electrical Isolation and Computerized Cable Routing System Database Verification/Validation

  NA-WB-95-0140 Electrical and Cable Issues Corrective Action Program - Subissues: Flexible Conduits, Cable Support in Vertical Raceways, and Cable Bend Radius

Nuclear Assurance Final Closure Notification, Cable and Electrical Issues Corrective Action Program, October 27, 1995

Review of the above reports indicated a thorough assessment of the implementation of the CAP corrective actions for these issues. The IVP conclusions were that the subissues were adequately implemented and ready for closure.

- Verify that all of the applicant's other open items on the issue are closed.

  The applicant documented the basis for the closure of the issues of cable support in vertical conduits and trays and CCRS. Open items were not identified.

- Verify that any issues known to the NRC or the applicant, which are likely to affect closure, are resolved.

  The applicant did not identify any issues associated with this item. No outstanding issues were identified by the inspector.

- Verify that all applicable PACR items are closed.

  The applicant did not identify any PACRs pertaining to these issues. The inspector's review of the PACR listing did not identify any applicable PACRs.

The inspector concluded that the applicant has adequately documented evaluation and completion of the above 19 items.

3.4 Conclusions

The implementation of the Cable Issues CAP for the issues of cable support in vertical conduits and trays and CCRS have been effectively completed. The applicant has addressed the issues identified in the NRC letter dated November 12, 1992, with regard to the Cable Issues CAP closure package. The applicant has completed independent evaluations as part of the QA IVP and concluded that these issues have been effectively completed.

On November 1 the applicant submitted notification to the NRC that the Cable Issues CAP, as defined in the WBN NPP, Volume 4, Revision 1, had been completed. The inspector performed a review of the status of the CAP open items and verified that they were closed. The NRC has completed the inspection of the subissues associated with the Cable Issues CAP. NRC inspections were documented in IRs identified below.

Cable CAP Issues	75 Percent IR (50-390/)	100 Percent IR (50-390/)
Silicone Rubber Insulated Cables	94-53	95-17
Cable Jamming	94-53	95-17
Cable Support in Vertical		

Conduit and Tray	94-53	95-77
Cable Proximity to Hot Pipe	94-53	95-57
Cable Pullbys	94-32	95-64
Cable Bend Radius	94-53	95-72
Cable Splices	94-53	95-72
Cable SWBP	94-18	95-64
Pulling Cable Through 90 Condulets and Mid-route Flexible Conduit	94-53	95-17
CCRS Software and Database Verification and Validation	94-53	95-77

Within the areas reviewed, no violations or deviations were identified.

4.0 ELECTRICAL ISSUES CAP (2512/20)

The Electrical Issues CAP is described in the applicant's Nuclear Performance Plan, Volume 4. The NRC previously reviewed the implementation of the Electrical CAP at the 75 percent completion stage as documented in IR 50-390/94-53. During this inspection period, the applicant notified the NRC that the Electrical Issues CAP technical subissue of physical cable separation and electrical isolation had been completed. The purpose of this inspection was to determine whether the applicant's implementation of the Electrical Issues CAP was complete for this issue. The NRC requested, by letter dated November 12, 1992, that the applicant provide a Electrical Issues CAP closure package at the 100 percent completion stage documenting the basis for concluding that the CAP was sufficiently implemented to support an NRC inspection. This CAP closure documentation was also reviewed during this inspection.

4.1 Physical Cable Separation and Electrical Isolation

This issue within the Electrical Issues CAP pertains to three subissues regarding cable separation and electrical isolation: separation between redundant divisions of Class 1E raceways; internal panel separation between redundant divisions of Class 1E cables; and coil-to-contact and contact-to-contact isolation between Class 1E and non-Class 1E circuits.

4.1.1 Separation Between Redundant Divisions of Class 1E Raceways

This issue pertained to inadequate physical separation between redundant division raceways. Typical configurations include conduit to conduit, conduit to tray, tray to tray, and free-air cable to conduit and tray. The applicant's Electrical Issues CAP described the corrective actions that were developed for implementation to resolve this technical issue. The applicant's programmatic corrective actions to resolve this issue were previously reviewed by the NRC and determined acceptable as documented in Safety Evaluation Report on the Watts Bar Nuclear Performance Plan, NUREG-1232, Volume 4, December 28, 1989. Additionally, the NRC performed additional reviews of the applicant's basis for the deviations from RG 1.75, Physical Independence of Electric Systems. As documented in the following documents, the NRC staff determined that the applicant's commitments for compliance with RG 1.75 were acceptable.

- Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 13, Section 8.3.3.3(5), April 1994.

- Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 14, Section 8.3.3.3(5), December 1994.

- Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 16, Section 8.3.3.3(5), September 1995.

The NRC has performed inspections of the applicant's implementation of the corrective actions for the physical separation issue. Initial inspections of physical separation determined that the applicant's walkdowns for conduits and cable trays were inadequate. These conclusions were documented in the following IRs:

The results of these inspections were documented in the following inspection reports:

- 50-390/94-18, paragraph 6.0. This report documented physical separation deficiencies including inadequate separation between redundant division conduits, inadequate physical separation between free-air cables and conduits, and inadequate installation of physical barriers. As a result, VIO 50-390/94-18-03, Failure to Implement Raceway Separation Requirements, was issued. The applicant's corrective actions have been subsequently reviewed and determined acceptable as documented in paragraph 10.16 of this report.

- 50-390/95-64, paragraph 2.2, Cable and Raceway Separation. This report documented physical separation deficiencies including inadequate separation between redundant division cable trays and inadequate installation of cable tray covers. As a result, VIO 50-390/95-64-01, Deficiencies Involving Cables, Conduits, and Cable Trays, was issued. The applicant's corrective actions have been subsequently reviewed and determined acceptable as documented in paragraph 10.16 of this report.

Additional NRC inspection efforts have included field verifications of the raceway and cable physical separation as documented in paragraph 10.16 of this report and the IRs listed below.

- 50-390/93-74, paragraph 10.e

- 50-390/94-53, paragraph 4.2, Physical Cable Separation and Electrical Isolation

- 50-390/94-55, paragraph 2.1, Field Inspections of Conduit Installations

- 50-390/95-57, paragraph 3.0, Physical Separation of Electrical Raceways

On October 27, 1995, the applicant informed the NRC resident inspector's office that the Electrical Issues CAP subissue of separation between redundant divisions of Class 1E raceways had been completed. This inspection focused on the review to verify that there was no outstanding work associated with this technical issue. This was verified through the review of licensing commitments, CAQ documents, and TROI data base. These inspection attributes were performed during the review of the Electrical Issues CAP closure package (paragraph 4.2 below).

4.1.2 Internal Panel Separation Between Redundant Divisions of Class 1E Cables

This issue pertained to the applicant's commitment to establish requirements for safety-related systems to be designed to meet the independence and separation as stated in FSAR Section 7.1.2.2.2.4 and Section 8.1.3.4.6. These sections describe the separation requirements for wiring inside the panels and control board enclosures to ensure physical independence. Various examples were previously identified which demonstrated non-compliance with internal panel wiring separation requirements. A minimum of six inches of air space or a metal barrier is described as being required to ensure adequate internal panel wiring separation. The applicant's Electrical Issues CAP described the corrective actions that were developed for implementation to resolve this technical issue. The applicant's programmatic corrective actions to resolve this issue were previously reviewed by the NRC and determined acceptable as documented in Safety Evaluation Report on the Watts Bar Nuclear Performance Plan, NUREG-1232, Volume 4, December 28, 1989.

The NRC performed reviews of the applicant's implementation of the corrective actions for the internal panel separation issue. The results of this inspection were documented in IR 50-390/94-53, paragraph 4.2.2. As documented in the IR, the NRC performed field inspections of five relay racks and two MCCs to verify that internal panel wiring complied with the separation requirements. The inspection was limited to enclosures outside of the main control room/auxiliary control room due to the large number of panels which the applicant had yet to complete. The inspection results indicated that the applicant had made significant progress in resolving concerns regarding internal panel separation. However, due to the complexity of the issue and the remaining scope of work, the area was identified as necessitating additional NRC review.

Subsequent to the above inspection, IR 50-390/94-82, paragraph 2.3, documented deficiencies identified regarding internal panel separation. The identified separation violations were located in a local panel and control room panels. At the time of the inspection, QA was also performing a field assessment of the corrective actions to resolve the internal panel separation issue. The inspector observed that internal panel separation issues identified by the NRC were also being identified through the on-going QA assessment being conducted by the applicant. Therefore, no new violation of NRC requirements is being identified based on the fact that the findings are part of the QA assessments.

Additional NRC inspection efforts have included field verifications of the raceway and cable physical separation as documented in IR 50-390/95-45, paragraph 2.4. The report documents the NRC inspection of six control room

panels with the overall conclusion that internal panel wiring separation was acceptable. Additionally, paragraph 10.11 of this report documents NRC inspection of panels located outside the control room with acceptable wiring separation.

On October 27, 1995, the applicant informed the NRC resident inspector's office that the Electrical Issues CAP subissue of internal panel separation between redundant divisions of Class 1E cables had been completed. This inspection focused on the review to verify that there was no outstanding work associated with this technical issue. This was verified through the review of licensing commitments, CAQ documents, and TROI data base. These inspection attributes were performed during the review of the Electrical Issues CAP Closure Package (paragraph 4.2 below).

4.1.3 Coil-to-Contact and Contact-to-Contact Isolation Between Class 1E and Non-Class 1E Circuits

This issue pertained to concerns regarding the lack of evaluation to support the use of coil-to-contact and contact-to-contact isolation between Class 1E and non-Class 1E as an acceptable means of electrical isolation. The applicant's Electrical Issues CAP described the corrective actions that were developed for implementation to resolve this technical issue. The applicant's programmatic corrective actions to resolve this issue were previously reviewed by the NRC and determined acceptable as documented in Safety Evaluation Report, NUREG-1232, Volume 4, December 28, 1989.

The NRC has performed reviews of the applicant's implementation of the corrective actions for the coil-to-contact and contact-to-contact isolation between Class 1E and non-Class 1E circuits issue. The results of the inspection were documented in IR 50-390,391/94-18, paragraph 6.b. The inspection conclusions were that implementation of the electrical CAP for this issue was acceptable.

On October 27, 1995, the applicant informed the NRC resident inspector's office that the Cable Issues CAP subissue of coil-to-contact and contact-to-contact isolation between Class 1E and non-Class 1E circuits had been completed. This inspection focused on the review to verify that there was no outstanding work associated with this technical issue. This was verified through the review of licensing commitments, CAQ documents, and TROI data base. These inspection attributes were performed during the review of the Electrical Issues CAP Closure Package (paragraph 4.2 below).

4.2 Electrical Issues CAP Closure Package

The inspector reviewed the closure package for the issue of physical cable separation and electrical isolation to evaluate the applicant's conclusion that the CAP implementation was complete. Discussed below are the documentation package attributes for these subissues.

- Verify that FSAR/Code requirements have been approved and met.

  The Electrical Issues CAP closure package identifies the Electrical Issues CAP criteria issues which required NRC action for resolution, such as FSAR changes. The closure report documents the status of the applicant's commitment to review the design basis documents for conformance to the FSAR. This commitment has been closed.

- Verify that all SER open items have been resolved.

  The following SSER documented the NRC's conclusion that the applicant had adequately resolved the issue of physical cable separation and electrical isolation.

  Safety Evaluation Report on the Watts Bar Nuclear Performance Plan, NUREG-1232, Volume 4, December 28, 1989.

- Verify that all commitments made by the CAP/SP have been adequately implemented.

  The respective closure report identified the commitments which were related to the issue of physical cable separation and electrical isolation. All of the identified commitments have been closed.

- Verify that specific items which formed the basis for the CAP, identified in the applicant's matrix dated July 13, 1989, have been resolved and field implemented.

  The specific items which formed the basis for the CAP have been closed.

- Verify that items such as CAQs, CATDs, NRC commitments, etc., which were identified by the applicant after July 13, 1989, to be resolved by the CAP corrective actions, have been resolved and field implemented and the documentation adequately closed.

  NRC commitments are discussed above. CATDs are discussed below. The inspector performed a review of that applicant's TROI database and did not identify any open CAQs related to the issue of physical cable separation and electrical isolation.

- Verify corrective actions for all other open items, VIOs, URIs, and IFIs related to the specific CAP/SP, have been completed.

  The Electrical Issues CAP closure package and the closure report identify that NRC open items such as VIOs, URIs, and IFIs associated with these issues are closed. The inspector verified through a review of the NRC open item listing that all NRC open items pertaining to the issue of physical cable separation and electrical isolation were closed.

- Verify that all Sargent and Lundy VSR findings related to the CAP/SP are closed.

The Electrical Issues CAP closure package and certification letter documented that VSR items pertaining to the issue of physical cable separation and electrical isolation were closed. The inspector reviewed closure packages for VSR items 14, 189, and 298 associated with cable separation and electrical isolation. No deficiencies were identified within the package.

- Verify that all CATDs related to the CAP/SP are closed.

The Electrical Issues CAP closure report and certification letter documented that applicable CATDs pertaining to the issues of cable separation and electrical separation were closed. The inspector performed a review of the CATDs status and verified that all associated CATDs were closed.

- Verify that all CDRs related to the CAP/SP are closed.

The inspector verified, through a review of the NRC open item listing, that applicable CDRs associated with the issue of physical cable separation and electrical isolation have been closed.

- Verify that all NRC BUs, INs, and TIs related to the CAP/SP are closed.

The Electrical Issues CAP closure package and closure report documented that applicable NRC open issues applicable to the issue of physical cable separation and electrical isolation were closed.

- Verify that all issues identified by previous applicant assessments, Black and Veatch, Nuclear Safety Review Staff, and other contractors, have been resolved.

Assessments conducted at WBN as documented in the WBN Nuclear Performance Plan, Volume 4, include those by United Engineers and Constructors, Duke Power, Nuclear Safety Review Staff, Institute of Nuclear Power Operations, and Black and Veatch. Associated items have been closed.

- Verify that all corrective actions related to the area identified by the applicant in the ECSP, and not a CATD, have either been implemented or other action taken to resolve the identified issue.

The inspector verified that employee concerns such as Class C concerns have been closed.

- Verify that all issues identified in NRR audits have been adequately resolved.

All SER open items associated with these issues have been resolved. There are no other outstanding NRR issues for the issue of physical cable separation and electrical isolation.

- Verify that all issues identified in the applicant's letter to the NRC, dated March 30, 1987, have been resolved.

  The inspector reviewed the applicant's review and resolution of the issues documented in the March 1987 letter which were applicable to the issue of physical cable separation and electrical isolation. The issues reviewed were classified as complex electrical issues. No deficiencies were identified during this review.

- Verify that all employee concerns, post-ECSP, related to the area have been closed or evaluated for impact.

  On November 2, the inspector performed a review of concerns provided to the applicant's CRS and Raytheon Constructors, Incorporated employee concerns office. No concerns were identified regarding the issue of physical cable separation based on the established cable separation criteria. The inspector determined that the applicant's evaluation of the concerns was acceptable.

- Verify that the Independent Verification Program is complete.

  The following IVP assessments for the issue of physical cable separation and electrical isolation were completed:

  NA-WB-95-0096 Electrical and Cable Issues Corrective Action Program - Subissues: Physical Cable Separation and Electrical Isolation and Computerized Cable Routing System Database Verification/Validation

  Nuclear Assurance Final Closure Notification - Cable and Electrical Issues Corrective Action Program, October 27, 1995

  Review of the above reports indicated a thorough assessment of the implementation of the CAP corrective actions for these issues. The IVP conclusions were that the subissues were adequately implemented and ready for closure.

- Verify that all of the applicant's other open items on the issue are closed.

  The applicant documented the basis for the closure of the issue of physical cable separation and electrical isolation. Open items were not identified.

- Verify that any issues known to the NRC or the applicant, which are likely to affect closure, are resolved.

  The applicant did not identify any issues associated with this item. No outstanding issues were identified by the inspector.

- Verify that all applicable PACR items are closed.

The applicant did not identify any PACRs pertaining to these issues. The inspector's review of PACR listing did not identify any applicable PACRs.

The inspector concluded that the applicant has adequately documented evaluation and completion of the above 19 items.

4.3 Conclusions

The implementation of the Electrical Issues CAP for the issue of physical cable separation and electrical isolation has been effectively completed. The applicant has addressed the issues identified in the NRC letter, dated November 12, 1992, with regard to the Electrical Issues CAP closure package. The applicant has completed independent evaluations as part of the QA IVP and concluded that these issues have been effectively completed.

On November 1, the applicant submitted notification to the NRC that the Electrical Issues CAP, as defined in the WBN NPP, Volume 4, Revision 1, had been completed. The inspector performed a review of the status of the CAP open items and verified that they were closed. The NRC has completed the inspection of the subissues associated with the Electrical Issues CAP. NRC inspections were documented in IRs identified below.

Electrical CAP Issues	75 Percent IR (50-390/)	100 Percent IR (50-390/)
Flexible Conduit Installations	94-45	95-72
Physical Cable Separation and Electrical Isolation		
- Physical separation	94-18	95-77
- Internal panel separation	94-53	95-77
- Coil-contact and contact-contact isolation	94-18	95-77
Contact and Coil Rating of Electrical Devices	94-18	95-64
Torque Switch and Overload Relay Bypass Capability for Active Safety-Related Valves	94-31	95-64
Adhesive Backed Cable Support Mounts	94-45	95-64

No violations or deviations were identified within the areas reviewed.

5.0 EMPLOYEE CONCERNS SPECIAL PROGRAM CATDS (2512/15)

The Employee Concerns Special Program was established to resolve approximately 6000 employee concerns received prior to February 1, 1986. The employee concerns included those obtained from the confidential interviews conducted by a contractor (QTC), NSRS concerns that were still open, items generated from the SWEC review of incoming NRC correspondence, and items generated by the ECSP evaluators. The concerns were grouped into nine categories: construction; engineering; operations; material control; welding;

intimidation, harassment, wrongdoing, or misconduct; management and personnel; Quality Assurance/Quality Control; and industrial safety. The concerns in each category were then sorted into 107 subcategories. The subcategories were broken down into elements which grouped the concerns by issue. Concerns were then investigated by issue. The ECSP investigations found that (1) some concerns could not be substantiated or that corrective actions were already completed (class A), (2) in some cases concerns were substantiated but did not represent a problem (class B), (3) in some cases the corrective actions were underway but not completed (class C), and (4) in some cases corrective action needed to be initiated (class D and E). The ECSP issued CATDs for validated issues in which the ECSP believed that additional corrective actions were needed (class D and E). Corrective actions for the issues identified in the CATDs were developed by the responsible line organization and concurred in by ECSP. These corrective actions were called CATD CAPs. The programmatic aspects of ECSP were accepted by NRC in a letter dated October 6, 1987.

A deviation process was later established to allow for changing the CATD CAPs. The deviation process established a senior review panel to review the changes and determine their acceptability. In addition, the process classified the deviations into three levels based on safety significance and established criteria for when NRC concurrence was needed. Level I deviations were defined as deviations from technical specifications, the design basis, FSAR, or cause a reduction in safety margins. Level II deviations were those that affected multiple plants, programmatic areas of weakness, deviated from the techniques or methods established in commitments, or involved organizational changes that directly affected CATD CAP closure. Level III deviations were described as all other changes. The deviation process was accepted by NRC in a letter to the applicant, dated April 15, 1991.

