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MAR 29 1994

U.S. Nuclear Regulatory Commission
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Gentlemen:

In the Matter of the Application of)
Tennessee Valley Authority) Docket No. 50-390

WATTS BAR NUCLEAR PLANT (WBN) - UNITS 1 AND 2 - NRC INSPECTION REPORT NO. 390, 391/93-204, INSPECTION OF PHASE IV OF THE PROGRAM FOR ASSURANCE OF COMPLETION AND ASSURANCE OF QUALITY (PAC/AQ)

The subject report documents the findings of this team inspection as deficiencies or observations. TVA has reviewed these issues and provides, for your information in Enclosure 1, a response to each of the deficiencies. The review of the observations identified certain issues (marked in italicized print) where additional information may clarify the issue. This information is also provided in Enclosure 1.

Enclosure 2 lists the commitments made in this submittal.

The Watts Bar staff is available to meet with members of the NRC inspection team to discuss this response if requested. If there are questions, please telephone P. L. Pace at (615) 365-1824.

Very truly yours,

William J. Museler

Enclosures
cc: See page 2

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ENCLOSURE 1
NRC INSPECTION REPORT 390/93-204
RESPONSE TO DEFICIENCIES AND OBSERVATIONS

Description of Deficiency 390/93-204-01 (Part 1)

The team reviewed design change notice (DCN) M-15527-A, "Failure to Auto Start Standby Air Conditioning System;" Calculation WBNOSG4-136, "Steady State DBE LOCA Temperatures for the Auxiliary Building," Revision 2; and Calculation EPM-WJK-041592, "Instrument Safety Limits, Analytical Limits and Setpoints for the Auxiliary Building HVAC System," Revision 4, to evaluate the technical adequacy of the developed corrective action plans. Based on this review, the team determined that post modification testing requirements and test acceptance criteria had not been specified in the DCN package. Site Standard Practice (SSP)-8.03, "Post-modification Testing," Revision 7, Section 2.1.3 assigned responsibility to the Site Engineering organization for specifying test requirements in DCN packages as required by Engineering Administrative Instruction (EAI) 3.05, "Design Change Notices". Section 5.1.7k of this procedure requires DCN packages that modify plant hardware (i.e., M-DCNs), to include requirements for verification and testing of the change on which the design is based by including appropriate post modification testing requirements. This section of the procedure also requires that for affected preoperational tests, the design change shall document the Preoperational Test Scoping Document Change Sheet numbers issued as a result of the plant modification. Furthermore, site Engineering is required to review and approve any testing instructions and test results for plant modifications for which a test scoping document has been issued or changed. DCN M-15527-A did not comply with these controls in that post modification test requirements were listed as "NONE." Nuclear Engineering's failure to comply with these design controls during preparation of DCN M-15527-A was identified as the first example of deficiency, 50-390/93-204-01.

Description of Deficiency 390/93-204-01 (Part 2)

The team reviewed the PACRs written as a result of the vertical slice review for Control Air System (CAS)/Auxiliary Control Air System (ACAS) and performed a system walk down. At the time of this inspection, the control air system was operating; however, it was still under the control of the Startup Test group. The team verified that required preventive maintenance was being performed on auxiliary air compressors and dryers. PACR-0317, which was issued after the PAC/AQ review of Abnormal Operating Instruction AOI-10, "Loss of Control Air," documented inadequate local controls for manual operator action of the main steam power-operated relief valves (PORVs) which fail closed on loss of air. This PACR was closed based on DCN M-21432 was issued by Engineering to add a backup nitrogen supply. During the team's review of the DCN, three additional DCNs were referenced. DCN M-12321 provides nitrogen bottles, tubing, supports, and associated valves for the level control valves on the discharge of the steam driven auxiliary feed water pumps which fail closed on loss of air and are required during a postulated control building fire or a total loss of ac power. DCN M-15645-A, initiated as a result of NRC Inspection Report 389/89-200, replaces main steam PORV valve trim, copper air supply tubing with stainless steel tubing, and rubber flex hose with flexible metal hose. DCN 12067-A adds an additional pressure solenoid valve for the main steam PORVs to prevent valve

inoperability resulting from spurious solenoid actuations during a postulated control building fire or a total loss of ac power.

As determined by the team, the specific post modification testing requirements were not delineated in the DCNs as required by EAI-3.05, "Design Change Notices," Revision 15, Step 5.1.7k and Site Standard Practice (SSP)-8.03, "Post Modification Testing," Revision 7, Step 2.1A. The failure to include post modification testing requirements in these DCNs is the second example of this deficiency involving failure to follow procedures, 50-390/93-204-01.

