

4.5.2 Pipe/Fittings Findings, WBN (continued)

F. Configuration

This specific concern indicated that a large diameter pipe in the unit 1 radiochemical lab may be deformed.

A walkdown of the general location (assumed to be the radiochemical lab on elevation 713 in the Auxiliary Building) revealed only one system of piping in the area larger than 3 inch dia.. That was the system 31 (HVAC) round exhaust duct which was heavily insulated. No obvious deformities were noticed; however, the insulation could have masked a small deformity if it existed.

The cognizant ONP Mechanical Test Unit (MTU) engineer stated that the system in question had recently been balanced in response to a request from personnel having troubles closing/opening a door in the area due to excessive pressure differential. The system was found out of balance and attributed to additional air filters being placed in the system. The system was rebalanced according to design flow rates with no problems encountered; however, no documentation of this test was made nor required. According to both the ONP and DNC system engineers, this was a non QA system which had no documented installation inspections. Only a nondocumented "engineering inspection" was performed to verify the installation conformed to the applicable drawings. For safety reasons, the MTU engineer stated that "face velocity" was the important consideration. A face velocity of 125 fpm was necessary at each hood in the lab. The MTU engineer stated that this velocity would be verified. The cognizant MTU engineer also performed a visual inspection of the ductwork and found no obvious deformities.

The ONP MTU performed a documented flow test of the radiochemical lab ventilation system. The test was deficient. The design flow was 5600 cfm; however, supply and return flow rates of 4537 cfm and 4800 cfm were recorded. An MR was generated.

G. Procedure Violation

The knowledgeable DNC MEU engineer was familiar with the described problem (pressure tests were not applied on many NPP-1 ASME Code data forms for containment penetrations) and stated that two NCRs had been generated - NCR 5609 and NCR 6420.

4.5.2 Pipe/Fittings Findings, WBN (continued)

This evaluation found that NCR 5609, Revision 0 was complete. It had been written against the applicable unit 1 and unit 2 penetrations on April 27, 1984. It was closed on a use-as-is basis on May 22, 1984. NCR 6420, Revision 0, had been written against the unit 2 penetrations, not addressed by NCR 5609 corrective action on October 28, 1985, and was still open.

The cognizant DNC N5 engineer explained that the weld which neither TVA nor the vendor had hydrotested was a circumferential vendor weld hidden from view by the guard pipe (part of the penetration). NCR 6420, Revision 0, nonconformed 32 unit 2 penetrations which were hydrotested after NCR 5609, Revision 0, was closed. The hydrostatic test pressure packages for the 32 unit 2 penetrations listed in NCR 6420 did not have specific instructions to alert the inspector to visually inspect the subject internal vendor weld. For information, NCR 6420 listed the one unit 2 penetration previously addressed by NCR 5609 as well as the 25 unit 2 penetrations which had not yet been hydrostatic tested and were therefore not nonconforming. As an interim response to NCR 6420, RO, the Watts Bar Engineering Project stated in part (memorandum B45 851202 256):

It is OE's position that the 32 primary containment vessel piping penetrations for unit 2 previously pressure-tested and accepted by OC can be dispositioned use-as-is The 25 penetrations that have not been pressure-tested by OC shall have their hydrostatic test packages clarified to require the inspector to examine the inaccessible internal weld Inspection of the inaccessible weld during the pressure-test for the 25 remaining penetrations will serve as a check for the 32 unit 2 penetrations and the unit 1 penetrations where the inaccessible weld was not examined.

DNE modified their response in memorandum B26 860429 014 from the WBN Engineering Project Manager to the WBN OC Project Manager. The memorandum stated in part:

4.5.2 Pipe/Fittings Findings, WBN (continued)

DNE's recommended disposition to NCR 6420 is use-as-is based on a [future] successful examination for leakage of the internal process piping welds located in the primary containment vessel piping penetrations listed in NCR 6420 RO For those penetration assemblies previously hydrotested, the weld should be examined with the system held at design pressure, or three-fourths of the hydrostatic test pressure, whichever is greater A meeting was held at WBN on January 24, 1986, involving the Division of Nuclear Construction (DNC), DNE, and Hartford personnel to discuss alternate methods to be used in the examination of the inaccessible welds. As a result of the meeting and field-validation work performed by DNC and DNE personnel, several methods will be available to DNC to perform the required examination for leakage of the inaccessible welds. As indicated in the referenced memorandum, DNC can perform an examination of the internal weld on any penetration listed in NCR 6420, RO, where the distance of the internal weld to the end of the guard pipe is short enough to allow observation of the weld (less than six feet). If insulation is present around the process line, DNC may remove the insulation to expose the weld for examination. Replacement of the insulation inside the guard pipe will be required only when the portion of the process line outside the guard pipe is required to be insulated. TVA drawing 47W331-1 will be revised per ECN 6309 to add a note allowing the removal of the insulation and indicating when replacement of the insulation will be required. . . Penetration assemblies listed in NCR 6420, RO, that have internal welds located more than six feet from the end of the guard pipe shall be remotely examined for leakage utilizing a fiber optic device (fiberscope). . . . To gain access to those penetrations with internal welds greater than 20 feet from the end of the guard pipe (penetrations 8A, 8B, 8C, 8D, 12A, 12B, 12C, 12D, 13A, 13B, 13C, and 13D), the guard pipe running through the fan room should be cut to allow access for the tubing and fiberscope. . .

After the examination has been performed, the removed segment of guard pipe shall be installed in accordance with TVA Class K construction requirements. . . .

4.5.2 Pipe/Fittings Findings, WBN (continued)

At the time of evaluation, NCR 6420, Revision 0, was open pending arbitration between NRC and TVA relative to the acceptability of the unit 1 penetration welds (use-as-is).

Conclusions

A. Temporary Support

The concern was not factual since no pipes of the specified diameter (30 inch) were located in the described area. A 24 inch dia. pipe in the described area had undergone hanger rework; however, the cognizant engineer was not aware of the pipe moving the cited 3 to 4 inches. The hangers for this section of pipeline in the Turbine Building were temporarily pinned. According to G-43, they will be permanently set at time of hydrostatic testing and any hanger discrepancies will be identified and corrected at that time.

B. Material Substitutions

The concerns relative to different schedules of pipe being welded together were factual; however, the NSRS evaluation concluded " . . . various piping systems have been designed with change points where safety classification, pipe size, schedule, or material sometimes changed." They went on to state, "changes in safety classification, pipe size, schedule, or material were made to suit design conditions." This evaluation concurred with those conclusions.

The concerns related to discrepancies with the ERCW pipeline between the pumping station and the plant were not factual. The NSRS evaluation found no evidence or documentation of leaks, or pump damage because of water starvation. They also determined that the section of pipe in question had always been specified as carbon steel and not stainless. This report concurred with those conclusions.

The two specific concerns related to incorrect materials and leaks in the 5th Diesel Generator Building sprinkler system, and the use of "Superglue" by craft personnel were not found to be factual. The ERT evaluation found no supporting evidence that "Superglue" had been utilized to hold gaskets to flanges. This evaluation report concurred with those conclusions.

4.5.2 Pipe/Fittings Findings, WBN (continued)

The concern that temporary materials were improperly placed into permanent service in the intake pumping station was not found to be factual. The construction superintendent named by the CI was not responsible for that work site during the specified timeframe nor were any work activities of the specified type being performed at that time.

No evidence was found to support the validity of the concern which stated that a temporary drain line had been left permanent without proper documentation or inspection. All applicable lines installed had been properly documented on the relevant drawings and the appropriate inspections had been conducted and documented.

The concern which cited "the wrong size expansion joint is installed on a . . . pipe in the "Argon Pit" in the Auxiliary Building, unit 2 . . . the Argon Pit is east of the south valve room one level below elevation 757," was not found factual. No area/room called the "Argon Pit" was known to exist at the plant nor was an area/room found in the described locations that could have been construed as an "Argon Pit."

C. Leaks

The evaluation of a concern relating that the SS patches in the 48 inch dia. section of the cooling tower blowdown line "did not work very well" was inconclusive. Leakage was evident in the downstream 66 inch dia. section of piping which had not been patched. No evidence existed that the 48-inch (patched) section of piping leaked; however, this section of piping was being included in the ongoing evaluation of the downstream leakage problem by ONP and DNE.

A concern citing a leaking pipe in the Auxiliary Building elevation 692 could have been factual; however, no evidence of the leak existed at the time of the NSRS evaluation. Adequate plant instructions were in place to address this type of normal maintenance activity as several leaks on that elevation had been addressed under MRs during the concern timeframe. An NSRS evaluation did not substantiate a concern that the ERCW supply line between the pumping stations and the plant had a leak. This evaluation report concurred with their conclusion.

4.5.2 Pipe/Fittings Findings, WBN (continued)

D. Hydrostatic Testing

Two concerns relative to hydrostatic testing, damage to piping due to the use of excessive pressure, and documentation not in accordance with procedural requirements, were found to be not factual by NSRS evaluations. One concern that a hydrotest was conducted improperly due to a pump being run throughout the test to maintain pressure was factual but technically and procedurally acceptable. The NSRS evaluation found that this practice was acceptable according to all applicable codes and procedures. This evaluator concurred with their conclusions.

E. Clearance

A concern citing an interference in the unit 1 Reactor Building between an access ladder and a 2 inch dia. pipe was not factual. Walkdowns of both the unit 1 and unit 2 cited interference locations revealed the required clearance at both locations.

F. Configuration

The concern stating "a large diameter pipe may be deformed" in the unit 1 "radiation lab" was not found factual. No obvious defects were found in the round ventilation duct; however, flow rates in the non QA vent system were found deficient. The necessary exhaust hood velocities were obtainable and were being verified under Engineering Section Letter (ENSL) M1.9 by the ONP MTU.

G. Procedure Violation

The concerns relative to pressure tests not being applied on many NPP-1 ASME Code data forms for containment penetrations was found factual. Two NCRs had been generated to address this problem. The first NCR was closed on a use-as-is basis; however, the second NCR's corrective action called for hydrotesting the vendor welds in question. The second NCR remained open pending hydrotesting and arbitration between the DNC N5 unit and NRC relative to the acceptability of the unit 1 penetration welds.

4.5.3 SQN Specific

Discussion

Three of the concerns identified at WBN relative to material substitutions and a procedure violation within the mechanical areas were evaluated as potentially generic to SQN. This portion of the evaluation addressed the applicability of IN-85-211-002, WI-85-053-012, and IN-86-282-004 to SQN.

The two areas of concern were:

- A. The ERCW system was installed using material other than the design specified SS. (Evaluated under Material Substitutions).
 - B. Pressure tests were not applied on many NPP-1 ASME Code Data Forms for containment penetrations. The penetrations were installed and hydrostatic tests were never verified and/or documented. (Evaluated under procedure violation).
- A. Material Substitutions

The employee concern files, including QTC expurgated files, were reviewed for any more detailed information and other reports related to these concerns. No additional information or reports were found.

NSRS Investigation Reports I-85-166-WBN and I-85-118-WBN were reviewed to determine if evaluation results were applicable to SQN. These NSRS reports addressed concerns related to the ERCW piping system not being SS, as required, at WBN. The evaluation addressed the portion of the ERCW system between the Intake Pumping Station and the plant buildings. It was determined that this portion of the piping was always supposed to be carbon steel. The NSRS evaluation addressed the area of yard piping because the description given by the CI was so vague and on another similar concern this was the area described. QTC had contacted the CI for additional information, but the CI gave no further information.

The WBN specific evaluation of this concern (section 4.5.2.A of this report) evaluated the concern from the point of view that the area of concern was the ERCW yard piping from the Intake Pumping Station to the plant buildings. The yard piping was addressed because of the concern description within another concern (IN-85-211-001)

4.5.3 Pipe/Fittings Findings, SQN (continued)

by the same CI on a similar subject. The ERCW system yard piping at WBN was originally designed as carbon steel and was installed as carbon steel. The evaluation was applicable to SQN, since the ERCW yard piping system was a similar design. The SQN evaluation by the WBN ECTG included the ERCW system piping inside the plant buildings as an additional scope to the concern, because of the changes to that portion of the ERCW system at SQN, to insure that all questions involving possible SS versus carbon steel would be evaluated relative to the ERCW system.

