EMPLOYEE CONCERNS

SPECIAL PROGRAM

VOLUME 4
MATERIAL CONTROL CATEGORY

SUBCATEGORY REPORT 40700
PROCEDURAL CONTROL

UPDATED

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TVA

NUCLEAR POWER

TVA EMPLOYEE CONCERNS
SPECIAL PROGRAM

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Revision 2: Revised to incorporate SRP and TAS comments, and to make editorial and format enhancements. | R2

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Preface, Glossary, and List of Acronyms
for ECTG Subcategory Reports

HISTORY OF REVISION

REV NUMBER	PAGES REVISED	REASON FOR CURRENT REVISION
3	i	To clarify that one or more attachments will help the reader find where a particular concern is evaluated

Preface

This subcategory report is one of a series of reports prepared for the Employee Concerns Special Program (ECSP) of the Tennessee Valley Authority (TVA). The ECSP and the organization which carried out the program, the Employee Concerns Task Group (ECTG), were established by TVA's Manager of Nuclear Power to evaluate and report on those Office of Nuclear Power (ONP) employee concerns filed before February 1, 1986. Concerns filed after that date are handled by the ongoing ONP Employee Concerns Program (ECP).

The ECSP addressed over 5800 employee concerns. Each of the concerns was a formal, written description of a circumstance or circumstances that an employee thought was unsafe, unjust, inefficient, or inappropriate. The mission of the Employee Concerns Special Program was to thoroughly investigate all issues presented in the concerns and to report the results of those investigations in a form accessible to ONP employees, the NRC, and the general public. The results of these investigations are communicated by four levels of ECSP reports: element, subcategory, category, and final.

Element reports, the lowest reporting level, will be published only for those concerns directly affecting the restart of Sequoyah Nuclear Plant's reactor unit 2. An element consists of one or more closely related issues. An issue is a potential problem identified by ECTG during the evaluation process as having been raised in one or more concerns. For efficient handling, what appeared to be similar concerns were grouped into elements early in the program, but issue definitions emerged from the evaluation process itself. Consequently, some elements did include only one issue, but often the ECTG evaluation found more than one issue per element.

Subcategory reports summarize the evaluation of a number of elements. However, the subcategory report does more than collect element level evaluations. The subcategory level overview of element findings leads to an integration of information that cannot take place at the element level. This integration of information reveals the extent to which problems overlap more than one element and will therefore require corrective action for underlying causes not fully apparent at the element level.

To make the subcategory reports easier to understand, three items have been placed at the front of each report: a preface, a glossary of the terminology unique to ECSP reports, and a list of acronyms.

Additionally, at the end of each subcategory report will be a Subcategory Summary Table that includes the concern numbers; identifies other subcategories that share a concern; designates nuclear safety-related, safety significant, or non-safety related concerns; designates generic applicability; and briefly states each concern.

Either the Subcategory Summary Table or another attachment or a combination of the two will enable the reader to find the report section or sections in which the issue raised by the concern is evaluated.

The subcategories are themselves summarized in a series of eight category reports. Each category report reviews the major findings and collective significance of the subcategory reports in one of the following areas:

- management and personnel relations
- industrial safety
- construction
- material control
- operations
- quality assurance/quality control
- welding
- engineering

A separate report on employee concerns dealing with specific contentions of intimidation, harassment, and wrongdoing will be released by the TVA Office of the Inspector General.

Just as the subcategory reports integrate the information collected at the element level, the category reports integrate the information assembled in all the subcategory reports within the category, addressing particularly the underlying causes of those problems that run across more than one subcategory.

A final report will integrate and assess the information collected by all of the lower level reports prepared for the ECSP, including the Inspector General's report.

For more detail on the methods by which ECTG employee concerns were evaluated and reported, consult the Tennessee Valley Authority Employee Concerns Task Group Program Manual. The Manual spells out the program's objectives, scope, organization, and responsibilities. It also specifies the procedures that were followed in the investigation, reporting, and closeout of the issues raised by employee concerns.

ECSP GLOSSARY OF REPORT TERMS*

classification of evaluated issues the evaluation of an issue leads to one of the following determinations:

Class A: Issue cannot be verified as factual

Class B: Issue is factually accurate, but what is described is not a problem (i.e., not a condition requiring corrective action)

Class C: Issue is factual and identifies a problem, but corrective action for the problem was initiated before the evaluation of the issue was undertaken

Class D: Issue is factual and presents a problem for which corrective action has been, or is being, taken as a result of an evaluation

Class E: A problem, requiring corrective action, which was not identified by an employee concern, but was revealed during the ECTG evaluation of an issue raised by an employee concern.

collective significance an analysis which determines the importance and consequences of the findings in a particular ECSP report by putting those findings in the proper perspective.

concern (see "employee concern")

corrective action steps taken to fix specific deficiencies or discrepancies revealed by a negative finding and, when necessary, to correct causes in order to prevent recurrence.

criterion (plural: criteria) a basis for defining a performance, behavior, or quality which ONP imposes on itself (see also "requirement").

element or element report an optional level of ECSP report, below the subcategory level, that deals with one or more issues.

employee concern a formal, written description of a circumstance or circumstances that an employee thinks unsafe, unjust, inefficient or inappropriate; usually documented on a K-form or a form equivalent to the K-form.

evaluator(s): the individual(s) assigned the responsibility to assess a specific grouping of employee concerns.

findings includes both statements of fact and the judgments made about those facts during the evaluation process; negative findings require corrective action.

issue a potential problem, as interpreted by the ECTG during the evaluation process, raised in one or more concerns.

K-form (see "employee concern")

requirement a standard of performance, behavior, or quality on which an evaluation judgment or decision may be based.

root cause the underlying reason for a problem.

*Terms essential to the program but which require detailed definition have been defined in the ECTG Procedure Manual (e.g., generic, specific, nuclear safety-related, unreviewed safety-significant question).

Acronyms

AI	Administrative Instruction
AISC	American Institute of Steel Construction
ALARA	As Low As Reasonably Achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
BFN	Browns Ferry Nuclear Plant
BLN	Bellefonte Nuclear Plant
CAQ	Condition Adverse to Quality
CAR	Corrective Action Report
CATD	Corrective Action Tracking Document
CCTS	Corporate Commitment Tracking System
CEG-H	Category Evaluation Group Head
CFR	Code of Federal Regulations
CI	Concerned Individual
CMTR	Certified Material Test Report
COC	Certificate of Conformance/Compliance
DCR	Design Change Request
DNC	Division of Nuclear Construction (see also NU CON)

DNE	Division of Nuclear Engineering
DNQA	Division of Nuclear Quality Assurance
DNT	Division of Nuclear Training
DOE	Department of Energy
DPO	Division Personnel Officer
DR	Discrepancy Report or Deviation Report
ECN	Engineering Change Notice
ECP	Employee Concerns Program
ECP-SR	Employee Concerns Program-Site Representative
ECSP	Employee Concerns Special Program
ECTG	Employee Concerns Task Group
EEOC	Equal Employment Opportunity Commission
EQ	Environmental Qualification
EMRT	Emergency Medical Response Team
EN DES	Engineering Design
ERT	Employee Response Team or Emergency Response Team
FCR	Field Change Request
FSAR	Final Safety Analysis Report
FY	Fiscal Year
GET	General Employee Training
HCI	Hazard Control Instruction
HVAC	Heating, Ventilating, Air Conditioning
II	Installation Instruction
INPO	Institute of Nuclear Power Operations
IRN	Inspection Rejection Notice