The results of the investigations for Sequoyah were initially published in element reports. NRC reviews of the Sequoyah element reports were contained in letters to the applicant, dated March 11, 1988 and November 11, 1988. Later, the collective results for all the plants were published in category reports and subcategory reports which were submitted to the NRC on February 6, 1989. The NRC published the results of its subcategory report sample review for Browns Ferry Unit 2 restart, 15 of 107, on May 31, 1990. For both Sequoyah and Browns Ferry, NRC inspection of the ECSP corrective action implementation was accomplished under TI 2515/74.

For Watts Bar, the NRC initially planned to review a sample of the subcategory reports similar to the Browns Ferry review. However, because the NRC had reviewed all of the 29 Watts Bar CAPs and SPs which included the ECSP corrective actions for those areas, the NRC concluded in NUREG 0847, Supplement 9, its commitment to review the ECSP subcategory reports for Watts Bar was completed. NRC inspection of the ECSP corrective action implementation at Watts Bar is being accomplished under TI 2512/15. These inspections indicated that approximately 10 percent of the CATD corrective actions had not been adequately accomplished to resolve the associated employee concern(s) and that 15 to 20 percent of the CATD closure packages contained deficiencies. In addition, IR 50-390,391/93-24 indicated that some of the corrective actions which were already in place prior to ECSP

investigation, but not complete, (Class C employee concerns) may not have been completed.

As a result of the NRC inspection findings, the applicant initiated the Lookback Project to ensure that all employee concern corrective actions, Class C and CATDs, were completed, and the employee concerns were adequately resolved. The initial NRC inspection of the Lookback Project effort on Class C employee concerns in IR 50-390,391/93-83 identified a lack of attention to detail, particularly in relation to documentation. However, Lookback Project management had already recognized this weakness and was well along in correcting the problem. Similar reviews were conducted by the Lookback Project for CATDs and the same documentation method was used. NRC IR 50-390,391/94-10 identified that the level of detail in the documentation had improved and was adequate.

As a result of NRC questions about the ECSP classification of concerns and Lookback Project findings when conducting the Class C reviews, the Lookback Project undertook a review of the classification of Class A and B employee concerns. The NRC review of that effort was documented in IR 50-390,391/94-30. The results were that the original ECSP classifications did not always meet the classifications described in the subcategory reports. The Lookback Project reclassified the Class A and B concerns into legitimate and not legitimate, upgrading approximately one-third of the unsubstantiated concerns reviewed. The basis for the upgrade was that corrective action was being taken for the associated concerns. However, the NRC review revealed that some Lookback reviews were shallow in depth and also missed the proper classification. The employee concerns that were reclassified as legitimate were to be associated with the Lookback review for the associated corrective action. The NRC review during the QA Records CAP inspection in IR 50-390,391/94-40 indicated that Lookback was having some problems with implementation of the links to the associated corrective actions, particularly where investigations into wrong doing were involved. That appeared to be an organizational interface problem due to the sensitive nature of wrong-doing investigations.

A QA audit of the CATD program (NA-WB-94-0105) was conducted in the fall of 1994, The audit concluded that the CATD packages prepared by the line organization needed improvement. Corrective action for the audit was to train personnel responsible for preparing the CATD packages and to conduct feedback sessions with the line about current findings from the CATD review process, Lookback, QA independent verification, and CRS overview. Trending of the CATD package rejections was also a corrective action that began after the audit. The trending effort was the first time that QA management had taken an active role in establishing the quality standard for CATD closure. All previous QA involvement was in conducting the independent review for closure. The results of those reviews were not used by QA management to establish a quality standard.

QA set the CATD quality standards for trending equivalent to those previously established for CAQ closures. Trending initially indicated that CATD package quality from the line organization was unacceptable with a cumulative acceptance rate of less than 50 percent through February 1995. These trends

were being reported to management as part of the NA weekly report. Corrective action was taken by the line organizations resulting in improvement. The results for April 1995 showed significant improvement over the previous six months with an acceptance rate of approximately 86 percent The cumulative average from October 1994 through April 1995 is now approximately 70 percent versus 39 percent through February 1995.

5.1 Review of CATD Corrective Actions

The inspectors reviewed CATD closure packages to determine whether the corrective actions taken resolved the associated employee concerns and whether the guidance contained in Procedure SSP 1.02, Concerns Resolution was followed. All of the CATD packages reviewed had been through the Lookback Project. The review included the associated subcategory report sections; the applicable employee concerns; the CATD; the associated CAP; the CATD closure package (including corrective action documents); the Lookback Project data sheet; and field verification of corrected hardware. For non-plant specific CATDs, the review included whether all actions required to resolve the identified concerns, as they pertained to WBN, were complete and acceptable. Actions required to resolve these concerns at other nuclear sites of the applicant were not addressed in this report. For those that were partial closures for Unit 1 only, the inspectors' review included verification that all Unit 1 actions were complete and acceptable, and that remaining Unit 2 actions are specifically identified and not needed for Unit 1 startup. The below listed CATD packages which the NRC had previously reviewed and commented on were reviewed to determine if the comments were resolved.

5.1.1 10300-WBN-01 Coatings

This CATD addressed coatings which were damaged. IR 50-390/93-24 documented review of this CATD package and that the MRs that were to perform the coatings repair work could not be found because the link between the employee concern and the MRs had not been retained. The applicant found two WOs which were to perform the same work and linked this CATD to those WOs. The lookback data sheet showed that the coatings work was accomplished under Procedure MAI 1.9 walkdown program prior to the WOs being accomplished. Consequently, the WOs were canceled. The coatings were non-safety related. The MAI 1.9 program has done a significant amount of coatings replacement throughout the entire plant. This work has been observed by the resident inspectors during review of room and area turnovers. No problems with the coatings have been observed. The associated employee concerns were resolved.

5.1.2 10400-WBN-09 Attachments to Steel

This CATD was issued to evaluate attachments to building and miscellaneous steel. IR 50-390/95-12 documented review of this package and found that the applicant had taken credit for the Civil CAPs, HVAC, HAAUP, instrument line, conduit supports, and cable tray supports, to provide the overall scoping corrective action; yet they were not closed. The inspector noted that these CAPs were now closed and the documentation was in the CATD package. The inspector concluded that the CATD issue was resolved.

5.1.3 19200-NPS-05 Generic Reviews

This CATD was issued because generic reviews of CAQ documents were inadequate, inconsistent, or had not been performed. The cause was that responsibility was fragmented among too many organizations to assure consistency and accountability in the review process. IR 50-390/93-75 documented review of this CATD and found that although corrective action had been taken which provided for all generic determinations to be made by licensing or engineering, it had been reversed to again allow all organizations to make generic determinations. The applicant processed a CATD CAP deviation which stated that although the responsible organization was making the initial generic determination, a standard review committee, MRC/SMRC, was performing a review of these determinations. IR 50-390/95-71 reviewed the performance of the review committee and the generic review process and determined it was adequate. This CATD was resolved.

5.1.4 30804-WBN-02 Vendor Drawings

This CATD was issued to address uncontrolled drawings in uncontrolled vendor manuals being used for repairs. IR 50-390/93-27 documented review of this CATD during the Vendor Information CAP 75 percent inspection and found that vendor drawing in the back of approved vendor manuals were considered for information only without being marked as such. The applicant stated they would stamp these drawings Information Only to clarify how they were to be used. The Lookback Project had verified that the drawings had been stamped and included documentation to support this in the package. The vendor manual cover sheets were also annotated that the drawings in the manual were for information only. The inspector reviewed NRC IRs 50-390/95-10, 50-390/95-51, and 50-390/95-67 which were also inspections of the Vendor Information CAP with IR 50-390/95-67 being the final inspection of the CAP. No other instances of this problem were identified. This CATD was resolved.

5.1.5 21509-WBN-01 Sampling of Supports

This CATD was issued to provide corrective action for connections to embedded plates that used both bolts and welds. IR 50-390/95-23 documented review of this CATD and found one problem. The problem was that a worst case sample was used and two failures out of 69 were found; no sampling plan was referenced that established whether the two of 69 was acceptable. The applicant provided clarification in that a bounding analysis was used, not a worst case sample. The bounding analysis found two connections which were not adequately designed. These were the two most heavily loaded connections. All of the other connections were adequate. The two connections were reworked. This resolved the CATD issue.

5.1.6 30100-NPS-01 Management Attention to DG Reliability Program

This CATD was issued to focus corporate management attention on DG reliability. IR 50-390/93-75 found that this CATD relied on several other CATDs which were not closed. This was identified as a premature closure. The relied upon CATDs are now closed (30102-WBN-03 and 30102-WBN-07). This CATD is resolved.

5.1.7 30102-WBN-03 DG reliability

This CATD was issued to address five items related to diesel generator testing and reliability. IR 50-390/93-75 documented review of this CATD and found that there was no procedural requirement to trend non-hardware related DG start failures. Subsequently, Procedure PAI 11.01, Emergency Diesel Generator Reliability Program, Revision 0 was issued June 17, 1994, which addressed DG start failures and treats hardware and non-hardware start failures the same. CATD 30102-WBN-07 addressed the same issues and was also closed. The CATD issues were resolved.

5.1.8 30710-NPS-01 Section XI 50.59

This CATD was issued because ASME Section XI relief requests were not receiving reviews under 10 CFR 50.59. IR 50-390/94-10 reviewed this CATD and documented that procedures had not been changed. The applicant has subsequently revised Procedures SSP 8.05, ASME Section XI System Pressure Test Program, Revision 3, Change Notice 1 and SSP 8.06, ASME Section XI Pump and Valve Inservice Testing, Revision 3, Change Notice 4. These revisions added a note that relief requests may require consideration under Procedure SSP 12.13, 10 CFR 50.59 Evaluation of Changes, Tests and Experiments. These changes resolved the CATD issue.

5.1.9 11200-NPS-02 Maintenance Equipment History

This CATD involved the issue that three different record keeping systems were being used to track the work and material history. IR 50-390/94-64 documented that the CATD was reopened due to PER 940186 which found problems with the implementation of the Maintenance Equipment History Program to support generic trending. Trending of maintenance WOs was addressed in IR 50-390/95-71 during review of the corrective action program. SSP 6.04, Equipment History and Failure Trending, was revised (Revision 5) to address the problems identified including how to complete the forms and NPRDS reporting. This CATD issue was resolved.

5.1.10 80112-NPS-01 QA audits

This CATD was found deficient in IR 50-390/93-75 because an approved CAP was not in the CATD folder. IR 390/95-23 documented that an approved CAP had been added to the CATD folder; however, the Lookback Project had not performed a review of the QA audit area. A review was performed with satisfactory results, but lookback found that PER 950077 had been issued because a construction audit had been missed. The CATD was reopened until the PER issue was resolved and closed. The CATD was then reclosed. This CATD was resolved.

5.1.11 20000-NPS-03 Employee Perceptions

This CATD addressed assessing improvements in employee attitudes toward quality. The CATD was reviewed in IR 50-390/94-30 and found that only one employee survey was being used to assess a change in employee attitudes. The corrective action was subsequently revised to use several employee opinion

surveys, 1991 and 1993, to assess employee attitudes. In addition, the surveys and interviews conducted by the OIG during their audits of the employee concerns programs were added to the CATD package as well as examples of current ongoing indicators such as the applicant's Monthly Status Report, NQA Trend Report, and the rolldown of the Nuclear Power Goals. These were adequate to provide indications that employee attitudes toward quality were satisfactory. This resolved the CATD issues.

5.1.12 80301-NPS-01 QC Inspector Certification and Experience Records

This CATD was issued because QC inspector certification and experience records in the vault were not accurate. IR 50-390/94-40 documented the review of this CATD and noted that some documentation of inspector certification was still missing. The report documented the additional actions that the applicant was taking. The additional information was added to the CATD folder and the lookback data sheet was revised. The information was acceptable to resolve the identified deficiency in the CATD package and resolve the issue.

5.1.13 80519-WBN-01 Falsification of QC Inspector Signatures

This CATD was issued to track the findings from an OGC investigation on QC inspector signature falsification. IR 50-390/93-83 reviewed this CATD and found that programmatic corrective action was adequate, but an issue of signature falsification identified had not been pursued from a technical standpoint. FIR 930211 was issued to provide technical resolution, which was escalated to SCAR 940002. The issue was found to be a Unit 2 issue that did not affect Unit 1. The SCAR was place in Unit 2 hold. The CATD issue was resolved for Unit 1.

5.2 Conclusions

During this inspection the applicant completed the remaining CATD packages needed for the startup of Unit 1. A review by the inspector found that over 450 of the 617 CATDs in safety-related categories had received either an NRC review of the completed CATD package or an NRC review of the CATD issue to determine if the actions that the applicant was taking, or took, were acceptable to resolve the associated employee concerns. In addition, the inspector performed a random sample of the completed CATD packages that had not been reviewed by the NRC to provide reasonable assurance that all CATDs had been completed. This sample review, 21 CATDs, included whether the Lookback review had been completed and whether documentation in the package showed that any lookback identified findings had been resolved. All of the 21 randomly selected packages were acceptable. Based on the NRC review of the over 450 CATD issues which the NRC has determined were adequately resolved, the sample review of the remaining packages, and the previous reviews of the applicant's actions on the Class A, B, and C employee concerns, the NRC concluded that the ECSP was adequately implemented.

Within the areas reviewed, no violations or deviations were identified.

6.0 NUCLEAR PERFORMANCE PLAN COMMITMENTS

The inspector reviewed the NPP and the applicant's TROI status to determine which commitments were still open. Four commitments were open at the time of the review with two remaining open at the end of the inspection. The two remaining open related to the Fuel Load Readiness Letter and the Procedure MAI 1.9 Loose, Damaged, Missing Parts Walkdowns. The inspector found the TROI status for the NPP Commitments to be accurate. The vast majority of the NPP Commitments were previously inspected by the NRC. These included CATDs, VSR DR items, CAPs, and SPs. The inspector concluded the applicant had adequately implemented the commitment with the exception of Procedure MAI 1.9 walkdowns. However, this issue was evaluated and found complete and documented in paragraphs 8.0 and 10.9 of this report.

Within the areas reviewed, no violations or deviations were identified.

7.0 SARGENT AND LUNDYS VERTICAL SLICE REVIEW

A Vertical Slice Review was performed by Sargent & Lundy in 1988 at WBN and identified 507 discrepancies that had to be resolved before fuel load. Correction of the VSR discrepancies was monitored by the NRC and documented in various NRC IRs and SER 17. The 507 discrepancies were tracked by WBN and controlled in an administrative control program by onsite procedures.

To assure all discrepancies were completed and closed prior to fuel load, the inspector obtained a TROI printout of open VSR items and verified that all 507 VSR discrepancies were corrected, reviewed by QA and administratively closed by the applicant. The TROI printout indicated all VSR items were resolved. The inspector had no further questions on this issue.

Within the areas reviewed, no violations or deviations were identified.

8.0 WALKDOWN VERIFICATION FOR DAMAGED, LOOSE, OR MISSING HARDWARE (2512/18, /23, and /26)

During this inspection period, the applicant continued to perform walkdowns to identify and correct damaged, loose, and missing hardware. This process is described by Procedure MAI-1.9, Walkdown Verification for Modifications System/Area Completion and Damaged, Loose, or Missing Hardware, Revision 6. The applicant has completed walkdowns of all areas which were scheduled to be turned over to the plant staff prior to Unit 1 fuel load. The area turnover process is continuing with post-fuel load areas such as in the turbine building.

The NRC had previously identified 143 area/rooms scheduled for turnover which the NRC staff determined included a significant amount of safety-related equipment. The NRC resident staff inspected each of those areas after the applicant completed turnover of the area to plant staff. Although the applicant's area turnover process is continuing with turnover of other areas, all of the above 143 area/rooms have been turned over to the plant staff. An attachment to this report identifies the applicant's and NRC's status relative to completion and final inspections of these areas.

To determine the adequacy of the ongoing walkdowns, the inspector performed a confirmatory walkdown of the Seal Water Heat Exchanger 1A Room, Unit 1 Elevation 713 Pipe Chase, Unit 1 Elevation 557 Personnel/Equipment Access, Refueling Room, 6.9KV Shutdown Rooms A and B, 480V Board Room 1B, 480V Shutdown Board Room 1B, 480V Transformer Room 2B, Unit 1 Auxiliary Instrument Room, Cable Spreading Room, and Unit 1 North Main Steam Valve Room. These areas had recently been turned over to plant staff.

The inspector reviewed the applicant's program for correction of deficiencies identified during the walkdown process. During this review the inspector selected several WOs which were referenced on the walkdown discrepancy logs for various areas to verify that the problems were actually being corrected. During this review the inspector paid particular attention to the method used to correct deficiencies along with the adequacy of the qualification of craft and QC inspection personnel involved in resolution of the deficiencies. The inspector selected five examples related to anchor bolt deficiencies which were identified in the walkdown discrepancy logs for various areas in the Unit 1 auxiliary building. Types of deficiencies included loose/missing anchor bolts or nuts. The logs stated that these deficiencies had been corrected on WOs 95-19352-41, 95-05337-64, 94-27844-99, 95-21745-29, and 95-21745-05. The inspector reviewed portions of these WOs and determined that the applicant had adequately corrected the documented deficiencies. Additionally, the inspector requested that the applicant provide documentation to show qualification of all craft and QC inspection personnel that had been involved with those five WOs. The inspector was provided copies of inspector certification for the QC inspectors and training requirements matrixes for each of the craftsmen. The inspector verified that the personnel had documented training necessary to qualify the personnel to perform anchor bolt installation activities. For those craft personnel selected by the inspector, each individual had received a six-hour training class titled Concrete Anchors for Craftsmen. Additionally, each individual had completed required reading on the most recent revisions of MAI-4.2A, Piping and Tubing Supports and MAI-5.1A, Expansion Shell Anchors. The inspector determined that the records provided by the applicant for the individuals selected by the inspector showed that the requirements of Procedure MAI-1.8, Managing Training, had been satisfied.

The quality of the area turnovers has generally been good. Oversight of the area turnover process by NA has contributed to identification of most damaged, loose, or missing hardware deficiencies in the areas prior to turnover.

Within the areas reviewed, no violations or deviations were identified.

9.0 WATTS BAR NUCLEAR PLANT FUEL LOAD CERTIFICATION PLAN

The inspector reviewed the process and documentation associated with the applicants Fuel Load Certification Plan. This plan consisted of a series of signoffs by the responsible site managers which verified completion of the key aspects of plant construction and the readiness to support plant operations. In addition, the implementation of this plan and the verification of implementation were discussed with representatives from the applicants licensing and QA organizations. Based on this review and discussion, the inspector concluded that an adequate basis for submittal of the applicant's

fuel load and low power licensing letter to the NRC was being established. The Fuel Load Certification Plan was approximately 90 percent complete at the time of the exit (November 4) for this inspection.

Within the areas reviewed, no violations or deviations were identified.