Cognizant DNE Engineers over the SQN ERCW System Mechanical Piping Design Evaluation Team were interviewed to determine the original pipe design requirements and the existing pipe status.

The cognizant DNE Engineers were in the process of taking marked up as-built drawings 47W450 and 47W845-series and evaluating the actual as-built condition of the pipe versus design of ERCW system piping.

The ERCW system piping was originally designed and installed at SQN as carbon steel pipe, both yard and plant buildings. The plant was fuel loaded and put into operation under the carbon steel design.

ECN L5009 Revision 0 was issued on February 24, 1981, requiring portions of the ERCW system piping inside plant buildings to be changed-out from carbon steel to SS because of corrosion problems experienced by carbon steel piping in raw water systems.

SQN implemented the ECN L5009 change on a piecemeal basis as outages and manpower permitted. The complete status of the pipe change-out was not adequately known. DNE had SQN Modifications Unit perform a walkdown of the system and make a set of drawings depicting where the SS pipe had been installed. The DNE Mechanical Pipe Unit was in the process of evaluating the as-built piping.

DNE will issue an ECN in approximately two months to document the piping that has been installed as SS or carbon steel. The ECN will also leave the pipe presently installed as carbon steel in its present configuration. Pipes that are to be changed-out to stainless in the future, will be initiated from a new ECN with a defined scope.

4.5.3 Pipe/Fittings Findings, SQN (continued)

ECN 6534 and ECN 6560 have already been issued to document the fact that part of the ERCW system was left as carbon steel instead of replaced by stainless.

Marked up as-built drawings of the 47W450 and 47W845 series were reviewed to determine physical status of pipes on the ERCW system inside the plant buildings. They showed that a large portion of piping remained as carbon steel.

Drawings for SQN, 17W302 series, show the original designed and as-built ERCW system yard piping was carbon steel.

The 17W302 series ERCW system yard piping was not included in ECN L5009 and was never intended to be changed to SS piping.

Cognizant engineers in the Civil Piping Analysis Group, SQN Project, used the marked up as-built drawings to perform the necessary analysis to qualify the as-built piping, whether carbon steel or SS. The analysis performed thus far, had verified that the piping not changed-out on the ERCW system could remain as carbon steel.

The ECN that will be issued by the SQN Mechanical Piping Unit will incorporate all analysis performed by the Civil Piping Analysis Group. This ECN is not required for the restart of either unit 1 or 2.

The above information was confirmed through a review of the change documentation (ECN L5009, ECN L6534, and ECN L6560). ECN L5009 was initiated on February 24, 1981, requiring the change-out of the carbon steel piping on the ERCW system to SS for the majority of the system lines that were 2 inches in dia. and smaller. Other ERCW lines were to be changed-out where system performance had deteriorated or calculations had indicated potential problems existed. ECN L5009 was intended to apply to plant building piping only, not yard ERCW piping. ECN L6534 was initiated on November 15, 1985, to resolve ERCW drawing discrepancies and remove rigorously analyzed piping from design drawings that had not yet been changed-out from carbon steel to SS. ECN L6560 was initiated on December 18, 1985, to change ERCW supply piping routed to the upper containment vent cooler to carbon steel. The piping previously had been designated to be changed from carbon steel to SS on ECN L5009, but SQN had never actually made the change. ECN L6534 and ECN L6560 were initiated to leave the pipe as carbon steel as originally designed.

4.5.3 Pipe/Fittings Findings, SQN (continued)

B. Procedure Violation

QTC expurgated files were reviewed for more detailed information. They revealed no additional information.

The WBN specific portion of this report (section 4.5.2.B.) evaluated the concern of pressure tests not being applied on many NPP-1 ASME Code data forms for containment penetrations. The evaluation found that two NCRs (NCR 5609 and NCR 6420) had been generated against the problem at WBN. The evaluation found that NCR 5609 was closed on a use-as-is basis and NCR 6420 was still open.

NCR 6420 was open pending arbitration between the NRC and TVA relative to the acceptability of the unit 1 penetration welds (use-as-is). The WBN ECTG evaluation applied to SQN with respect to the WBN NCR's possibly being generically applicable to SQN.

NCR 6420 was forwarded to SQN by a memorandum from the Chief of Nuclear Engineering to the SQN Engineering Project Manager, (B45 860311 255) for a SQN potential generic condition evaluation of this condition adverse to quality identified on WBN. The evaluation for potential applicability to SQN was forwarded to the ONP SQN Codes and Standards Unit.

The cognizant engineer in ONP Codes and Standards Units for SQN was interviewed to determine the status of NCR 6420 with regard to SQN. The ONP Codes and Standards Unit for SQN was in the process of performing an operating experience review on WBN NCR 6420. He had already determined that the condition did exist at SQN since the same vendor, Tube Turns, was the supplier and since the deficient criteria, with respect to hydrotesting the penetrations, was not identified until 1984. His evaluation was scheduled for completion by August 16, 1986. An SQN NCR will be generated at that time as appropriate. NCR 5609 was being evaluated, along with NCR 6420, for generic applicability to SQN.

Conclusions

- A. The concern relative to the ERCW piping required to be SS was partially accurate with respect to SQN. Portions of the ERCW piping system within the plant buildings were

4.5.3 Pipe/Fittings Findings, SQN (continued)

changed from the original design of carbon steel to SS on ECN L5009 in February, 1981. Some of the piping was changed-out as plant operations permitted. However, SQN DNE was in the process of analyzing the ERCW system as built piping and initiating a new ECN to leave the pipes as they existed. The ERCW yard piping was originally designed and installed as carbon steel. Even though some piping remained carbon steel, no problem existed with operations and safety of the plant.

- B. The WBN concerns relative to pressure tests not being applied on many NPP-1 ASME Code Data Forms for containment penetrations was accurate and potentially generically applicable to SQN. NCR 6420 and NCR 5609 were written against the problem at WBN and dispositioned use-as-is, with NCR 5609 closed and NCR 6420 still open. The two NCRs were being evaluated by the SQN ONP Codes and Standards Unit for disposition with regard to SQN. The evaluation was due to be completed August 16, 1986. SQN NCRs will be generated at that time as appropriate.

4.5.4 BFN Specific

Discussion

Only one issue within the Pipe/Fittings element was determined to be generic to and evaluated at BFN. The Procedure Violation issue was relative to pressure tests not applied on many NPP-1 ASME Code Data Forms for containment penetrations. The penetrations were installed and hydrostatic tests were never verified and/or documented.

Potential Generic Condition Evaluation Memorandum (B45 860311 255) was sent to the BFN Design Project Manager from the DNE Chief Nuclear Engineer informing him of OC NCR 6420, Revision 0. The text of this generic memorandum (OEP-17 Revision 3, Attachment 5) read:

The attached document OC NCR 6420RO describes a condition adverse to quality which was identified on WBN. Please examine the attached to determine if this condition exists in your area of responsibility. The bottom portion of this form should be completed and this memorandum returned to me within two weeks of the above date. [March 11, 1986] Should this condition be found to exist in your area of responsibility, within two weeks of the

4.5.4 Pipe/Fittings Findings, BFN (continued)

above date, the generation of a problem identification report or a significant condition report per OEP-17 is required.

The bottom (reply) portion of this form provided two reply alternatives, (a) or (b);

We have examined our activities in the area of concern and found that the condition:

(a) Does not exist

(b) Does exist

PIR/SCR No. _____

The BFN DNE Project Manager chose to type in a third alternative: (c) send transmittal memorandum to ONP Project Manager . . . (B22 860325 012). It stated in part, "This documentation is being transmitted for your information and evaluation of the condition as it may apply to BFN." The transmittal went on to state, "Please provide me with a tracking number noting the receipt of this memorandum and acknowledging your handling of the matter. OE will be pleased to assist you in the review of life of plant records to determine the applicability of this condition at BFN." Per the BFN Engineering Project Chief, once they sent their Potential Generic Condition Evaluation Transmittal to ONP, they no longer tracked it. He voiced that they only stated "provide me with a tracking number" in their memorandum to prompt ONP to track it.

According to the BFN Site Director's Tracking Program, item number R35-860326-021, the NCR 6420 Revision 0 transmittal memorandum was received from the BFN Design Project and forwarded to the BFN Compliance Supervisor on March 26, 1986. This item was still listed as being "open" in the Tracking Program.

According to the cognizant Compliance Engineer, at the time of this evaluation, the generic applicability of NCR 6420, Revision 0, to BFN had not been addressed. He stated that the responsibility for addressing this issue had recently (after July 3, 1986) been transferred to the OER (Operating Experience Review) Group. He also stated that the Compliance organization had no procedure/program in place governing the handling of Potential Generic Condition Evaluation memorandums received from DNE.

4.5.4 Pipe/Fittings Findings, BFN (continued)

Conversations with the responsible OER Group Engineer revealed that the OER Group had not yet begun to address the generic applicability of NCR 6420 Revision 0 to BFN. According to the OER Group Supervisor, BFN Standard Practice BF-21.17 governed how these memorandums were handled by ONP.

BF-21.17 dated August 7, 1985, was reviewed. It contained no reference to or instructions for the processing of these Potential Generic Condition Evaluation Memorandums from the BFN Engineering Project.

Site Directors Standard Practice SDSP 15.2 Revision 1 addressed the handling of CAQs by Power Operations Review Staff (PORS) identified by DNE as applicable to BFN. It stated in part, "CAQs are submitted to and processed by BFN as Engineer Reports (ERs)." It listed OEP-17 "Corrective Action" as its only referenced document. There was made no mention of Potential Generic Condition Evaluation Memorandums from the Design Project or vehicle for handling these memorandums within this Standard Practice.

A review of the Site Director's Tracking Program revealed that twelve (12) Potential Generic Condition Evaluation Transmittal memorandums had been received by the Plant Manager's Office between March 26, 1986 and June 26, 1986. Of these, four were still listed as "open".

Conclusions

At the time of this evaluation (July 1986), no action had been taken at BFN to address the potential generic applicability of WBN NCR 6420, Revision 0, to that site.

The BFN DNE Project had received Potential Generic Condition Evaluation Memorandum B45 860311 255 from the Chief Nuclear Engineer informing him of OC NCR 6420 Revision 0 which documented the concern issue at WBN. Contrary to the governing procedure OEP-17, Revision 3, the BFN Design Project did not determine if this CAQ existed at BFN, nor did they implement a tracking program for meeting the stated two-week evaluation timeframe. The BFN Design Project attempted to transmit the responsibility for evaluating the BFN applicability of this CAQ to the ONP Site Director via memorandum B22 860325 012. The BFN ONP organization had no procedure/program for performing this evaluation and no attempt to do so had been made.

4.5.5 BLN Specific

Discussion

As at BFN, only one WBN issue in the area of pipe/fittings was determined to be potentially generic to BLN. However, three additional BLN specific concerns were also addressed in the pipe/fittings element.

- The generic issue of pressure tests not applied on many NPP-1 ASME Code Data Forms for containment penetrations was documented and addressed at WBN under WBN NCR's 5609 and 6420. As stated in section 4.5.1, "Pipe/Fittings Findings - Generic," the cognizant DNE engineer informed BLN of the potential generic CAQ, NCR 5609, Revision 0, by phone. The cognizant BLN engineer informed DNE that the CAQ did not exist at BLN since their hydro procedures addressed the inspection of the vendor weld in question during the system hydro tests. The BLN Design Project, as the other projects, was formally informed of WBN NCR 6420 Revision 0, via Potential Generic Condition Evaluation memorandum B45 0311 255 as specified in OEP-17, Revision 3.