TVA Response to Deficiency 390/93-204-01

The intent of the Appendix H form in EAI-3.05 was to identify if any testing documents needed to be initiated or revised as a result of a DCN. As stated in Deficiency 390/93-204-01, the requirements of the EAI were not complied with in that testing requirements were not specified on the Appendix H nor was a written justification provided if testing was not required or affected. Prior to identification of this deficiency, TVA had notified NRC of plans to implement a standard Preoperational Testing Program in accordance with Regulatory Guide 1.68 and Final Safety Analysis Report (FSAR) Chapter 14. Implementation of this commitment is achieved in part through the Startup Manual Procedures (SMPs). These procedures define the testing program requirements and ensure that DCNs are implemented and completed in the field, as required, prior to performance of system or component tests. Therefore, the failure to properly complete the Appendix H form, for DCNs completed prior to preoperational testing, would have no effect on the adequacy of the testing documents or testing program and is considered to be an administrative noncompliance issue.

To address this deficiency, Problem Evaluation Report (PER) WBP930473 was initiated. The PER condition represents a failure to comply with an administrative requirement that is not needed for DCNs being implemented prior to system testing. However, in order to assure that testing requirements were properly stipulated, a review of the systems that have completed System Plant Acceptance Evaluation (SPAE) Phase I was performed. This review specifically addressed the M or W type DCNs which had their implementation deferred until after system testing. For these DCNs a determination was made whether the Appendix H has been completed correctly. Revisions or corrections were made to incorrect Appendix H forms in accordance with EAI-3.05.

To prevent recurrence of this deficiency, EAI-3.05, Revision 17, was issued on February 10, 1994, to revise the applicability of the Appendix H form to apply to M and W DCNs affecting systems for which the preoperational testing has been completed per SMP-4.0 or the system has been accepted by the plant manager. Additional controls were initiated by revising EAI-3.07, "SPAE." Revision 9, of this procedure was issued on February 10, 1994, to require at SPAE Phase I, a review by Nuclear Engineering of any DCNs that are being deferred until after system testing. The review is to determine if any post modification testing requirements are needed for the DCN. If any requirements are identified, they will be included in the DCN.

Description of Deficiency 390/93-204-02

PACR-0337 required review of the control room annunciators for the ACAS based on the criteria of the detailed control room design review. The team verified that the applicable annunciators were grouped on panel 1-M-6.

The annunciator response procedure for AUX AIR TR-A MOISTURE HI was reviewed. Based on this review, two concerns were noted with the procedure. The set point for the annunciator is greater than or equal to 6-percent relative humidity as determined by moisture sensor (MS)-32-83. Design Engineering stated that this was equal to a 22° F dew point as opposed to the design basis set point of -40° F. The alarm response procedure does not provide operators with sufficient information to determine if the system is outside the design basis of -40° F specified in System Description N3-32-4002, Revision 3, "Compressed Air System," Section 3.2.6. Therefore, when the annunciator alarms, the air supplying safety-related components is outside the system design basis which could make the supplied equipment inoperable due to excessive moisture intrusion.

Secondly, the response procedure does not require notification of Engineering to evaluate the impact of moisture in the system or the performance of inspections as required by the TVA response to Generic Letter (GL) 88-14 which states that procedures will be written or revised as appropriate to require internal inspection of components suspected of contamination following indication of contamination due to the presence of water, particulates, or oil in system headers. This commitment was identified in PAC/AQ Phase I in GLT-0163.

This example of failure to properly implement design control is identified as a deficiency, 50-390/93-204-02.

TVA Response to Deficiency 390/93-204-02

For the first issue cited by this deficiency, a DCN which establishes a setpoint at -15° F for the moisture switch will be initiated. For the second issue, TVA agrees with the inspection team's concern regarding the need to notify system engineering to initiate component inspections. Therefore, revisions will be made to the appropriate Annunciator Response Instruction (ARI) to incorporate the required actions. Commitment NCO890050035, which tracked this item, will be updated to track the revision to the ARI.

Description of Deficiency 390/93-204-03

During a general condition inspection of cable trays, a damaged and abandoned Unistrut bracket assembly was discovered resting on cable tray 4B2203 outside the 6.9-kV shutdown board room A (El. 757). This bracket assembly appeared to have been damaged during earlier work in the area. TVA verified that the DCN which damaged the bracket was closed out, and subsequently TVA generated Work Request No. 242789 to tag the bracket assembly for removal as future work on DCN-11727. As determined by the team, this condition represented a deficiency involving a failure to follow procedures. Specifically, TVA Site Standard Practice SSP-12.07, "Housekeeping Temporary Equipment Control," Rev. 5, Section B.4 states: "For maintenance and modification work, the controlling work instruction shall contain steps to verify the work area is returned to normal (i.e., cleaned up) upon completion of the activity." Furthermore, this procedure requires that

a housekeeping checklist be completed after work is finished. Appendix B of this procedure contains items that shall be considered in the checklist. Item 7 states: "there is no accumulation of foreign materials, parts, or tools around the exterior of electrical boards and panels or in cable trays and similar areas." Contrary to the requirements specified in SSP-12.07, a DCN was completed and signed off with the damaged bracket assembly abandoned in place in the cable tray which could have resulted in damage to the associated cables or raceway. This example of failure to follow procedures is identified as Deficiency 50-390/93-204-03.