10.0 NRC OPEN ITEM STATUS REVIEW (92700, 92901, 92902, 92903, 92904)

10.1 (Closed) CDR 390/85-59, Flooding in Category I Structures Outside Containment

This construction deficiency report involved the discovery that the environmental qualification for Class 1E and 10 CFR 50.49 electrical equipment located in Category I structures outside containment may not have been adequately evaluated for the effects of flooding due to postulated events such as MELBs and HELBs, respectively. The subject deficiency was initially reported to NRC on October 28, 1985 in accordance with the reporting requirements of 10 CFR 50.55(e). An interim report was submitted by the applicant on December 13, 1985, and a final report was submitted on January 28, 1986.

This item was examined in NRC IRs 50-390/91-26, 50-390/95-53, and 50-390/95-61. The first IR evaluated whether the applicant's recurrence controls and corrective actions taken were adequate for construction restart. The report summarizes a four point program that had been implemented by the applicant to resolve the concern and to prevent further recurrence. The report concluded that the actions taken by the applicant were adequate to support construction restart. However, this item was left opening pending completion of identified equipment and structure modifications.

The later two inspections evaluated the adequacy of the applicant's MELB corrective action programs for Class 1E equipment. The corrective measures taken included such actions as sealing junction boxes and conduits from moisture intrusion. Walkdowns were performed by NRC during these inspections to verify that conduit seals, both internal and external, had been properly installed. The inspector concluded from these reviews that the MELB special program has been adequately implemented.

The applicant's corrective action programs for 10 CFR 50.49 equipment that was installed below the postulated HELB flood level were examined as part of the follow-up on CDR 50-390/89-12, 10 CFR 50.49 Cables Located Below Flood Level Are Not Qualified. The results of this review are discussed in paragraph 10.27 below. Based on the above, the inspector concluded that this item has been satisfactorily resolved by the applicant and is considered closed.

10.2 (Closed) CDR 50-390/86-25, Non-Quality Assurance Data Used in Calculations for Cable Tray and Conduit Loading

This CDR involved the use of undocumented and unverified cable weights and diameters for Class 1E and non-Class 1E cables in calculations for conduit and cable tray seismic loadings and cross-sectional area fill. The result was that overfill conditions in conduits and cable trays existed that were not in

accordance with design criteria. The corrective actions for this CDR were previously reviewed and determined acceptable as documented in IR 50-390/91-31, paragraph 9.e.

The corrective actions and recurrence controls included the verification and validation of the WBN CCRS software and database. Verified values for cables and manufacturer supplied cable weights and cross sectional areas were entered into the CCRS database and were subsequently controlled as QA data. the applicant's corrective actions with respect to the validation and verification of CCRS were reviewed by the NRC and determined acceptable as documented in Cable Issues CAP Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 7, Appendix P, September 1991.

The applicant completed the evaluation of overfilled conduits and cable trays to identify any rework required from an ampacity standpoint. The applicant issued DCNs to replace those cables with inadequate ampacity. The NRC has previously performed reviews of the applicant's implementation of the corrective actions associated with the replacement of cables due to inadequate ampacity. These inspections were documented in IR 50-390/94-81, paragraph 2.1.2, CEI 13, 17, 25, and 26: Cable Ampacity. Following the completion of cable replacement activities for various issues including ampacity, the applicant began the re-installation of cable tray covers as required. Covers were installed to resolve cable separation violations and to provide cable protection. Subsequently, the applicant re-performed ampacity calculations to verify the adequacy of the installed cables considering cable tray overfill and the presence of cable tray covers. As documented in paragraph 3.2 of this report, the NRC reviewed the applicant's evaluation of V4 and V5 voltage level cables and determined that the calculations were acceptable.

The NRC has also performed reviews of the applicant's evaluation of overfilled raceways and the seismic loading impact. This review was documented in IR 50-390/95-69. The results of the review indicated acceptable applicant resolution of the seismic loading deficiencies.

Based on the above documented NRC inspections of the applicant's corrective actions for this CDR, this item is closed.

10.3 (Closed) CDR 50-390/86-27, 50-391/86-23, Flexible Conduit Not Installed to Compensate for Thermal and Seismic Movements

This CDR was previously reviewed, and the results of the review were documented in IR 50-390,391/91-26.

The IR identified improper installation of Class 1E flexible conduit which involved displacement and length requirements that were not in accordance with the General Construction Specification G-40. Three categories of deficiencies were noted: flexible conduit to pipe mounted devices did not compensate for seismic and thermal movement; violation of minimum bend radius; and conduit-to-floor mounted equipment did not allow for lateral seismic movements. These issues and others were included within the scope of the Conduit and Conduit Support CAP.

The applicant determined the deficiencies resulted from NE's failure to provide adequate installation requirements in design output documents such as drawings and procedures. Additionally, NE did not identify those conduits subject to thermal and seismic movement.

To prevent recurrence of the deficient conditions, the applicant revised the G-40 specification to clarify and define flexible conduit installation requirements for displacement, minimum length, and bend radius, and also provided inspection criteria. New field Procedure MAI-3.1, Installation of Electrical Conduit Systems and Conduit Boxes, Revision 0, was issued that implements the G-40 specification with installation and inspection requirements.

The inspector reviewed the above actions and determined that the corrective actions relative to recurrence controls were adequate and still in place. Procedure MAI-3.1 is now at Revision 12.

In order to resolve and correct identified deficiencies, the applicant performed inspections of installed conduit and supports and developed Calculation WCG-1-1803, Revision 1, that provides detailed resolution to each discrepancy found during inspections. Resolution included rework or engineering acceptance for use-as-is.

The applicant's programmatic approach and the adequacy of engineering justifications provided in the calculation were evaluated and accepted by the NRC during inspections documented in IR 50-390/95-69.

During this inspection period, the inspector conducted a review of the installation of flexible conduit installations for attributes including conduit length, bend radius and hardware. The Turbine Driven Auxiliary Feedwater Pump Room, RHR Pump 1B-B Room, RHR Pump 1A-A Room in the auxiliary building, and Accumulator 3 Room in the reactor building were reviewed. No deficiencies were identified.

This CDR is closed.

10.4 (Closed) CDR 50-390/86-61, Cable Configuration Control

The subject deficiency was reported to NRC on July 23, 1986, pursuant to the requirements of 10 CFR 50.55(e) . The applicant submitted reports on this item in letters dated August 22, 1986, May 29, 1987, and December 3, 1990. During NRC Inspection 50-390/91-31 the applicant's corrective actions relative to recurrence controls were evaluated and determined to be adequate for construction restart. However, this item was left open pending completion of field activities.

This CDR involved the discovery of documentation deficiencies for 10 CFR 50.49 cables located in harsh environments. This discovery was the result of an assessment of 10 CFR 50.49 requirements for WBN Unit 1 electrical cables. Records for approximately 4,256 Unit 1, common, and Unit 2 cables required for Unit 1 operation were reviewed, and 244 cables were identified as having documentation discrepancies. Upon discovery, SCRs WBN EQP 8624, 8625, 8627,

8628, and 8648 were issued by the applicant to initiate corrective action. SCRs 8624, 8625, 8628, and 8648 were superseded by SCAR WBP890364SCA, Revision 0, and SCAR 8627 was superseded by SCAR WBP890363SCA, Revision 3.

The NRC reviewed the applicant's corrective actions for SCAR WBP890363SCA, Revision 2, in IR 50-390/93-74, dated December 20, 1993. This inspection resulted in the two examples of URI 50-390/93-74-03, Walkdown Inspections for Wiring Extensions and Splices. Example 1 involved deficiencies noted with the implementation of the corrective action for SCAR WBP890363SCA, Revision 2. Example 2 involved the acceptability of splicing in raceways. Example 1 was later upgraded to VIO 50-390/94-51-01, and example 2 was resolved. The NRC review of the applicant's corrective actions and closure of the violation was documented in IR 50-390/94-66.

This inspection examined the applicant's closure package for the above SCARs and verified that those remaining field activities that had not been completed prior to inspections 50-390/91-31, 50-390/93-74, and 50-390/94-66 were completed satisfactorily in accordance with applicant commitments and regulatory requirements. In a status package dated October 29, 1991, the applicant summarized those actions that had been completed and those actions that remained to be performed. Review of the closure packages for the above SCARs supported the fact that the corrective actions specified were satisfactorily completed. The inspector verified by review of appropriate documentation (e.g., DCNs, WCSs, WPs, WP closures, and other supporting records included in the SCAR closure package) that each of the identified actions has been satisfactorily completed. The inspector also verified that NA had performed reasonable reviews of the closure packages of the above SCARs to ensure that the approved corrective action programs have been satisfactorily implemented. Based on the review of these closure packages this item is considered closed.

10.5 (Closed) VIO 50-390/87-05-01, Hydrogen Analyzer Design and ANSI N45.2 Compliance

This was a two part violation. The first part identified a failure to consider vendor requirements in the design of the hydrogen analyzer installation. The second part identified a failure to meet ANSI N45.2.1 cleanness requirements for the reactor pressure vessel. Additionally, IR 50-390,391/87-05 requested the applicant provide a description of the program for compliance with all the ANSI Standards committed to in the FSAR or Quality Assurance Topical Report.

The first part violation was inspected and closed in IR 50-390/95-67. For the second part, in addition to evaluating the corrective actions relative to the reactor pressure vessel, the inspector reviewed the applicants action relative to addressing all committed ANSI requirements. The applicants response to the violation stated that to ensure that all ANSI requirements have been included in site procedures, matrices have been developed for applicable ANSIs listed in the FSAR. Further, after completing the review, the applicant stated that nonconformance reports would be issued to resolve any areas that failed to include the ANSI requirement during the earlier construction period. The

nonconformance reports would evaluate the impact on plant design and correct adverse conditions as appropriate.

The inspector reviewed the applicants list of nonconformance reports listed in the applicants Attachment A to the ANSI matrix. This attachment list each ANSI standard, 28 total, for WBN. In addition, the attachment listed all nonconformance reports issued to correct specific requirements. Of the 28 ANSI standards, 14 are listed with a corresponding nonconformance report. Four hundred thirty-three procedures were included in the review. Most of the nonconforming conditions were identified on NCR 7229. For this NCR, NRC had previously reviewed and documented the inspection findings in IR 50-390/90-12 as being acceptable. The inspectors review of this violation found the specific item had been corrected, and the applicant had issued nonconformance reports for all discrepant conditions. Additionally, the inspector verified, where appropriate, that the applicant had revised the procedure to assure any future work activities would meet the ANSI requirements. This violation is closed.

10.6 (Closed) VIO 50-390/87-11-02, Failure to Control Lifted Cables and Wires Per Approved Procedures or Drawings

The applicant's responses dated October 16, 1987 (RIMS L44871016810), along with supplemental responses dated May 4,1988 (RIMS L44880504808), August 29, 1988 (RIMS L44880829805), and March 2,1990 (RIMS T03900302896) were considered acceptable by Region II. The NRC reviewed a status package for release of the construction stop work order and documented the results in IR 50-390/91-26. The NRC's review of the completed corrective actions pertaining to recurrence controls were determined adequate for restart of construction activities. The violation was left open pending completion of field inspections to obtain data to determine the extent of condition for Part 1-Spare Cable Control, of the NOV.

Additional examples of improperly spared cables were identified by the NRC in VIO 50-390/94-53-01. IR 50-390/94-66 documented the NRC's conclusion that the corrective actions implemented for VIO 50-390/87-11-02 failed to identify all spare and abandoned cables within conduits. The applicant was requested to perform additional evaluations in order to determine the true extent of this issue. Corrective action plans developed and implemented by the applicant for VIO 50-390/94-53-01 was transmitted to the NRC by letter dated October 21, 1994 (T0494102199). The NRC has reviewed the applicant's implementation of the commitments for correcting VIO 50-390/94-53-01 and the results were documented in IR 50-390/95-72.

Corrective actions completed by the applicant for Part 1- Spare Cable Control, of VIO 50-390/87-11-02 were documented in the following design output documents. The inspector reviewed these documents to determine the technical adequacy of the completed actions.

- Calculation WBPE2858910080, Methodology and Technical Justification for Dispositioning Deleted (Spare/Abandoned) Cables Listed on DCNs C02374A, C02445A, and C02466A, Revision 0.

- DCN C02374A, List Reflecting Nuclear Construction Status of Nuclear Engineering Cables, dated November 9, 1988

- DCN C02445A List Reflecting Nuclear Construction Status of Nuclear Engineering Deleted Cables, dated November 11, 1988.

- DCN C02466A, List Reflecting Nuclear Construction Status of Nuclear Engineering Deleted Cables, dated November 22, 1988.

- DCN C02407A, Enter Spare Identifiers into the Cable Routing System, dated November 15, 1988.

Based on the above reviews the inspector determined that the applicant had met their commitment for evaluating the extent of condition related to spare and abandoned cables in relay panels.The results of the extent of condition evaluation indicated a maximum population of 2055 spare or abandoned cables.

Corrective action document SCAR WBP890560SCA, Revision 4, was developed and implemented for correcting the spare/abandoned cable deficiencies identified by both the NRC and the applicant. In corrective action 5 of this document, modifications was described as having completed walkdowns of 42 percent of the 2055 spare or abandoned cables identified in VIO 50-390/87-11-02. These walkdowns have not resulted in identifying any unaccounted for spare or abandoned cables. The applicant concluded that these results validate the conservatism of the engineering assumptions used in the above analysis. Based on review of the above documentation, this violation is closed.

The inspector concluded that the applicant had determined the full extent of the violation, taken actions to correct current conditions, and developed corrective actions needed to preclude recurrence of similar problems. Corrective actions stated in the applicant's responses have been implemented.

10.7 (Closed) CDR 50-390/87-14, Containment Purge Air Bellows Have No Fire Rating or Environmental Qualification

This CDR reported that the HVAC ducts associated with the Containment Purge Air System had bellows expansion joints, adjacent to the duct penetrations into the 3-hour fire-rated containment building, that did not have a fire rating, and there were no dampers at the fire wall penetration to prevent the egress of fire. In addition, these bellows had no documented EQ for radiation. Also, several other HVAC expansion joints lacked EQ and fire protection certification.

As a result of this deficiency and in an effort to minimize the use of Thermolag, the applicant implemented the following corrective actions which were tracked by SCAR 890150:

- The applicant compiled a listing of all safety-related bellows/expansion joints in the plant HVAC systems. This action also included updating of fire compartmentation drawings to show fire cells.

- An analysis of the fire cells was performed considering the material which was used to fabricate the bellows/expansion joints. This analysis resulted in corrective action for several cells.

- The bellows at the containment penetrations in the Containment Purge Air System were wrapped with 3-hour fire rated fabric. This action was accomplished by DCN 36185 which was implemented by WO 95-17416-00.

- It was determined that the materials used to fabricate the HVAC joints had been purchased on two contracts, 78K74-823015 and 83K74-833127-1. Review of these contracts and the vendor supplied documentation determined that the joints fabricated from contract 78K74-823015 were acceptable for both EQ and Appendix R applications. Materials associated with the other contract lacked proper certification. As a result, DCN M-08936-A which was implemented by WPs D-08936-01 through 15, 17 through 32, and 42, was issued to replace the uncertified material.

- The applicant installed fire dampers at nine penetrations where ducts penetrated auxiliary building floors. This action was accomplished by DCN W-35361-A which was implemented by WOs 95-06890-00 through 08 and 95-06257-08.

- In order to prevent recurrence, the applicant revised engineering procedures to provide for an interdisciplinary review and to clearly require design changes to consider fire protection and EQ requirements (reference Procedures SEP 9.5.6, Revision 0; EAI 3.05, Revision 21; NEP 3.1, Revision 1; NEP 5.1, Revision 2; NEP 5.2, Revision 0; and WBEP 5.03, Revision 22).

The inspector reviewed the listing of bellows/joints compiled by the applicant, the fire protection drawings, SCAR 890150, the DCNs which made the hardware changes, the contracts and vendor documentation for the old material which was accepted by the applicant, a sample of the WOs and WPs which implemented the DCNs, and the engineering procedures associated with the corrective actions above. This review, as well as a walkdown of the hardware in the plant, confirmed that the corrective actions stated in the applicants response to the CDR, and in the closure package for this item had been effectively implemented.

Based on this review, the inspector concluded that the corrective action for this item was adequate for the closure of the item on Unit 1. Corrective action for Unit 2 has not been completed and the item will remain open for Unit 2.

10.8 (Closed) CDR 50-390/89-06, Inadequate Qualification for Cable Tray Supports and Fittings

This CDR reported that qualification documentation for cable trays and tray supports could not be located. This included the fact that there was lack of documented design qualification for cable tray hardware, installed configurations did not comply with design output, and there was a lack of

documentation to verify previous inspections. As a result of these deficiencies, the applicant developed and implemented the cable trays and Cable Tray Supports CAP. The corrective actions related to this CDR were tracked to completion by SCAR 880040 and by completion of the CAP. A summary of the corrective actions were as follows:

- Performance of a design basis review and upgrade of cable tray support documentation.
- Completion of an evaluation of cable trays for structural integrity.
- Review and revision of the design basis document for cable trays and tray supports (WB-DC-20-21.1).
- Verification of adequate thread engagement for bolting of tray fittings and hardware.
- Revision of appropriate procedures to include installation, QA, and maintenance requirements.
- Revision of procedures to assure that design documents qualify cable tray hardware, the installed configuration complies with the design output, and re-inspections were properly documented.

The NRC conducted detailed inspections of the implementation of the Cable Trays and Cable Tray Supports CAP at the 75 percent completion point and near the completion of all CAP activities. These inspections are documented in IRs 50-390,391/94-64 and 50-390,391/95-69. In addition, inspection of the records for this area was conducted during inspection of the QA Records CAP. This inspection is documented in IR 50-390,391/93-78. Based on the results of these inspections, the inspector concluded that adequate corrective actions for the closeout of this CDR had been taken. Corrective action for Unit 2 has not been completed and the item will remain open for Unit 2.

10.9 (Closed) CDR 50-390/89-11, Significant Trend Associated with Damaged, Loose, or Missing Hardware

This CDR reported the discovery of significant deficiencies involving damage to permanent plant equipment and related hardware, and loose and missing parts of components and systems thought to be complete. Corrective actions associated with this issue were previously reviewed by the NRC as documented in IRs 50-390/93-74 and 50-390/95-17. During the most recent of those reviews the inspector determined that the applicant's ongoing walkdowns were adequate to identify any significant instances of damaged, loose, or missing hardware within each area as the area was turned over to the plant staff. This item was left open pending further monitoring of the applicant's walkdown activities.

The applicant continued to perform walkdowns to identify and correct damaged, loose, and missing hardware. This process is described by Procedure MAI-1.9, Walkdown Verification for Modifications System/Area Completion and Damaged, Loose, or Missing Hardware, Revision 6.

The NRC identified a total of 143 area/rooms scheduled for turnover prior to Unit 1 fuel load which the NRC staff determined include a significant amount of safety-related equipment. To determine the adequacy of the ongoing walkdowns, the inspectors performed a confirmatory walkdown of each of those areas after the applicant completed turnover of area to plant staff. Examples of these reviews are documented in IRs 50-390/94-75, 94-66, 95-06, 95-17, 95-33, 95-38, 95-45, 95-57, 95-72, and paragraph 8.0 of this report. The NRC has completed inspection of those 143 areas. An attachment to this report identifies the applicant's and NRC's status relative to completion and final inspections of these selected areas. The quality of the area turnovers has generally been good. Oversight of the area turnover process by NA has been good and has contributed to identification of most damaged, loose, or missing hardware deficiencies in the areas prior to turnover. Although a few examples of the applicant's failure to document walkdown deficiencies have been identified during previous inspection periods, no failure by the applicant to identify significant deficiencies was identified by the inspectors.