Based on discussions with the cognizant BLN, DNC, and DNE Design Services personnel, the BLN Design Project promptly responded (memorandum B21 860325 001) stating that the CAQ did not exist at BLN. They justified this statement stating in part, "Although the penetration assemblies are similar in design, the process lines inside the guard pipe are not insulated [as at WBN and SQN] which leaves the inaccessible welds exposed for inspection. . . . BLN CONST is aware of the welds existence and have revised their QCPs requiring their inspectors to examine these welds during hydrostatic testing"

According to interviews with the cognizant DNC MEU engineer and a review of the applicable QCP (QCP-10.4 Revision 14 and Construction Test Procedure CTP-7.6 Revision 5 "Hydrostatic Testing"), the statement that ". . . BLN CONST . . . [has] revised their QCPs requiring their inspectors to examine these welds during hydrostatic testing.", was incorrect. Conversations with a knowledgeable engineer, a CONST QC inspector, and the BLN Authorized Nuclear Inspector (ANI) supported the statement that "BLN CONST is aware of the welds existence. . . ."; however, the ANI stated that QC inspectors have had to be reminded on several occasions to specifically inspect the hidden vendor weld during applicable hydros.

4.5.5 Pipe/Fittings Findings, BLN (continued)

BNP-CTP-7.6 Revision 5, Attachment A, "Hydrostatic Test Procedure Package", step 3.C stated in part, "(ENG) verifies that all areas to be examined for leaks are uninsulated, exposed, and have suitable access for examination." Step 14 of the same procedure stated, "(INSP) Perform system leak checks and verify all welds, bolted flanges and threaded connections, and regions of high stress are acceptable."

- Within the issue of Hydrostatic Testing, two BLN specific concerns were addressed. One concern (XX-85-068-001) cited: "Two pressure gauges were over pressurized prior to performance of phase 2 of hydrostatic test 1KC H001. These gauges were not properly recalibrated, and phase 1 of the hydrotest was not reperformed, despite ANI request to do so. NCR 3075 dispositioned this test. . .". The other BLN specific Hydrostatic Testing concern (QCP-10.35-8-15) stated that water in the Fire Protection System (FPS) would react with air after testing or use and promote the rusting of pipes and valves.

Relative to the specific hydrostatic test (1KC H001) concern, a review of 1KC H001 revealed a detailed description of events prior and post the test pressure gauge over pressurization on page 93A. NCR 3075 was reviewed and found closed. The correction method stated in part, "Since the post calibration test on these gauges has been highly accurate prior to the gauge being damaged it is recommended that the hydro data taken [phase 1] with these gauges (1KC-H001) be accepted and the test gauge retired." Contrary to the stated concern, the correction method was reviewed and approved by the ANI as documented in section 6 of NCR 3075.

Relative to the FPS corrosion concern, a review of the BLN concern file for concern BLN-QCP-10.35-8-15 revealed that a previous evaluation had been conducted. The previous evaluation stated in part, "Office of Engineering was contacted about this concern. They stated that because of seismic and corrosion considerations, the type of fire protection system at BLN is the 'dry pipe system'." The evaluation report went on to state, "The dry pipe system is pitched to facilitate drainage. Although this will not prevent rust, it will be kept to a minimum, and industry experience has shown it will not appreciably affect the operation of the system. Additionally, after the plant is in operation, fire protection is occasionally flushed to remove rust."

4.5.5 Pipe/Fittings Findings, BLN (continued)

The BLN Mechanical Design Group Engineer responsible for the previous evaluation report was interviewed for clarification of his statement that ". . . industry experience has shown it [rust] will not appreciably affect the operation of the system.". He stated that this information came from knowledgeable DNE MEB Fire Protection Group Engineers.

Appendix A to the NRC APCS BTP 9.5-1, "Guidelines for Fire Protection . . .", was reviewed for relevant information/requirements. It stated in part, "Lined steel or cast iron pipe should be used to reduce internal tuberculation. Such tuberculation deposits in an unlined pipe over a period of years can significantly reduce water flow through the combination of increased friction and reduced pipe diameter. Means for treating and flushing the systems should be provided. . .".

BLN Standard Practice BLM 3.5 defined the responsibilities and frequencies for testing and maintaining transferred fire protection systems and equipment. The instruction stated in part, ". . . the maintenance, inspection, and testing of Attachment 1 shall be conducted." Attachment 1 specified the following relevant activities:

Every 31 days, the Operations section is responsible for flushing the sprinkler system supply headers through the supplied flush lines.

Also, two such flushes a year shall coincide with the semiannual flush of the Raw Water System using the RWS pumps instead of the fire pumps.

Annually, the Operations and Mechanical Maintenance Sections are responsible for performing the following inspections and tests:

- A. Test Automatic deluge/preaction valves for proper operation. Verify proper initiation of fire pump start signal and actuation of alarms. Check breather ports for blockage and solenoid valve strainer for cleanliness. Inspect for system integrity and perform at least one of the following checks on the nozzles for:

4.5.5 Pipe/Fittings Findings, BLN (continued)

Interior Systems

1. Closed nozzle systems - remove and inspect a representative number (minimum of four) of nozzles for signs of blockage or rust.
2. Open nozzle systems - use compressed air and check for signs of blockage or rust and pressure switch actuation.

Exterior Systems

1. Same as 1 for interior systems.
 2. Same as 2 for interior systems.
 3. Take protected equipment out of service during the test of the automatic deluge valve described above.
- B. Test manual water suppression systems by cycling the supply valve with the system isolated and the bypass to drain valve open. Check for signs of leakage, physical damage, accessibility, and strainer cleanliness. Perform at least one of the nozzle checks listed for interior system nozzles on automatic deluge/preaction systems.

A memorandum from the Manager, Nuclear Licensing, to Chief, Nuclear Engineering Support Branch (84 0104TO 426) titled, "WBN Units 1 and 2 - TVA Compliance with Appendix A to the BTP 9.5-1, Guidelines for Fire Protection", was found to be relevant and was reviewed for information. Paragraph E2, "Fire Protection Water Supply Systems, Item (a)," stated in part, ". . . cast iron and unlined steel pipe is used in the system. Line sizes are extensively conservative and because TVA's extensive testing and flushing program, tuberculation has not proved a serious problem at previous plants . . .". BLN's compliance memorandum was not available at the time of elevation; however, the WBN memorandum's previous experience statement was also applicable to BLN.

4.5.5 Pipe/Fittings Findings, BLN (continued)

- Within the issue of pipe/fittings configuration, one BLN specific concern (BLN-QCP-10.35-8-14) was evaluated. The statement of concern was:

The employee's work has been with the Fire Protection Sprinkler System. Most recently, it has been to correct the slope of the pipes in the Auxiliary Building and other areas. The specifications called for a 2-percent tolerance in the slope, but it should have been on a downward slope, not upward as some were installed. The system is a gravity feed system. They were correcting this problem.

A review of the BLN expurgated file for this concern found that it had been previously evaluated under BLN QCP-10.35. The evaluation report stated in part, "The National Fire Protection Association Guidelines were consulted, and the investigation yielded that fire protection pipes are sloped not to facilitate the gravity feed of the system but to facilitate drainage after system use." They went on to state, "Due to structural design and the many overhead interferences . . . TVA has been forced to amend this guideline slightly per the drawing note shown on Attachment 2." Attachment 2 referenced FCR M5290. This FCR and resulting ECN 2873 replaced Note 17 on drawing 3BWO471-00-26 Revision 6. Note 17 stated in part, "All sprinkler piping shall be sloped to avoid low areas where excessive water can be trapped. Piping . . . should be sloped . . . in the direction opposite of flow unless otherwise noted. Field routed piping should be sloped toward the main header if practical." . . .

The National Fire Protection Association (NFPA) Guidelines for pipe slope found in Section 13, paragraph 3-10.1, "Pitching of Piping for Drainage", concurred with the above quoted statement.

4.5.5 Pipe/Fittings Findings, BLN (continued)

The following documents were reviewed for relevant sprinkler system requirements: BLN QCP-6.22, Revision 2, "Mechanical Fire Protection"; TVA General Construction Specification (G Spec) G-73, "Inspection, Testing, and Documentation Requirements for Fire Protection Systems and Features"; and 10 CFR 50.48, "Fire Protection", 10 CFR 50, Appendix A, Criterion I.3, "Fire Protection", and 10 CFR 50 Appendix R Criterion III G, III J, and III O. This review determined that the quoted NFPA Guidelines were the appropriate standards for Fire Protection sprinkler system.

Appendix A to the NRC Auxiliary Power Systems Branch (APCSB), Branch Technical Position (BTP) 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants docketed prior to July 1, 1976," was also reviewed for sprinkler system slope requirements. Section C.3(c) of Appendix A, "Water Sprinkler and Hose Standpipe Systems", stated in part, "Automatic sprinkler systems should as a minimum conform to requirements of appropriate standards such as NFPA 13, 'Standard for the Installation of Sprinkler Systems'." . . .

The cognizant DNC MEU engineers were interviewed for information relative to the portion of the concern which stated the employee was working to "correct the slope."

They stated that work to correct FPS slope as mentioned by the CI was done in response to an Engineering Inspection for location, slope, and configuration conducted prior to the formal MQC inspection.

Conclusions

- Procedure Violation (vendor welds on containment penetrations)

The potential generic issue was found to be inadequately addressed at BLN. As stated in their response to the Potential Generic Condition Evaluation Memorandum, the

4.5.5 Pipe/Fittings Findings, BLN (continued)

procedures did address the weld in question by stating that the inspector performs leak checks and verifies all welds and regions of high stress are acceptable. The responsible personnel interviewed were also aware of the welds existence and the requirements for inspection during hydrostatic testing; however, no vehicle existed at the time of evaluation to flag this uncommon situation (hidden vendor weld requiring hydro inspection) to future inspections and engineers. This was contrary to paragraph two of BLNs response to the Potential Generic Condition Evaluation memorandum. BLN had not " . . . revised their QCPs requiring their inspectors to specifically examine these welds during hydrostatic testing."

- Hydrostatic Testing (Pressure gauges overpressurized)

This concern was factual; however, it was not a problem. The hydrostatic test deficiency was well documented in the hydro package, an NCR was written, corrective action was recommended by TVA and approved by the ANI, and the NCR was closed.

- Hydrostatic Testing (The presence of air in the drained Fire Protection System after use or testing promotes corrosion of pipes and valves.)

This concern was factual; however, that fact was not considered a problem. The system was designed, constructed, inspected, and maintained per NFPA guidelines and NRC specifications. Also, industry experience has shown that tuberculation is not a serious problem.

- Configuration (Incorrect slope of FPS)

This concern was not factual. FPS piping was not sloped for gravity feed as cited but for gravity drain after actuation/testing.

4.6 Mixed Structural Connections Findings

4.6.1 Generic

This concern issue was found to be WBN site specific; therefore, a generic evaluation was not warranted.

4.6.2 WBN Specific

Discussion

The concern issue addressed the fact that mixed connections located in the pipe chase building did not meet the requirements of the AISC Code.

For the purpose of this evaluation, it was assumed that all applicable design inputs were adequate. It was also assumed that the applicable site procedures satisfied upper tier requirements and the adequacy of the procedures was not challenged.

Evaluation revealed that the mixed connections addressed by the CI were the various types of structural steel connections installed in the unit 1 and unit 2 pipe chases.

For example, a mixed connection might be an installation where a structural beam used for grating (platform) support is attached to the concrete structure by a combination of (more than one) methods. Specifically, the structural beam may be attached or connected on one end by concrete anchors while the other end is welded to an embedded plate or, at one end, the north side is attached by two concrete anchors while the south side uses only one concrete anchor.

Site CEU personnel stated that these miscellaneous structural connections were mostly grating (platform) supports, both welded and bolted, found in the pipe chase area and were commonly referred to as "mixed connections."