L/R	Labor Relations Staff
M&AI	Modifications and Additions Instruction
MI	Maintenance Instruction
MSPB	Merit Systems Protection Board
MT	Magnetic Particle Testing
NCR	Nonconforming Condition Report
NDE	Nondestructive Examination
NPP	Nuclear Performance Plan
NPS	Non-plant Specific or Nuclear Procedures System
NQAM	Nuclear Quality Assurance Manual
NRC	Nuclear Regulatory Commission
NSB	Nuclear Services Branch
NSRS	Nuclear Safety Review Staff
NU CON	Division of Nuclear Construction (obsolete abbreviation, see DNC)
NUMARC	Nuclear Utility Management and Resources Committee
OSHA	Occupational Safety and Health Administration (or Act)
ONP	Office of Nuclear Power
OWCP	Office of Workers Compensation Program
PHR	Personal History Record
PT	Liquid Penetrant Testing
QA	Quality Assurance
QAP	Quality Assurance Procedures
QC	Quality Control
QCI	Quality Control Instruction

QCP	Quality Control Procedure
QTC	Quality Technology Company
RIF	Reduction in Force
RT	Radiographic Testing
SQN	Sequoyah Nuclear Plant
SI	Surveillance Instruction
SOP	Standard Operating Procedure
SRP	Senior Review Panel
SWEC	Stone and Webster Engineering Corporation
TAS	Technical Assistance Staff
T&L	Trades and Labor
TVA	Tennessee Valley Authority
TVTLC	Tennessee Valley Trades and Labor Council
UT	Ultrasonic Testing
VT	Visual Testing
WBECSP	Watts Bar Employee Concern Special Program
WBN	Watts Bar Nuclear Plant
WR	Work Request or Work Rules
WP	Workplans

EXECUTIVE SUMMARY
MATERIAL CONTROL CATEGORY
SUBCATEGORY REPORT 40700 "PROCEDURAL CONTROL"

SUMMARY OF THE ISSUES

The Procedural Control subcategory addresses the adequacy of procedures governing material control functions. To aid in the evaluation effort, the 18 concerns assigned to the subcategory were grouped into 12 issues pertaining to: (1) heat code as used for material control during construction, (2) heat code as used for material control during operation, (3) allegedly changed heat numbers, (4) use of non-code material, (5) material upgrading/reclassification, (6) allegedly unvalidated heat numbers for structural steel, (7) material allegedly received by inappropriate personnel, (8) warehouse access control, (9) verification of a material discrepancy, (10) the adequacy of a search for defective material, (11) the adequacy of procedures governing storage and tracking of instrumentation materials, and (12) the adequacy of controls on the purchase and handling of nondestructive examination materials.

MAJOR FINDINGS

The problems identified primarily involved pressure boundary material (2 1/2-inch and under pipe and loose fittings) at all four plants. Basically, the problem is primarily one of documentation deficiencies with the potential for hardware deficiencies.

Upper-tier documents require that certain pressure boundary material be marked in such a manner as to provide traceability to the reports of relevant specified tests and examinations performed on the material. Positive controls are required to ensure proper handling and to maintain identification, either by markings on the material or by records traceable to the material, throughout fabrication, erection, installation, and use. The intent of material identification and control measures is to prevent the use of incorrect or defective material, parts, and components. |R2

TVA has generally used the "heat" number (or heat code) to verify the identification of material (the heat number is the "lot" or batch number assigned by the manufacturer to identify material produced by a specific manufacturing "run"). However, material from the same heat is often supplied for different code classes: the difference between classes of material is the extent of tests and examinations required for certification. Therefore, the heat number does not, by itself, identify the class of material or provide traceability to its Certified Material Test Report.

The material control procedures at Watts Bar, Sequoyah, and Bellefonte Nuclear Plants did not ensure full compliance with regulatory requirements with regard to traceability of some pressure boundary materials. |R2

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In order to establish the record control and materials identification requirements, the ASME Code governing these requirements should be specified; but, the Final Safety Analysis Reports (FSAR) for Watts Bar, Sequoyah, and Bellefonte did not clearly define the applicable Code of Record.

Furthermore, site procedures at Watts Bar, Bellefonte, and Sequoyah did not provide for the required verification of properly certified pressure boundary material and traceability to its Certified Material Test Report (CMTR) throughout fabrication, storage, installation, and use. These findings were applicable to both initial installations and replacements installed during modifications and maintenance activities. Personnel at Watts Bar and Sequoyah were relying on heat numbers; however, heat numbers are not unique to nuclear class material and do not provide material identification and traceability. At Bellefonte, the mark number system in use did not ensure the proper material was installed and did not provide traceability to the CMTR. Additionally, Quality Assurance requirements for material identification and storage were not adequately defined in the general specification and were not being met.

Browns Ferry (BFN) met the codes and standards to which it was committed through construction, with only isolated discrepancies. However, for post-construction modifications and maintenance activities, Browns Ferry is committed to 10 CFR 50, Appendix B, Criterion VIII, "Identification and Control of Material, Parts, and Components". The Nuclear Quality Assurance Manual did not accurately define the requirements for material identification and control procedures necessary to ensure compliance with commitments; therefore, site procedures were deficient.

Browns Ferry Design Criteria was and is still unclear and contradictory in defining the Nondestructive Examination (NDE) requirements. This resulted in documentation discrepancies with respect to BFN's design output documents and materials.

Evaluations and reports from the Material Control Subcategory Report 40700, "Procedural Control" address items which are related to items addressed by Quality Assurance/Quality Control (QA/QC) Subcategory Report 80100, "QA Management and Policy." An area that is not addressed in the 40700 report, but is addressed in the 80100 report, is the impact or contribution of QA Audits and/or Surveillance Programs on procedural control functions. The QA/QC evaluation/report will indicate problems, trends, and/or factors identified by these audits/surveillances and their effect on procedural control functions. The two reports, 80100 and 40700, should be considered collectively for a full appreciation of this issue. R2

COLLECTIVE SIGNIFICANCE OF MAJOR FINDINGS

The Final Safety Analysis Report is the governing document defining the requirements for the as-built condition of a nuclear plant. It serves as the basis for licensing by the NRC and provides information important to public safety. Inaccurate or incomplete information in the FSAR has the potential to introduce questions about the licensing basis for a nuclear power plant. All FSARs include ASME/ANSI codes as reference standards and these codes have R2

material identification requirements, but these can vary depending upon the Code of Record invoked by the respective FSAR. This review showed that code requirements were not made adequately clear in the SQN, WBN, and BLN FSARs, causing uncertainity about whether TVA had adequately met traceability commitments. R2

Verification of properly certified Pressure Boundary Material and life of plant traceability to Certified Material Test Reports is intended to ensure the integrity of material in critical systems. The actual impact on plant safety is minimized by the construction, preoperational, and startup tests and by surveillance and inspection programs during plant operation. The absence of some traceability does not mean that safety has been unacceptability compromised; however, it can contribute to an indeterminate situation that must be resolved by other means. Installed material, whose traceability to referenced records cannot be fully verified, requires further evaluation to ensure it meets code requirements or to be otherwise certified as suitable for service. Generally, the problem in the TVA plants is one of documentation deficiencies rather than hardware deficiencies, although some hardware deficiencies were also encountered. R2