Based on the above review the inspector determined that the applicant's corrective actions has been adequate to address the issue associated with damaged, loose and missing hardware. This item is closed.

10.10 (Closed) CDR 50-390,391/90-10, Unqualified Cable Seal Penetration Seals

During an evaluation of cable tray fire penetration seals installed in various fire barriers, the applicant determined that certain cable tray penetration seal configurations were not supported by test data. These included the following:

- Cable tray penetration seals with more than 39 percent cable fill in 1-1/2 hour fire rated walls and floors thinner than 18 inches;

- Cable tray penetration seal with more than 39 percent cable fill in 3-hour fire rated walls and floors, regardless of wall or floor thickness;

- One computer room cable tray penetration which exceeded the maximum size of any tested configuration.

This CDR was first reported to the NRC by the applicant's letter of December 7, 1990. The applicant submitted interim reports to the NRC on January 28, 1991, and March 29, 1991, and a final report on May 31, 1991. The applicant also issued SCAR WBN900534SCA which evaluated this item and initiated action to correct the discrepancy.

The NRC reviewed the status of the applicant's corrective action in late 1991, and the CDR was left open pending completion of the applicant's corrective action and subsequent NRC review. This status review was documented in NRC IR 50-390,391/91-31.

During this current inspection, the inspector reviewed the documentation and the corrective actions implemented to resolve this CDR. The actions initiated

to correct the seal qualification issue and to prevent recurrence were as follows:

- The applicant's contractor, ICMS, performed an evaluation of industry test reports for cable tray penetration seals which were similar to the penetration seals installed at WBN. The WBN Fire Protection Report states that electrical penetration seals are required to meet the IEEE 634 Standard. This standard requires a penetration seal to limit the transmission of heat through the seal during a standard 3-hour fire test to less than 700 degrees Fahrenheit and the fire side of the seal to pass a fire hose stream test upon removal of the tested assembly from the test furnace.

  ICMS developed report FTR-WBNP-3, Mechanical Sleeve and Seals for Category I Structures and Electrical Penetrations, which was reviewed and approved by the applicant's site engineering group for use in the design and construction of fire-rated penetration seals.

- Each fire barrier electrical cable tray penetration at WBN was evaluated by ICMS. The evaluation found that all of the cable tray penetration seals conformed to a tested configuration, except for 34 cable tray penetrations.

- Further evaluation by ICMS and the applicant concluded that, although 30 of the 34 cable tray penetrations did not conform to a tested configuration, these penetration seals had a fire resistant rating equivalent to the fire resistant ration of the wall or floor barrier in which they were installed. Therefore, these penetrations were considered acceptable by the applicant. Since test data representative of the remaining four penetrations was not available, the applicant contracted with an independent test laboratory, Omega Laboratories, to perform fire test 1C0109135 which tested these four penetrations. The test results were found acceptable by the applicant. The inspector reviewed the data from test report 1C0109135 for these four penetration, and verified that, except for the temperature recorded by one thermocouple, the test was satisfactory (i.e., test on cold side of penetration did not exceed 700 degrees Fahrenheit after three hours, and fire side of penetration passed the hose stream test). The temperature recorded by one thermocouple was 706 degrees Fahrenheit after 2 hours and 58 minutes. Since the penetration seal was in a 2-hour fire barrier and the fire rating of the seal exceeded two hours, the applicant determined that the installed penetration seal was satisfactory. The inspector concurred with the applicant's position.

- The evaluations by ICMS and the applicant identified additional concerns related to the overfill of electrical cable trays. These items were not addressed as part of the resolution of CDR 50-390,391/90-10 but were incorporated with CDR 50-390/86-25 and 50-391/86-21.

- As documented by NRC IR 50-390/95-40, several concerns were identified during an NRC review of the applicant and ICMS engineering data on the penetration seal program related to the qualification testing and

extrapolation of thermal performance data for cable slots, large cable tray blockouts and large diameter mechanical sleeves. To resolve these concerns, the applicant contracted with an independent laboratory to conduct an additional fire test on representative penetration seals at WBN. The tested configuration consisted of 14 penetration seals and included 12 cable tray penetrations and two spare penetrations. The cable trays had various quantities of cables fill, i.e., from 0 percent to 100 percent cable fill. The test demonstrated that following a standard 3-hour fire test, the maximum temperature on the cold side of the penetration seal did not exceed 601 degrees Fahrenheit (700 degrees Fahrenheit or below is acceptable), and the fire side of the seal successfully passed a fire hose stream test. The final report for this test was being prepared during this inspection; however, a letter to the applicant from the testing laboratory, Omega Point Laboratories, dated October 23, 1995, stated that the test met the acceptance criteria. A representative from the NRC witnessed the test and will document the test results in a supplement to the WBN SER.

- During the applicant's engineering assessment of the penetration seals, a number of cable tray penetrations were identified which did not fully meet a tested configuration. The applicant issued DCN W-38292-A to resolve this issue by providing for the installation of additional foam in a number of penetration seals. The inspector verified that the work required by this DCN had been completed.

- To prevent recurrence, the applicant revised the applicable engineering specification and design documents to include the requirements for adequate seal designs using available documentation, testing and supporting calculations. This data was included in Engineering Specification N3M-937, Installation, Modification, and Maintenance of Electrical and Mechanical Penetration Assemblies.

  The inspector reviewed Design Criteria WB-DC-40-62, Fire Protection, and noted that this document did not refer to Engineering Specification N3M-937 but referenced Design Criteria WB-DC-40-69, Design Criteria for Electrical and Mechanical Penetration Seal Assemblies for Category I Structures, which referenced Engineering Specification N3M-937. This appeared acceptable.

Based on the above, this CDR is closed.

10.11 (Closed) URI 50-390/90-22-01, Verification of Electrical Separation Audit Activities

This URI was previously updated in IRs 50-390,391/94-18 and 50-390,391/95-64 to reflect the results of NRC inspections of raceway physical separation. This URI also identified concerns in different areas of electrical separation requirements. Issues were identified as remaining to be reviewed by the NRC. Below is a status of the issues which required further NRC review as documented in IR 50-390,391/95-64.

- Adequacy of the criteria established for physical separation between redundant division Class 1E conduits and open Class 1E trays which may cross:

  The NRC review of this issue has been completed. This issue will remain open pending issuance of the SSER to document the NRC staff position on the resolution of the technical issue.

  The NRC issued SSER, Supplement 16, related to the operation of WBN on September 25, 1995. SSER Section 8.3.3.3, Physical Independence (Compliance with GDC 17) in paragraph (5), Separation Between Open Cable Trays and Conduits, presented the staff's position on technical issues. Based on the information therein, the staff found that the separation between open cable trays, including cables in free-air, and conduits as specified in Design Criteria WB-DC-30-4 was adequate. Therefore, this item is closed.

- Internal panel separation verification inspections:

  NRC inspection of this issue continues; previous inspections have been documented in IRs 50-390,391/94-82, paragraph 2.3, 50-390,391/95-38, paragraph 5.1, 50-390,391/94-53, paragraph 4.2.2, and 50-390,391/95-45, paragraph 2.4. This item will remain open pending additional NRC reviews.

  During this inspection period the applicant completed verification of corrective actions for SCAR WBSCA950004 which described numerous and repetitive occurrences of the required 6 inches of free air space train separation violations. The corrective actions consisted of training of personnel performing separation evaluations, identification of panels and cabinets which contain cables from more than one division, and re-inspection of previous work. Throughout the process, the applicant's verification activities conducted by QA for this open item, which consisted of document reviews and field inspections, were reviewed and considered adequate by the NRC inspector.

  The inspector reviewed the corrective actions identified above and concluded they were adequate. In addition, the inspector conducted independent inspections of multi-divisional panels outside of the control room. IR 50-390/95-45 and others discuss inspection of control room panels. The panels inspected were 0-PNL-276-L430-S, 1-PNL-31-L572 e,f and c,d, and 1-PNL-46-L326. No deficiencies were identified. This URI is closed.

10.12 (Closed) IFI 50-390/90-27-22, Loss of Control Power Annunciation

IR 50-327,328/86-27 documented URI U5.3-5, as the lack of provision to detect and annunciate the loss of control circuit power for a Class 1E feeder breaker. The applicant's management was requested to review this item of concern for it's applicability to Watts Bar. The applicant, in letters dated July 22, 1988, and October 22, 1990, provided responses concerning this issue.

The applicant stated that the installation of the BISI system and the ERFDS would ensure prevention of this design deficiency.

The NRC, in a letter dated March 28, 1991, provided a safety evaluation of the applicant's submittals concerning the above systems. The NRC stated that on the basis that the BISI system met all pertinent criteria and that it would be implemented before fuel load, the staff considered proposed license condition 10 fully resolved. NUREG-0847, Supplement 13, also documented the NRC's reviews of the applicant's removal of 60 components from the BISI monitoring device list. The staff concluded that the WBNP BISI system still met all pertinent criteria noted in SSER 7.

The inspector reviewed the following DCN's and verified that installation of the BISI portion of the ERFDS had been completed:

- DCN M-11410-A, Upgrade Technical Support Center Data System

- DCN W-25945-A, ERFDS/P2500 Parallel Inputs

- DCN W-37354-B, DPM50 Multiplexer Subsystem/Replace

The inspector also reviewed test reports of post-installation tests of the multiplexer installed per DCN W-37354. The test requirements specified in SPT-264-01, Emergency Response Facility Data System Analog and Digital Input Point Test, Revision 0, demonstrated operability of all monitored points in the ERFDS. Among the points tested were those from the BISI system. Additionally, the test results of SPT-264-03, ERFDS Software Functional Test, Revision 0, was reviewed and verified to specify requirements which demonstrated that the system software functioned as described in the specification documents.

The inspector reviewed Drawing Number 1-45W760-3-1, Wiring Diagrams, Main and Auxiliary Feedwater System Schematic Diagram, Revision 15, and verified that provision had been made for monitoring the auxiliary feedwater pump circuit breaker control power. Auxiliary relays A2-92 and B2-92 each provided a normally open contact input to the status monitoring multiplexer data base file.

Based on review of the above drawing, the inspector concluded that the NRC's specific concern had been fully resolved. The applicant's broader commitment for installing the BISI system was also determined to have been met based on the reviews of the DCNs and test summary reports. This item is now closed.

10.13 (Closed) URI 50-390/90-30-05, Adequacy of Junction Boxes and Wire Terminations.

Originally, 10 junction boxes were identified by NRC in which questionable conditions were present. The items were left unresolved pending the applicant's evaluation and corrective action. After further evaluation of the junction box deficiencies, the applicant determined that six of the 10 junction boxes had construction deficiencies that would require rework. These problems involved missing door gaskets, missing conduit seals (internally and

externally), terminations that were not properly coated with the Dow Corning 3140 RTV coating, and pull wires that were neither cutoff nor protected with tape or Raychem Materials. The applicant initiated PER WBPER910257 to investigate the cause, determine extent of condition, and guide the corrective actions for those deficiencies.

This inspection examined the adequacy of the applicant's closeout of this PER. Revision 1 of this report was reviewed during this inspection. The corrective actions specified in PER WBPER910257, Revision 1 were that Class 1E and 10 CFR 50.49 junction boxes would be inspected, as necessary, to ensure that terminations and junction boxes were installed in accordance with design. The applicant inspected a total of 548 junctions boxes to ensure that conduit seals, gasket covers, terminal coatings, and weep holes were installed as specified by design output documents. A list of the junction boxes inspected and the work implementing documents that performed the inspections was provided in PER WBPER910257, Revision 1 closeout documentation package. To verify the adequacy of the walkdown list the inspector provided the applicant with a list of seven Class 1E junction boxes that had been previously removed from the 10 CFR 50.49 Equipment list because they were located in a essentially mild environment. Since these boxes were identified as Class 1E, they were required to be considered for inspection as part of the corrective action for the PER WBPER910257, Revision 1. The inspector found that three of the junction boxes (i.e., 0-JB-292-1706-A which was subsequently deleted by DCN F-28344-A and replaced by 0-JB-292-6057-A, 0-JB-292-2034-A, and 1-JB-292-4275-A) were included on the list of junction boxes inspected by the PER. The other four junction boxes, 1-JB-1182-B, 2-JB-292-1183-B, 1-JB-292-2049-B, and 2-JB-292-2050-B, were not included on the list. The inspector then requested the applicant to provide appropriate design output documentation to support the basis why these junction boxes were not within the scope of the PER. The applicant provided the design drawings which supported the fact that there were no seal requirements for the junction boxes, and the boxes were not classified as 10 CFR 50.49. The inspector reviewed the drawings and agreed with the applicant's assessment that these boxes were not required to be inspected as part of the corrective action for the PER.

The inspector reviewed excerpts from completed work records which provided reasonable assurance that those deficiencies identified in IR 50-390/90-30 with junction boxes 1-JB-292-1565-B, 1-JB-292-1422-B, 1-JB-292-2208-B, 1-JB-292-2386-A, 1-JB-293-1750-A, and 1-JB-293-1748-B have been adequately dispositioned by the applicant. To verify the adequacy of the records, the inspector selected Junction Box 1-JB-292-1422-B to conduct a field inspection. A WO was approved by the applicant to open junction box 1422-B to perform a visual inspection of the box internals to verify that the previously identified deficiency in IR 50-390/90-30 involving pull wire not being cutoff or protected with tape or Raychem material had been corrected in accordance with Construction Specification G-38, Revision 14 and applicant modification procedures, i.e., Procedures MAI 3.2 and MAI 3.3. The inspector observed that the junction box was correctly labeled as 1-JB-292-1422-B; weep holes in the bottom of the junction box had been sealed with RTV 738 as required by DCN W-20217-A; the terminations were coated with RTV 3140; conduits were sealed both internally and externally; spare conductors were capped with Raychem; and

no exposed pull wires were found. A review of the design drawing series 47E235 indicated that the maximum postulated MELB flood level in the room where this junction box is located is 60 inches. The conduit and grounding drawing 45N824-17, Revision 23, indicated the junction box was located 4-feet 6-inches above the floor which is below the MELB flood level of 60 inches. Field measurements confirmed that the bottom of the box was approximately 47 inches from the floor. The box was required by design drawings, i.e., 45N824-17, Revision 23; 45W1768-5, Revision 8; DCAs-20217-02, -30, -31, -42, and -43, to be gasketed and sealed with RTV 738, the terminals were required to be coated with Dow Corning RTV 3140, and spare conductors and pull wires were required to be protected. Based on the above observations, the inspector concluded that the junction box configuration was in accordance with design and was consistent with completed work records. The junction box was later resealed by WO 95-24318-00 on October 26, 1995. The inspector reviewed this WO package to verify that it included appropriate reseal requirements as specified by DCN W-20217-A which indicated that all conduits/fittings/boxes that had been sealed for MELB and later breached by maintenance activities shall be resealed. The inspector found the WO to be acceptable.

The applicant's NA verification activities associated with this unresolved item included a review of the documentation that dispositioned those previous deficiencies that were identified in IR 50-390/90-30 with the 10 junction boxes. The results of this review were summarized in the NA verification report, dated August 15, 1995. In a verification report dated October 12, 1995, for PER WBPER910257, Revision 1 Closure Package, NA concluded that closure of the PER was acceptable. NA verified that WIDs implemented for the inspection or rework of the junction boxes had been closed. NA did not perform field inspections due to a lack of accessibility and the fact that additional work documents would be required. Based on the results of this inspection, the inspector concluded that the verifications performed by NA were reasonable and appropriate to verify resolution of this item. This URI is now considered closed.

10.14 (Closed) IFI 50-390/92-09-02, Effects of Debris in Conduit on Cable Pulling.

This IFI involved an NRC concern that the applicant had not addressed employee concerns of debris in conduits as a potential contributing cause of cable pulling difficulties experienced at Watts Bar. A total of 15 separate conduits had been identified from employee concerns which had some reference to debris. This issue was previously reviewed in IR 50-390/94-61. During that review, an inspector had witnessed boroscope examination of one section of conduit. No debris or cable damage was observed during that examination. The IFI was left open pending completion of the 14 remaining field inspections and disposition of the issue.

During this inspection period the inspector observed the successful boroscope examinations of two additional sections of conduits. This review is documented in paragraph 2.1 of this report. For those portions of conduit examined, the internal surfaces were free of debris and no cable damage was observed. Additionally, paragraph 2.1 of this report describes an unsuccessful attempt to perform a boroscope examination of a section of

conduit cable tray jumper from Cable Tray Nodes 3N2155 and 3N2896. The applicant personnel were unable to complete this evolution due to the large number of cables present in the tray jumper. The inspector determined that this section of conduit cable tray jumper, along with the cables contained in the conduit, were classified as non-Class 1E. Additionally, the inspector confirmed that the conduit cable tray jumper was listed in CCRS as having a known high rate of cable fill and that the high fill condition had been properly evaluated by the applicant's engineering organization.

The inspector was subsequently informed that the applicant had decided not to perform the boroscope examinations of the remaining 11 conduits. The inspector held discussions with members of the applicant's engineering organization. The inspector determined that the remaining 11 conduits contained only Unit 2 cables which were not required for Unit 1 operation. The inspector verified this information by review of the CCRS and other documentation provided by the applicant. Based on the above reviews, the inspector determined that the applicant had adequately addressed the concern with regard to debris in conduit. This item is closed.

10.15 (Closed) IFI 50-390,391/93-58-04, Follow-up Items from VSR Inspection

NRC conducted inspections which were documented in IRs 50-390,391/93-51 and 50-390,391/93-58 of the two VSRs conducted by contractors at WBN. The first VSR was conducted by Black and Veatch in 1983 and the second VSR was conducted by Sargent and Lundy in 1988. The NRC review, documented in IR 50-390,391/93-58, resulted in one NRC violation and a five-part IFI. VIO 50-390/93-58-03 was evaluated and closed by the NRC in IR 50-390,391/94-61. The five-part IFI, resulting from the two VSR reviews, were identified as IFI 50-390,391/93-58-04. A description of the IFI, resolution by the applicant of the IFI, and NRC inspection follows:

Item 1:

An issue was identified during NRC inspection related to deficiencies in high pressure/low pressure interfaces of system piping. Black and Veatch Item 300 stated that check valves provided inadequate isolation between high pressure feedwater piping and low pressure chemical feed piping.

In response to these findings, the applicant stated that as a part of the WBN calculation upgrade program, all of the operational mode calculations for safety-related systems and some nonsafety-related systems were performed or re-performed. The calculations were all performed in accordance with mechanical Design Standard DS-M5.1.1, Operational Modes Analysis for Piping Systems. Section 3.7 of this document contains the following statement:

> In situations other than normal plant conditions where a high-pressure section of piping is separated from a low-pressure section of the same line by a single closed valve or single seated check valve, the valve is assumed to leak causing pressure to equalize across the valve.

The applicant maintains that this assured that the relief protection concern was addressed in the subsequent design temperature/pressure calculations.

The inspector was concerned that the design standard only addressed "situations other than normal plant conditions." Relief protection was not provided for normal plant conditions. Additionally, the standard only addressed single isolation valves and check valves. Double check valves when used as isolation valves were not addressed. This issue is the first example of IFI 50-390,391/93-58-04, Follow-up Items from the VSR Inspection.