TVA Response to Deficiency 390/93-204-03

The condition documented by deficiency 390/93-204-03 did not result from a failure to follow procedural requirements but was an in-process work activity. Work plan D-11141-02 removed the fire barrier and left the frame partially bolted in place so that the equipment would not be discarded prior to reinstallation. With the barrier partially bolted in place, one end of the structure did rest on the edge of the cable tray. This configuration prevented movement of the structure over the cables and therefore, did not place the cables in the tray in danger of being damaged.

Reinstallation of the barrier was not included in the scope of Work Plan D-11141-02, but was captured as an element of DCN M-11727-A. To ensure that reinstallation was addressed and not overlooked, DCN M-11727-A was referenced by Work Plan D-11141-02 as the document controlling reinstallation of the fire barrier. Subsequent to the identification of this deficiency by the inspection team and to ensure the team's concerns were properly addressed, Work Request 242789 removed the barrier from the cable tray area and tagged it for future installation by DCN M-11727-A.

The work area was reviewed by TVA at the time the team inspection was performed and did not exhibit any debris associated with the removal of the barrier. This indicates that the work area was properly cleaned to remove any debris. Additionally, the workplan contained the appropriate documentation required for acceptance of the area based on housekeeping requirements.

As stated previously, TVA considers the cited deficiency to be an example of in-process work and therefore, an isolated occurrence since Workplan D-11141-02 did not contain any specific requirements for removal of the frame from the work area.

Description of Observation, Report Section 2.2.2.5, Page 7

PACR-0325 noted that material requirements specified on preventive maintenance instructions (PMIs) were applicable for air dryers DRYR-032-0156 and 0157, but the applicability for DRYR-032-0010 was not specified. Corrective actions associated with this item included revising the procedure to include DRYR-032-0010. The team reviewed the list of 319 PMIs written for the CAS and ACAS and selected several PMIs for detailed review.

As a result of this review, some discrepancies were noted and are identified as an observation. Specifically, PMI WBN COMP-032-0060, File 02, Revision 4 states on page 1 of 14 in the requirements summary that there are no quality control

(QC) hold points and no post maintenance testing requirements; however, the remainder of the procedure does have QC hold points and does require post maintenance test. Responding to inquiries from the team, Preventive Maintenance personnel indicated that the cover sheet is not transmitted to the people performing the work. *The team felt that this practice should be reviewed since, under the equipment category, such information as whether the equipment is safety related, and under the equipment qualification program, or whether the power supply is Class IE, should be available to the personnel performing the work. In the same procedure, the measurement and test equipment did not require notation of calibration dates. Steps 3.4 and 4.0 require responses of "acceptable" or "unacceptable" to check components for leakage. However, there is no direction for any further action to be taken if the leakage is unacceptable. Procedure AI-9.2.6, Appendix E, "Preventive Maintenance Identification and Approval Sheet," for FCV-032-0074 states "Initiate MRs to perform MI-0.13 on the valves listed below. Note: Indicate on MR that these are containment isolation valves." Two of the five valves listed are not containment isolation valves, but are CAS/ACAS isolation valves.* The team noted that many TIIC numbers were missing from the procedures. As discussed with TVA personnel, the PMIs are reviewed for TIIC numbers prior to each procedure being performed. Subsequent to the identification of these items TVA initiated actions to address these procedural inconsistencies.

TVA Response to Observation, Report Section 2.2.2.5, Page 7

WBN practice is to include the PM instruction as part of a Repetitive Work Order (RWO) package. The RWO cover sheet contains the applicable information from the PM cover sheet so it is not considered necessary to include the PM cover sheet in the work package. In addition, the RWO that is issued with the PM contains a form which requires the notation of M&TE calibration dates.

Site Standard Practice (SSP)-6.01, "Conduct of Maintenance," requires unacceptable conditions, such as leakage, to be reported for appropriate corrective actions. In addition, a standard statement has been incorporated into upgraded PMs to provide direction to be taken for unacceptable conditions or deficiencies.

The PM in which the valves were listed as containment isolation valves was one of the last of the "transition" PMs. It has since been upgraded via the PM upgrade program. The applicable upgraded PMs now refer to Site Standard Practice (SSP)-8.06, "ASME Section XI Pump and Valve Inservice Testing," for identification of containment isolation valves.

Description of Observation, Report Section 2.3.2.1, Page 9

Results of the CCS PACR review generally indicated that the PACRs were appropriately addressed and closed. *However, based on the review of PACR-0367, concerning miscellaneous radiation detection issues, it was determined that this PACR was closed without adequate tracking or implementation of the recommended corrective actions.* The proposed corrective actions originally proposed involved revising radiation monitoring alarm logic to eliminate a nuisance alarm for non-operating CCS heat exchangers. *As determined during this inspection, no project control number had been assigned to this corrective action until the team identified the issue. Therefore, the team identified this matter as an observation.* Subsequently, a TVA Change Control Board meeting was conducted on December 1, 1993, to address this issue. Technical merit for the revision was approved and a project control number (PCN-94004) was assigned. As determined by the team,

the associated work activity is scheduled to be placed on the Master Issues List for completion after Unit 1 fuel load.