Thus far, nothing has arisen from the investigations in the subcategory to indicate that plant safety has been compromised by installation of unsuitable material. However, some major deficiencies in materials control practices were determined to require supplemental evaluation to address potential technical problems and, in some instances, corrective measures were found necessary. R2

CAUSES OF THE MAJOR FINDINGS

Essentially, the problems with Code of Record definitions in the FSARs and procedural control of material verification and traceability requirements occurred because TVA did not fully clarify what was required by the stipulated code nor did it develop a material identification and control program that would ensure full compliance with code material traceability requirements. R2

Procedures were in place to provide traceability through heat numbers; however, heat numbers did/do not adequately prescribe the materials records needed for nuclear class material and cannot be used as the sole means of material identification/verification. R2

CORRECTIVE ACTION ON MAJOR FINDINGS

Corrective actions have been initiated to address the specific deficiencies at each site. The actions initiated vary according to each site's code of record. Generally, WBN, SQN, and BLN will review upper-tier material use criteria and revise the FSARs as necessary to ensure commitments properly reflect those criteria. Reviews will also be performed of other TVA governing requirements, implementing specifications, and site procedures to identify potential deficiencies. Corrections will be made as necessary to bring the overall programs into compliance with appropriate code and regulatory requirements. R2

TVA plans to use statistical sampling programs at SQN, WBN, and BLN to demonstrate the adequacy of presently installed pressure boundary material. The samples will be of sufficient size to provide a high degree of confidence of the suitability for service of material installed in code class systems at the three affected sites. Installed pressure boundary material that is not adequately traceable will be tested, inspected, or otherwise analyzed to determine compliance with requirements. Material that does not meet code, design, or regulatory requirements will be evaluated to determine suitability for service; unsuitable material will be replaced. R2

In response to corrective actions initiated by ECSP, BFN reviewed its post-construction material control documentation. The review found that even though site procedures had been inadequate during post construction, personnel had maintained identification and control during receipt, storage, and installation. Therefore, BFN was found not to require further review. However, BFN is upgrading its document control, as a result of this evaluation, to make material records more accessible. In addition, where design requirements regarding NDE are unclear, BFN-DNE is redefining those requirements applicable to BFN's Material Control Program. The remaining problems with pressure boundary material at BFN were limited to isolated problems for which corrective actions have been assigned.

A total of 45 corrective actions were initiated to address deficiencies identified by evaluations in this subcategory. Corrective actions for specific deficiencies vary according to the requirements of each site's Code of Record. Generally, Watts Bar, Bellefonte, and Sequoyah will review upper-tier criteria and revise their Final Safety Analysis Reports as necessary to ensure commitments are accurately specified.

The Division of Nuclear Engineering has initiated a Specification Improvement Program to upgrade the TVA nuclear engineering specifications. The complete set of specifications, i. e., Master Specification, Engineering Requirements Specification, and Pre-Engineered Replacement Items Specifications, will require material identification and traceability consistent with regulatory requirements and with the code requirements applicable to each site. Development of these specifications will be coordinated with the sites to ensure resolution of the material control requirements deficiencies identified by Employee Concerns Special Program evaluations. R2

Implementation of the specifications will be controlled in accordance with the Nuclear Procedures System (NPS) requirements. A NPS standard is being developed to provide interdivisional control of implementation of the specifications throughout the Office of Nuclear Power. The standard will be developed by Division of Nuclear Engineering and coordinated with all divisions for their review and concurrence. The standard will be applicable to all procedures involved in procurement, fabrication, construction, modification, and maintenance activities at each plant. User organizations will be required by the standard to maintain compliance with Engineering Requirements Specifications as they are revised over time.

Subcategory 40700 was the only subcategory in the ECSP that required upper-management resolution of evaluator nonconcurrence with corrective action responses. Some evaluators of this subcategory, did not concur with the corrective action plans provided by line management to address issues at Watts Bar and Sequoyah Nuclear Plants. Evaluator nonconcurrence with

Sequoyah's corrective action plans for the material verification and traceability issue was ultimately elevated to the Manager of Nuclear Power for resolution. Two independent consultants were contracted by the Manager of Nuclear Power to review and recommend disposition of the identified problems. The evaluations and recommendations provided by these independent assessments provided the bases for resolving the issues at Sequoyah. |R2

Corrective action for another Sequoyah issue was elevated to the Employee Concerns Special Program Manager. After evaluating the information provided by all parties the ECSP program manager concurred with the corrective action plans submitted by Sequoyah. Some corrective action plans submitted by Watts Bar and Sequoyah and not accepted by some evaluators were accepted by the Category Group Leader and were not elevated further. |R2

SUBCATEGORY REPORT 40700
PROCEDURAL CONTROL
EXECUTIVE SUMMARY TABLE

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Construction (A lack of credibility of methods used in the Construction Program, Heat Number Sort Printout (HNSP), for verification of properly certified Pressure Boundary Material, at installation.)	X		This issue was found to be factual at WBN, SQN, and BLN. The issue was not factual at BFN but some side issues were found. At WBN, following deficiencies were found to have occurred: • The site specific FSARs did not define the Code of Record for Nuclear Class I, II, and III (TVA Class A, B, and C/D) piping installed/modified during construction activities. • Site procedures did not always provide adequate measures to ensure that Code and regulatory requirements were met. • Reliance on the heat code/number or mark number system to identify/verify material traceability was inadequate since the heat code/number or mark number systems were not always unique to the Nuclear Class, Pressure Class, or product form.	The overall cause for the problems identified in this issue was a failure by TVA to clearly define the upper-tier criteria including applicable codes, standards, and regulatory requirements. This in turn resulted in a failure to recognize a need to develop and maintain an adequate material identification and control program with respect to nuclear piping components and material. This cause was further expanded by both TVA and its suppliers relying upon material manufacturer's heat numbers/codes alone as unique identification for traceability.	WBN: Seven CATDs were initiated for deficiencies identified for this issue. One Corrective Action Plan (CAP) was established to correct the deficiencies as follows: • TVA will perform an in-depth review of TVA upper-tier requirements and implementing specifications and procedures to identify program deficiencies and weaknesses. TVA will make necessary corrections to bring all WBN procedures pertaining to material control into compliance with ASME Code and associated regulatory commitments. TVA will demonstrate the adequacy of presently installed pressure boundary

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ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Construction (continued)			• Compliance of Nuclear Class Piping Components to the applicable Codes of Record and 10CFR50 Appendix B was sometimes indeterminate at WBN, SQN, and BLN.		material through a sampling program and will submit the program to the NRC prior to performing work. DNE will assess the adequacy of those items that do not meet ASME Code or regulatory requirements. The results will be transmitted to the NRC and appropriate licensing amendments will be made as necessary. (CATDs 40700-WBN-08 through -14)
			At SQN, the same deficiencies as identified at WBN were found to have occurred with respect to this issue.		SQN: Two CATDs were initiated for the deficiencies identified for this issue. CAPs are as follows: • The SQN FSAR will be clarified. An engineering requirements specification will be written to provide a baseline for the requirements. Other affected lower tier documents will be revised as appropriate to clearly reflect the applicable code requirements. (CATD 40703-SQN-01) • Large bore piping will be assessed and acceptability for