To resolve the IFI, the applicant revised Design Standard DS-M5.1.1 to drop the words "situations other than normal plant conditions" from Section 3.7.f. Additionally, for extent of condition, the applicant reviewed 30 ASME Section III piping systems and determined that there were no other examples of piping with the high pressure piping downstream of the double check valves. This condition was corrected by providing overpressure protection (e.g., a relief valve was added) in the lower pressure piping. The inspector reviewed the documentation on this issue, including DS-M5.1.1, Revision 4, Operational Modes Analysis For Piping Systems; this IFI example is closed based on the applicant's actions taken.

Item 2:

The next issue involved VSR DR 16 which had identified that the design criteria of WB-DC-40-36.1, Classification of HVAC Systems, Revision 2, required that grilles and balancing dampers serving safety-related systems must remain functional after a DBE. It also states the balancing dampers and adjustable louvers must be able to be secured in the applicable position after balancing, and it required that appropriate instructions and detailed drawings be issued describing this task.

The applicant developed Calculation EPM-FM-032889 to show that the subject grilles would not close after a seismic event. The inspector reviewed this calculation and identified several deficiencies in the document. The applicant investigated the inspector's concerns and concurred that the calculation was inadequate and initiated corrective action document PER WBPER930191 on July 13, 1993.

The inspector identified that the assumptions used in the calculation were nonconservative, in that, aerodynamic forces acting to close the diffuser vanes were not properly considered. In addition, the EOC for dampers or louvers being loose or partially closed was not adequately evaluated because additional walkdowns, performed as part of the applicant follow-up, identified other examples of vane deficiencies.

Based on the NRC concerns discussed above, the applicant initiated DCN 25836-A. The objective of this DCN was to secure the blades of all of the identified dampers, grilles and adjustable louvers in their balanced positions. Complete scoping by the applicant of affected components will be established after the completion of PER WBPER930191. The results from DCN implementation will be reviewed in a subsequent inspection. This item was

identified as the second example of IFI 50-390,391/93-58-04, Follow-up Items from the VSR Inspection.

The inspector performed a follow-up review to assure PER WBPER930191 was adequately implemented and closed. The inspector verified that Revision 4 of the PER was closed on August 15, 1995. DCN 25836-A, closed November 11, 1994, was reviewed by the inspector to assure that:

> The adjustable blades of grilles in all safety-related HVAC systems will be fixed in the wide-open position using the procedure described on Detail Drawing 47A900-197. This will satisfy the WB-DC-40-36.1 Attachment 1 requirement to secure the adjustable louvers in place after balancing. Calculation EPM-FM-032889, Revision 1, confirms that this method will assure that the blades remain open after a seismic event.

The inspector found 18 WOs had implemented the subject DCN. QA verification included confirmation that all safety-related grilles required for Unit 1 operation which have adjustable blades were modified and secured in the wide-open position to minimize the airflow effect on the blades. The QA verification was completed on August 15, 1995. Additionally, the inspectors reviewed the QA verification of DCN S-27124-A that confirmed that balancing dampers and adjustable louvers in safety-related HVAC systems were secured in place after balancing and included the blades on duct diffuser outlets and air cooling and ventilation equipment. The inspector's review of the above activity associated with securing diffusers and adjustable blades after flow balancing was complete was found acceptable. The second example of this IFI is closed.

Item 3:

The issue addressed in this unresolved item involved configuration control of design documents. The inspector found that the MVSR system flow diagrams and the system description were not always in agreement in specification of the valve's design conditions. The concern was that inconsistencies in plant documents may lead to ineffective criteria in procurement procedures for replacement components. This issue, Impact of Inconsistent Plant Documents on Procurement Procedures, is considered as Example 3 of IFI 50-390,391/93-58-04, Follow-up Items from the VSR Inspection.

The inspectors review of this IFI found the applicant has resolved the concern in the following manner.

The MVSR information has been replaced by the EMS database. The information is now part of the QA portion of EMS. Additionally, the applicant has modified Procedures SSP-10.01, Procurement of Materials and Services, Revision 10, and SSP-10.05, Technical Evaluation For Procurement of Materials and Services, Revision 13. The inspectors reviewed both procedures and found the applicant has provided ample instructions in the procedures for purchasing materials. The inspector's review of the applicant's actions to resolve this concern was found acceptable, and Example 3 of the IFI is closed.

Item 4:

FSAR Section 9.2.2.2 specified that the design temperature for CCS containment isolation valve bypass check valve 1-CKV-70-87-B was 650 degrees Fahrenheit. The VSR found that the vendor drawing for the valve indicated that its design temperature was only 300 degrees Fahrenheit due to a soft-seat material in the valve. The VSR resolution noted that the containment peak temperature was 327 degrees Fahrenheit, and the potential temperature for the RCP thermal barrier heat exchangers during a tube failure was 650 degrees Fahrenheit. Additional review by the applicant revealed 23 additional containment isolation valves with similar soft seats. To address exceeding the design temperature of the valve seat for the RCP thermal barrier tube failure event, the applicant revised the flow diagram and the vendor drawing for the valve by adding a note requiring valve soft-seat maintenance after a thermal barrier tube failure.

The inspector had a concern that specific maintenance or acceptance criterion was not described in a procedure. The inspector reviewed Procedure MI-68.6, Removal, Inspection, and Maintenance of Reactor Coolant Pump Rotating Element, Revision 8, which contains the following note in Section 6.17, "When this instruction is being used to remove the RCP thermal barrier for repair or replacement due to a tube leak, then check valve 1-CKV-70-687 shall be inspected and repaired in accordance with Procedure MI-0.17." Procedure MI-0.17, Kerotest Valve Maintenance, Revision 12, was also reviewed by the inspector. The procedures did not indicate what type damage would be expected and could be detected visually on the valve seat material following temperature exposure at temperatures greater than the qualified temperature.

In addition, the procedure did not address latent temperature effects on soft-seat materials which may not be evident immediately following exposure of the seat material to the higher temperatures. The procedure appeared to rely on skill-of-the-craft to determine the extent of damage which may have occurred to the seats. The procedure also failed to either define acceptance criteria for the seat material or require replacement of the seat material. The extent to which vendor information was used was not available during the inspection.

The applicant has revised Procedure MI-0.017, Kerotest Valve Maintenance, to require valve seat replacement in the event of tube failure of the RCP thermal barrier. The inspectors reviewed Procedure MI-0.017, Revision 14, and verified that the soft-seat material replacement requirements were included in the procedure. Example 4 of this IFI is closed.

Item 5:

DR 212 stated, "Reference drawings indicate that when the normal or alternate source breaker control is transferred to its auxiliary control power source, the breaker can be manually closed in parallel with the standby source." The significance of this condition is that the electric power sources could be paralleled out of synchronization and, therefore, cause damage to either or both sources. The inspector had reviewed system drawings and procedures and determined that if a loss of offsite power occurred while in operation from the auxiliary control room, the DGs would start but would not load onto the

shutdown boards because the auto closing logic was bypassed. To re-energize the shutdown boards from the auxiliary control room requires direct operator action. Special precautions may be necessary for operation of equipment when normal control logic and interlocks are not operable. The inspector had reviewed Procedure AOI-27, Main Control Room Inaccessibility, Revision 11, and found that there were no instructions describing operation of the DGs from the auxiliary control room. The applicant confirmed that the procedure was incomplete.

To resolve this concern, the applicant has included a step in Procedure AOI-30.2, Fire Safe Shutdown, Revision 0, that requires the ASOS, in the event that offsite power is lost, to ensure the DGs are running and connected to the 6.9 kV shutdown boards. The inspectors reviewed this procedure and found it adequately resolved the concern. Example 5 of this IFI is closed.

IFI 50-390,391/93-58-04, Follow-up on VSR Items is closed.

10.16 (Closed) VIO 50-390/94-18-03, Failure to Implement Raceway Separation Requirements

(Closed) VIO 50-390/95-64-01, Deficiencies Involving Cables, Conduits, and Cable Trays

These violations pertained to inadequate implementation of the applicant's cable separation criteria. The deficiencies identified pertained to inadequate separation involving Class 1E conduits, cable trays, and free-air cables. During this inspection period, the NRC performed inspections of the applicant's corrective actions for both violations.

VIO 50-390/94-18-03

This violation documented numerous examples of inadequate implementation of cable and raceway physical separation requirements. The deficiencies identified included the following:

- Seven conduit Marinite barrier installations were not installed in accordance with installation requirements.

- Two divisional conduits were not appropriately marked in that a divisional conduit was marked with white tape signifying a non-divisional conduit, and a divisional conduit was not identified for a distance of about 25 feet.

- Non-divisional conduit 1PLC1037 was inappropriately marked with a red tape indicating a divisional conduit.

- Eighteen conduit and cable installations were not in accordance with physical separation requirements for divisional conduits. Examples of inadequate separation include less than 1-inch separation between divisional conduit-to-conduit interactions, less than 1-inch separation between divisional conduit-to-flexible conduit interactions, and contact between a divisional conduit and a redundant division free-air cable.

The above deficiencies were determined to be significant and were documented in SCAR WBSCA940019. The applicant provided a response to the violation in a letter dated May 18, 1994. Corrective actions included the following:

- Re-inspection of the approximately 900 Class 1E conduits within the Unit 1 containment.

- The results of the re-inspection identified additional examples of the violation examples. Engineering evaluation of the identified conditions was performed. Those conditions not accepted through the engineering evaluation will be reworked.

- Re-inspection of the areas outside the Unit 1 containment will be performed to verify separation requirements in conjunction with marinite board and conduit marking re-inspections.

- One-inch templates were developed to provide consistent measuring techniques.

- DCN F-29368-A was issued to provide a design for a mechanical separator to address separation violations due to flexible conduit migration

- Training was provided for craft, field engineers, and QC inspectors in the requirements of conduit separation and marinite board installations

The applicant's walkdown efforts to inspect Class 1E raceways was performed through the implementation of Walkdown Procedure WD-039, Electrical Conduit and Conduit Support Walkdown. The walkdown inspected for various conduit attributes including conduit support and electrical attributes. Electrical attributes included the following:

- Electrical separation (rigid, flex, and free-air);
- Train marking;
- Conduit identification;
- Hot pipe separation to flex;
- Marinite board;
- Flex conduit length;
- Flex conduit bend radius;
- Flex conduit damage.

The NA closure verifications to support the closure of SCAR WBSCA940019 included field verifications of approximately 120 conduits for various conduit installation attributes. Additionally, NA performed other field assessments of the WD-039 walkdown program. These assessments included NA-WB-95-0066, NA-WB-95-0077, and NA-WB-95-0094. The overall conclusions were that the implementation of the WD-039 walkdown was acceptable.

The NRC has performed followup inspections of raceway separation as documented in IR 50-390/94-55, paragraphs 2.1 and 8.19. The report documented that numerous conduits observed where the applicant had appropriately installed marinite boards or mechanical separators to provide the required physical separation between conduits. Approximately 75 conduit installations were

inspected in two containment building fan rooms at the upper ceiling elevations. However, one example of inadequate separation was identified during the inspection which was performed following the applicant's re-inspection of the conduits in the Unit 1 containment. The applicant documented this deficiency in PER WBPER940419. The corrective actions for this PER included the performance of an informal sample walkdown of three Class 1E conduits in 16 rooms in the Unit 1 containment. The informal sample was used instead of a formal sample due to the fact that QC had already completed a larger sample consisting of 25 percent of each field engineers' work. This QC overview was performed following the above discussed re-inspection efforts. The results of the QC overviews and acceptable results from the 18 conduits inspection provided the applicant's justification that the identified PER deficiency was caused by poor work practices on the part of the individual involved. The deficient condition identified by the NRC was corrected by the installation of a marinite board barrier between the conduits. Deficiencies were not identified during the inspector's review of closed PER WBPER940419.

Additional NRC reviews of the applicant's physical separation criteria were documented in the following reports:

- 50-390/93-74, paragraph 10.e;

- 50-390/94-53, paragraph 4.2, Physical Cable Separation and Electrical Isolation;

- 50-390/94-55, paragraph 2.1, Field Inspections of Conduit Installations;

- 50-390/95-57, paragraph 3.0, Physical Separation of Electrical Raceways.

During this inspection period, the NRC performed conduit and free air cable separation inspections in the following plant areas:

- 480V Board Rooms 1A (A851) and 2A (A866);
- 480V Board Rooms 1B (A852) and 2B (A865);
- Cable Spreading Room (C301);
- Miscellaneous Equipment Room (A810);
- Auxiliary building elevations 692, 713, and 737.

Inspection in the above plant areas included a sample inspection to verify that the violation example deficiencies were corrected. During the above reviews, the inspector verified that the installed configurations met the separation criteria specified in drawings 45W3000-1 and 45W3000-2. Inspection attributes included adequate separation involving the following types of interactions between redundant division raceways and cables:

- Conduit to conduit;
- Conduit to free air-cables;
- Conduit to cable tray;
- Free-air cables to free-air cables;
- Free-air cable to cable tray;
- Cable tray to cable tray;

- Installation of marinite board barriers.

During the NRC inspections, examples of inadequate physical separation were identified. However, the inspector verified that these conditions had been previously identified by the applicant during dedicated conduit and cable tray walkdowns. These configurations were evaluated by engineering for acceptability and the engineering conclusion was that the configurations were acceptable as-is. The applicant's design criteria WB-DC-30-4, Separation/Isolation, was revised to include documented engineering exceptions to the design criteria to justify the field conditions. The NRC has previously reviewed the applicant's methodology and criteria for case-by-case exceptions for the separation criteria. The applicant's process was determined acceptable as documented in Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 16, Section 8.3.3.3(5), September 1995.

Additional NA assessments were performed to evaluate the adequacy of the applicant's cable separation walkdown inspections. These assessments were documented in reports NA-WB-95-0096, NA-WB-94-0071, NA-WB-94-0101, NA-WB-94-0115, NA-WB-94-0140, NA-WB-94-0153, NA-WB-95-0066, NA-WB-95-0077, and NA-WB-95-0153.

Based on the results of the NRC inspection of the applicant's implemented corrective actions, results of QA field verifications of conduit installations, and corrective actions implemented through SCAR WBSCA940019, the inspector concluded that the applicant had implemented the raceway separation criteria described in the FSAR. Raceway separation configurations where inadequate separation existed were documented and evaluated by NE for acceptability. The technical justifications for the acceptability were documented in exceptions to the existing design criteria documents.

No deficiencies were identified during the inspector's review of the applicant's corrective actions for this violation. Therefore, VIO 50-390/94-18-03 is closed.

VIO 50-390/95-64-01

This violation documented numerous examples of inadequate implementation of raceway physical separation requirements. The applicant provided a response to the violation in a letter dated October 30, 1995. The deficiencies identified included the following:

- A division B flexible conduit was identified as being separated less than one-inch distance from division A open cable tray. This deficiency was documented in PER WBPER950435.

- Division A free-air cables were separated less than one-inch distance from a division B conduit. This deficiency was documented in PER WBPER950435.

- A division A cable tray contained cables which extended above the height of the tray side rails and the vertical distance between those cables

and the bottom of a division A tray was less than 12 inches. This deficiency was documented in PER WBPER950432.

- A division B cable tray required the installation of a cover extending three feet past interaction point with division A cable tray. However, on one side of the tray crossing the installed tray cover length only extended 18 inches. This deficiency was documented in PER WBPER950433.

- A cable tray was removed and not re-installed following the completion of work activities associated with the cable in the tray. This deficiency was documented in PER WBPER950434.

As discussed in paragraph 4.1 of this report, the applicant's Electrical Issues CAP describes the corrective actions being implemented to resolve deficiencies pertaining to inadequate cable separation. The above deficiencies were identified by the NRC during inspections to assess the adequacy of the corrective action implementation.

During this inspection period, the inspector performed additional field inspections of the implemented corrective actions for the above identified violations. These inspections were performed following the completion of the applicant's inspection of free-air cables, conduits and cable trays for adequacy of physical separation. Additional inspection attributes included cable repairs or splices installed in trays, protection of cables, installation of tray covers where marked, cable tray voltage level and node identification, and spared and abandoned cables. The inspector reviewed the applicant's corrective actions for the above PERs and determined that they were acceptable. Corrective actions included re-inspection of the plant areas where the cable tray and free-air cable separation inspections had been previously completed.

NRC inspections were performed in the following rooms:

- 480V Board Rooms 1A (A851) and 2A (A866);
- 480V Board Rooms 1B (A852) and 2B (A865);
- Cable Spreading Room (C301);
- Miscellaneous Equipment Room (A810);
- Auxiliary Building elevations 692, 713, and 737.

Inspection of the above areas indicated that the applicant had adequately implemented the corrective actions to address the deficiencies identified by the NRC. The inspector verified that acceptable physical separation existed between redundant division raceways and cables routed in free-air. Marinite barriers installed were verified to be properly installed and supported, cable tray covers were installed where appropriate to meet separation requirements, and their location was properly marked on the tray side rails. Cable trays and conduits were verified to be properly marked and identified corresponding to their voltage level (trays) and division. The inspector did identify installed raceway configurations which did not meet the physical separation criteria during the above inspections. These were presented to the applicant for review. Subsequent discussions indicated that the applicant had previously identified the separation deficiency and had documented engineering

exceptions to the existing design criteria. The technical justifications concluded that the as-installed conditions were acceptable. The applicant's methodology for evaluating and documenting exceptions to the existing design criteria was previously reviewed by the NRC as documented in Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2, NUREG-0847, Supplement 16, Section 8.3.3.3(5), September 1995. The applicant's approach was determined to be acceptable.

The applicant documented the location of the cable tray cover installations to provide the information to NE for further evaluation. Workplan data sheets were used to transmit this data and it documented the location of the cable tray cover, with respect to tray node, as well as tray length. As documented in paragraph 3.2 of this report, the NRC performed additional review of the cable tray cover impact on cable ampacity calculations.

NRC cable tray inspection attributes such as cable repairs or splices installed in trays, protection of cables, installation of tray covers where marked, cable tray voltage level and node identification, and spared and abandoned cables were determined to be acceptable.

NA assessments were performed to evaluate the adequacy of the applicant's cable separation walkdown inspections. These assessments were documented in reports NA-WB-95-0096, NA-WB-94-0071, NA-WB-94-0101, NA-WB-94-0115, NA-WB-94-0140, NA-WB-94-0153, NA-WB-95-0066, NA-WB-95-0077, and NA-WB-95-0153.

No deficiencies were identified during the inspector's review of the applicant's corrective actions for this violation. Therefore, VIO 50-390/95-64-01 is closed.

10.17 (Closed) VIO 50-390,391/94-35-01, Failure to Follow Site Procedures for Cable Installation and Termination

This violation was identified by the NRC after visual inspection of the safety-related instrumentation cabinets located in the auxiliary building. Four examples of failure to fully implement established procedure requirements for the termination and installation of cables were the basis for the violation.

The applicant responded to the violation in a letter to the NRC, dated July 20, 1994, in which the applicant acknowledged the violations and specified corrective actions and action to prevent recurrence for each example.

The violation response letter and the implementation of specified corrective actions for each of the four examples were reviewed and documented by the inspector in IR 50-390,391/95-24. Not all of the corrective actions were complete at the time of the inspection. The inspector reviewed progress to date to ensure adequacy and effectiveness of the proposed corrective actions and determined Examples 3 and 4 of VIO 50-390,391/94-35-01 were closed in IR 95-24.