Interviews with CEU personnel indicated that there was no pipe chase building at WBN and units 1 and 2 pipe chases were the only areas the CI could have been referring to. This statement was corroborated further when it was explained that the numerous grating (platform) supports in both pipe chases employed all types of mixed structural connections.

CEU personnel indicated that the miscellaneous steel grating (platform) connections were shown on the 48N1210 and 48W1213 series of drawings. It was also noted that the installation parameters, as called for on the drawings, were very broad and allowed considerable flexibility with respect to final installation configurations.

4.6.2 Mixed Structural Connection Findings, WBN (continued)

A review of the WBN FSAR (Volume 5, Section 3.8.4.5.2) revealed all structural steel installed in Category I structures was required to meet AISC Code requirements. A review of the design drawings for miscellaneous steel platforms revealed the following:

1. Note 7 of 48N1210-1, Revision 12, and Note 6 of 48N1210-7, Revision 16, require all structural steel fabrication and erection in Category I structures to be in accordance with the AISC Code.
2. Note 1 of 48W1213-1, Revision 11, references the notes of the drawings listed in item 1 above which detail fabrication and erection requirements.

A review of other existing documentation revealed that in the 1981 through 1983 timeframe; NCRs 2375R, 3579R, and 3659R were initiated to document questionable fillet weld quality on miscellaneous steel in Category I structures, questionable configuration of platforms, ladders, and stairs in Category I structures and potential overstressing of miscellaneous steel installations. The dispositions of these NCRs included a platform sampling program at WBN where DNE evaluated identified discrepancies. Drawing changes and field rework were performed when required to correct these deficiencies..

Summarization of this information revealed a comprehensive exercise to correct identified deficiencies with respect to structural steel installations in the pipe chase area(s).

A further review of the applicable drawings (48N1210 and 48W1213 series) revealed numerous revisions to incorporate by Field Change Request (FCR) and ECN those changes required as a result of the aforementioned NCRs.

A general review of the AISC Code Manual, specifically, part 4 on connections, was performed. Of those details reviewed, no deviations/discrepancies were noted between the AISC requirements and those connection details shown on the applicable design drawings referenced above. The AISC Code Manual did not specifically address "mixed connections."

The parameters of the NCRs and other documentation addressed previously in this report were discussed with site CEU personnel. This discussion indicated that the applicable drawing notes had been revised to allow more latitude with respect to the structural steel connections employed, especially in the pipe chase areas.

4.6.2 Mixed Structural Connection Findings, WBN (continued)

Interface with personnel in the Civil Engineering Design Branch (CEDB) indicated that all structural steel connections in the pipe chase areas were designed in accordance with the AISC Code. However, it was also noted that typical (standard detail) AISC type connections were not employed on a regular basis because of the congestion and diversified configurations required in these areas. In addition, CEDB indicated that Note 3 of drawing 48N1210-1, Revision 12, allowed additional structural grating supports to be installed as required when not shown on the drawing and Note 7 of the same drawing required AISC beam connections "except as noted." This note 7 allowed several variations of each connection shown and included details such as angle size, shim size/placement, and welded or concrete anchor attachment options. At this point, CEDB reiterated that the connections, as installed, probably did not match the typical (standard detail) AISC connections because of the numerous configuration options allowed. However, all connections were designed to comply with the AISC Code.

Field evaluation of approximately 20 miscellaneous structural connections in the south end of the unit 1 pipe chase was made by the evaluator and CEU individual. This physical evaluation revealed no installations outside the scope of the applicable drawing configurations and drawing notes. Several AISC typical connections were found as shown on the 48W1213-2, Revision 8, drawing as well as numerous variations to these typicals as allowed by the drawing notes.

Conclusions

Based on the results of this evaluation, the statement made by the CI in the subject concern could not be verified as being factual. No evidence was found to indicate that structural steel mixed connections in the pipe chase area do not meet the design requirements of the AISC Code. (Note: This evaluation did not address weld quality. Weld quality concerns were addressed by the Weld Project.)

5.0 COLLECTIVE SIGNIFICANCE

Of the 44 concerns evaluated within the Construction-Mechanical Subcategory, 39 were evaluated at WBN. Four of these concerns were deemed potentially generically applicable to and evaluated at SQN. Three of these concerns were found potentially generically applicable to and evaluated at both BFN and BLN. Four additional site specific concerns were raised and evaluated at BLN. Therefore, a total of 54 site concerns were evaluated within this subcategory. Of these, nine site problems (17-percent) were identified that had not been fully addressed. One of these (2-percent; class B valve in a class A line at WBN) had already been addressed under an NSRS evaluation, corrective action had been identified and completed at the time of this evaluation. Three of the nine problematic site concerns (6-percent of the total, 33-percent of problematic) actually stemmed from one Limitorque valve orientation/maintenance concern raised at BLN and evaluated at each site. It was found to be a problem issue at three of the four sites (therefore, three site concern problems), WBN, BFN, and BLN. This concern issue was being partially addressed at those sites by the Environmental Qualification programs (EQ Binders/QMDS).

Two other WBN concerns (containment penetration vendor welds not hydroed) were factual and a problem at WBN and also potentially generic to all sites. Proper documentation (NCRs) of this issue had been issued and the CAQ made generic to all sites prior to the concerns being raised through QTC. This evaluation found that neither SQN nor BFN had addressed this CAQ at their sites. Also, BLNs response to the respective CAQ potential generic condition was found inaccurate (therefore, three additional site concern problems or 6-percent of the total). A related issue to a concern citing that ERCW system was designed as stainless steel but not constructed as such was found partially factual and a problem at SQN. SQN had implemented an ECN to change portions of the ERCW system piping inside the plant from carbon to stainless steel because of corrosion problems. The change-out was performed on a piecemeal basis as outages and manpower permitted. The complete status of the pipe change-out was not adequately known; therefore, DNE and SQN modifications were in the process of evaluating the 83 built piping (one site concern problem or 2-percent of the total). The last site concern related problem (the ninth) was identified by a BLN specific concern. It cited that some valves in the plant were rusty on the outside but O.K. on the inside. The concern itself was found to not constitute a problem; however, in the process of evaluation, it was found that DNC employees did not have a vehicle comparable to the ONP MR for initiating and tracking corrective maintenance on plant equipment. The current vehicle at their disposal was the Employee Concern Program which, in this evaluators opinion, was a very inefficient means of identifying and correcting minor maintenance items.

Of these problematic issues, no generic collective significance could be drawn. As discussed above, they were diverse in character and no overall pattern or trends could be identified.

The remainder of the 54 site concerns (83-percent) were found to be either not factual or factual but not a problem. Why did 34 persons (85-percent of concerned individuals) perceive problems when problems didn't exist? It was this evaluator's opinion that this collectively significant question should be addressed on the Category or ECTG Final Report levels. Nevertheless, this question was evident upon reflection on the evaluation findings.

All of the issues evaluated were each represented by one concern with three exceptions: (1) the two concerns addressed under Procedure Violation (containment penetration vendor welds not hydroed, see above), (2) two concerns raised (by the same individual) citing that the ERCW line at WBN was originally designed as stainless steel but that stainless steel was not installed, and (3) five concerns were raised citing that mixed schedules and grades of pipe were welded together at WBN within the same systems. No collective significance could be assigned to issues (1) and (2); however, the five factual but not a problem concerns, issue (3), did imply a problem. Why did the five concerned individuals think that a problem existed? It was this evaluator's opinion that the problem perception was due to ignorance of the following criteria: (1) the appropriate safety classes for piping systems and components were based on the DNE evaluation of various criteria such as location (e.g. inside/outside containment), pressure, temperature, etc., and (2) in any given piping system, system design change points could be designated where any of the above criteria changed. Based on the concerned individuals' ignorance of these basic facts, the effectiveness of management in answering basic questions such as these either through training, employee involvement meetings, or a simple question and answer must be questioned.

6.0 CAUSES

The problem issues raised by the evaluation of the 44 concerns within the Construction-Mechanical Subcategory were:

- Limitorque valve operators were not maintained properly (WBN, BFN, and BLN).
- A 2 inch dia. class B check valve was installed in a class A line at WBN (WBN only).

6.0 CAUSES (continued)

- Pressure tests were not applied on many NPP-1 ASME Code Data Forms for containment penetrations at WBN. The penetrations were installed; however, hydrostatic tests were never verified and documented (WBN, SQN, BFN, BLN).
- An SQN issue relative to a WBN concern which cited that the ERCW piping was required to be stainless steel. At SQN, portions of the ERCW piping system within the plant were changed from the original design of carbon steel to stainless steel under ECN L5009. Some of the piping was changed-out; however, the as-constructed status of the system was not adequately known.
- DNC employees had no vehicle for identifying and tracking corrective maintenance items, such as the ONP Maintenance Request, shy of the Employees Concerns Program (BLN).

6.1 Causes of Valves Issue Problems

Three problems were identified within the valves issue. The first was related to the proper orientation and maintenance of Limitorque valve operators. The second was a CAQ previously identified and corrected as a result of an NSRS evaluation of the respective employee concern. It cited that a class B valve was installed in a class A line. This evaluation found that the valve in question was still improperly tagged. The third was relative to cosmetically rusted valves at BLN.

- Limitorque valve operator orientation and maintenance

The inadequacies and incongruencies found in the WBN, BFN, and BLN Limitorque preventive maintenance programs were due in part to the fact that numerous persons/organizations were assigned the responsibilities of defining these activities for their respective organizations. The problem findings were also attributed to inadequate programs and controls established to ensure that all applicable vendor, EQ, and other TVA specified PM activities and storage requirements were defined and updated as necessary, scheduled, and then performed at the required intervals and on the required equipment.

- Class B Valve in a Class A line

Designer error was the root cause, as specified on the applicable NCR, for a 2-inch dia. Class B check valve having been installed in a Class A line at WBN. The valve tags not being in place was attributed to normal wear and tear.

6.0 CAUSES (continued)

- Cosmetically rusted valves at BLN

The causes for corrective action not being taken on cosmetically rusted valves at BLN could be attributed to two factors: (1) DNC employees had no efficient vehicle, such as the ONP MR program, for initiating and tracking corrective maintenance on plant equipment short of the Employee Concerns Program, and (2) the responsibilities of ONP employees for initiating an MR, when the need for corrective maintenance was identified, was not delineated in the appropriate plant procedures.

6.2 Causes of HVAC Issue Problems

No problem causes existed since no problems were identified within this issue.

6.3 Causes of Mechanical Equipment Issue Problems

No problem causes existed since no problems were identified within this issue.

6.4 Causes of Insulation Issue Problems

No problem causes existed since no problems were identified within the Insulation issue.

6.5 Causes of Pipe/Fittings Issue Problems

Two problems were identified within this issue. In addition, the evaluation of a concern related to leaks in the upper portion of the cooling tower blowdown line at WBN was indeterminate. At the time of this evaluation, DNE was in the process of evaluating whether or not leakage in that line was indeed a problem.

- The two concerns evaluated at each site under "Procedure Violation" cited that neither the vendor nor TVA had hydro tested a circumferential vendor weld in the process pipe portion of containment penetrations at WBN.

The cause of this problem at WBN as cited on the previously generated NCRs documenting this CAQ, was that the DNE Contract Engineering unit failed to ensure that Code requirements had been met on the DNE procured penetrations in question.

6.5 Causes of Pipe/Fittings Issue Problems (continued)

The evaluation of this issue for generic applicability to SQN, by SQN compliance, had been initiated but had not been completed at the time of this evaluation; however, BFN had not yet begun their evaluation at the time of this evaluation. The cause for the delay in evaluation of this potentially generic CAQ to BFN was due to the BFN Design Project not performing the evaluation per procedure OEP-17 R3, but attempting to transfer the responsibility for the evaluation of this potential CAQ to the ONP Site Director's Organization. The BFN Site Director was also at fault for neither accepting nor rejecting this responsibility.