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Construction (con't)					service documented or replaced. Small bore piping, 2-inch NPS and less, will be assessed to determine if it meets the ANSI B31.7 forty percent stress reduction for Class A applications. If it can not be met, then acceptability for service will be demonstrated or the material will be replaced. This corrective action will be tracked by CAQR SQP 870627. (CATD 40703-SQN-02)
			At BLN, the same deficiencies as identified at WBN were found to have occurred with respect to this issue. Additionally, during the evaluation of this issue at BLN, discrepancies with the traceability of non-ASME QA material were found. ANSI B31.1 or B31.5 seismic category I piping material was stored and assigned the same BLN site mark number as B31.1 non-QA piping material. This may allow non-QA material to be installed in QA application.		BLN: Five CATDs were initiated for the deficiencies identified for this issue. CAPs to correct these deficiencies are as follows: • CAQR BLF870193 has been written to address DNE and DNC controlling documents not adequately defining the NQAM requirements for QA(L). A review of the DNE and DNC documents will be performed to verify any deficiencies or

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Construction (con't)					weaknesses. Upon completion of the review, appropriate corrective actions will be identified and implemented. (40700-BLN-01) • BLN FSAR System Description Sections will be reviewed and revised to clearly reflect the Code of Record for each ASME class. FSAR section 3.9.7 will be expanded to include a summary of non-RCP code compliance. (40700-BLN-02) • Noncompliances with the ASME code and associated regulatory commitments relative to material control will be reviewed and dispositioned by the following: 1. Verify and establish the ASME code requirements where deficient. 2. Perform an in-depth review of BLNs upper tier requirements and

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat code as Related to Material Control for Construction (con't)					implementing specifications and procedures to identify and correct deficiencies. 3. Correct BLN project procedures so that they comply with the upper-tier documents. 4. Perform a sampling of installations to determine the amount of non-compliance for DNE analysis and disposition in order to maintain BLNs licensability. Specific issues/ deficiencies identified will be addressed and resolved to completion under CAQR BLP870365, R0. (CATDs 40700-BLN-05 through -07)
			At BFN, traceability of Code or Record Material was found to meet the codes and standards which BFN was committed to, through construction. Four discrepancies were found during this evaluation as follows:		BFN: Five CATDs were initiated for the identified deficiencies for this issue. CAPs to correct these deficiencies are as follows: * Accept as is. The Construction of BFN was underway before

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Construction (con't)			1. General Electric Design Specification 22A1406, R2, took an exception to the Nuclear Code Cases of USAS B31.1.0 for Power Piping. This is in direct conflict with the BFN FSAR and 10CFR50.55a. 2. NDE requirements for pipe forgings were unclear because bills of material specified identifical mark numbers for forgings requiring additional NDE (PT or MT) requirements and forgings requiring no additional NDE requirements. These forgings were specified to have the PT and MT tests performed on the principle piping contract and/or TVA bills of material. 3. Installed 2 inch piping was found to not meet the brittle fracture requirements of AEC criteria 35.* ASTM A-106 without impact testing was installed instead of ASTM A-333 which required impact testing.	* AEC Criteria 35 is now Criteria 31 of 10 CFR 50 Appendix A.	10CFR50.55a (and predecessor documents) was issued. This document was a compilation of industry codes and standards. GE design was supplemented with state-of-the-art technology surpassing the Code Cases. The subject of AEC Question 4.1.3) (p. Q4.1.3-1/4.1.3-2) will be included in the BFN FSAR, with reference to GE Design Specifications supplementing the B31.1 Code in significantly greater detail and using much more up-to-date technology than the Nuclear Code Cases. This is addressed by CAQRBFF870088 and CAQRBFF870089. (CATD 40700-BFN-01) • DNE (Knoxville) is to provide a matrix of material NDE requirements on the basis of design commitments. DNE (site) is to prepare a detailed plan to review material

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Construction (con't)			4. Installed 6 inch piping was found to not meet the brittle fracture requirements of AEC criteria 35.* ASTM A-106 without impact testing was installed instead of ASTM A-133 which required impact testing.	* AEC Criteria 35 is now Criteria 31 of 10 CFR 50 Appendix A.	documentation to establish a high level of assurance of the adequacy of TVA Class A, B, C, D, and E forgings. Any discrepancies will be identified and resolved via CAQRs. (CATDs 40700-BFN-02 and 03) * The installed ASTM A-106 steam drain piping is subjected to temperature well above nil ductility transition temperature and does not exhibit brittle fracture. The FSAR does not require impact tests for material less than 1/2 inch thick (nominal wall thickness). The installed pipe nominal wall thickness is 0.344 inches such that no impact testing is required. The material is acceptable as installed and three drawings will be revised denoting the acceptability of the ASTM A-106 material. (CATD 40700-BFN-04)

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Construction (con't)				* AEC Criteria 35 is now Criteria 31 of 10 CFR 50 Appendix A.	* The installed piping is ASTM A-106 without impact testing. The BFN FSAR clarifies the brittle fracture control requirements in AEC Criteria 35.* Impact tests are not required for material with a nominal pipe size of 6 inch diameter and less, regardless of thickness, therefore, the use of ASTM A-106 Grade B without impact testing is acceptable for this application. Furthermore, since the location and environment of this piping indicates that it is subjected to temperatures well above nil ductility transition temperature, the ASTM A-106 will not exhibit brittle fracture. To provide clarity of the design requirements for materials, affected drawings will be revised to allow the use of ASTM A-106 Grade B as an alternative to ASTM A333 Grade 1. This is being accomplished under PIRBFNNEB8709. (CATD 40700-BFN-05)

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (A lack of credibility of methods used in the Nuclear Power Program for verification of properly certified Pressure Boundary Material, at installation.)	X		This issue was found to be factual at three TVA nuclear sites. At WBN, the following deficiencies were found to have occurred: • The TVA-NQAM for all three nuclear sites did not accurately define the requirements for material identification and control procedures, necessary to ensure compliance with 10 CFR 50 Appendix B, Criterion VIII. • Site procedures did not always provide a positive documented traceability path between the material installed and its CMTR. • The modifications performed on CSSC components did not comply with the requirements of 10 CFR 50 Appendix B, for identification and control of these	Same as cause for issue "Heat code as Related to Material Control for Construction."	WBN: Two CATDs were initated for the identified deficiencies. CAPs are as follows: • Subject material, TIIC AQF-085M, is shown on the MAMs data base as QA N/R. Power Stores typed the ledger cards in August 1987 to match the data base. Only one issue of the subject material had been made and it was for non-CSSC application. Materials and Procurement Services will establish an initial QA Level I stock TIIC SA-312 piping material. (CATD 40700-WBN-15) • Five material/documentation discrepancies identified are to be

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)			components through their fabrication, erection, installation and usage. • Design and inspection personnel displayed a lack of understanding in the Code of Record requirements for Code material, both in the design/procurement and identification/ verification processes at installation.		corrected as follows: 1. The heat number on a 575 and the material in stock for 3/16 inch diameter, SA-213 type 316, stainless steel tubing is 20179 while the receiving documentation is 408734. The material was either received or tagged incorrectly. If a non-QA application exists, the material will be downgraded. If a non-QA application does not exist, the material will be surplused and material that will meet correct plant requirements will automatically be reordered. The material installed will be traced to the receipt package, and if the heat number is not acceptable, the Materials and Procurement Services Group will recommend that the material be replaced.

