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DEC 20 1991

WBRD-50-390/91-14
WBRD-50-391/91-14

10 CFR 50.55(e)

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of) Docket Nos. 50-390
Tennessee Valley Authority) 50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - DEFICIENCY IN THE
APPLICATION OF 6.9 KV SPLICES - WBRD-50-390/91-14, WBRD-50-391/91-14 -
FINAL REPORT

The subject deficiency was initially reported to NRC Inspector K. Barr on March 21, 1991, in accordance with 10 CFR 50.55(e) as Significant Corrective Action Report (SCAR) WBSCA 910173. An interim report was submitted on April 30, 1991. Since that time, however, TVA has identified additional information which significantly lessens the significance of this item. The enclosed final report reflects this new information. No new commitments are made by issuance of this report.

If there are any questions, please telephone P. L. Pace at (615) 365-1824.

Sincerely,

John H. Garrity

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
DEFICIENCY IN THE APPLICATION OF 6.9kV SPLICES
SIGNIFICANT CORRECTIVE ACTION REPORT WBSRA 910173
10 CFR 50.55(e)

FINAL REPORT

DESCRIPTION OF DEFICIENCY

On February 15, 1991, during an NRC review of workplan N6536-1, it was discovered that questionable crimps that had been identified while performing this workplan during the December 1986 timeframe had been replaced without first documenting them as a separate adverse condition.

Workplan N6536-1 had been initiated to look for the misapplication of T&B 54500 butt splice connectors identified by Nonconforming Condition Report (NCR) 6536. This NCR documented potential improper use of this type connector in 6.9kV applications. The criteria for the inspection was to remove the insulation and inspect the splice on one conductor (phase) for each cable for acceptability. If this conductor failed to meet the acceptance criteria, each of the other two conductors was to be inspected. If the conductor that was inspected passed the acceptance criteria, it was to be reinsulated and the remaining two conductors were assumed to be acceptable.

No T&B 54500-series connectors were found. However in the course of conducting these inspections, questionable conditions were found with other type connectors. Of the 48 total splices, 26 had their insulation removed. On 10 of the 26 splices, crimps on the connectors were questionable and 11 of the splices had less than the 1/2-inch minimum exposed conductor length required by standard drawing SD-12.5.3. The responsible engineer evaluated the questionable crimps and decided to replace them while he had the component out of service. Due to the nature of this problem, this condition should have been documented and evaluated as a potential adverse condition. (Subsequently, this condition was identified as example 2 of Violation 390/91-03-05. This violation noted that inspection and rework documentation for four of the splices completed by workplan could not be found.)

At the time the subject workplan was implemented, the engineer responsible for performing the inspection did not interpret the applicable procedure as requiring the identification of these conditions separately from the NCR. Work was being completed under AI-2.8.3, Revision 12, "Nonconformances 10 CFR 50 Appendix B," and was interpreted by the engineer to mean that if work was in progress when a related condition was discovered, an additional adverse condition report was not necessary. The administrative instruction in place at the time for identifying and correcting adverse conditions stated that:

"The following areas do not necessarily constitute a WBN initiated NCR:
5.1.1.1 A deficiency identified as part of an in-process inspection or test or work performed as a modification or addition (report per AI-8.5 or AI-8.8)."

The "sample" was not expanded to include the remaining splices because the NCR specified certain criteria regarding the connectors and the method and number of splices to be addressed. The responsible engineer believed that he had exceeded the minimum requirement of the NCR for the number to be examined when he replaced the questionable crimps since the NCR required him to inspect the remaining 2 splices for a particular cable only if a T&B 54500-series connector was found. The "sample" was not expanded to include the remaining splices because the engineer believed that no recognized adverse condition was identified. The engineer believed the crimps were questionable and a field change request was already in place to address conductor exposure. The subsequent rework and inspections were performed to existing procedures with appropriate quality control verifications.

Past procedures and programs for identifying adverse conditions provided a limited range of alternatives for the individual identification of conditions adverse to quality. Due to the nature of the example identified, the population should have been expanded to include other cables of this configuration. A revision was made to the workplan to make provisions for the replacement of any improper splices.