The cause for BLN not revising their applicable QCPs requiring their inspectors to specifically examine the welds in question during hydrostat testing, as stated in their response to the Potential Generic Condition Evaluation memorandum, was attributed to a miscommunication between the cognizant DNE and DNC engineers.

- The second problem identified within this issue was at SQN and was related to a WBN concern which cited that the ERCW piping was required to be stainless steel. At SQN, portions of the ERCW piping system within the plant were changed from the original design of carbon steel to stainless steel on ECN L5009. Some of the piping was changed-out; however, the as-constructed status of the system was not adequately known. The DNE Mechanical Pipe Unit was in the process of evaluating the as built piping. The cause for the portions of the SQN ERCW piping required to be stainless steel under the applicable ECNs not being changed from carbon steel was because the design change had been initiated after the plant had gone into operation with the originally designed carbon steel piping. Plant operations restricted the ability to get all the changes made.

6.6 Cause of Mixed Structural Connections Issue

No problem causes existed since no problem was identified within this issue.

7.0 CORRECTIVE ACTIONS

7.1 Corrective Action Completed

7.1.1 Valves Issues

- **Limitorque Valve Operators**

BLN had taken action to address the incongruencies in their DNC and ONP PM programs by assigning the equipment PM assessment responsibilities to the appropriate ONP System Engineer (BLN QCP-1.3 R8 and BLM 3.1 R9). Although this was a step in the right direction, it had not been brought to fruition at the time of this evaluation as documented by the deficiencies in the findings of this report.

- **Class B Valve in Class A Line at WBN**

SCR WBNMEB 8523 had documented this CAQ. The valve was upgraded under ECN-5841 by Kerotest, the vendor. Work plan (WP) 5841-1 placed the Class 1 ASME tag on the valve. The SCR was closed.

7.1.2 **HVAC Issues**

Corrective Action did not apply since no problems were identified within this issue.

7.1.3 **Mechanical Equipment Issues**

Corrective Action did not apply since no problems were identified within this issue.

7.1.4 **Insulation Issues**

Relative to a concern which cited that supports at WBN were insulated contrary to procedure, NSRS evaluation report I-85-667-WBN determined that at least one application of the fire barrier material was contrary to procedure. PIR WBNMEB 8618 was issued to track this item. The disposition of this PIR required a test to be performed by the vendor (3M, Electro Products Division) to determine the acceptability of the installed insulation configuration. According to the 3M Corporation individual knowledgeable of the test, the subject test was performed on May 22, 1986, and the results were successful in qualifying the fire barrier material "as installed" configuration. A final report on this test was forthcoming.

7.1.5 Pipe/Fittings Issues

- WBN NCR-5609 RO had been issued to document and resolve the issue of pressure tests not applied on many NPP-1 ASME Code Data Forms for containment penetrations. This NCR had been closed on a use-as-is basis. WBN NCR 6420 RO had also been issue to further document the cited problem (both NCRs had been generated before the employee concern) at WBN. At the time of evaluation, NCR 6420 RO was still open pending hydrostatic testing and arbitration between TVA and NRC relative to the acceptability of NCR 5609s use-as-is disposition. SQN, BFN, and BLN had been notified of this potential CAQ; however, only BLN had responded to the Potential Generic Condition Evaluation memorandum (Their response was determined to be inaccurate by this evaluation) at the time of this evaluation.
- Relative to the SQN ERCW system piping change-out under ECN L5009, ECNs 6534 and 6560 had already been issued to document that part of the ERCW system which was left as carbon steel instead of replaced by stainless. The DNE Mechanical Pipe Unit was in the process of evaluating the as built piping present status.

7.1.6 Mixed Structural Connections Issue

Corrective action did not apply since no problem was identified within this issue.

7.2 Corrective Action from CATDs

7.2.1 Valves Issues

- Limitorque Valve Operators

NPS

Generic Technical Standard TS 01.00.15.14.03 should be updated to reflect the current storage requirements (DPM and vendor) for Limitorques (CATD 17101-NPS-01). (QR-quality related)

7.2.1 Valves Issues (continued)

The following corrective action plan was provided by ONP Corporate in response to CATD 17101-NPS-01:

The DPM N82A17 will be modified to include Limitorque Corporation recommended long-term storage requirements. These are consistent with EQ requirements. The applicable portions of N82M3, dealing with storage of Limitorque operators, will be reviewed for incorporation into DPM N82A17.
(NCO-CAR-87-005-R)

WBN

In order to alleviate incongruencies in the PM of Limitorques at WBN, the responsibility for defining proper preventive maintenance activities for both transferred and nontransferred Limitorques at WBN should be assigned to ONP (similar to the BLN program presently in place).

WBN and BLN should establish adequate programs/controls to ensure that all applicable vendor, EQ, and other TVA specified PM activities and storage requirements (such as DPM N82M3) are identified, updated as necessary, scheduled, and then performed at the required intervals and on the required equipment (CATD Numbers 17101-WBN-03, 17101-BLN-01). WBN ONP had partially addressed this problem by revision 17 to AI-9.2 requiring the responsible Maintenance Engineer to document adherence to or deviation from the QMDS and vendor PM requirements for each piece of equipment within 30 days of transfer. (All CATDs QR)

7.2.1 Corrective Action From CATDs, Valves Issues, WBN (continued)

The following corrective action plan was provided by WBN line management in response to CATD 17101-WBN-03:

Proposed corrective action will be to revise AI-9.2 Attachment 11 to include evaluation of other TVA specified requirements for PM activities and evaluation of any available documented operating experience. These changes and those requirements presently in place will also be incorporated into MSL 2.2 and ESL 4.5. In addition, a program is now underway to evaluate, review, and revise the MMS and EMS PM program which includes evaluation to meet requirements of AI-9.2. As a minimum, this program will evaluate all CSSC PMs prior to Unit 1 fuel load. These evaluations will be documented as per AI-9.2. The Site Director/Project Manager will review the WBN PM program to determine if program changes or enhancements similar to the BNP PM program would be cost effective.

The following corrective action plan was provided by WBN line management in response to CATD 17101-BLN-01:

Our review of this problem revealed one item related to limitorque preventive maintenance for which corrective action is required. This item is related to the implementation of DPM N82M3 by section instruction letter EMSIL-14.3.1. The limitorque maintenance requirements contained in EMSIL-14.3.1 will be placed in a plant procedure which requires PORC review. This action will be completed by 09/01/87. No other program deficiencies related to limitorque preventive maintenance has been identified. Concerns related to the application of vendor requirements and environmental qualification requirements in the BLNP preventive maintenance program are addressed in our responses to CATD Numbers 17101-BLN-03 and 17101-BLN-05.

DNC's Preventive Maintenance Program adequately addressed the applicable PM and storage requirements with the following exceptions: (1) the storage level was specified as level "C" (no humidity or temperature control) with no requirement to energize heaters, (2) no preferred operator warehouse stored orientation was specified, (3) no

7.2.1 Corrective Action From CATDs, Valves Issues, WBN (continued)

inspection of motor leads for oil/grease damage (swelling) was performed during PM; although, this was done at time of transfer on QA operators (QCT-3.06-2), and (4) the verification of limit switch assembly proper screw length and the installation of lock washers were not specified (CATD 17101-WBN-01). (QR)

The following corrective action plan was provided by WBN line management in response to CATD 17101-WBN-01:

The corrective method of NCR 7199 RO is the corrective action plan to close this CATD. NCR 7199 correction method was:

- 1) DNQA to research requirements applicable to this subject and revise appropriate division level Quality Assurance procedures.
- 2) Site DNQA and DNC organizations to revise appropriate site procedures to agree with the revised division level procedures.
- 3) Review valves that have had rework performed without proper inspection and documentation and correct problem with the inspection/documentation and update of the RAP to reflect the correct status. See attached list of valves pages 1 through 16.
- 4) Update Attachment A's of QCP 1.52 R6 to reflect the requirements of the Limitorque Corporation Manuals.

ONPs Limitorque PM program was found deficient in the following areas: (1) The meggering of CSSC operator motors was not being performed per QMDS requirements and (2) non-CSSC operators were not being exercised per vendor and DPM recommendations (CATD 17101-WBN-02). (QR)

7.2.1 Corrective Action From CATDs, Valves Issues, WBN (continued)

The following corrective action plan was provided by WBN line management in response to CATD 17101-WBN-02:

Limatorque PM instructions will be revised to include meggering of CSSC operator motors and exercising of non-CSSC operators where and when practical. In addition, a review will be performed to assure all applicable vendor, QMDS, and other TVA requirements are being met. Review of these requirements and documentation of any deviations will be done in accordance with AI-9.2 utilizing Attachment 11.

At the present time, all IE harsh environment Limatorque motors are being megger tested as part of WP 6025-1 post maintenance MOVATS testing. All additional CSSC motors will be tested as the PM schedule dictates.

At this time, DNC (CATD 17101-WBN-01) plans to take responsibility for developing their own PM program from the same upper tier documents as ONP MMS.

• Class B Valve in Class A Line at WBN

Corrective action (SCR WBN MEB 8523, ECN 5841, and WP 5841-1) had been completed on this issue relative to upgrading the valve and installing the upgraded ASME Tag; however, no vehicle was generated to replace the missing system I.D. and TVA class and drawing tags as identified in NSRS report I-85-169-001. ONP should initiate an MR to address the replacement of these tags (CATD 17101-WBN-04). (QR)

The following corrective action plan was provided by WBN line management in response to CATD 17101-WBN-04:

Modifications has initiated MR A196490 to fabricate, install and document the installation of the TVA identification tag (refer to 47B601-0-4 & 47B406-62A-01 sh. 15 for tag requirements.) As far as a TVA class and drawing tag needing to be replaced, the upgraded ASME tag installed by WP E5841-1 has the required ASME class 1 identification and also has the figure number (TVD-D-9911-(1)) which is also the manufacturer dwg for the valve. There is no other requirement for any

7.2.1 Corrective Action From CATDs, Valves Issues, WBN (continued)

information to be on the valve in the field. One problem was identified with a drawing associated with the valve. The 47B406-62A-1 sh. 15 still shows the old valve dwg. (TVD-D-9911-(2)). The drawing should be TVD-D-9911-(1). Modifications has initiated FCR-87-58 to correct this problem.

SQN

Sequoyah was found to have adequate programs in place to maintain their installed operators in accordance with all applicable recommendations/requirements.

BFN

Browns Ferry was found to have adequate programs in place to maintain their installed operators per all applicable recommendations/requirements.

BLN

DNC's storage procedure, QCP-1.2, should be revised specifying proper Limitorque operator storage level and orientation requirements (CATD 17101-BLN-02). (QR)

The following corrective action plan was provided by BLN line management in response to CATD 17101-BLN-02:

BNP-QCP-1.1 (Receiving Inspection) requires the N-5 Receiving Inspector to forward a copy of BNP-QCP-1.1 Attachment C to the Plant Superintendent of Maintenance PS(M) to specify any special storage/maintenance requirements of permanent material/equipment received at the warehouse. BNP-QCP-1.2 requires the PS(M) to perform a review of vendor literature to determine special requirements for storage of materials or equipment covered by vendor manuals. The storage levels and orientation of limitorque operators while in storage would be specified by the PS(M) on the Attachment C of BNP-QCP-1.1.

7.2.1 Corrective Action From CATDs, Valves Issues, BLN (continued)

ONP Standard Practice BLM-3.1 should outline guidelines to be used by System Engineers in assessment of equipment PM/Storage requirement. These ONP PM/Storage assessment guidelines were currently specified in Construction Procedure QCP-1.3 (CATD 17101-BLN-03). (QR)

The following corrective action plan was provided by BLN line management in response to CATD 17101-BLN-03:

The guidelines for ONP system engineers to use in the assessment of equipment PM/storage requirements is given in Standard Practice BLA7.8, Section 5.0 Preventive Maintenance. This procedure will be revised by May 1, 1987 to state "In assessing the need for periodic maintenance, the (maintenance) sections shall consider vendor recommendations, other TVA special PM requirements, the probable status (e.g. dry layup, wet, deenergized, etc.) of the equipment from time of tentative transfer to plant operations and shall review DNC preventive maintenance methods to determine if they should be continued after transfer." BLE 10 "Long-Term Preservation and Maintenance of Plant Equipment" is the upper tier document for implementation of BNP-QCP-1.3 and BLM 3.1.