The violation had been evaluated and was considered a high concern issue under the NRC program for open item review. Example 1 of this issue is a known

problem area and, depending on the results of the applicant's sampling of the extent of condition, has the potential to require significant resources and time to resolve.

The applicant notified the NRC that corrective actions for the remaining examples of the violation were complete and ready for NRC review.

The status of violation Examples 1 and 2 as documented in IR 50-390,391/95-24 and the applicants subsequent corrective actions are as follows:

Example 1 corrective actions were not complete. The review of the results of a sampling program of RWLs to access the extent to which other identified work was overlooked has not been completed. An RWL is a "remaining work list" and was part of the Safety Net Review Process, a comprehensive applicant review of "old program" work packages (prior to the stop work initiated in 1990). The review was performed to document outstanding work so that the "old" identified work could be completed using "new program" controls.

Example 1 documented that Cable 1-2PM-65-3765-B in Panel 1-R-131 had not been terminated. The cable was not identified in any "new program" WP to be terminated even though it was documented in the remaining work for WP K-P07265A-1. A new request, C258728, was initiated to properly terminate the cable. The applicant had sampled other closed RWLs and committed to take appropriate corrective actions based on sample results. This issue and others were addressed in SCAR WBSCA940043.

The inspector identified no deficiencies in the work order or field observations.

The inspector found that the applicant was conducting its sampling process using Procedure QAI-17.02, Additional Systematic Record Review Trending and Disposition, Revision 1. Procedure QAI-17.02 did not appear to provide the same level of rigor or analysis as Procedure EAI-8.04. The adequacy of the sampling techniques will be reviewed as part of the closure of this issue in future inspection to ensure appropriate techniques are used.

During this inspection period, the inspector evaluated the results of the sample conducted of the RWLs. The sample plan, results, and corrective actions were documented in SCAR WBSCA940043. The sample consisted of a review of 72 RWLs. Acceptance criteria as stated in the SCAR was, "An RWL is acceptable if each individual line item on the RWL is closed in accordance with the requirements of SSP-7.B, Appendix J." Furthermore, "An RWL is rejectable if a line item has not been: completed or captured for future completion by a WID or DCN or invalidated."

The results of the sample indicated 19 RWLs met the acceptance criteria, 54 RWLs were rejectable. The applicant performed a rigorous analysis of the discrepancies which caused the sampled RWLs to fail to meet the acceptance criteria an concluded the sample indicated that no further review of RWLs was necessary.

The inspector disagreed with the conclusion. Procedure QAI-17.02 does not allow evaluation and acceptance of deficiencies. The procedure describes methods to enter findings onto a computer program that provides a sample analysis. The inspector could find no evidence that Procedure QAI-17.02 was utilized for anything more than establishing the sample size. The inspector concluded the applicant had apparently utilized portions of both Procedures QAI-17.02 and EAI-8.04 because Procedure EAI-8.04 permits engineering evaluation of discrepant condition to determine significance and if the discrepancy is a defect.

The inspector reviewed the discrepancies and the basis for accepting the conditions and disagreed with many of the conclusions that were used as a basis for acceptance. For example, the SCAR noted four instances (sample items 11, 15, 65, and 74) where the RWL listed unsatisfactory QCIRs that were not satisfied by work documents listed as required by Procedure SSP-7.B. The justification provided was, "This condition is a violation of the requirements of Procedure SSP-7.B, but this problem does not, in and of itself, indicate that a hardware problem exists. In each violation of this requirement, the RWL reviewer looked for defective hardware and found no problems which were engineering significant. Therefore, no additional actions are required."

In a second example, the RWL listed a safety-related cable which required megger testing. No documentation could be identified that showed megger testing had been performed. The applicant concluded that since the cable was functionally tested, the omitted megger test was inconsequential. However, the applicant did perform a successful megger test of the cable on WO 95-08989-00.

In both of the examples the applicant had specific commitments to the NRC to perform the required inspections and tests.

The NRC concerns with the adequacy of both the sampling process and the analysis of the sample identified discrepancies were communicated to the applicant in a meeting with representatives of QC on October 24, 1995.

To resolve the inspectors concerns, the applicant performed additional reviews of WBSCA940043 and determined the following:

- During the implementation of the sampling plan a decision was made to modify the acceptance criteria. This change was not properly addressed in the SCAR. The approved sampling plan should have been revised and appropriate approval obtained. A record supplement has been processed to document the changes and appropriate approvals.

- Additional data was located on some of the RWL items discussed in the sampling results. A record supplement has been processed to add this information to the SCAR and reflect the applicable changes in conclusions reached by the sample evaluation results.

- The sampling procedure specified by WBSCA940043 is Procedure QAI-17.02 which was intended for use on sampling records. The methods specified by Procedure QAI-17.02 were compared to Procedure EAI-8.04 and

determined to be comparable for establishing an adequate confidence level for acceptance of the reviewed population. In order to validate this position, the revised sample plan was compared to Procedure EAI-8.04 and reviewed by engineering. The original sample data was then evaluated against the revised sample plan. The results of this evaluation confirmed that the original sampling results reached a proper conclusion.

- Nuclear Assurance evaluated the need of Procedure QAI-17.02 and has elected to cancel this procedure. A procedure cancellation form was initiated.

As discussed above, the inspector also questioned sample items 11, 15, 65, and 74 where the RWL listed unsatisfactorily QCIRs that were not satisfied by work documents listed as required by Procedure SSP-7.B. To resolve this concern, QC performed an accountability review of IRs open at restart of construction following SWO 90-01. This accountability review identified a total of 388 IRs closed on the basis of inclusion in RWLs. The applicant performed a detailed review of the 388 items with the following results:

Qty	Results	Action Taken
209	QC Inspector performed, RWL closed per requirement	No action required
29	RWL closed with NE technical justification and no QC concurrence obtained.	Obtained QC concurrence
67	IRs originally closed in WID	No action required
22	RWL closed to New Program	No action required
5	Unit 2 only	Obtained QC concurrence
5	IR invalid	Obtained QC concurrence
10	No QC re-inspection	QC reinspected/no rework required
1	No QC re-inspection	QC reinspected and rework required
40	No QC re-inspection	Non-1E NE/EQE approved
388	Total	

The inspector reviewed the applicant's actions relative to assuring the sample met the requirements of Procedure EAI-8.04. Additionally, the inspector

verified the applicant had cancelled Procedure QAI-17.02. The inspector also reviewed the disposition of the IR that had failed to receive an inspection through the RWL process and verified the re-inspections were completed. The inspector also verified the item that was re-inspected and found unacceptable was reworked and re-inspected by QC after the rework was completed. This example was found acceptable after the applicant had completed the re-evaluation efforts and re-inspections as discussed above. This example is closed.

Example 2 corrective actions were completed and consisted of the proper termination of cable 1-3PL-31-3606-A at TB438 by WR C251735. The cable had been found improperly taped and leads lifted without traceability to a work document that caused the cable leads to be lifted.

In IR 50-390,391/95-24, the inspector's review of the applicant's actions for Example 2 consisted of reviewing completed WO 94-18623-00 and inspecting completed work in panel 1-PNL-275-R74A. The field inspection was satisfactory. The review of the WO indicated an additional example of the problem defined by the violation. WO 94-18623-00 documented that, when the craft opened the panel to terminate cable 1-PL-31-3606-A, it had already been re-terminated. The termination was verified correct and the panel closed. No explanation was given for the condition. The inspector considered an additional investigation was necessary to determine why safety-related leads are lifted and re-landed without proper authorization.

The applicant responded to the inspector's concerns and conducted further reviews of WOs and determined that plant startup group had initiated and completed WO 94-18121-00 during the time between when the NRC identified the problem cable and before WO 94-18623-00 was initiated. The startup group had identified the problem during component testing. The lifted lead prevented the automatic starting of the shutdown board room pressurizing fan A-A motor.

During this inspection period the inspector reviewed WO 94-18121-00 and verified proper documentation of the lifted lead. The inspector concluded that the wire had been properly terminated using an approved plant program. This violation is closed.

10.18 (Closed) VIO 50-390/94-53-01, Failure To Implement DCN and WP Requirements for Electrical Modifications

VIO 50-390/94-53-01 identified seven examples of failure to implement DCN and WP requirements and deficiencies regarding work control and spared/abandoned cables. The applicant responded to the violation in a letter dated October 21, 1994. The response provided recurrence controls, corrective actions, and commitments to perform future corrective actions for each of the cited examples of the failure to implement procedures. Provided below is a summary of the actions detailed in the applicant's response accompanied with the inspector's evaluation of the proposed corrective actions for each example.

Nuclear Quality Assurance Plan TVA-NQA-PLN89-A, Site Standard Practice SSP-7.53, Modification and Addition Instructions MAI-3.2, and MAI-3.3, WP D-11422-06 were not complied with in the following cases:

- WP D-11131-01 did not contain the construction requirements provided in DCN M-11131-A (Example 1). The design change notice requirements were to lift the subject cables from support points prior to installing cable supports to ensure cables were not damaged from excessive sidewall bearing pressure due to the hanging weight of improperly supported cables. If cables could not be lifted from the support point, the cables were to be replaced. As a result of the omission of the requirement from the DCN, cable supports were added for cables in conduits 1VC4403B, 1PLC1072A, 1PLC1078A, 1PLC1082A, and 1PLC1087B without verifying that the cables could be lifted from the support point.

  The applicant determined other examples of the failure to implement construction notes specified in design output documents had not been incorporated into work documents as evidenced by the fact that three corrective action documents addressed the same issue. The applicant escalated the issue to a higher level and initiated a SCAR because a negative trend had been identified. SCAR WBSCA940039 provided specific corrective actions and actions to prevent the recurrence of the failure to implement construction notes specified in design documents into the craft work documents. The applicant had taken steps to improve the design process procedure and determined that the DCN discussed in Example 1 was developed before the process improvements had been implemented. The inspector reviewed SCAR WBSCA940039 and concluded the corrective actions were appropriate. In addition, the applicant reviewed the DCN M-11131-A and reinspected affected cables. Inspectors witnessed the re-inspections. No additional deficiencies were identified. This example is closed.

- The cables installed in conduits MC906B and 1NM3256F did not have cable supports provided and the installed unsupported cable lengths exceed the limits of Procedure MAI-3.2, Appendix B, Table B-1 (Example 2).

  The applicant documented the deficient conditions in SCAR WBSCA940051. Corrective actions for the violation included a review of calculation WBPEVAR9007011 to determine which conduits had specific DCNs issued for cable supports and which conduits were passed-off to other cable work. For those which had specific DCNs issued, the applicant inspected 25 percent of those conduits with a portion from each of the DCNs to determine if support requirements were met. For those conduits which were passed-off, the applicant performed a 100 percent inspection to determine if the support requirements were met. To address the extent of condition where a cable support requirement was deleted by an F-DCN, the applicant performed a review of 100 percent of F-DCNs associated with the cable support DCNs to determine if other cable supports were deleted inappropriately.

  In the case of cable in conduit MC906B, the procedure required the installation of supports and the supports were not installed. In the case of cable in conduit 1NM3256F the requirement was in the base DCN, however, a change to the DCN removed the requirement. The reason was personnel error. The applicant issued WOs 94-17723-00 and 94-17781-00 to

install the vertical supports. In addition, the applicant evaluated all changes to DCNs related to the vertical conduit issue to ensure no other support requirements were removed. No other examples were found.

The applicant also reviewed other work implementing documents to ensure proper implementation of support requirements. Several deficiencies were identified and corrected. The inspector reviewed the results of the applicant's evaluation of the cable support calculation, re-inspection efforts, and F-DCN reviews. The results of these reviews were documented in SCAR WBSCA940051. The inspector reviewed the above documents and concluded the applicant took appropriate actions to ensure proper installation of vertical supports in conduits. This example is closed.

- The WP instructions for the installations of cable supports were signed as completed by the craftsmen, field engineer, and quality control inspector without properly installing cable supports for all the installed cables (Example 3).

The applicant determined installation requirements had been misinterpreted by field personnel, and as a result the as-constructed condition in the field was considered adequate. The applicant revised WP D-11422-06 to provide adequate work instructions and committed to inspect other trays worked in the same DCN and to develop a list and re-inspect any conduits that may have had similar type vertical supports installed. The corrective actions were developed and tracked by the applicant in SCAR WBSCA940051 and corrective actions 9 and 10.

The results of the applicant's review were documented in the SCAR and indicated 10 instances of vertical supports that did not meet installation requirements. The cases were reviewed by engineering. The results of the reviews were that there was no significant impact on the effectiveness of the supports and, therefore, exceptions to the installation requirement were documented in construction specification G-38. The inspector reviewed several of the exceptions and justifications and concluded procedural requirements were met.

The inspectors concluded if installation of Kellum type vertical supports were not installed in accordance with procedures, then other types of vertical supports may be suspect.

The review of acceptable types of vertical supports for cables in raceways was addressed by the NRC in Supplement 9 to NUREG-0847 dated June 1992. Section 2.7.3. provides a discussion which states, "In general, to avoid improper installations, any support method should be substantially tested and have the cable manufacturers' acceptance that it will not be mechanically injurious to, and is compatible with, the specific types of cables involved. For example, the use of OZ Gedney wedge-type supports with wood or hard polymer inserts will be mechanically injurious to some cables, especially multi-conductor cables over a long period of time." The inspector reviewed G-38, Section 3.2.1.9, Support of Cables Routed in Vertical Conduits, and determined

no special consideration was provided for the use of wedge-type anchors. Procedure MAI-3.2, Cable Pulling of Insulated Cables Rated Up To 15,000 Volts, Revision 15, indicates the selection and use of the anchors is the task of craft installation personnel without engineering input as to the compatibility of the support to the type of insulation and the potential impact on multiconductor cables. The vendor information provided by the applicant was silent on wedge type support use for multiconductor cable applications. The applicant was informed of the inspector's concerns on October 20, 1995.

The applicant conducted a review of the known installations of the wedge-type anchors and found no applications in safety-related conduits. On October 27, the applicant issued SRN-G-38-175 to G-38 specification. The SRN stated that OZ-Gedney wedge-type supports shall only be used when approved by site engineering on a case-by-case basis in design output documentation. The applicable G-38 section (3.2.1.9.2) was source noted to NRC SSER 9, Appendix Y. This SRN resolved the inspector's concerns.

- A permanent cable tray segment in manhole 5A was removed without documented work instructions (Example 4). As a result, the cable tray has not been reinstalled and the cable and splice that should have been in the tray segment were being supported with ropes.

  The applicant could not determine why the tray segment had been removed. WO 94-017516-00 was initiated to reinstall the tray. Walkdown programs in place to identify such deficiencies had not yet been performed in the affected manholes. The inspector reviewed the above completed work order and inspectors performed tours of other manholes. No other deficiencies were identified. This example is closed.

Examples 5, 6, and 7 pertained to improperly abandoned and spared Class 1E cables. These examples are summarized below.

- Spared cable marked as 0-3SP-285-944B was properly spared (sealed and identified) and located at cable tray node 3B2384. However, the CCRS reflected this cable to be spared at cable tray node 3B2383 (Example 5).

- A three-conductor cable was cut with the conductor ends exposed at cable tray segments 4A2009-4A2010 (Example 6). Work Request Tag C094442, dated January 9, 1992, was attached to this cable to properly abandon the cable. However, this work request was canceled when the tagged cable could not be subsequently located in the field. As a result, the improperly abandoned cable remained at the subject tray segments.

- Cable 1-3M-3-1452-A, located at tray node 3A2002, was improperly spared in that it had exposed conductor strands and no end caps (Example 7).

The applicant initiated a drawing deviation (DD 94-0329) to update CCRS to reflect spared cable in Example 5. WO 94-17328-00 was issued to abandon cables properly in Examples 6 and 7. In addition, the applicant added an attribute to ongoing cable tray walkdowns to inspect visually accessible trays

for the presence of improperly terminated cables. The inspector reviewed the completed WOs and concluded abandon cables were documented as properly abandoned.

The applicant's initial corrective actions included the addition of an attribute to the ongoing cable tray walkdowns to identify and tag abandoned and spared cables found in cable trays (letter dated October 21, 1994). In 1995, the applicant changed the previous commitment to the NRC which stated that all cables tagged as abandoned cables would be verified to be in CCRS and those abandoned cables not tagged as abandoned would be tagged and added to CCRS. The new commitment documented in a letter from the applicant to the NRC, dated September 21, 1995 (T04950921212), stated that abandoned cables which were not tagged as abandoned would be tagged. Based on data collected during inspections to date, it was determined that the percentage of additional spared/abandoned cables being identified added no appreciable weight to trays and the trays were within design margins which presented no safety impact.

Based on the inspector's review of the above corrective actions and cable tray walkdown results to date, Examples 5, 6, and 7 of VIO 50-390/94-53-01 are closed.

This violation is closed.

10.19 (Closed) VIO 50-390/94-53-02, Design Control Deficiencies; Cable Routing

The applicant's response dated October 21, 1994, was considered acceptable by the NRC. The inspector reviewed the following documents and verified completion of the corrective actions for Examples 1 and 4 of the NOV.

- Corrective Action Document Closure Package WBPER940314, Revision 0;
- Corrective Action Document Closure Package WBPER940405, Revision 0;
- Calculation WBPVAR9007011, Class 1E Cables in Vertical Conduit Walkdown Evaluation and Disposition, Revision 3;
- DCN W-33234-A, Cable Support in Vertical Conduit;
- DCN S-32713, Revise CCRS to Reflect As-installed Route.

Review of problem evaluation report PER WBPER940314 revealed that Example 1 and 4 of the NRC violation was similar to deficiencies the applicant had identified as a result of an assessment of the cable issues CAP completion performed by NA. The applicant's self identified deficiencies included: (1) DCN's listed in calculation WBPEVAR9007011 as having reworked conduit configurations to either alleviate the need for vertical cables support or to install vertical cable support when cables were reworked did not include these requirements in the work statements; (2) Conduit/cable configurations which exceeded vertical drop requirements had been accepted as-is with inadequate justification; and (3) measurements contained in sketches within the calculation were exact in the field. To address the extent of condition for

vertical drop concern the applicant reviewed approximately thirty calculations associated with the Electrical and Cables Issues CAP plans. The applicant concluded that the conditions responsible for the deficiencies were isolated personnel errors and recurrence controls were not required. The root cause analysis and recommended corrective action plans implemented by DCN W-33234-A for the above deficiencies were reviewed by the inspector and determined to be adequate. Additionally, the inspector verified that the seven conduits, identified in Examples 1 and 4 of the NOV as examples of deficient conditions, had been corrected.

The applicant prepared and implemented PER WBPER940405 for resolution of Example 2 in the NOV. This example involved a failure to document accurately the distribution of routing information for cable 1PL4706 on the CCRS multi-card set. The applicant determined that this deficiency was a documentation problem and that the cable was correctly installed as required by CCRS. An extent of condition review was performed for all multi-card cables in CCRS that did not have a tray segment node duplicated on the preceding or succeeding card. This review resulted in the identification of an additional 178 cables with a similar deficiency. The inspector reviewed PER WBPER940405 and verified that the developed corrective action plans addressed the root causes of the deficiencies. Recurrence controls established by revision of Procedure EAI-3.15, Cable and Conduit Record Development and Issue Procedure, was verified to have been incorporated in Revision 9.