TVA Response to Observation, Report Section 2.3.2.1, Page 9

Business Practice 366, "Issue Management," requires that proposed work activities be documented on an Issue Identification Form and submitted for approval by the Change Control Board. PACR-0367 was closed based on the responsible manager initiating the Issue Identification Form for the elimination of nuisance alarms from non-operating CCS heat exchangers. The initiation of the form occurred on June 25, 1993 and considering that the issue was an enhancement, the PACR was closed. However, as noted by the inspection team, the approved Issue Identification Form was not processed to the Change Control Board. Subsequent to the team identifying this, the issue was approved on technical merit by the Change Control Board on December 1, 1993. The issue was assigned number 94004 and placed on the Master Issues List (MIL) for work after fuel load as a Minimization of Personnel Errors item. This issue is now being handled in accordance with the requirements of BP-366 and will be assigned a Project Control Number after it has been prioritized by Operations and approved for work. No other instances of misplaced Issue Identification Forms associated with PACR closures could be identified and therefore, the failure to properly process the form associated with this issue is considered an isolated case.

Description of Observation, Report Section 2.3.2.2, Page 9

The team performed selected CCS walk downs to assist in evaluating hardware related PACR deficiencies and to assess the operational readiness of the system. Based on relative importance and safety significance, the following CCS components were included in the walk downs: CCS heat exchangers, CCS pumps, CCS surge tank, spent fuel pool heat exchangers, and excess letdown heat exchanger. As a result of these system walk downs, the following observations were identified.

Housekeeping was generally poor in that work areas contained excessive debris (plastic, tape remnants, torn cloth, etc.). Also, fire-retardant material was peeling off cable trays located in the vicinity of the CCS heat exchangers.

Two examples of inaccurate permanent equipment tagging were identified in which the CCS piping and instrumentation diagram (P&ID) did not match the installed equipment tag (spent fuel pool heat exchanger valves 0-70-529B and 0-70-528A). Another valve (2-FCV-70-3) did not have an equipment tag attached.

As determined by the team, deficient equipment labeling was previously identified by PAC/AQ as a concern (PACR-0034-2) and brought to the attention of TVA management. Recommended corrective actions are being monitored internally by TVA's Tracking and Reporting of Open Items (TROI) database (TROI tracking number OPS-92-003). As a result of this PACR, Procedure SSP-2.52 "Replacement and Upgrade of Plant Component Identification Tagging/Labeling," Revision 3 had been issued.

Two examples of poor work control were also identified. Specifically the limit switch compartment for valve 1-FCV-70-3 was open (missing cover plate) and the hand wheel for valve 2-FCV-70-3 was removed with the valve internals exposed. In both cases, it would be possible for foreign material to

enter either the limit switch compartment or valve internals and potentially degrade the valve. Use of a temporary covering would address this problem and was noted to TVA. Subsequent to the identification of these discrepancies, TVA initiated corrective work documents. Additionally, it was noted that these valves did not have a work control tag attached which would indicate that work is in progress; however, as determined by the team, work requests for the valves were identified on the CCS Master Tracking System.

Numerous examples of relatively old temporary equipment tags (2 to 3 years old) were also identified in the CCS. Some temporary tags were incompletely filled out (i.e., missing signatures and/or dates).

Approximately 3 feet of pipe insulation was missing around the 8-inch CCS discharge piping from the non-regenerative letdown heat exchanger. Similarly, no work control tag was found to identify if work was currently being performed on this section of piping.

TVA Response to Observation, Report Section 2.3.2.2, Page 9

The cited housekeeping observation (i.e., plastic, tape remnants, torn cloth, etc.) was found on a platform located above the Component Cooling System heat exchangers. Upon identification of this issue, the TVA organization responsible for this area was notified and the area was immediately cleaned and subsequently verified during the inspection. The damaged fire wrap issue had been identified by TVA prior to the inspection and documented on Work Request 118627. Additionally, items of this nature would have been discovered during the area turnover walkdown process controlled by Modification/Addition Instruction (MAI)-1.9, "Walkdown Verification for Modifications System/Area Completion and Damaged, Loose, or Missing Hardware." This walkdown had not been performed at the time the inspection occurred.

Work requests for the valves 1-FCV-70-3 AND 2-FCV-70-3 existed and were tracked on MTS but no work control tags were attached to the valves. SSP-6.02, "Maintenance Management System," defines the criteria for the routine placement of Work Request tags and provides the Designated Supervisor with the latitude to not place the tags on the equipment. As additional information, DCN W-21582-A has been issued to remove valve 2-FCV-70-3 and seal the housing with full face gasket and silicone casting.