The maintenance activities specified in Section 5.0 of Standard Practice BLA-7.8 R6 should be specified within the PM Data Base. Also the PM activities specified in EMSIL-14.3.1 (reference DPM-N82M3) should be specified within the PM program (CATD 17101-BLN-04). (QR)

The following corrective action plan was provided by BLN line management in response to CATD 17101-BLN-04:

BLA7.8 Section 5.0 requires the system engineer to have the grease in Limitorque operators replaced if not Nebula EP-1. This is presently being accomplished via MR. No corrective action is required in this area. The grease in the limit switch gears of all Class 1E operators located in harsh environments will be changed to mobil-grease 28 by DNC prior to system/component transfer to plant operations. A limit switch grease inspection program will be initiated just prior to fuel loading. EMSIL-14.3.1 will be put in an Electrical Maintenance Guidelines (EMG) and implemented through the PM data base by 09/01/87.

7.2.1 Corrective Action From CATDs, Valves Issues, BLN (continued)

Referenced CATD 30801-BLN-01, ECSP Report is 308.01-BLN for inclusion of inspection program into the BLN PM program. (QR)

The CAP for CATD 30801-BLN-01 referenced above was: "The BLN (DNC and ONP) PM program data base will be revised to include requirements for lubricant inspection in the Limitorque limit switchgears of the operators. This action will be completed by July 1, 1987."

BLN had no QMDS implementation program or any recognition of environmental qualification maintenance requirements within their maintenance programs. BLN should be implementing QMDS PM requirements (CATD 17101-BLN-05). (QR)

The following corrective action plan was provided by line management in response to CATD 17101-BLN-05:

- (1) DNE complete the development of an EQ program for BLN which complies with the requirements of 10 CFR 50.49 and Regulatory Guide 1.39.
- (2) ONP implement the requirements of EQ maintenance in plant procedures.

Background

BLN's current program for maintenance of environmentally qualified (EQ) equipment is described in BLM1, Section 1.10 on Maintenance of Class 1E equipment, and also in BLM10.1, Section 2.2.2 and 3.0, Preparation of MRs. Purchase of spare/replacement parts of Class 1E equipment is described in BLA9.1 and BLA9.8.

DNE started development of an EQ program to comply with the requirements of 10 CFR 50.49 and preparation of an EQ manual to classify parts work was stopped on the program for BLN. This work activity is being tracked on TROI (SCR BLN-EES-8543).

• Rusted Valves

BLN ONP should revise BLA-10.1 to delineate ONP employee's responsibilities for initiating an MR when the need for corrective maintenance is identified (CATD 17101-BLN-06). (NQR-not quality related)

The following corrective action plan was provided by BLN line management in response to CATD 17101-BLN-06:

General Employee Training course GET 4 identifies that all employees have the responsibility for initiating a maintenance request when the need for corrective maintenance has been identified. All plant personnel are required to attend GET 4 training.

BLN DNC should implement a program, more efficient than the Employee Concerns Program, for DNC to initiate and track corrective maintenance on plant equipment (CATD 17101-BLN-07). (NQR)

The following corrective action plan was provided by BLN line management in response to CATD 17101-BLN-07:

DNC will initiate a program that provides DNC employee's a vehicle to initiate and track corrective maintenance on permanent plant equipment. This program will be in the form of a new BNI procedure or revision to an existing BNP procedure. The new procedure will be incorporated into the existing DNC program by December 15, 1987.

7.2.2 HVAC Issues

No problems were identified within this issue; therefore, corrective actions did not apply.

7.2.3 Mechanical Equipment Issues

No problems were identified within this issue; therefore, corrective actions did not apply.

7.2.4 Insulation Issues

No problems were identified within this issue; therefore, corrective actions did not apply.

7.2.5 Pipe/Fittings Issues

Four issues require corrective actions from CATD's within this element:

(1) Leakage in the Cooling Tower Blowdown line WBN, (2) Neither the vendor nor TVA had hydrotested a circumferential vendor weld in the process pipe portion of containment penetrations at WBN, (3) at SQN, a concern related to the fact that some of the ERCW piping was required to be stainless steel, and (4) the collective significant issue (section 5.0) of five employees raising concerns about a subject that was not a problem.

- WBN Cooling Tower Blowdown Line Leakage

No visual evidence existed that the 48-inch (patched) section of piping leaked as cited; however, this section of piping was being included in the ongoing evaluation of the downstream leakage by ONP and DNE to determine whether or not leakage in that line was indeed a problem. The evaluation of this leakage should be completed and documented. The ONP/DNE evaluation should address both the upper and lower portions of the cooling tower blowdown line (CATD 17105-WBN-01). (NQR)

The following corrective action plan was provided by WBN line management in response to CATD 17105-WBN-01:

Since the portion of line in question was not well defined, we will address all the buried discharge piping.

The piping downstream from the Tee to the yard pond was replaced with 48-inch concrete pipe by Construction Change Notice Number C-47R3 (Copy attached). The 66-inch fiberglass pipe downstream of the Tee leading to the river presently is being replaced with 72-inch concrete pipe under ECN 6455 (delivery of materials has started.) The presently installed 48-inch fiberglass pipe from the cooling tower to the Tee is under observation. We do not anticipate any leakage in this run, however should future leakage develop, corrective action will be taken, which may include replacement of that section of pipe.

- Containment Penetration Hydro Tests

WBN-NCR-5609 and NCR-6420 documented the concern issue of hidden containment penetration vendor welds not inspected at the time of hydro testing by the vendor or TVA. NCR-5609 was closed on a use-as-is basis; however, NCR-6420 was open at the time of

7.2.5 Corrective Action From CATDs, Pipe/Fittings Issues (con't)

evaluation pending hydrostatic testing and arbitration between TVA and NRC relative to the acceptability of NCR 5609s use-as-is disposition. (CATD Number 17105-WBN-03) (QR)

The following corrective action plan was provided by WBN line management in response to CATD 17105-WBN-03 (and 80605-WBN-01 and 02):

Discrepancies in the hydrostatic testing of penetration assemblies for Units 1 and 2 were reported on NCR 5609. Nonconforming condition report NCR 6420 was issued at a later date to address the hydrostatic testing of Unit 2 penetration assemblies only. NCR 5609 was dispositioned use-as-is for the Unit 1 penetration assemblies and based on this disposition, an N-5 Data Report was completed for the Unit 1 systems involved. Approval of the N-5 Data Report form was based on a policy approved in December 1983, by the Board on Nuclear Codes and Standards. This policy states in part:

It is the sentiment of the Board on Nuclear Codes and Standards that, in these situations, the determination of how to satisfy Code requirements is best resolved through interaction and agreement between the parties involved, taking into account the specific conditions of the situation. Such agreements would include but not necessarily be limited to the Owner, applicable Certificate Holders, their respective Authorized Inspection Agencies, and appropriate jurisdictional and/or regulatory bodies.

The TVA use-as-is disposition was reviewed by the Authorized Inspection Agency, the site Authorized Nuclear Inspector, the Installer (CONST), and the N Certificate holder taking overall responsibility for the piping (EN DES). It was TVA's position at the time that these actions satisfied Code requirements. However, the agreements on the use-as-is disposition did not include the Nuclear Regulatory Commission (NRC) as required by the BNCS policy. The course of action specified below will obtain the agreement of all involved parties in the use-as-is disposition in accordance with the BNCS policy, or implement alternative actions to ensure Code requirements are met.

7.2.5 Corrective Action From CATDs, Pipe/Fittings Issues (con't)

- (1) TVA will prepare a report detailing the actual events leading to the use-as-is disposition of NCR 5609 and TVA's justification for Code compliance. This report will be submitted to the NRC with a request for a technical review.
- (2) If this report is acceptable to the NRC, the Watts Bar FSAR will be revised to include the report by reference.
- (3) If this report is not accepted by the NRC, NCR 5609 will be redispositioned and pressure testing will be performed in accordance with the recommendations provided in memorandum B26 860429 014, for NCR 6420, or as required by the NRC. In either case, the final disposition will be documented in a supplement to the N-5 Data Report Form. The supplement will be signed by the organizations which signed the original N-5 Data Report Form. The approved supplement will be attached to the applicable N-5 Data form, which shall be annotated to reflect inclusion of the supplement and resigned by the same organizations which approved the original. The supplemented N-5 Data Report will then be distributed to controlled document holders.

The Potential Generic Condition Evaluations of NCR-6420 RO to SQN and BFN (B45 860311 255) should be completed utilizing current procedures. BLN should revise QCP-10.4 and CTP-7.6 requiring their inspectors to specifically examine the subject penetration welds as they stated they had done in their response memorandum to the Potential Generic Condition Evaluation memo. The completion of this action should also be documented in a like response memorandum (CATD Numbers 17105-BFN-01, 17105-SQN-02, and 17105-BLN-01). (All CATDs QR)

The following Corrective Action Plan was provided by SQN line management in response to CATD 17105-SQN-02:

These three items were not SQN restart activities.

1. The design basis for Sequoyah Nuclear plant (SQN) piping is USAS B31.1.0 - 1967. The use of B31.7 was an enhancement at SQN in lieu of the applicable B31 Nuclear Code Cases N7, N9, and N10. The SQN FSAR, Table 3.2.2-1, "Summary of Codes and Standards for components of the Sequoyah Nuclear Plant for Procurements prior to April 2, 1973," is currently being clarified in accordance with PIR SQNNEB8638 to more accurately reflect the SQN piping code requirements. ANSI B31.1.0 - 1976, paragraph 137.1, states, "Where a hydrostatic test is not practicable, an initial service leak test, a vacuum test, or 100 percent radiography of all welded joints in an all-welded system may be substituted." The penetrations were hydrostatically tested to the requirements as specified in G29M, process specification 3.M.9.11. The welds in question were given 100 percent radiography and a surface exam, either MT or PT, by Tube Turns. Although not required, the penetrations at SQN were N-stamped by Tube Turns.
2. The generic review of WBN NCR 6420 under the OER Program, SQA 26, Attachment 3, is being revised and completed.
3. When it was asked that SQNs corrective action plan be coordinated with BFN, BLN, and especially WBN; SQN responded stating, "Each nuclear plant has a different code of record based on its construction permit date. Therefore, each plant has different code requirements it must follow. Watts Bar's code of record is ASME Section III, 1971, Summer 73 Addenda. SQN's code of record is USAS B31.1.0 - 1967. Since each plant has a different design basis, each plant would have different CAPs. Therefore, coordination of this issue with TVA's other nuclear plants is not necessary."

The first two items in SQN line managements CAP for CATD 17105-SQN-02 as cited above were acceptable; however, the item three statement that ". . . coordination of this issue with TVA's other nuclear plants is not necessary," was not acceptable. The evidence to support this argument follows. WBN NCRs 5609 and 6420 documented a condition that was potentially generic to all sites. Potential Generic Condition Evaluation (PGCE) memorandums were forwarded to each site. In response to this CAQ:

7.2.5 Corrective Action From CATDs, Pipe/Fittings Issues (con't)

- WBN has planned to rehydro the welds nonconformed by NCR 6420 and go to great lengths to inspect the subject welds (see memorandum B26 860429 014, Standefer to Wadewitz) during the hydros. This proposed corrective action was coordinated between DNE, DNC and the ANI.
- BLN responded promptly to their PGCE memorandum stating that the potential CAQ did not exist at BLN (memorandum B21 860525 001) since they were aware of the welds existence and had been inspecting these welds during applicable system hydros.
- At the time of this evaluation, BFN had not yet performed their evaluation of this PGC.
- SQN has now evaluated this PGC at their plant and determined that, upon revision of their FSAR clarifying the applicable Code of Record, the condition described in NCR 6420 does not exist at their plant.