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)					2. CAQR WBP 870768 has been initiated to resolve the heat number discrepancy between the CMTR and COC for a 3 inch diameter tee received on contract 347739. 3. No 1 1/2 inch diameter pipe caps remain in Power Stores stock. MPS is to request Modifications to review the installed material (WP-E6591-02). If the heat number can be verified, the 575 will be changed and re-entered into the RIMS tracking system. If the heat number cannot be verified, the material will be replaced. 4. No 1 inch diameter stainless steel tubing remains in Power Stores stock. The 575 indicates that all the received material was issued for a non-CSSC application. Since there is a high probability

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)					that the heat number on the 575 was transposed at the time of issue, Power Stores will change the 575 to read the correct heat number and re-enter into RIMs for traceability. 5. The correct contract number is 37388 and the balance of material in Power Stores Bin HT14-92 is correctly marked. The 575 has been changed to read the correct contract number and entered into RIMs. (CATD 40700-WBN-16)
			At SQN, the same deficiencies as identified above for WBN were found to have occurred with respect to this issue.		SQN: Seven CATDs were initiated for the identified deficiencies. CAPs to correct those deficiencies are as follows: • The NQAM will be reviewed to determine if references to applicable code edition and addenda are accurate. Further, the NQAM will be reviewed to assure it requires SQN

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)					to issue procedures to comply with code requirements. PIR SQNNEB8638 will track this to completion. (CATD 40703-SQN-03) • Seven SQN site implementing procedures require revision to provide additional verifications to ensure control and traceability of Code of Record material. These procedures are SQA-162, AI-11, AI-36, SQM-2 or SQM-1, AI-19, SQA-45, and M&AI-1. CAR SQ-CAR-86-064 has been issued to track this to completion (CATD 40703-SQN-04) • SQN site procedure AI-14 is being revised to require inspectors to be trained on material identification/verification requirements. CAR SQ-CAR-86-04 has been issued to track this to completion. (CATD 40703-SQN-05)

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)					• SQN is to review all modification work performed on ASME XI piping components. If the modifications are found not to meet ANSI B31.7 and 10 CFR 50 Appendix B requirements, acceptability for service will be demonstrated or they will be replaced. CAQR SQP 870627 has been issued to track this to completion. (CATD 40703-SQN-06) • Resolution of CATDs 40703 SQN-02 and 40703-SQN-06 will resolve the SQN response to generic WBN NCR 5087, R1. (CATD 40703-SQN-07) • System flow diagrams and physical piping drawings for all systems will be reviewed and revised as required to properly and clearly define all piping class breaks. Work is to be performed per ECN L6784. (CATD 40703-SQN-08)

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)					• A clear and distinguishing boundary between the primary coolant loops and their branch lines was found to exist, by DNE review, such that a CAQ does not exist. (CATD 40703-SQN-09)
			At BFN, the same deficiencies as identified above for WBN were found to have occurred with respect to this issue.		BFN: Four CATDs were initiated for the identified deficiencies. CAPs are as follows: • There is no procedural inadequacy in SP BF-6.2 in the area of material verification during weld joint fit-up. No corrective action is required. SP BF-A6 dated February 9, 1973, shows the requirements in place for control of materials after issue from Power Stores through installation. This practice was in use through April 14, 1978. SP BF-Modification and Addition Instruction 15 dated December 27, 1979, provided for material accountability from

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)					the time of material issue until installation. Ample evidence exists that materials were required to be controlled in a manner to preclude incorrect material from being installed prior to present revision of SP BF 6.2. (CATD 40700-BFN-06) • Modifications at Browns Ferry, including the work cited in this CATD 40700-BFN-07, have been performed in a manner that provides adequate material traceability to meet the criteria of 10 CFR 50 Appendix B, Criterion VII and VIII. Material traceability has been/is maintained. However, as a result of this investigation and in order to enhance records retrievability, the set of Modifications files presently located in

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)					Modifications Fabrication Shop S21 will be secured by Document Control in a manner consistent with lifetime storage requirements. (CATD 40700-BFN-07) A. Assigning duplicated weld numbers and retrevability of weld documents does not impact on the weld quality. However, the development and implementation of a weld map program shall address various concerns such as assigning unique weld numbers for modification and maintenance, and improving retrievability of weld documents for new work. This will be done on BF-CAR-0038. B. No corrective action is required. Futhermore, pressure-temperature ratings for pipe could be used to estimate a pipe wall thickness as a function of th

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)					materials and operating conditions. The pressure-temperature rating for pipe is based on the minimum wall thickness requirements, and is a convenient design guide to avoid repetitive minimum wall calculations. The current practice for BFN, relative to weld maps, is fully detailed in Site Director Standard Practice (SDSP) 13.13 and does ensure ongoing control/maintenance for these documents with a cross-reference to the relative work packages. (CATD 40700-BFN-08) • Due to inconsistency of material non-destructive examination (NDE) requirements in the Bill of Materials, the Division of Nuclear

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Heat Code as Related to Material Control for Nuclear Power (con't)					Engineering will provide a matrix of material NDE requirements on the basis of design commitments made for BFN. This matrix will be used to review Bills of Material to establish a high level of assurance for adequacy of tubular products in TVA piping classification A and B. This corrective action item is already identified in CATD No. 40700-BFN-02 and 40700-BFN-03. (CATD 40700-BFN-09)
			At BLN, no program for heat code/traceability was found to exist within the operations group. However, since no modifications had been performed on transferred Code of Record systems, (Nuclear Class I, II, and III piping systems and components), no hardware deficiencies existed. A program will have to be established before any transferred Code of Record Components are modified and/or installed.	NONE	NONE

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Changed Heat Numbers (Heat numbers have been changed without Quality control's knowledge.)	X		This issue was found to be not factual at WBN. No evidence was found that indicated that the issue had occurred.	NONE	NONE
Use of Non-Code Material (Watts Bar Nuclear Plant was constructed with non-code material in certain areas.)	X		This issue was found to be factual at all four TVA nuclear plants. (The NRC requested TVA to evaluate this issue at all four nuclear plants.) The evaluations were based on the evaluations from "Heat Code as Related to Material Control for Construction and for Nuclear Power" and "Material Upgrading/ Reclassification." Also, the terms "non-code" and "certain areas" had to be defined for each plant site. The term "non-code" was defined as material that did not meet the site-specific Codes of Record and the term "certain areas" was defined as Code of Record systems at each plant site. When the evaluations and conclusions of the three issues (as applicable to each nuclear plant) were evaluated collectively, non-code	Same as cause for issue "Heat Code as Related to Material Control for Construction.	No corrective actions were initiated for this issue since the deficiencies identified were already addressed in the three issues used as the basis for the evaluation of this issue. Also, CATD 40700-NPS-01 will cause a programmatic review and revision to TVA's overall material control program.