In 1991 TVA initiated a program controlled by SSP-2.52, "Replacement and Upgrade of Plant Component Identification Tagging and Labeling." Green temporary tags have been used to identify components which do not have permanent tags. Since the use of an "enhanced" style of tags is being implemented at Watts Bar to replace the existing style of tags, it was decided that the green temporary tags would be left in place until the enhanced tags are available. This option was chosen over replacing the temporary tags with the old style of permanent tags. During the early stages of the SSP-2.52 program, TVA identified the problem regarding the improperly filled out temporary tags. Ongoing training provided to personnel involved in hanging temporary tags has alleviated this situation. While all tagging problems may not yet have been corrected, TVA is aware of the problem and is continuing to make progress in resolving it. Additionally, Plant Administrative Instruction (PAI)-5.01, "System Pre-Operability Checklist," requires that component labeling be completed in accordance with SSP-2.52 and that it be acceptable to Plant Operations prior to the turnover of a system to Plant Operations. This checklist has not yet been completed for the CCS system. Prior to Inspection 390/93-204, TVA recognized the problems with the system 70 insulation which had been removed for maintenance or inspections. Work Request

120408 was initiated in 1992 and will ensure, after the system is essentially complete, that the insulation is properly replaced.

Description of Observation, Report Section 2.3.2.3, Page 10

The CCS MTS items were reviewed for status of PACR corrective actions. As determined by the team, the PACRs that were closed because another tracking document was initiated such as a DCN or, were included in the Master Tracking List until closure. However, the team found more than 700 open items on the list, some of which involved systematic walk downs to assure compliance with programmatic corrective actions. **Because the CCS is considered essentially construction complete, the team was concerned that so many open items remained to be completed. The team made the observation that the turnover of the CCS to Startup Test could be adversely affected by this relatively large number of work items.**

TVA Response to Observation, Report Section 2.3.2.3, Page 10

It is TVA's policy to complete the physical work that could impact testing on systems prior to release from Modifications to the Startup and Test organization. The remaining hardware items are evaluated by Startup and Test prior to performing preoperational test to ensure test activities are not impacted. These items are completed and closed prior to turnover to the Plant for operation with minor exceptions. To illustrate this, the data available for the systems that have been transferred to the Plant indicate that the average number of open items has remained very low. Currently an average of 16 items per system have remained open on the 49 systems that have been turned over to the Plant. An analysis of the 700 open items which were open at the time of the inspection indicates that most (about 600) are related to documentation closure, testing-related activities not normally conducted during the Modifications work process, and hanger work not essential to the performance testing of the system.

Description of Observation, Report Section 5.1.2, Page 19

The team reviewed the TVA-Controlled Vendor Manual for Power Conversion Products, Inc., "Three Phase Thyristor Controlled Battery Chargers," Manual Number WBN-VTM-P319-0060, Rev. 6. The Engineering Requirements Applicability Form contained in this manual indicates that engineering concurrence is needed prior to deviating from vendor manual requirements. This vendor manual stated in part that: "The length of wiring between the battery and the charger should not exceed twenty feet. The load should be connected directly to the battery. These precautions will prevent destructive voltage surges from being conducted back to the charger." **The team noted that the configuration of the installed battery chargers was contrary to the vendor recommendation and that TVA could not demonstrate that it had considered the vendor requirements in TVA design documents. Subsequent to the team's observation, TVA Nuclear Engineering contacted the vendor to obtain concurrence for the TVA installation. A facsimile transmittal memo was sent from Power Conversion Products, Inc. to TVA on December 2, 1993, advising that the as-installed configuration described by TVA was acceptable relative to the precaution. TVA committed to include this information in its controlled vendor manual documentation.**

The team concluded that the installed battery chargers were consistent with design requirements, specifications, and capacities, with the exception of the above observation.

TVA Response to Observation, Report Section 5.1.2, Page 19

The statement in the manual, "The length of wiring between the charger and battery should not exceed 20 ft," was considered by TVA to be a recommendation and not a specific requirement. The recommendation was met, but through other means (e.g., bus filters). Although the approved design output takes precedence over the vendor manual, to ensure that this issue is properly addressed, the documentation of Power Conversion Products, Inc. acceptance of the installation will be included in an upcoming revision of the vendor manual.