The root cause of this CAQ (NCRs 5609 and 6420) as cited by ENDES in NCR 5609, RO, Section 10, was that "Design did not alert construction of need to witness the unhydroed welds. Construction did not review the containment penetration data package prior to performing the system hydro to determine which welds needed to be included in the hydro inspection program." The generic evaluation of this root cause to TVA had not been performed. Only nonconcerted site evaluations of the CAQ itself (NCR 6420) were conducted as cited in section 7.2.5 of subcategory report 17100. SQNs CAP to CATD 17105-SQN-02 was accepted as-stated; however, the CAQ coordination issue has been identified and tracked by CATD 17105-NPS-01 as a corporate level problem.

The following Corrective Action Plan was provided by BFN line management in response to CATD 17105-BFN-01:

The subject employee concern is partially incorrect in one area. PGCE response dated 3/25/86 (RIMS #B22 860326 003) was the BFN Design Project response for Browns Ferry.

7.2.5 Corrective Action From CATDs, Pipe/Fittings Issues (con't)

This response actually stated the CAQ condition did not exist at Browns Ferry in the BFN Design Project "activity" area. BFN Design Project therefore did evaluate the BFN applicability in the area of design activity as stated on the PGCE form. However, they apparently did not evaluate BFN applicability to activities performed by ONP in the area. Procedure NEP-9.1 Revision 0 is not clear for this area of responsibility. It does not specifically identify that the BFN Design Project is responsible for evaluation regarding normal ONP construction, maintenance, or QC activities. As NEP-9.1 is presently written the problem appears to be interpretation of the scope of the procedure. Since the CAQ process defined by this procedure is to be revised by March 30, 1987, the more important subject is to address the evaluation whether a BFN CAQ condition may exist. The following activities are being implemented to resolve the described employee concern:

- (1) PIRBFNNEB8719 Revision 0 has been written to address NCR-6420 RO for which the BFN Design Project originally transferred evaluation responsibility to ONP. Corrective action for this PIR will evaluate the disposition of this CAQ and ensure that any condition which may exist at Browns Ferry Project is properly documented.
- (2) Future occurrences of this description should not occur since the existing program for SCR/PIR's will no longer be used after March 30, 1987. At that time NEP-9.1 Revision 1 will be implemented and EA will establish a CAQR coordinator to monitor all CAQ activities. CAQ's will be tracked and controlled by Engineering Assurance (EA), therefore, a more closely monitored program will be utilized. NEP-9.1, sections 7.4 and 7.5 will ensure all PGCE responses are complete and adequate.

Note: At this time DNE does not consider this item to be a requirement for unit 2 restart.

7.2.5 Corrective Action From CATDs, Pipe/Fittings Issues (con't)

The following corrective action plan was provided by BLN line management in response to CATD 17105-BLN-01:

The response to NCR 6420 R0 Potential Generic Condition evaluation memorandum stated that BLN construction had revised their procedures requiring inspectors to examine these welds during hydrostatic testing. This was done 07/24/85 for CTP-7.6 as paragraph 5.6.1 was revised requiring inspectors to inspect all welds (vendor and TVA). This was done 08/07/85 for CTP7.7 as paragraph 5.6.1 was changed to read the same as for CTP7.6. There was never a commitment to revise QCP10.4, Control of Nonconformances, in connection with this problem.

The root cause of NCR 5609 and 6420 (WBN) as cited by DNE in NCR 5609 R0, Section 10, was "Design did not alert CONST of need to witness the unhydroed welds. CONST did not review the containment penetration data package prior to performing the system hydro to determine which welds needed to be included in the hydro inspection program". The generic evaluation of this root cause to TVA Corporate had not been performed. Only nonconcerted site evaluations of the CAQ itself (NCR 6420) were conducted as cited in Section 7.2.5 of subcategory report 17100. (CATD Number 17105-NPS-01). (QR)

The following corrective action plan was provided by DNE line management in response to CATD 17105-NPS-01:

Because the potential generic condition evaluation (PGEC) process was not properly completed and documented for NCR WBN 6420, a new PGCE will be performed for each nuclear site in accordance with NEP-9.1. The results of the PGCE for each site will be reviewed to determine if a generic root cause exists that resulted in this condition occurring at the other TVA nuclear sites. If a generic root cause exists, a CAQR will be generated, and action will be taken to ensure this type of problem is precluded in the future. In addition, an evaluation of the Tube Turns contract will be performed to determine the sequence of events that resulted in the condition occurring at each site in order to determine if this condition is an isolated case or if an engineering process deficiency exists.

7.2.5 Corrective Action From CATDs, Pipe/Fittings Issues (con't)

- ERCW Piping at SQN Required to be Stainless

Portions of the ERCW piping system within the plant buildings were changed from the original design of carbon steel to stainless steel under ECN-L5009 in February, 1981. Some, but not all of the ECN designated piping, was changed-out as plant operations permitted. SQN was in the process of analyzing the ERCW system as built piping and initiating a new ECN to leave the pipes as they currently existed. Both the analysis and new ECN should be completed. This corrective action was being tracked by CATD number 17105-SQN-01 dated October 6, 1986. (QR)

The following two part corrective action plan was provided by SQN line management in response to CATD 17105-SQN-01:

Item one was an SQN restart activity.

1. The seismic analysis has been revised to incorporate the carbon steel to stainless steel piping changes per ECN L5009. ONP (Mech Modifications) transmitted information to DNE on the partial implementation of ECN L5009. This information was used to evaluate the effect of partial implementation on the seismic analysis and no problems were found. The information was not quality information; therefore, DNE will ask that it be resubmitted as quality information. Differences from the previous submitted will be evaluated for effects on analysis. This will be done before restart.

Item two was not an SQN restart activity.

2. An ECN will be written to back out portions of ECN L5009 that were not implemented using the information from ONP. This will be a post-restart activity.

7.2.5 Corrective Action From CATDs, Pipe/Fittings Issues (con't)

• Collective Significant Issue

Five employees raised concerns about a subject that was not a problem. The subject was that mixed schedules and grades of pipe were welded together at WBN within the same systems. Although the subject of the concerns was not a problem, the fact that five individuals perceived that a problem existed implied that the CIs were ignorant of the governing criteria and implementing procedures.

This corrective action was tracked by CATD number 17105-WBN-02 dated January 16, 1987. (NQR)

The following corrective action plan was provided by WBN line management in response to CATD 17105-WBN-02:

We agree this CATD is not a problem. In all five of these instances there were extenuating circumstances which tended to make some aspects of the installations look suspicious to employees not intimately involved in the unique engineering details of each situation.

Material substitutions are acceptable when they have DNE concurrence. The material specifications of any pipe or fittings being placed in a safety related system will be verified at the time of installation.

Establishment of regular employee involvement meetings, along with the current management philosophy of giving quality, in-depth answers to all employee questions and concerns should reduce or eliminate this type of misconception in the future.

7.2.6 Mixed Structural Connections at WBN Issue.

No problem was identified within this issue; therefore, no corrective action was warranted.

8.0 ATTACHMENTS

8.1 Attachment A, "Listing of Employee Concerns Indicating Safety Relationships and Generic Applicability"

8.2 Attachment B, "List of Evaluators"

8.3 Attachment C, "List of Concerns by Issue"

ATTACHMENT A

REFERENCE - ECPS131J-ECPS131C
 FREQUENCY - REQUEST
 ONP - ISSS - RWM

TENNESSEE VALLEY AUTHORITY
 OFFICE OF NUCLEAR POWER
 EMPLOYEE CONCERN PROGRAM SYSTEM (ECPS)
 LIST OF EMPLOYEE CONCERN INFORMATION
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CATEGORY: CO CONSTRUCTION-PROCESS

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	GENERIC APPL				QTC/NSRS INVESTIGATION REPORT	P S R	CONCERN DESCRIPTION	REFERENCE SECTION #	
				B	B	S	W				Category	Subcategory
				F	L	Q	B					
EX-85-034-001 T50139	CO	171	WBN	N	N	N	Y		SR	MECHANICAL DISCREPANCIES ON MOTOR OPERATED VALVES. DETAILS KNOWN TO QTC, WITHHELD DUE TO CONFIDENTIALITY CONSTRUCTION DEPT. CONCERN. CI HAS NO FURTHER INFORMATION OR DETAILS. NO FOLLOW UP REQUIRED.	1.2.1 3.2.1 4.1.2 5.0	
EX-85-046-001 T50162	CO	171	WBN	N	N	N	Y	I-85-757-WBN	SR	CI IS CONCERNED THAT THE FIRE DAMPER IN DIESEL GENERATOR BUILDINGS #1 AND #5 HAVE NEVER BEEN OBSERVED TO OPERATE PROPERLY OR PASS THE REQUIRED TESTS. CI EXPRESSED THAT THIS COULD BE A PROBLEM WITH THE DAMPER DESIGN. THE ONLY DAMPER NUMBER CI COULD RECALL IS 1-ISD-30-650, WHICH IS IN BUILDING #5. THE PROBLEM MAY APPLY TO ALL DIESEL GENERATOR BUILDINGS. NUCLEAR POWER DEPT CONCERN. CI HAS NO FURTHER INFORMATION.	1.2.2 3.2.2 4.2.2 5.0	

CONCERNS ARE GROUPED BY FIRST 3 DIGITS OF SUBCATEGORY NUMBER.

ATTACHMENT A

REFERENCE - ECPS131J-ECPS131C
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				B F	B L	S Q				W B	CATEGORY	CO
IN-85-008-002 T50177	CO	171	WBN	N	N	N	Y	I-85-667-WBN	SR	IN FALL OF 1984, IN AUXILIARY BLDG. 737, ELECTRICIANS AND INSULATORS WERE INSTALLING INSULATION OVER CEILING PLATES AND CABLE TRAY SUPPORTS. SOME INSULATION WAS INSTALLED CONTRARY TO PROCEDURE IN THAT SLITS MADE IN INSULATION (TO GO AROUND SUPPORT) WERE OVER EACH OTHER IN TWO LAYERS- INSTEAD OF AT LEAST 90 DEGREES TO SLIT IN OTHER LAYER. CONST. DEPT. CONCERN. CI HAS NO FURTHER INFORMATION. NO FOLLOW UP REQUIRED.	1.2.4 3.2.4 4.4.2 5.0 7.1.4	
IN-85-055-N04	CO	171	SQN	N	N	Y	N		SR	NRC IDENTIFIED THE FOLLOWING CONCERN FROM REVIEW OF QTC FILE. "EMERGENCY HAND VALVE INCORRECTLY INSTALLED."	1.2.1 3.2.1 4.1.2	4.1.3 5.0
IN-85-070-001 T50065	CO	171	WBN	N	N	N	Y		SR	POSSIBLE CRACKED SLEEVE THROUGH CRANE WALL AND AROUND REACTOR COOLANT SYSTEM PIPING IN UNIT 1. C/I DOES NOT KNOW WHICH LOOP OR WHETHER PIPING IS HOT LEG OR COLD LEG PIPING. NO FURTHER INFORMATION AVAILABLE. NO FOLLOW-UP REQUIRED.	1.2.3 3.2.3 4.3.2 5.0	

CONCERNS ARE GROUPED BY FIRST 3 DIGITS OF SUBCATEGORY NUMBER.