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
			material could have been installed in code systems at all four TVA nuclear plants.		
Material Upgrading/ Reclassification (A lack of credibility of methods used for upgrading and reclassification of Pressure Boundary Material.)	X		This issue was found to be factual at WBN and BLN. WBN: Reclassification of ASME Section III material was found to be acceptable, but upgrading of non-ASME Section III/QA material was found to have been done improperly. Upgrading was performed in accordance with Code Cases N-247 and N-242-1, which were not applicable to WBN. No site procedures existed allowing material upgrading. After a material heat number had been upgraded, no site procedure existed to ensure that it was not received as a lower class material at a later date and then installed as if it had been upgraded. All of these deficiencies occurred during the WBN construction phase. No material was found to have been upgraded by WBN ONP. In fact, no program	Same as cause for issue "Heat Code as Related to Material Control for Construction."	WBN: Six CATDs were initiated for the identified deficiencies for this issue. One CAP was established to correct these deficiencies. * Same as corrective action for WBN for issue "Heat Code as Related to Material Control for Construction." (CATDs 40700 WBN-02 through -07)

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Material Upgrading/ Reclassification (continued)			existed. Before WBN ONP upgrades material in the future, a proceduralized program will have to be implemented. BLN: As stated in the issue on "Heat Code as Related to Material Control for Construction," the BLN FSAR did not define the applicable Code of Record. Also, Code Case N-242-1 was used to upgrade material even though it did not apply to BLN's Code of Record. Upgrading was begun in 1976 without a site procedure such that the material upgraded may not be in compliance with applicable codes and standards.		BLN: Two CATDs were initiated for the identified deficiencies for this issue. CAPs are as follows: • BLNs FSAR will be revised to show the correct Code Cases and revisions and will list the components the Code Cases were used on. (CATD 40700-BLN-03) • Same as corrective action for BLN for CATDs 40700-BLN-05 through 07 in "Heat Code as Related to Material Control for Construction." (CATD 40700 BLN-04)

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Unvalidated Heat Numbers for Structural Steel (Heat numbers for QA material, structure steel, may be entered into the "log book" without Certified Material Test Reports being in the record vault.)	X		This issue was found to be factual at SQN and not factual at WBN. WBN: The original evaluation for this issue was found to be not factual. Subsequent evaluations of this issue at SQN raised additional questions as a side issue. These additional questions were addressed as part of the evaluations for "Heat Code as Related to Material Control for Construction" at WBN. SQN: The Heat Number Validation process and HNSP used heat number documentation accountability/ retrievability which were/are not sufficiently controlled by QA procedures. The HNSP contained errors and retrievability of CMTRs was found to be difficult and time consuming. However, interviews with SQN material inspection personnel determined that no known instances of material inspectors being prevented from validating heat numbers/codes of material received at SQN had occurred.	Same as cause for issue "Heat Code as Related to Material Control for Construction."	WBN: No corrective actions were initiated for this issue due to it not being factual. Any corrective actions for the side issue will be addressed by the corrective actions for the issue "Heat Code as Related to Material Control for Construction." SQN: One CATD was initiated for the identified deficiencies for this issue. The CAP is as follows: • The Heat Number Sort Printout (HNSP) is not used to control activities that affect quality, rather as a guide in locating CMTRs and other documents. Its use does not represent a potential for degradation of safety-related equipment. The printout does contain errors and omissions but they do not adversely affect plant safety as

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Unvalidated Heat Numbers for Structural Steel (con't)					demonstrated by the Kelly and Landers Executive report. When material verifications/ searches are performed, hard copy documentation will be used to the extent necessary to ensure adequate material verifications/ searches. The HNSP was not used for installation verification of civil items. Structural shapes and plates were verified at installation during construction. Material was verified upon receipt and heat numbers were maintained to identify the material as acceptable. This practice was for civil QA items. Civil item heat numbers were input into the HNSP in 1978 when the responsibility for the HNSP was assumed by the Materials Service Unit. When civil materials were issued for use

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Unvalidated Heat Numbers for Structural Steel (con't)					as pressure boundary attachments, control and verification of the material was handled in the same manner as material procured as pressure retaining. Out of 500 individual items evaluated by HCTTG, no instances were identified where the wrong material specification was installed. The report did identify problems with pipe class distinction but no instances where the wrong material specification was installed. Additionally, the heat numbers identified in the subject ECTG report for which CMTRs were not found have had certifications located by SQN. (CATD 40705-SQN-01)

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Material Received by Inappropriate Personnel (Inappropriate personnel and practices were used in the receipt of material.)	X		This issue was found to be not factual at WBN and BFN. The evaluations determined that no upper-tier criteria or procedural requirements have been violated and that the engineering aides' review of material received on-site was adequate.	NONE	NONE
Warehouse Access (Access to the warehouse is uncontrolled.)		X	This issue was found to be not factual at WBN. The evaluation determined that physical access to the warehouse was adequately controlled. However, access was not limited to authorized personnel as required by upper-tier criteria and site procedures.	This problem identified as a side issue was caused by a failure to comply with site procedures.	WBN: One CATD was initiated for the identified deficiencies for this issue. The CAP is as follows: Access to the warehouse yard has been further controlled by the following actions being taken: • An electric gate has been installed at the warehouse yard entrance. • A material clerk is assigned to man the gate. • Authorized personnel are required to sign in at the warehouse gatehouse and state the approximate location and type of material to be issued. Entrance and exit times were logged.

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Warehouse Access (con't)					• Access is now limited to authorized personnel as defined in a revision to SOP-PMS-047 (reference sections 6.1.6 and 6.1.9). (CATD 40700-WBN-01)
Verification of Material Discrepancy There were conflicts between departments resulting in Procedural violations, regarding the verification of material discrepancy Non-Conformance Report (NCR).	X		This issue was found to be not factual at WBN and BLN. No facts were found that supported the perceived problem. Interviews with site personnel and a review of NCRs failed to provide any evidence to support the perceived problem.	NONE	NONE
Material Personnel-Search for Defective Material (Material personnel at SQN were not given an opportunity to verify whether or not defective material had been received on site from a certain manufacturer and a report to Knoxville that the material was not on-site was made without input from materials personnel.)	X		This issue was found to be not factual at WBN and SQN. No facts were found to indicate that any employee was impeded in the search for Ray Miller, Inc. material and that a report to Knoxville stating that the material was not on site was made without input from materials personnel. However, facts were found which indicated that TVA's response to NRC Bulletin IEB 83-07 (Ray Miller, Inc., supplied material) was inadequate.	This problem identified as a generic side issue was determined to be caused by TVA's failure to develop an adequate program to address NRC Bulletin IEB 83-07, "APPARENTLY FRADULENT PRODUCTS SOLD BY RAY MILLER, INC."	SQN: One CATD was initiated for the identified deficiencies for this issue. The CAP is as follows: • TVA Nuclear Safety and Licensing Staff is to perform a thoroughly documented evaluation of TVAs past actions regarding Ray Miller, Inc., material (IEB 83-07). The evaluation will address, but not be limited to the following:

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Material Personnel-Search for Defective Material (con't)			Deficiencies with TVAs response to IEB 83-07 are as follows: • The responsibilities for developing TVAs response was divided between SQN Division of Nuclear Power (DNP) for SQN and NEB for the remainder of TVA Nuclear plants. • A response was prepared by NEB for all TVA nuclear plants that sited only one instance of Ray Miller, Inc., material being used in a safety-related systems at SQN (L16 840224 884). Two were in CSSC systems. • NEB superceded its original response with a new one. The new response for all TVA nuclear plants identified four instances of Ray Miller, Inc., material being installed in safety-related systems (A27 840321 011). Two were located at SQN and one at BLN and Yellow Creek Nuclear Plant, respectively. • TVA's "official" response for IEB 83-07 to the NRC contained the last NEB		1. Activities for all TVA plants, including cancelled plants, in relation to the IEB 83-08 requirements. 2. Identify material installed in safety-related systems, along with its safety significance. 3. Disposition of all Ray Miller, Inc., material that remained in stock. 4. The specific examples identified in ECTG report 40709-SQN. Any deficiencies found will result in CAQRs to ensure that the NRC is advised that TVAs original response (A27 840322 014) was in error and that a revised response will be prepared and issued. This process is identified on CAQR CH5870013. (CATD 40709-SQN-01) Corporate: One CATD was issued for this issue.