The applicant prepared and implemented DCN S-32214-A to correct the deficiencies identified in Example 2 of the NOV. Similarly, DCN S-32713-A, was prepared to revise CCRS to reflect the as-installed condition of the 178 cables identified during the extent of condition review performed for resolution of Example 2 of the NOV. The inspector reviewed both DCN's and verified that the revision to CCRS had been completed.

Example 3 of the NOV was also identified by the applicant as a documentation problem with CCRS. The inspector verified completion of corrective action for this example by reviewing F-DCN 24097 which had been initiated to correct the CCRS route for cable PL3501B and to correct DCA-08809 to reflect the installed configuration for conduit PLC3971B. Based on review of the closure package for PER WBPER940388, Revision 0, the inspector concluded that the applicant had corrected the deficiency identified in Example 3.

The inspector concluded that the applicant had determined the full extent of the violation, taken actions to correct current conditions, and developed corrective actions needed to preclude recurrence of similar problems. Corrective actions stated in the applicant's response have been implemented.

This violation is closed.

10.20 (Closed) CDR 50-390/95-03, Inadequate Reviews of Conduit Separation

The applicant identified various types of conduit-related deficiencies which remained uncorrected although specific programs designed to identify and correct deficiencies had been completed. The deficiencies were self-identified by the applicant's nuclear assurance group during assessments of completed walkdowns of spaces in the auxiliary building and documented in SCAR WBSCA950003.

The applicant determined that the cause of the deficiencies was a combination of improperly trained personnel and a procedure inadequacy. The Class 1E conduit walkdown program was established as a means to implement various corrective actions. Early in its implementation, the program was considered very effective and appeared to be functioning adequately. However, as additional walkdown personnel increased, these individuals were not given the level of training as were the initial personnel. In addition, Walkdown Procedure WD-039 did not specifically require use of the "go, no go" gauge previously established as a measuring device. This combination of causes resulted in the deficiencies described above.

The applicant's corrective actions consisted of retraining the field engineers associated with walkdowns to highlight known deficiencies and stress the use of the "go, no go" devices, complete re-inspection of spaces inspected before this issue, and a continuation of the independent inspections by NA.

The inspector reviewed SCAR WBSCA950003 and the associated corrective actions and concluded the actions were adequate to correct the programmatic deficiencies identified. In addition, the inspector reviewed results of NA assessments performed after the implementation of the corrective actions and concluded that applicant verification activities conducted by NA for this open item, which consisted of document reviews and field inspections, were reviewed and considered adequate by the NRC inspector.

Technical issues with the adequacy of the completion of the CAP associated with conduit will be part of the evaluation of VIO 50-390/94-18-03.

This item is closed.

10.21 (Closed) VIO 50-390/95-22-01, Failure to Provide Coordination of Overcurrent Protective Relays Due to Lack of Design Control

This violation involved the incorrect setting of four overcurrent relays located on the 6.9 kV shutdown boards. The incorrect setting resulted in lack of selective coordination for certain types of faults. The violation was cited against design control, and the root cause was an error by design personnel. The overcurrent relay settings for the relays in question were revised to provide the desired coordination margins. The new settings were reviewed by the NRC inspector and found to be acceptable. NRC inspectors verified implementation of the new settings by inspection of the installed relays and set point sheets. VIO 50-390/95-22-01 is closed.

10.22 (Closed) IFI 50-390/95-22-02, Potential for DC Saturation of Current Transformers

The issue in this IFI was the potential for saturation of current transformers due to excitation by the direct current component of transient current. The applicant addressed the issue in an IFI response package dated August 31, 1995. The applicant's analysis, including calculation and supporting data, was reviewed by the NRC inspector. The inspector agreed with the applicant's conclusion that DC saturation of current transformers was not a safety concern at Watts Bar given the equipment ratings and system configuration. IFI 50-390/95-22-02 is closed.

10.23 (Closed) IFI 50-390/95-22-03, Review of PSB-1 Test Results

This IFI was identified to ensure staff review of the applicant's evaluation of a special test aimed at validating the computer model used for voltage analysis. The applicant had collected the necessary data but had not evaluated the data which involved running a load flow case with the computer program. Subsequently, the test results were incorporated into Calculation WBN-EEB-MS-TI20-0026, GDC 17 Verification, Revision 1, dated September 22, 1995. The inspector reviewed this calculation and agreed that the computer model for voltage analysis was validated by test measurements. Test measurements and computer results matched well within the acceptable margin specified in Branch Technical Position PSB-1, thus validating the computer model of the distribution system. IFI 50-390/95-22-03 is closed.

10.24 (Closed) VIO 50-390/95-27-01 Inappropriate use of Q-DCNs

This violation was issued because a number of Q-DCNs were being used for functions other than allowed by Procedure EAI 3.05, Design Change Notices. Q-DCNs were found being used to specify changes to design input/output information thus bypassing the design control program and accepting nonconforming conditions for plant changes bypassing the corrective action program. The applicant responded to the violation on June 30, 1995, acknowledging the violation, but denying one of the examples. The NRC inspector met with the applicant on July 11, 1995 and NRC's response of July 18, 1995, identified to the applicant that the example was still valid.

The applicant identified several corrective actions in their June 30, 1995, response. One was a memorandum to the engineering employees that was mentioned in IR 50-390/95-27. A second was a revision to Procedure EAI 3.05 to provide clearer, more effective instructions. A third was to train engineering personnel. A fourth was to review the Q-DCNs for each discipline to determine the extent of misapplication. The applicant identified in the response that the above corrective actions to resolve Q-DCN misapplications will resolve any problems associated with the continued use of Q-DCNs in work documents.

This item was reviewed for closure in IR 50-390/95-72 and was found to not be fully corrected. The NRC concluded in that report that the corrective actions to resolve the inappropriate use of Q-DCNs had not encompassed the entire extent of condition in that when engineering was correcting the Q-DCN issuance

process, they failed to realize that modifications and maintenance had inserted a number of Q-DCNs in the standard work control process.

During this inspection period, the applicant has removed all reference to Q-DCNs in the standard work control documents. The use of existing Q-DCNs in the work control process is addressed in Procedure SSP 6.02, Maintenance Management System, Revision 16, Change Notice 1, which requires engineering approval to use a Q-DCN in the maintenance WO process. In addition, engineering has discontinued the issuance of Q-DCNs and has removed them from the DCN process through Revision 29 to Procedure EAI 3.05, Design Change Notices. Existing Q-DCNs will be reviewed by engineering and incorporated into procedures as appropriate. NA interviewed 16 maintenance and modifications planners as to whether the procedural requirements and intent on use of Q-DCNs was understood. The results indicated that the procedural expectations had been effectively communicated by the supervisors.

The inspector verified that the above procedures had been changed and that the use of Q-DCNs had been removed from the standard work document templates. The inspector discussed this issue with engineering management and the maintenance and modification work planning management. The corrective actions taken to address the inappropriate use of Q-DCNs adequately resolved the issue. This item is closed.

10.25 (Closed) VIO 50-390/95-30-01, Inadequate Design Control for Bailey Meter Seismic Restraint Clamp Bars

This violation identified inadequate design control of the seismic restraint bars on safety-related instrument panels. The seismic design of the equipment was not maintained following the applicant's maintenance and calibration activities on these panels. The applicant's immediate corrective actions included walkdown and verification of clamp bar installation. Prior to the NRC review of these corrective actions, documented in IR 50-390,391/95-55, the applicant performed walkdowns and again identified clamp bars incorrectly installed. The applicant concluded that further corrective actions were necessary to resolve this item. These actions included restricting panel access by changing the locks and a design change to assure proper installation of the clamp bars. This item remained open pending completion of these actions.

The locks were changed on August 24, 1995, by WO 95-20994-00. DCN 37590, Bailey Clamp Bar Enhancement, was completed on October 22, 1995. The inspector performed an installation verification on a sample of instrument panels on October 23, 1995. Panels 1-R-127, 1-R-128, 1-R-131, 1-R-125, and 1-L-11B were inspected. The retention bar modifications were completed and the bars were properly installed. The inspector concluded that the issue was adequately resolved. This violation is closed.

10.26 (Closed) VIO 50-390/95-45-01, Failure to Install RTDs in Accordance with Design Output Drawing.

This violation identified that the installation of several RTDs did not meet vendor installation drawing requirements for maximum length of unsupported

cable. Note 7 on Westinghouse Drawing 3D22098, Revision 1, required that the maximum acceptable length of unsupported cable between the RTD and the first support to be 15 inches. Additionally, the maximum distance between subsequent cable supports is specified as 24 inches. The inspectors identified four examples of RTD installations which violated these requirements. The inspectors determined that other similar RTD support deficiencies had been previously identified by the applicant as documented in PER WBPER930379.

The inspector reviewed the applicant's response to the violation dated September 14, 1995, and supplemental response dated October 27, 1995. In their responses, the applicant stated that the RTD cables were mistakenly installed using the applicant's generic component installation instructions rather than the appropriate vendor guidelines. This failure was attributed to personnel error by NE and construction personnel who did not follow procedures requiring the consideration of vendor requirements.

The applicant issued PER WBPER950360 to address the corrective actions associated with the recently identified deficient RTD supports. The inspector reviewed completed documentation associated with this PER. Corrective actions included:

- The applicant performed a walkdown of existing RTD installations previously addressed by PER WBPER930379. No support span discrepancies associated with those RTDs were identified.

- The applicant performed a walkdown of all other RTD installations not previously addressed by PER WBPER930379. As the result of this effort, several additional supports were identified which required modification.

The inspector noted that DCNs F-38158, W-37395, F-38324, and W-37478 were issued to correct deficiencies associated with the walkdown of RTD installations that had not previously been addressed by PER WBPER930379.

RTDs 1-TE-068-0319-F, 1-TE-068-0324-G, and 1-TE-074-0014-G were subsequently reinspected by an inspector. The inspector verified that the supports associated with these RTDs had been modified and now met the vendor installation requirements. Additionally, the inspector noted that the cable supports associated with RTD 1-TE-074-0025-F had not required modification. This determination was based on information contained in a vendor letter dated November 19, 1993. This letter, which was contained in PER WBPER950360, stated that Westinghouse had agreed that all supports beyond the first support could be installed utilizing the applicant's typical seismic support installation guidelines for flex conduit and cable provided that the first support satisfied the 15-inch span criteria.

Based on the above reviews the inspector determined that the applicant's corrective actions were adequate to address the problem and should preclude recurrence. This violation is closed.

10.27 (Closed) IFI 50-390/95-54-01, Review Closeout Activities to Complete EQ Program

This item was identified to track the completion of the EQ/MEQ Special Programs at WBN. At the time of the above inspection, several key elements of the program had not been completed. Although implementation up to that point was found to be adequate, it was deemed necessary to verify that all actions remaining were completed satisfactorily. The inspector reviewed the Watts Bar EQ/MEQ Special Programs Closure Report dated October 20, 1995. The EQ/MEQ SPs were not considered 100 percent complete in this report; however, they were considered effectively complete in that little remained to be completed. Based on this report, the items remaining were: (1) complete final acceptance turnover for systems 90 and 292; (2) close those open items that remain in nine EQ binders; and (3) complete implementation and verification activities to close two NRC Commitment NCO items, six CAQ items, and one CATD item. The report also indicated that all EQ/MEQ equipment and EQ cable binders had been issued although as stated above open items remained in nine EQ equipment binders. All other items associated with the implementation of the EQ/MEQ Special Programs were identified as being complete.

In a letter to the NRC dated November 1,1995, the applicant certified that the EQ/MEQ SPs had been completed including the resolution of those items summarized below:

NRC COMMITMENTS

NCO860317002 (Closed, October 20, 1995)
NCO900020005 (Closed, October 26, 1995)

CORRECTIVE ACTION TRACKING DOCUMENTS

21002-WBN-01 (Closed, October 23, 1995)

CORRECTIVE ACTION DOCUMENTS

WBP890178SCA (closed, October 23, 1995)
WBP890362SCA (Closed, October 27, 1995)
WBP890363SCA (Closed, October 19, 1995)
WBP890421SCA (Closed, October 29, 1995)
WBPER940085 (Closed, October 03, 1995)
WBPER940707 (Closed, October 25, 1995)
WBPER950099 (Closed, October 29, 1995)

To verify completion of the EQ/MEQ SP the following records were examined and evaluated by the inspector. The EQ Closure Report dated October 20, 1995, indicated that EQ equipment binders CSC-001, CSC-002, IPT-001, IZS-005, JBOX-001, MOT-002, MOT-004, SOL-002, and SOL-004 all had open punchlist items in them. Qualification was based on these items being satisfactorily resolved by the applicant. The open item identified the qualification problem and the proposed corrective action. What remained in most cases was the implementation of the corrective action and field verification that actions taken were acceptable. The inspector reviewed the latest revision of record

for the above binders and verified that all open items had been resolved satisfactorily in the binder. The inspector performed a detail review of EQ Binder SPLC-003, Revision 1, to verify that it demonstrated qualification for the Raychem Heat Shrink Cable Repair kits Models NJRT and NWRT in accordance with the requirements of 10 CFR 50.49. This EQ binder had been issued subsequent to the last NRC EQ inspection, IR 50-390/95-54. The inspector concluded that the test results and the qualification documentation included in the binder adequately demonstrated that the splice configurations and cable repairs were qualified for five years. During the course of this inspection, the applicant's corrective actions for SCAR WBP890363SCA, Revision 3, were examined by NRC and were found to be acceptable. The results of this examination are discussed in paragraph 10.1 above. The corrective actions for SCAR WBP890421SCA involving the qualification of EQ cables located below HELB flood levels were reviewed during NRC IR 50-390/95-72. This review concluded that the corrective actions had been completed satisfactorily. Based on the results of this sample, the inspector concluded that this item is now closed.

10.28 (Closed) VIO 50-390/95-63-01, Failure to Identify and Correct Inadequate Design Verification Activities.

During a review of Employee Concern file ECP-94-WB-791-F1, the inspector determined that the applicant's investigation of this concern had not been adequate. This concern was associated with calculation, D1872407-12-F23420A, which had been issued by Ebasco design engineering personnel at Watts Bar on December 16, 1993. This calculation had analyzed several variances from typical safety-related conduit supports and served as a basis for qualification of those supports. The concern file had been closed by the applicant's CRS organization on January 24, 1995. When the applicant subsequently performed a second review of the closed concern file at the inspector's request, it was determined that the subject checker had also performed the independent verification function for the entire calculation. This was contrary to Section 4.9 of E-30-TVA, Preparation, Review, and Approval of Calculations and Section 4.9 of E-76-TVA, Procedure for Design Verification, which requires that the independent verifier shall review, confirm, or substantiate design output independently and shall not have performed the original design. In this case, the applicant's CRS organization had failed to identify that a preparer had signed as independent verifier of his own work. As the result of this failure, the inspector determined that the applicant had failed to identify and document a CAQ as required by the applicant's corrective action program.

The inspector reviewed the applicant's response to the violation dated October 13, 1995. In the response, the applicant attributed the failure to identify the CAQ to personnel error. The CRS staff specialist had failed to recognize the problem. The CAQ was attributed to contractor personnel failing to follow procedure. As the result of this problem the applicant issued PER WBPER950539 on September 6, 1995. The inspector also reviewed the completed PER and associated documentation.

The inspector noted that once the problem was identified, the applicant took immediate corrective actions. With respect to the failure to identify the

problem, this employee concern file was reopened and a CRS representative from the corporate office reviewed all concern files that had been previously closed by the same individual which could have resulted in a failure to identify and/or document a CAQ. The employee that had originally reviewed the CRS file was no longer employed by the applicant. The inspector was informed by the CRS Site Representative that the results of this additional review showed that this failure was an isolated case. Additionally, the inspector was informed that sensitivity training was conducted for CRS personnel at each of the sites and at the corporate office.

With respect to the inadequate design verification, site QA personnel were assigned to review additional engineering calculations performed by the RE&C organization in order to determine the extent of condition. An engineer from the RE&C corporate office performed an independent review of Calculation D1872407-12-F23420A to determine if it was technically adequate. The inspector was informed that no deficiencies were identified during the review of this calculation. The inspector determined based on results from the applicant's investigation, that the problem was isolated to conduit support calculations prepared by specific individuals in the Systems Completion Department, Civil Engineering Group performed after November 1, 1993. As part of the ongoing investigation the applicant reviewed all conduit support variance calculations performed by those individuals during this period. This review identified 13 calculations that indicated that the checker/design verifier was also involved in the preparation of the calculation. As part of the corrective actions for PER WBPER950539 each of those 13 calculations was again independently reviewed by another qualified design reviewer.

In order to establish that other groups responsible for preparation of calculations had not checked/verified their own work, the applicant selected several mechanical, electrical and civil (not prepared by the System Completions Group) calculations for review. No similar examples of improper design verification activities were identified in any of those calculations.

Based on the above reviews the inspector determined that the applicant's completed corrective actions were adequate to address the problem and to prevent recurrence. This violation is closed.

10.29 (Closed) IFI 50-390/95-71-02, Adequacy of QC Inspection

URI 50-390/95-71-02 identified a concern with the adequacy of inspections performed by a certain QC inspector. Subsequently, the applicant issued PER WBPER950579 to evaluate the adequacy of inspections performed by that QC inspector working at WBN. The URI was left open to review the corrective actions taken to resolve the PER.

The applicant completed the PER and closed the issue on October 24, 1995. The inspector reviewed the corrective actions, recurrence controls, extent of condition evaluation, and closure for the PER and determined the applicant had taken adequate corrective action on resolving the QC inspectors work. No additional hardware problems were identified based on the applicants re-inspection of a sample of the inspectors previous work. This URI is closed.

Within the areas reviewed, no violations or deviations were identified.

10.30 (Closed) URI 50-390/95-72-01, IPS Ribbons

The inspectors conducted a series of area walkthroughs of portions of the Unit 1 reactor building, auxiliary building, Unit 1 ERCW tunnel, IPS, and both Unit 1 main steam valve rooms. These walkthroughs were performed on those areas after site management had completed their walkthroughs of those areas. The site management walkthroughs were conducted as part of the applicant's final preparations for fuel load. The inspectors identified a number of potential deficiencies during these walkthroughs which were identified to members of site management. The inspectors verified that all identified deficiencies were subsequently resolved or tracked by a work request prior to start of fuel loading. Each deficiency was evaluated by an inspector, and no significant problems were identified which would have impacted the ability of plant staff to safely proceed with fuel loading.

As documented in IR 50-390/95-72, the inspector had previously identified in the IPS that work on a support had not been done as required by the WID. The inspector found this deficiency when performing walkthrough inspections and noted a ribbon hanging on a support. The inspector questioned the ribbons existence, and subsequent investigation by the applicant identified the support should have been reworked before the room was turned over to operations. The ribbon had been placed there by PCG to alert craft of the supports location. This URI was subsequently identified as a violation and documented in IR 50-390/95-69. Based on the violation being issued, this URI is being closed.

11.0 EXIT INTERVIEW

The inspection scope and findings were summarized on November 3, 1995, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results. Dissenting comments were not received from the applicant. Proprietary information is not contained in this report.