ATTACHMENT A

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CONCERN NUMBER	CAT	SUB CAT	PLT LOC	GENERIC APPL			QTC/NSRS INVESTIGATION REPORT	P S R	CONCERN DESCRIPTION	REFERENCE SECTION #			
				B	B	S				W	F	L	Q
IN-85-089-007 T50276	CO	171	WBN	N	N	N	Y		SR	THE WRONG SIZE EXPANSION JOINT IS INSTALLED ON A 10-12" STAINLESS STEEL PIPE IN THE "ARGON PIT" IN THE AUXILIARY BUILDING, UNIT 2. THE FITTING TO THE PIPE IS TOO COMPRESSED TO WORK PROPERLY. THE "ARGON PIT" IS EAST OF THE SOUTH VALVE ROOM, ONE LEVEL BELOW ELEVATION 757'. CONSTRUCTION DEPARTMENT CONCERN. NO FURTHER INFORMATION AVAILABLE IN FILE.	1.2.5 3.2.5 4.5.1 5.0		171
IN-85-169-001 T50007	CO	171	WBN	N	N	N	Y	IN-85-169-001	SR	2" CLASS "B" VALVE INSTALLED IN A CLASS "A" SYSTEM (SYSTEM 62 AUXILIARY SPRAY). LOCATED-- UNIT #1 AROUND ELEVATION 720, AZ 130 DEG. @ THE CRANE WALL.	1.2.1 5.0 6.1 7.1.1 7.2.1		
IN-85-173-001 T50025	CO	171	WBN	N	N	N	Y	IN-85-173-001	SR	POSSIBILITY OF LEAKS IN THE SPRINKLER SYSTEM IN THE 5TH DIESEL GENERATOR BUILDING. POSSIBILITY OF WRONG CLASS OF FITTINGS BEING USED. LEAKS WERE FOUND WHILE TESTING.	1.2.5 3.2.5 4.5.1 4.5.2 5.0		

CONCERNS ARE GROUPED BY FIRST 3 DIGITS OF SUBCATEGORY NUMBER.

ATTACHMENT A

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CONCERN NUMBER	CAT	SUB CAT	PLT LOC	GENERIC APPL B B S W F L Q B	QTC/NSRS INVESTIGATION REPORT	P S R	CONCERN DESCRIPTION	REFERENCE SECTION # CATEGORY - CO SUBCATEGORY - 171
IN-85-186-001 T50007A	CO	171	WBN	N N N Y	IN-85-186-001	NO	HIGH PRESSURE 24" AND 48" STEAM LINES IN BOTH UNITS, WHICH WERE INSULATED BY NORTH BROTHERS. CONTACTORS ARE INSULATED WRONG. INDIVIDUAL STATED THAT THE METAL INSULATION COVERING CVER LAPS -1" WHICH DOES NOT COMPLY WITH THE SPECIFICATION REQUIREMENT THAT THE METAL EDGES TOUCH WITHOUT OVERLAP. EXAMPLE TURBINE BUILDING ON ELEVATION 755'.	1.2.4 3.2.4 4.4.2 5.0
IN-85-210-001 T50007A	CO	171	WBN	N N N Y	IN-85-210-001	NO	ENGINEERS FAIL TO COMPLETELY FILL OUT DOCUMENTATION IN ACCORDANCE WITH PROCEDURAL REQUIREMENTS, RESULTING IN UNNECESSARY REWORK DUE TO LACK OF APPROPRIATE OBJECTIVE EVIDENCE. EXAMPLE: THE HYDRO TESTING DOCUMENTATION. BOTH UNITS INVOLVED	1.2.5 3.2.5 4.5.1 4.5.2 5.0
IN-85-211-001 T50007A	CO	171	WBN	N N N Y	I-85-118-WBN	SR	ERCW LINE COMING FROM PUPMING STATION TO REACTOR BUILDING HAS HAD A LEAK FOR APPROXIMATELY 2 MONTHS. THE LEAK HAS BEEN IDENTIFIED BUT AS NOT YET REPAIRED. ERCW LINE ORIGINALLY WAS	1.2.5 3.2.5 4.5.1 4.5.2 5.0

CONCERNS ARE GROUPED BY FIRST 3DIGITS OF SUBCATEGORY NUMBER.

ATTACHMENT A

REFERENCE - ECPS131J-ECPS131C
 FREQUENCY - REQUEST
 ONP - ISSS - RWM

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CATEGORY: CO CONSTRUCTION-PROCESS

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	GENERIC APPL			QTC/NSRS INVESTIGATION REPORT	P S R	CONCERN DESCRIPTION	REFERENCE SECTION #		
				B	B	S				W	CO	171
IN-85-211-001 (Continued)												
IN-85-211-002 T50038	CO	171	WBN	N	N	Y	Y	I-85-166-WBN	SR	TO BE STAINLESS STEEL HOWEVER SS WAS NOT INSTALLED. EMPLOYEE DOES NOT KNOW IF THERE WAS A DESIGN CHANGE. AT LEAST 1, IF NOT 2, PUMPS HAD TO BE REPLACED DUE TO INSUFFICIENT WATER. LINE IS BURIED IN GROUT. THIS IS A BLOW DOWN LINE.	1.2.5 3.2.5 4.5.1 4.5.2 4.5.3	5.0 6.5 7.1.5 7.2.5
IN-85-352-003 T50038	CO	171	WBN	N	N	N	Y		SR	PIPE IS INSTALLED TO WITHSTAND HIGHER PSI, IE DESIGN REQUIRES SCHEDULE 20- SCHEDULE 40 IS INSTALLED. DESIGN REQUIRES SCHEDULE 40, SCHEDULE 80 IS INSTALLED. THIS SUPPOSEDLY ALSO ALLOWS FOR MORE INTENSE CLEANING AND AND NOT EXCEED MINI WALL THICKNESS.	1.2.5 3.2.5 4.5.1 4.5.2 5.0	

CONCERNS ARE GROUPED BY FIRST 3 DIGITS OF SUBCATEGORY NUMBER.

2515T

ATTACHMENT A

REFERENCE - ECPS131J-ECPS131C
 FREQUENCY - REQUEST
 ONP - ISSS - RWM

TENNESSEE VALLEY AUTHORITY
 OFFICE OF NUCLEAR POWER
 EMPLOYEE CONCERN PROGRAM SYSTEM (ECPS)
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 SUBCATEGORY: 171 MECHANICAL

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CATEGORY: CO CONSTRUCTION-PROCESS

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	GENERIC APPL			QTC/NSRS INVESTIGATION REPORT	P S R	CONCERN DESCRIPTION	REFERENCE SECTION #	
				B B F	S L Q	W B				CATEGORY	CO
IN-85-442-X10 T50044	CO	171	WBN	N	N	N	Y	IN-85-442-X10	NO	COOLING TOWER BLOWDOWN DRAINS, 17W 303 SHEET 1-5 TVA DIVERS INSPECTED AND FOUND PLASTIC LINER THAT HAD BEEN PATCHED ABOUT 6 YEARS AGO HAD FAILED. AN FCR (F3376) WAS ISSUED FOR FIX, BUT DIDN'T WORK VERY WELL.	1.2.5 3.2.5 4.5.1 4.5.2 5.0 6.5 7.2.5
IN-85-463-003 T50036	CO	171	WBN	N	N	N	Y		SR	REACTOR #2, IN-CORE INSTRUMENT ROOM, TVA IDENTIFIER 2-FCV-30-20 or 2-FCV-30-58, CONTROL VALVE ON SYSTEM 30 INSTALLED AGAINST AN ELECTRICAL PENETRATION WHICH CREATES AN AN OPERATIONAL AND PERSONNAL SAFETY PROBLEM. SHEET METAL COVER BOX CANNOT BE INSTALLED; ARM OF VALVE WILL MAKE CONTACT WITH CONDUCTORS (COMING THRU PENETRATION) IF NOT COVERED; PEOPLE COULD EASILY MAKE CONTACT WITH ENERIZED CONDUCTORS.	1.2.1 3.2.1 4.1.2 5.0

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2515T

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CATEGORY: CO CONSTRUCTION-PROCESS

SUBCATEGORY: 171 MECHANICAL

CONCERN NUMBER	SUB CAT	PLT LOC	GENERIC APPL				QTC/NSRS INVESTIGATION REPORT	P S R	CONCERN DESCRIPTION	REFERENCE SECTION #		
			B	B	S	W				Category	Subcategory	
IN-85-534-005 T50115	CO	171	WBN	N	N	N	Y	I-85-398-WBN	SR	THE UNIT 1 FIRE PROTECTION HYDRO WAS CONDUCTED IMPROPERLY, THE TEST PRES-SURE WAS MAINTAINED THROUGHOUT THE TEST BY RUNNING THE PUMP. THIS HAPPENED 3 YEARS AGO. CI HAS NO FUR- THER INFORMATION. CONSTRUCTION DE- PARTMENT CONCERN. NO FURTHER FOLLOW UP REQUIRED.	1.2.5 3.2.5 4.5.1 4.5.2 5.0	CO 171
IN-85-559-001 T50048	CO	171	WBN	N	N	N	Y		NO	NEUTRON DETECTOR BOXES, INCORE REACT OR #2, 713'ELEV OR A LITTLE ABOVE, 40"X30" WERE SHOWN ON THE WESTING- HOUSE DRAWING BUT WERE FABRICATED AND INSTALLED ON SITE. 1974/1975. IRON WORKERS FABRICATED AND INSTALLED	1.2.3 3.2.3 4.3.2 5.0	
IN-85-719-001 T50079	CO	171	WBN	N	N	N	Y		SR	A 36" MAIN STEAM LINE WAS HYDROSTAT- ICALLY TESTED (1979) AND THE VALVE WHICH ISOLATED THE TURBINE (IN SOUTH VALVE ROOM) LEAKED. CI WAS INFORMED THAT THIS VALVE WOULD BE LAPPED/RE- PAIRED BUT DOES NOT KNOW IF THIS WAS EVER DONE. UNIT #1.	1.2.1 3.2.1 4.1.2 5.0	

CONCERNS ARE GROUPED BY FIRST 3 DIGITS OF SUBCATEGORY NUMBER.

2515T

ATTACHMENT A

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SUBCATEGORY: 171 MECHANICAL

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	GENERIC APPL				QTC/NSRS INVESTIGATION REPORT	P S R	CONCERN DESCRIPTION	REFERENCE SECTION #	
				B	B	S	W				F	L
IN-85-793-003 T50223	CO	171	WBN	N	N	N	Y		SR	IN LATE 1983, SUPERVISION (NAME KNOWN) DIRECTED CRAFT (NAME KNOWN) TO WELD SCHEDULE 40 & 60 FITTINGS, THAT HAD BEEN UPGRADED BUT NO TORQUED DOWN TO PIPE WALL THICKNESS, TO SCHEDULE 40 PIPE. UNIT #2, SECTION C OF MAIN CONDENSER, COMPONENT COOLING, ELEVATION 737' CLASS G PIPE (8", 10", 12" PIPE). CONSTRUCTION DEPT. CONCERN. CI HAS NO FURTHER INFORMATION.	1.2.5 3.2.5 4.5.1 4.5.2 5.0	CO 171
IN-85-820-001 T50083	CO	171	WBN	N	N	N	Y		NO	REACTOR BUILDING #2, AZ 90, APPROXIMATELY EL. 714', THERE IS A STAINLESS STEEL 2" PIPE RUBBING AGAINST AN ACCESS LADDER. THIS INSTALLATION WAS REPORTED TO MANAGEMENT SEVERAL WEEKS AGO, BUT NO ACTION HAS BEEN TAKEN. THE SAME CONDITION MAY EXIST IN UNIT #1. NO FURTHER DETAILS AVAILABLE.	1.2.5 3.2.5 4.5.1 4.5.2 5.0	CO 171
IN-85-868-003 T50245	CO	171	WBN	N	N	N	Y		SR	CI STATED THAT MIXED CONNECTIONS IN PIPE CHASE BUILDING ARE NO PER AISC CODE. CI DECLINED TO PROVIDE ADDITIONAL INFORMATION. CONSTRUCTION DEPARTMENT CONCERN.	1.2.6 3.2.6 4.6.2 5.0	CO 171

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