SAFETY IMPLICATIONS

Based upon further review of Workplan N6536-1 for inspection of medium voltage splices, the data does support making the determination that all splices in the subject cables are acceptable. The problems identified which caused replacement of butt splice connectors were minor in nature and would not have been a problem (i.e., length of exposed conductor adjacent to the butt splice connector) since a gap had been verified to exist between the insulation and the connector. Butt splice connectors which have an excessive number of crimps or crimps near the bands are of concern. The root cause analysis for the subject Significant Corrective Action Report (SCAR) has determined that the engineer did find that some of the crimps were not crimped as he believed they should be. He performed an evaluation on the crimps and although they met minimum requirements, he was not satisfied with the quality of workmanship. To be conscientious, he decided to go ahead and replace the splices while he had the components out of service. One of the questionable crimped connectors was cut into a cross section and examined by the responsible field engineer and a design engineer. No deficiencies were found inside the connector. Because the crimps met the minimum requirements, leaving them uncorrected would not have adversely affected the operation of the plant.

CORRECTIVE ACTIONS

TVA has instituted a new Corrective Action Program effective February 11, 1991 which, among other things, provides a wide range of avenues for identifying adverse conditions. This new program enhances personnel awareness of adverse conditions and provides various methods for identification. In addition, it allows individuals to document any questionable condition as a Problem Evaluation Report (PER) and provides for feedback to the initiator regarding the status of the adverse condition. Indoctrination of engineers and managers to this program was completed February 1991.

Work control processes at WBN have undergone a complete restructuring to align the procedures, both administrative and technical, with the procedures and processes used at TVA's Browns Ferry Nuclear Plant. These procedures and processes have proven to be successful in the restart activities for that site. The new processes will ensure a minimum of 3 checks for field safety-related installations, as the field engineer, the craft foreman, and the quality control inspector will be required to verify adherence to procedures and adequate craft skills.

Appropriate personnel have received training on these procedures as part of the construction restart effort, with emphasis on personnel responsibilities and requirements.

In addition, the following specific corrective actions were identified in the response to Notice of Violation 390/91-03-05. However, based upon the evaluation performed for the SCAR which is the subject of this 10 CFR 50.55(e) report, the discussion after each action will provide additional clarification of these actions.

1. The 4 splices not addressed by the documentation in Workplan N6536-1 for NCR 6536 may not exist at the locations indicated by the NCR due to cable rework. A walkdown of the subject cables will be performed to verify the existence or absence of the 4 splices. If the 4 splices do exist, they will be addressed and reworked as necessary based on the acceptance criteria of NCR 6536.

Discussion:

Further research into the subject workplan has determined that the 4 splices discussed above did not exist. Because the work instructions were based on the locations of splicing activities, single identified splices with phases in different manholes appeared to be additional splices. The required documentation of each splice is in the workplan. Accordingly, no documentation is missing and corrective action is not required.

2. TVA will inspect Workplan N6536-1 splices not previously inspected for acceptable crimping and conductor exposure. This will include the splices not inspected when the first splice was found acceptable. These splices will be inspected and evaluated as soon as possible, but no later than applicable system group completion.

Discussion:

The engineer's evaluation of the questionable crimps and subsequent replacement were precautionary. When one of the worst questionable crimps was cut into a cross section and evaluated by the field engineer and a design engineer, no deficiencies were found to warrant further inspection or replacement of the other conductor splices not inspected. Accordingly, this action is no longer considered necessary.

3. Field investigations performed as a part of the corrective action for SCAR WBSCA 910173 will provide the basis for any further actions. Corrective actions will be completed as soon as possible, but no later than system group completion.

Discussion:

Field investigations for crimps of a similar questionable nature are being performed as part of the corrective actions associated with the replacement of the Raychem splice effort and being tracked by SCARs WBP 880676SCA and WBP 900450SCA. Please note SCAR WBP 900450SCA was reported as Condition Adverse to Quality Report (CAQR) WBP 900450 on Construction Deficiency Report (CDR) 90-04. Any other questionable conditions identified will be addressed under the Corrective Action Program. Therefore, no corrective actions or further extent of condition review will be necessary for this SCAR.