Item Number	Status	Description and Reference
390/85-59	Closed	CDR - Flooding in Category I Structure Outside Containment (paragraph 10.1)
390/86-25	Closed	CDR - Non-Quality Assurance Data Used in Calculations for Cable Tray and Conduit Loading (paragraph 10.2)
390/86-27 391/86-23	Closed	CDR - Flexible Conduit Not Installed to Compensate for Thermal and Seismic Movements (paragraph 10.3)

390/86-61	Closed	CDR - Cable Configuration Control (paragraph 10.4)
390/87-05-01	Closed	VIO - Hydrogen Analyzer Design and ANSI N45.2 Compliance (paragraph 10.5)
390/87-11-02	Closed	VIO - Failure to Control Lifted Cables and Wires Per Approved Procedures or Drawings (paragraph 10.6)
390/87-14	Closed	CDR - Containment Purge Air Bellows Have No Fire Rating or Environmental Qualification (paragraph 10.7)
390/89-06	Closed	CDR - Inadequate Qualification for Cable Tray Supports and Fittings (paragraph 10.8)
390/89-11	Closed	CDR - Significant Trend Associated With Damaged, Loose, or Missing Hardware (paragraph 10.9)
390,391/90-10	Closed	CDR - Unqualified Cable Seal Penetration Seals (paragraph 10.10)
390/90-22-01	Closed	URI - Verification of Electrical Separation Audit Activities (paragraph 10.11)
390/90-27-22	Closed	IFI - Loss of Control Power Annunciation (paragraph 10.12)
390/90-30-05	Closed	URI - Adequacy of Junction Boxes and Wire Terminations (paragraph 10.13)
390/92-09-02	Closed	IFI - Effects of Debris in Conduit on Cable Pulling (paragraph 10.14)
390,391/93-58-04	Closed	IFI - Follow-up Items from VSR Inspection (paragraph 10.15)
390/94-18-03	Closed	VIO - Failure to Implement Raceway Separation Requirements (paragraph 10.16)

390,391/94-35-01	Closed	VIO - Failure to Follow Site Procedures for Cable Installation and Termination (paragraph 10.17)
390/94-53-01	Closed	VIO - Failure to Implement DCN and WP Requirements for Electrical Modifications (paragraph 10.18)
390/94-53-02	Closed	VIO - Design Control Deficiencies: Cable Routing (paragraph 10.19)
390/95-03	Closed	CDR - Inadequate Reviews of Conduit Separation (paragraph 10.20)
390/95-22-01	Closed	VIO - Failure to Provide Coordination of Overcurrent Protective Relays Due to Lack of Design Control (paragraph 10.21)
390/95-22-02	Closed	IFI - Potential for DC Saturation of Current Transformers (paragraph 10.22)
390/95-22-03	Closed	IFI - Review of PSB-1 Test Results (paragraph 10.23)
390/95-27-01	Closed	VIO - Inappropriate Use of Q-DCNs (paragraph 10.24)
390/95-30-01	Closed	VIO - Inadequate Design Control for Bailey Meter Seismic Restraint Clamp Bars (paragraph 10.25)
390/95-45-01	Closed	VIO - Failure to Install RTDs in Accordance with Design Output Drawing (paragraph 10.26)
390/95-54-01	Closed	IFI - Review Closeout Activities to Complete EQ Program (paragraph 10.27)
390/95-63-01	Closed	VIO - Failure to Identify and Correct Inadequate Design Verification Activities (paragraph 10.28)

390/95-64-01	Closed	VIO - Deficiencies Involving Cables, Conduits, and Cable Trays (paragraph 10.16)
390/95-71-02	Closed	IFI - Adequacy of QC Inspection (paragraph 10.29)
390/95-72-01	Closed	URI - IPS Ribbons (paragraph 10.30)

12.0 LIST OF ACRONYMS AND INITIALISMS

AOI	Abnormal Operating Instruction
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASOS	Assistant Shift Operations Supervisor
BISI	Bypassed and Inoperable Status Indication
BU	Bulletin
CAP	Corrective Action Program
CAQ	Condition Adverse to Quality
CATD	Corrective Action Tracking Document
CCRS	Computerized Cable Routing System
CCS	Component Cooling System
CEI	Complex Electrical Issues
CDR	Construction Deficiency Report
CFR	Code of Federal Regulation
CRS	Concerns Resolution System
DBE	Design Basis Event
DCA	Drawing Change Authorization
DCN	Design Change Notice
DD	Drawing Deficiency
DG	Diesel Generator
DR	Deficiency Report
DS	Design Standard
EAI	Engineering Administrative Instruction
ECP	Employee Concerns Program
ECSP	Employee Concerns Special Program
EEB	Electrical Engineering Branch
EMS	Equipment Management System
EOC	Extent of Condition
EQ	Environmental Qualification
EQP	Equipment Qualification Project
ERCW	Essential Raw Cooling Water
ERFDS	Emergency Response Facility Data System
FIR	Finding Identification Report
FSAR	Final Safety Analysis Report
GDC	General Design Criteria
HAAUP	Hanger Analysis and Update Program
HVAC	Heating, Ventilation, and Air Conditioning
HELB	High Energy Line Break
ICMS	Insulation Consultant Management Services
IEEE	Institute of Electrical and Electronics Engineers

IFI	Inspection Follow-up Item
IN	Information Notice
IPS	Intake Pumping Station
IR	Inspection Report
IVP	Independent Verification Program
kW	kilowatt
MAI	Modification/Addition Instruction
MCC	Motor Control Center
MELB	Moderate Energy Line Break
MEQ	Mechanical Equipment Environmental Qualification
MI	Maintenance Instruction
MOV	Motor Operated Valve
MR	Maintenance Request
MRC	Management Review Committee
MVSR	Master Valve Status Report
NA	Nuclear Assurance
NC	Nuclear Construction
NCR	Nonconformance Report
NE	Nuclear Engineering
NEP	Nuclear Engineering Procedure
NJRT	Nuclear Jacket Repair Tape
NOV	Notice of Violation
NPP	Nuclear Performance Plan
NPRDS	Nuclear Plant Reliability Data System
NQA	Nuclear Quality Assurance
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NSRS	Nuclear Safety Review Staff
NUREG	NRC technical report designation
NWRT	Nuclear Wire Repair Tape
OGC	Office of General Counsel
OIG	Office of Inspector General
PACR	Potential Area of Concern/Recommendation
PAI	Plant Administrative Instruction
PCG	Plant Completion Group
PER	Problem Evaluation Report
PSB	Project Services Branch
QA	Quality Assurance
QAI	Quality Administrative Instruction
QC	Quality Control
QCIR	Quality Control Inspection Report
QTC	Quality Technology Corporation
RCP	Reactor Coolant Pump
RE&C	Raython Engineers & Construction
RG	Regulatory Guide
RHR	Residual Heat Removal
RIMS	Records Information Management System
RTD	Resistance Temperature Detector
RTV	Room Temperature Vulcanizing
RWL	Remaining Work List
SCAR	Significant Corrective Action Report
SCR	Significant Condition Report

SEP	Site Engineering Procedure
SER	Safety Evaluation Report
SMRC	Senior Management Review Committee
SP	Special Program
SRN	Specification Revision Notice
SSER	Supplemental Safety Evaluation Report
SSP	Site Standard Practice
SWBP	Sidewall Bearing Pressure
SWEC	Stone and Webster Engineering Corporation
SWO	Stop Work Order
TER	Technical Evaluation Report
TI	Temporary Instruction
TROI	Tracking, Reporting Open Items
URI	Unresolved Item
V	Volt
VIO	Violation
VSR	Vertical Slice Review
WBEP	Watts Bar Engineering Project
WBN	Watts Bar Nuclear Plant
WCS	Work Completion Statement
WID	Work Implementing Document
WO	Work Order
WP	Workplan
WR	Work Request

ATTACHMENT

SUMMARY OF NRC RESIDENT REVIEW OF AREA/ROOM TURNOVERS					
ROOM	DESCRIPTION	ACCEPTED BY PLANT	IRs	NRC REVIEW COMPLETE	COMMENTS
A208	Containment Spray Pmp 1B-B	02-14-95	95-17	Y	
A209	Containment Spray Pmp 1A-A	02-14-95	95-17	Y	
A210	RHR Pmp Room 1B-B	01-27-95	95-17	Y	
A211	RHR Pmp Room 1A-A	02-21-95	95-17	Y	
A216	U1 676' Pipe Chase	05-12-95	95-38	Y	
A306	Turbine Driven AFW Pmp Room	04-18-95	95-45 95-06	Y	
A307	U1 Pent Room	09-29-95	95-72	Y	
A308	U1 Pipe Chase	07-14-95	95-57	Y	
A309	CHG Pmp 1A-A	02-21-95	95-38	Y	
A310	CHG Pmp 1B-B	02-21-95	95-38	Y	
A311	CHG Pmp 1C	02-21-95	95-45	Y	
A312	SI Pmp Room 1B-B	09-23-94	94-75	Y	
A313	SI Pmp Room 1A-A	09-23-94	94-75	Y	
A406	U1 Pent Room	09-27-95	95-72	Y	
A407	VCT Room	11-21-94	95-38	Y	
A408	U1 RX Bldg Access Room	07-01-95	95-57	Y	
A410	Seal Water HXCH 1A	11-21-94	95-77	Y	
A411	RHR & CS HXCH Room 1B-B	03-07-95	95-06 95-38	Y	
A412	RHR & CS HXCH Room 1A-A	03-08-95	95-45 95-06	Y	Breached Penetration Seal
A423	El 713 CVCS Valve Gallery	01-29-95	95-38	Y	
A428	U1 713 Pipe Chase	11-03-95	95-06 95-77	Y	
A501	U1 S MS Valve Room	09-13-95	95-72	Y	
A502	U1 S MS Valve Room	09-29-95	95-77	Y	
A508	U1 PASS Room	09-01-95	95-72	Y	
A516	U1 Shield Bldg Rad Mon Room	08-18-95	95-72	Y	
A703	HVAC Room	10-06-95	95-72	Y	

SUMMARY OF NRC RESIDENT REVIEW OF AREA/ROOM TURNOVERS					
ROOM	DESCRIPTION	ACCEPTED BY PLANT	IRs	NRC REVIEW COMPLETE	COMMENTS
A706	Airlock to U1 S MS Valve Room	07-30-95	95-72	Y	
A707	Letdown HXCH Room	05-12-95	95-45	Y	
A713	Airlock to U1 UHI Room	07-01-95	95-72	Y	
A801	Aux Ctr Room	07-01-95	95-45	Y	
A802	6.9KV SD Room A	10-14-95	95-77	Y	
A803	125V Vital Battery BD Room II	04-07-95	95-38	Y	
A804	125V Vital Battery BD Room I	04-24-95	95-38	Y	
A805	480V SD BD Room 1B	10-07-95	95-77	Y	
A809	U1 Personnel & Equip Access	07-09-95	95-77	Y	
A811	U1 RX Bldg Equip Hatch	05-19-95	95-45	Y	Caulking
A812	U1 RX Bldg Access Room	08-18-95	95-64	Y	
A813	Refueling Room	11-03-95	95-77	Y	
A816	EGTS Filter Room	09-01-95	95-72	Y	
A821	480V SDBD Room 2A	09-15-95	95-72	Y	
A822	125V Vital Battery Bd Rm IV	04-18-95	95-38	Y	
A823	125V Vital Battery Bd Rm III	04-18-95	95-38	Y	
A824	6.9KV SDBD Room B	10-14-95	95-77	Y	
A825	Aux Control Inst Room 1A	07-03-95	95-45	Y	
A826	Aux Control Inst Room 1B	04-24-95	95-38	Y	Housekeeping poor
A827	Aux Control Inst Room 2A	03-25-95	95-38	Y	
A828	Aux Control Inst Room 2B	03-25-95	95-38	Y	
A851	480 BD Room 1A	07-22-95	95-72	Y	
A852	480 BD Room 1B	09-27-95	95-77	Y	
A853	125V Vital Battery Room II	09-09-94	94-61	Y	
A854	125V Vital Battery Room I	09-09-94	94-61	Y	
A855	480V XFMR 1B	09-01-95	95-64	Y	
A856	480V XFMR 1A	08-04-95	95-64	Y	
A858	5th Vital Battery & BD Room	08-26-95	95-64	Y	
A861	480V XFMR 2B	07-15-95	95-77	Y	
A862	480V XFMR 2A	08-04-95	95-57	Y	
A863	125V Vital Battery Room IV	09-09-94	94-61	Y	
A864	125V Vital Battery Room III	09-09-94	94-61	Y	

SUMMARY OF NRC RESIDENT REVIEW OF AREA/ROOM TURNOVERS					
ROOM	DESCRIPTION	ACCEPTED BY PLANT	IRs	NRC REVIEW COMPLETE	COMMENTS
A865	480V BD Room 2B	09-08-95	95-72	Y	
A866	480V BD Room 2A	07-22-95	95-57	Y	
A901	U1 MG Set Room	07-30-95	95-57	Y	
A902	PZR HTR XFMR Room Train A	07-07-95	95-57	Y	
C107	24/48V Battery Room	05-18-95	95-38	Y	
C108	24/48V Battery BD & Charger Rm	05-19-95	95-38	Y	
C201	U1 Aux Inst Room	10-07-95	95-77	Y	
C301	Cable Spreading Room	10-21-95	95-77	Y	
C412	Main Control Room	07-21-95	95-45	Y	
C413	Relay Room	09-08-95	95-72	Y	
D104	D/G 1A-A	03-20-95	95-33	Y	
D105	D/G 2A-A	03-20-95	95-33	Y	
D106	D/G 1B-B	03-20-95	95-33	Y	
D107	D/G 2B-B	03-18-95	95-33	Y	
D109	Pipe Gallery & Corridor	04-21-95	95-33	Y	
D203	Air Exh Room	04-18-95	95-33	Y	
D204	480V BD Room 1A	04-21-95	95-33	Y	
D206	Air Exh Room	04-18-95	95-33	Y	
D207	480V BD Room 2A	04-21-95	95-33	Y	
D209	Air Exh Room	04-18-95	95-33	Y	
D210	480V BD Room 1B	04-21-95	95-33	Y	
D212	Air Exh Room	04-18-95	95-33	Y	
D213	480V BD Room 2B	04-21-95	95-33	Y	
E101	U1 UHI Room	08-04-95	95-72	Y	
E102	U1 Add Equip Bldg 740'	08-04-95	95-72	Y	
E103	U1 Add Equip Bldg 752'	08-04-95	95-72	Y	
I101	Electrical BD Room	07-03-95	95-57	Y	
I102	ERCW Strainer Room A	07-03-95	95-57	Y	
I103	ERCW Strainer Room B	07-03-95	95-57	Y	
I105	ERCW Pump Room A	07-09-95	95-57	Y	
I106	ERCW Pump Room B	07-09-95	95-57	Y	
I107	HP FP Pump Room A	07-09-95	95-57	Y	

SUMMARY OF NRC RESIDENT REVIEW OF AREA/ROOM TURNOVERS					
ROOM	DESCRIPTION	ACCEPTED BY PLANT	IRs	NRC REVIEW COMPLETE	COMMENTS
I108	HP FP Pump Room B	07-09-95	95-57	Y	
M101	Manhole 1	08-11-95	95-64	Y	
M102	Manhole 2	08-11-95	95-64	Y	
M103	Manhole 3	08-11-95	95-64	Y	
M104	Manhole 4A	06-08-95	95-64	Y	
M105	Manhole 5A	06-08-95	95-64	Y	
M106	Manhole 6A	08-18-95	95-64	Y	
M107	Manhole 7A	08-18-95	95-64	Y	
M108	Manhole 8A	08-24-95	95-64	Y	
M118	Manhole 18	06-08-95	95-64	Y	
M119	Manhole 19	08-24-95	95-64	Y	
M120	Manhole 20	09-01-95	95-64	Y	
M121	Manhole 21	09-01-95	95-64	Y	
M122	Manhole 22	08-18-95	95-64	Y	
M123	Manhole 23	08-25-95	95-64	Y	
M124	Manhole 24	08-25-95	95-64	Y	
M125	Manhole 25	08-25-95	95-64	Y	
M126	Manhole 26	05-12-95	95-64	Y	
M127	Manhole 27	08-24-95	95-64	Y	
M204	Manhole 4B	06-08-95	95-64	Y	
M205	Manhole 5B	06-08-95	95-64	Y	
M206	Manhole 6B	08-18-95	95-64	Y	
M207	Manhole 7B	08-19-95	95-64	Y	
M208	Manhole 8B	08-11-95	95-64	Y	
M209	Manhole 9B	08-18-95	95-64	Y	
R101	SW Quad, Loop 1 702'-713'	06-12-95	95-45	Y	Poor Housekeeping
R102	NW Quad, Loop 2 702'-713'	06-12-95	95-45	Y	Poor Housekeeping
R103	NE Quad, Loop 3 702'-713'	06-12-95	95-45	Y	Poor Housekeeping
R104	SE Quad, Loop 4 702'-713'	06-12-95	95-45	Y	Poor Housekeeping
R105	Outside Crain Wall 702'-713'	06-28-95	95-45	Y	
R110	Reactor Cavity & Refueling Canal/Pit	05-11-95	95-45	Y	

SUMMARY OF NRC RESIDENT REVIEW OF AREA/ROOM TURNOVERS					
ROOM	DESCRIPTION	ACCEPTED BY PLANT	IRs	NRC REVIEW COMPLETE	COMMENTS
R111	SW Quad, Loop 1 713'-755'	05-26-95	95-45	Y	Poor Housekeeping
R112	NW Quad, Loop 2 713'-755'	05-26-95	95-45	Y	Poor Housekeeping
R113	NE Quad, Loop 3 713'-755'	06-02-95	95-45	Y	Poor Housekeeping
R114	SE Quad, Loop 4 713'-755'	06-02-95	95-45	Y	Poor Housekeeping
R116	Accum Room 1	05-19-95	95-45	Y	Poor Housekeeping
R117	Accum Room 2	05-26-95	95-45	Y	Poor Housekeeping
R118	Accum Room 3	06-15-95	95-45	Y	Poor Housekeeping
R119	Accum Room 4	07-17-95	95-45	Y	Poor Housekeeping
R120	Fan Room 1	06-16-95	95-45	Y	Poor Housekeeping
R121	Fan Room 2	07-10-95	95-45	Y	Poor Housekeeping
R122	Regen/Letdown HXCH Room	05-02-95	95-45	Y	
R123	Airlock	06-25-95	95-45	Y	
R124	Seal Table Area	06-28-95	95-45	Y	
R125	SW Quad, Loop 1 756'-819'	03-25-95	95-45	Y	Poor Housekeeping
R126	NW Quad, Loop 2 756'-819'	04-01-95	95-45	Y	Poor Housekeeping
R127	NE Quad, Loop 3 756'-819'	04-01-95	95-45	Y	Poor Housekeeping
R128	SE Quad, Loop 4 756'-819'	04-07-95	95-45	Y	Poor Housekeeping
R129	Ice Condenser	04-05-94	95-45	Y	Poor Housekeeping
R131	Airlock 757'	05-11-95	95-45	Y	
R150	Annulus	07-07-95	95-45	Y	Poor Housekeeping
Y121	U1 RWST	02-23-95	95-33	Y	
Y122	U1 CST	07-30-95	95-72	Y	