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Material Personnel-Search for Defective Material (con't)			response (A27 840321 011) which did not include the SQN DNP response. This response (A27 840322 014) was also found to not comply with the requirements of IEB 83-07. The two SQN items were from Ray Miller, Inc., contracts outside the 1975 through 1979 time period. • A review of Ray Miller, Inc., contracts for material purchased and received, both directly and indirectly during the 1975 through 1979 time period, was performed. Eight contracts were found (five at SQN and three at WBN) that were not included in TVAs "official" response to the NRC (A27 840322 014). • Before TVAs "official" response was released, a list of secondary companies having the potential of supplying Ray Miller, Inc., material was established from an evaluation of IEB 83-07, Supplement 1. The results of this evaluation, including		The CAP to correct the identified deficiencies is identical to the CAP for CATD 40709-SQN-01 above. (CATD 40709-NPS-01)

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Material Personnel-Search for Defective Material (con't)			a response from Goulds Pumps, Inc. (L16 840323 194), were omitted from TVAs response (A27 840322 014). • IEB 83-07, Attachment 1, identified SQN contract number 79P88-1613 as having applicability to the 1975 through 1979 time period and was omitted from TVAs response (A27 840322 014). The contract identifies SQN as both the "buyer" and "dolivery point." Based on the above listed deficiencies, a re-evaluation of the identification and subsequent reporting of Ray Miller Inc., material needs to be performed.		

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Procedural Control for Issued Instrumentation (Parts stored in the Turbine Building Storage area are not controlled by a procedure and no tracking/documentation of instrument/parts exits.)		X	This issue was found to be factual at WBN and corrective actions had been initiated before this evaluation. No method was used to track the inventory of instruments in the TB storage area. However, the method of traceability used did allow for traceability from the point of installation back to procurement including certificate documentation. During this evaluation, a side issue on tubing material received and installed without a CMTR or COC was identified. Six discrepancies were found in which documentation errors were found. The correct material identification markings were not transcribed onto the material tags and storeroom requisitions by the Power Stores Clerk. Upper-tier and site procedures only required the Power Stores Clerk to be responsible for the material identification markings placed on identification tags and storeroom requisitions.	Same as cause for issue "Heat Code as Related to Material Control for Construction."	• Same as Corrective Actions for WBN for issue "Heat Code as Related Material for Construction." (CATD 40700-WBN-17)

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Procedural Control for Issued Instrumentation (con't)			The procedures do not specifically require QA material identification/ verification by a QA inspector at time of issuance or installation. Also, no procedural requirements existed requiring a QA receipt inspector to verify the tagging performed by the Power Stores Clerk.		
Control of NDE Material (Purchase and subsequent control of NDE materials at BNP appears to be inadequate.)	X		This issue was found to be factual at BLN and corrective actions had been initiated before this evaluation. Site procedure BLN-QCP-10.3 had been revised to show that NDE materials were to be procured as "safety-related." All three construction procurement forms had been changed to require the usage of the material to be indicated ("Safety-Related", "Limited QA," or "Nonsafety-Related"). All NDE procured material documentation was reviewed with only one deficiency being found. This deficiency was corrected and documented by the use of existing site procedures.	NONE	NONE

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Generic Material Control (Collective of all Material Control Issues)	X		Numerous instances of CSSC material either installed or available for installation, at TVA nuclear sites, for which traceability between the item and its CMTR were found not to exist. Due to 44 specific CATDs being issued for those and other quality-related deficencies for this subcategory, a NPS CATD was issued to address this issue from the corporate perspective.	As collectively described for the previous issues.	• A set of Master Specifications are being developed to incorporate the top level engineering requirements under the control of the DNE discipline branches. The Master Specifications, MS-NEB-001, "Safety-Related Piping Installation, Modification, and Maintenance," and MS-NEB-015, "Procurement, Storage, Installation, Modification, and Maintenance of Materials," will document the TVA requirements relative to the Material Control Category CATDs. Detailed requirements for specific materials or generic classes of materials will be documented in Pre-engineered Replacement Items Specifications being doveloped by the DNE Replacement Items Program. The complete set of specifications, i.e.,

ISSUES	SR	NS	FINDINGS	CAUSE	CORRECTIVE ACTION
Generic Material Control (Collective of all Material Control Issues) (con't)					Master Specification (MS), Engineering Requirements Specification (ER Spec), and Pre-Engineered Replacement Items Specifications, will require material identification and traceability consistent with the requirements of 10 CFR 50 Appendix B, Criterion VIII and code requirements as applicable to each site. (CATD 40700-NPS-01)

SUBCATEGORY REPORT 40700
PROCEDURAL CONTROL
EXECUTIVE SUMMARY
EVALUATION REQUIREMENTS TABLE

PLANT	PHASE OF WORK	IDENTIFIED IN	10CFR50 APPENDIX A & B	ANSI B31.1 & CODE CASES N2, N7, N9 & N10	ANSI B31.7	ASME SECTION III	ASME SECTION XI
WBN	DESIGN	FSAR	X				
		FSAR				X (1) (2)	
	FABRICATION	FSAR	X				
		FSAR				X (1) (2)	
	CONSTRUCTION	FSAR	X				
		10CFR50.55a				X (1) (2)	
	OPERATIONS AND MAINTENANCE	FSAR	X				
		10CFR50.55a				X (1) (2) (AFTER 5-87)	X (1) (2) (BEFORE 5-87)
BLN	DESIGN	FSAR	X				
		FSAR				X (1) (3)	
	FABRICATION	FSAR	X				
		FSAR				X (1) (3)	
	CONSTRUCTION	FSAR	X				
		FSAR				X (1) (3)	

(1) The Code is Referenced in the FSAR, but the Edition and Addendum adopted was not referenced.
(2) Code of Record for WBN is ASME Section III 71 Edition through Summer of 73.
(3) Code of Record for BLN is ASME Section III 74 Edition through Summer of 74.