Description of Observation, Report Section 5.1.3, Page 19

The team reviewed TVA Configuration Controlled Drawing 1-45W703-1 dated September 22, 1990, ("Wiring Diagrams," 125-V Vital Battery Board I Single Line Sheet 1, Circuit Schedule) which identifies Unit 1 fuse assemblies for Columns D and E as non-safety-related. ***The team noted that TVA is not including the 125-V dc load supply fuses, contained in the battery boards, as part of the System 236 turnover to operations. These non-safety-related attached load fuses provide Class 1E system protection for System 236 battery boards and will not be verified by TVA prior to turnover to operations.*** The team reviewed the "EMS, Safety Related Fuse Report for System 236," Report ID: EMSB 2301, dated December 2, 1993, and based on a random sample, the fuses in question were contained on the Master Fuse List and listed as Safety Class 1E. The team reviewed the TVA System Boundary Guidance Drawings, SMP-13.0, Rev. 0, dated June 14, 1993, which captures the method used for defining and documenting the boundaries of systems, subsystems, or areas turned over to start-up from modifications. Section 2.2B, "Electrical," states: "Breakers and switches...will typically be assigned to the boundary for which they provide service, i.e., the boundary would occur at the terminal on the line side of a breaker." However, this procedure continues with: "If the distribution system supplies the loads of multiple systems or subsystems, i.e., the boundary occurs at the terminal on the load side of the breaker." The latter is technically correct for the 125-V dc vital safety system. ***The team considers this observation of the current System 236 turnover boundary methodology as a poor application of safety-related systems technical requirements. In addition, the identification of the safety classification for the supply fuses as contained in the configuration controlled drawing versus the TVA fuse report may lead to confusion in subsequent operations, modifications, maintenance, or tests.*** With the exception of the above observations, the team concluded that the installed battery boards were consistent with design requirements, specifications, and configuration controlled drawings.

TVA Response to Observation, Report Section 5.1.3, Page 19

This observation noted that fuses for non-safety-related loads supplied from the 125V-dc Vital Power system are included in the boundary for the non-safety system rather than the power system boundary. The Inspection Team considered this practice questionable since the fuses perform the function of protecting the safety-related bus from the non-safety loads.

The system boundaries for the fuses supplying non-safety loads from the 125V-dc Vital Power System are consistent with that specified for general practice in TVA Procedure SMP-13.0, "Boundary Drawings." Section 2.2.B states that the load system boundary typically extends to the line side of the protective device unless the protective device supplies loads of more than one system.

TVA does not consider this practice to impose unusual or unacceptable safety concerns since the fuses included in the non-safety system boundaries are classified as safety-related and are controlled by TVA's fuse control program via the Master Fuse List. In addition, the fuses supplying non-safety loads are supplied by safety-related circuit breakers within the 125V-dc Vital Control Power System boundary. The circuit breakers provide additional protection of the safety bus from non-safety loads.

Regarding the potential for confusion in identifying the safety classification for the supply fuses, SMP-13.0 clearly defines the boundaries and this is the TVA instruction that Operations, Modifications, Maintenance or Startup use to do work.

Description of Observation, Report Section 5.1.4, Page 20

The team observed that temporary enclosures were constructed over the 125V-dc battery assemblies in the auxiliary building (El. 772 battery rooms). The purpose of these enclosures was to provide physical protection to the battery assemblies while modifications to the battery ventilation systems were performed. TVA was asked to provide the documented assessment for the temporary ventilation for hydrogen control concerns. The team made the observation that TVA had not documented this assessment prior to constructing the temporary enclosure. However, TVA did perform a documented assessment subsequent to the NRC request, and supplied a copy dated December 3, 1993, to the team. This documented assessment titled "Auxiliary Building El 772.0 125 V Battery Rooms Temporary Ventilation for Hydrogen Control," references Calculation EPM-RU-112288, Rev. 4. This TVA assessment concluded that the temporary enclosure and temporary exhaust configuration were adequate to prevent hydrogen gas accumulation. However, as a result of this assessment, the flexible duct was relocated to exhaust from the upper regions of the enclosure, rather than from the floor. ***The team observed that the calculation assumed that battery hydrogen generation rate at current conditions is not greater than for designed plant operating conditions. The team questioned the validity of this assumption because higher generation rates could be produced during deep discharge and recharge conditions. In addition, the team made the observation that the temporary enclosures were constructed of wood, with a plastic lining covering the structure. These enclosures would preclude the dispersion of fire suppression to the fire load source for the room. This condition was also not analyzed by TVA in their documented assessment.***

TVA Response to Observation, Report Section 5.1.4, Page 20

There were two questions associated with this observation. First, will the ventilation be adequate in a mode outside what was assumed to be normal operation (i.e., deep discharge/recharge conditions) and second, the enclosure would preclude the dispersion of fire suppression to the fire load source for the room.

For the first question, the following excerpt is from the Exide Stationary Lead-Acid Battery Systems manual, section 50.00 paragraph D.3.c:

"Significant amounts of hydrogen are evolved only as the battery approaches full charge."

This condition is within the bounds of the assumption of "normal operation" that was used in the original analysis. Deep discharge and consequent recharge conditions do not produce more hydrogen than normal operating conditions.

For the second question, the enclosure protecting the batteries does not meet the criteria of FPI-0100, Section 2.3 and therefore, does not require a Fire Protection Impairment permit. The sprinkler system in the vital battery rooms is a manually actuated system, and would require personnel to respond to a fire alarm for the area. However, the fire detection systems on Elevation 772.0 of the Auxiliary Building are currently not required and are considered inoperable at this time under generic FPI-0100 Appendix C, Fire Protection Impairment Permit Number C93-0466.

Description of Observation, Report Section 5.2.2, Page 21

During the course of the System 236 vertical slice inspection, the team identified multiple inconsistencies in the application of grounding straps or grounding cable jumpers across flexible conduits. As an example, a 4-inch diameter flex conduit connected to compartment 5 of the 480-V shutdown board 1B1-B did not have a grounding cable, but the other flexible conduit on the same panel did. TVA was asked to address this condition. TVA submitted Problem Evaluation Report (PER) No. WBP930020, approved on March 11, 1993, which addressed this issue. The PER cited previous problems with misapplication of and failure to follow the grounding requirements of TVA Procedure, Modification/Addition Instruction, MAI-3.1 and G-4, "Installation, Modification, and Maintenance of Electrical Conduit, Cable Traps, Boxes, and Containment Electrical Penetrations, Electrical Conductor Seal Assemblies, Lighting, and Miscellaneous Systems." This PER did not include the 125-V dc or ac system in the scope or "extent of condition." This PER was also signed off by the TVA Modifications (MODS) organization, that "MODS shall verify all corrective actions are complete."

In addition, the team noted that Section 3.2.6.1, Paragraph 3 of TVA Procedure G-49, Rev. 12, cites a September 30, 1993, completion date for correcting all missing flex conduit jumpers. The TVA PER indicated that electrical field engineers and electrical QC inspectors were retrained to the requirements of MAI-3.1 and G-4 pertaining to grounding of flex conduit with reoccurrence control signed off on March 22, 1993. In addition, this PER indicated that a TVA field verification was completed on May 12, 1993, that the TVA MODS organization implemented work orders to correct any flex conduit grounding found to be deficient, and that the TVA MODS organization verified all corrective actions were completed on June 10, 1993. ***Despite these corrective measures, the team identified an observation that there are still missing grounding jumpers on flex conduits inconsistent with the requirements of TVA Installation Procedure G-4, Rev. 12 and Modification/Addition Instruction MAI 3.1.*** In response to this issue, TVA stated that a final conduit walk down is being formulated in order to resolve any remaining conduit grounding jumper issues.

TVA Response to Observation, Report Section 5.2.2, Page 22

The corrective action for PER WBPER930020 included field verification of flex conduit grounding for transferred systems (6.9kV Shutdown Boards, 480V Shutdown Boards, 480V C&A Vent Boards, Battery Boards, 480V Reactor MOV Boards, and 480V Reactor Vent Boards). Work Requests were written for each board to correct any identified deficiencies. Work Request 179908 was written for 480V Shutdown Board 1B1-B under Work Order 93-06490-00. This PER also lists the 125V-dc Vital Battery Boards under the extent of condition. Work Orders 93-08145-00, 93-08148-00, 93-08154-00, 93-08156-00 will correct grounding deficiencies associated with these boards. Implementation of the corrective actions associated with the PER are currently not complete. Additionally, it was recognized from the PER that there had been some confusion about the grounding requirements, therefore, retraining of the electrical field engineers and Quality Control (QC) inspectors was completed on March 22, 1993.

In addition to the corrective action to the PER, a final Class 1E conduit walkdown that includes flex conduit grounding as one of the walkdown attributes, will be performed. This walkdown will provide additional assurance that class 1E flex conduit grounding is installed in accordance with site requirements. Also, this action will address systems, such as the 125V-ac system, cited by the team in this observation.

Description of Observation, Report Section 5.2.3, Page 22

During the System 236 walk down, multiple loose conduit cover plates were identified along with the following other miscellaneous items:

- Aux. Bldg. El. 772 Column A6/R loose cover on conduit at O-XSW-236-6AC-S
- Aux. Bldg. El. 772 column A5/R 125-V dc cover on conduit loose at PNL O-XSW-236-6D-S
- Aux. Bldg. El. 757 Column A5/R 125-V dc system inverter panel was painted shut
- Aux. Bldg. El. 757 Ceiling Column A4/R Room 757.0-A4 junction box needs cover installed
- Aux. Bldg. El. 772 Column A3/Q loose cover on conduit
- A sprinkler deflector pan is loose and hanging on the sprinkler head assembly

TVA generated work requests to correct these discrepancies and provided the team with copies. TVA also indicated that they are committed to perform a final walkdown as part of the TVA Area Completion Program. This process will be procedurally governed by Modification/Addition Instruction MAI-1.9, "Walkdown Verification for Modifications, System/Area Completion and Damaged, Loose, or Missing Hardware," Rev. 3. The team reviewed this procedure and found it an acceptable guidance document for performing general walkdown verifications. ***However, there is a general concern that the identified deficiency may be indicative of poor quality workmanship and housekeeping related to ongoing construction activities and that general walkdowns will not completely address the lack of attention to detail and poor plant conditions that were identified during this inspection.***

TVA Response to Observation, Report Section 5.2.3, Page 22

Upon identification of the conditions listed in this observation, TVA initiated Work Requests 242786, 242788, 242784, 242785, 242787 and 237973 to implement the required repairs. Similar loose parts conditions have been previously noted by TVA and to address this issue, Modification/Addition Instruction (MAI)-1.9, "Walkdown Verification for Modifications System/Area Completion and Damaged, Loose, or Missing Hardware," has been instituted. The items documented by this observation would have been addressed by the area walkthroughs to be performed as an element of this program. A presentation was made to the inspection team and documentation for the MAI-1.9 walkdown performed in the northwest quadrant of Pressurizer Room 126 was provided to the inspection team.

TVA acknowledges the inspection team's general concern with housekeeping. Measures have been taken through the implementation of SSP-12.07, "Housekeeping/Temporary Equipment Control," to address housekeeping deficiencies which may accrue during work activities. This, along with the walkdowns controlled by MAI-1.9 provide assurance that the cleanliness of the plant will be controlled.

Description of Observation, Report Section 5.2.4, Page 22

As a result of this review, which included field verification of hardware changes, the team generally determined that the PACRs were well developed and implemented with the exception of PACR-0171. This PACR documented a discrepancy involving the control and storage of the spool pieces used for flood control. The condition identified in the PACR was resolved and verified, and the PACR was subsequently closed. **However, during the team's examination of the storage of the spool pieces, it was determined that they were not appropriately staged.** Subsequent to the identification of this issue, PACR-0393 was initiated to address the control and storage of these spool pieces.

TVA Response to Observation, Report Section 5.2.4, Page 22

As noted in this observation, PACR-0171 was initiated to address the control and storage of the spool pieces and resulted in the initiation of Preventive Maintenance (PM) 1-PIPE-074-B. However, due to the movement of the storage containers to facilitate construction activities the proper storage of the spool pieces was not maintained in accordance with PM 1-PIPE-074-B. PACR-0393 was initiated to provide assurance that PM 1-PIPE-074-B was properly implemented.

This resulted in the following corrective action:

1. All spool pieces and their boxes will be removed from the present plant location.
2. The spool pieces and their associated hardware will be stored in cabinets in the Turbine Building at the turbine elevation. This location will not adversely affect the ability to utilize the spool pieces within the required response time frames. This task will be completed by April 15, 1994.
3. An assessment will be performed prior to fuel load to verify the ability to install the spool pieces. Based on the results of this verification, the storage location of a given spool piece may be changed if accessibility problems are encountered.
4. Preventative Maintenance (PM) procedure 1-PIPE-074-B will be revised by April 15, 1994 to reflect the new location and disposition of the spool pieces. This PM will be performed on a semi-annual basis.

ENCLOSURE 2

LIST OF COMMITMENTS

1. For the first issue cited by this deficiency, a DCN which establishes a setpoint at -15° F for the moisture switch will be initiated.
2. TVA agrees with the inspection team's concern regarding the need to notify system engineering to initiate component inspections. Therefore, revisions will be made to the appropriate Annunciator Response Instruction (ARI) to incorporate the required actions. Commitment NCO890050035 will be updated to track the revision to the ARI.
3. As additional information, DCN W-21582-A has been issued to remove valve 2-FCV-70-3 and seal the housing with full face gasket and silicone casting.
4. Prior to Inspection 390/93-204, TVA recognized the problems with the system 70 insulation which had been removed for maintenance or inspections. Work Request 120408 was initiated in 1992 and will ensure, after the system is essentially complete, that the insulation is properly replaced.
5. To ensure that this issue is properly addressed, the documentation of Power Conversion Products, Inc. acceptance of the installation will be included in an upcoming revision of the vendor manual.
6. Work Request 179908 was written for 480V Shutdown Board 1B1-B under Work Order 93-06490-00. This PER also lists the 125V-dc Vital Battery Boards under the extent of condition. Work Orders 93-08145-00, 93-08148-00, 93-08154-00, 93-08156-00 will correct grounding deficiencies associated with these boards.
7. In addition to the corrective action to the PER, a final Class 1E conduit walkdown that includes flex conduit grounding as one of the walkdown attributes, will be performed. This walkdown will provide additional assurance that class 1E flex conduit grounding is installed in accordance with site requirements. Also, this action will address systems, such as the 125V-ac system, cited by the team in this observation.
8. All spool pieces and their boxes will be removed from the present plant location. The spool pieces and their associated hardware will be stored in cabinets in the Turbine Building at the turbine elevation. This location will not adversely affect the ability to utilize the spool pieces within the required response time frames. This task will be completed by April 15, 1994.
9. An assessment will be performed prior to fuel load to verify the ability to install the spool pieces. Based on the results of this verification, the storage location of a given spool piece may be changed if accessibility problems are encountered.
10. Preventative Maintenance (PM) Instruction 1-PIPE-074-B will be revised by April 15, 1994 to reflect the new location and disposition of the spool pieces. This PM will be performed on a semi-annual basis.
11. Upon identification of the conditions listed in this observation, TVA initiated Work Requests 242786, 242788, 242784, 242785, 242787, and 237973 to implement the required repairs.