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SUBCATEGORY REPORT 40700
PROCEDURAL CONTROL
EXECUTIVE SUMMARY
EVALUATION REQUIREMENTS TABLE

PLANT	PHASE OF WORK	IDENTIFIED IN	10CFR50 APPENDIX A & B	ANSI B31.1 & CODE CASES N2, N7, N9 & N10	ANSI B31.7	ASME SECTION III	ASME SECTION XI	
SQN	DESIGN	FSAR	X					
		FSAR		X				
	FABRICATION	FSAR	X					
		FSAR			X (1) (BEFORE 4-73)	X (1) (4) (AFTER 4-73)		IR2
	CONSTRUCTION	FSAR	X					
		FSAR			X (1)	X (1)		
	OPERATIONS AND MAINTENANCE	FSAR	X					
		10CFR50.55a					X	
BFN	DESIGN	FSAR	X (AFTER 7-72)					
		FSAR		X				
	FABRICATION	FSAR	X (AFTER 7-72)					
		FSAR		X				
	CONSTRUCTION	FSAR	X (AFTER 7-72)					
		FSAR		X				
	OPERATIONS AND MAINTENANCE	FSAR	X (AFTER 7-72)					
		10CFR50.55a					X	

(1) The Code is Referenced in the FSAR, but the Edition and Addendum adopted was not referenced.
(2) Code of Record for WBN is ASME Section III 71 Edition through Summer of 73.
(3) Code of Record for BLN is ASME Section III 74 Edition through Summer of 74.
(4) For TVA procurements and vendor shop fabrications. IR2

OUTLINE OF CONTENTS

1.0 CHARACTERIZATION OF ISSUES:

1.1 Introduction:

This Subcategory Report, Procedural Control, addresses the procedural adequacy relating to the issues indicated by the 18 concerns assigned to this subcategory. To aid in the evaluation effort, the concerns were grouped into 12 issues as follows:

- Heat Code as Related to Material Control for Construction
- Heat Code as Related to Material Control for Nuclear Power
- Changed Heat Numbers
- Use of Non-Code Material
- Material Upgrading/Reclassification
- Unvalidated Heat Numbers for Structural Steel
- Material Received by Inappropriate Personnel
- Warehouse Access
- Verification of Material Discrepancy
- Material Personnel - Search for Defective Material
- Procedural Control for Issued Instrumentation
- Control of NDE Material

1.2 Description of Issues:

1.2.1 Heat Code as Related to Material Control for Construction:

The perceived problem, as derived from the following concerns, is there is a lack of credibility of methods used in the Construction Program, Heat Number Sort Printout (HNSP), for verification of properly certified Pressure Boundary Materials, at installation.

IN-85-388-006
IN-85-545-X07
WI-85-008-002
XX-85-027-X02

1.2.2 Heat Code as Related to Material Control for Nuclear Power:

The perceived problem, as derived from the following concerns, is there is a lack of credibility of methods used in the Nuclear Power Program for verification of properly certified Pressure Boundary Material, at installation.

EX-85-023-001
IN-85-660-001
IN-85-825-001

1.2.3 Changed Heat Numbers:

The perceived problem as stated by concern number WI-85-091-010 is that,

> "Heat numbers have been changed without Quality's knowledge."

1.2.4 Use of Non-Code Material:

The perceived problem as stated by concern number 2850162001 is that,

> "Watts Bar Nuclear Plant was constructed with non-code [non-ASME] materials in certain areas [ASME systems]."

1.2.5 Material Upgrading/Reclassification:

The perceived problem, as derived from the following concerns, is there is a lack of credibility of methods used for upgrading and reclassification of Pressure Boundary Material.

IN-85-012-001
IN-85-493-003

1.2.6 Unvalidated Heat Numbers for Structural Steel:

The perceived problem, as derived from concern number XX-85-027-X02 is,

> "Material inspectors were not allowed to validate heat numbers of structural steel received on site as required by procedure[;] heat No. 7438383 is an example."

This is in error based upon additional information obtained from the NSRS unexpurgated files.

Based upon this additional information the perceived problem is as stated in NSRS Report No. I-84-34-SQN:

> "Heat numbers for QA [Quality Assurance] material (steel) may be entered into the 'log book' [Heat Number Sort Printout (HNSP)] without Certified Material Test Report (CMTRs) being in the record vault. Heat No. 7438383 was provided as an example."

1.2.7 Material Received by Inappropriate Personnel:

The perceived problem as derived from the following concerns is inappropriate personnel and practices were used in the receipt of material.

BFN-85-008-001
IN-85-988-001

1.2.8 Warehouse Access:

The perceived problem as derived from concern number IN-85-369-005 is that access to the warehouse is uncontrolled.

1.2.9 Verification of Material Discrepancy:

The perceived problem as derived from concern number XX-85-068-004 is that there were conflicts between departments resulting in procedural violations, regarding the verification of material discrepancy Non-Conformance Reports (NCR).

1.2.10 Material Personnel - Search for Defective Material:

The perceived problem as derived from concern number XX-85-027-X04 is that material personnel at SQN were not given an opportunity to verify whether or not defective material had been received on site from a certain manufacturer, and a report to Knoxville that the material was not on site was made without input from materials personnel.

1.2.11 Procedural Control for Issued Instrumentation:

The perceived problem as derived from concern number WBN-223 is that parts stored in the Turbine Building storage area are not controlled by a procedure and no tracking/documentation of instrument/parts exists.

1.2.12 Control of NDE Material:

The perceived problem as derived from concern number BNP QCP 10.35-2 is that purchase and subsequent control of NDE materials at BLN appears to be inadequate.

2.0 EVALUATION PROCESS:

2.1 Evaluation Methodology:

The various issues raised by the employee concerns within this subcategory were evaluated according to the Material Control Category Evaluation Plan.

2.1.1 General Methodology

The following general methodology was utilized for 11 of the 12 Procedural Control issues. The issue on "Use of Non-Code Material" did not have an evaluation methodology per se because the findings were based on the findings from three other issues in this subcategory. This general methodology was:

a. Contacted QTC for any additional information relative to the concerns addressed by the issue.

b. Reviewed ECTG files, and any outstanding reports to obtain any additional information that would assist in the evaluation of the concerns.

c. Reviewed upper-tier criteria to determine the guidelines governing the requirements relative to the issue.

d. Reviewed site procedures to determine if the upper-tier criteria were implemented and/or contained any other requirements relative to the issue.

e. Conducted interviews to determine the processes used relative to the issue and if the perceived problems had and/or did exist.

f. Performed random sample searches and inspections of installed material including it's applicable documentation to determine if the material complied with Code of Record and upper-tier criteria. |R2

g. Discussed and coordinated with other evaluators in Material Control and other categories to determine the affect, if any, of their evaluation findings on this subcategory. |R2

Not every step was needed to perform the evaluations for each issue but each was considered to maintain uniformity within this subcategory.

2.1.2 General Methodology Exception

The issue of "Use of Non-Code Material" was added to this subcategory in June 1987 as result of a "request" from NRC to TVA in a letter dated March 19, 1986, (A02 860321 016). No formal evaluation plan/methodology was formulated for this issue. Rather, information gathered from the evaluations of three other Procedural Control issues ("Heat Code as Related to Material Control for Construction", "Heat Code as Related to Material Control for Nuclear Power", and "Material Upgrading/Reclassification") were utilized. The factual or non-factual determination of this issue for each site was determined based on the findings of these other three issues at the respective sites.

2.2 Requirements or Criteria Established for Individual Issues:

The evaluations performed for most of the twelve Procedural Control issues began through the review of standard requirements or criteria applicable to the nuclear industry, TVA's nuclear program, and/or to each specific nuclear plant. The following requirements or criteria were reviewed for most of the twelve Procedural Control issues.

Generic:

a. 10 CFR 50, "DOMESTIC LICENSING OR PRODUCTION AND UTILIZATION FACILITIES."

   1. Section 50.34, Contents of applications; technical information.

   2. Section 50.55a, Codes and Standards.

   3. Section 50.49, Environmental qualification of electric equipment important to safety for nuclear power plants.

   4. Appendix B - Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.

b. U. S. Nuclear Regulatory Commission, Regulatory Guide 1.58, "QUALIFICATION OF NUCLEAR POWER PLANTS INSPECTION, EXAMINATION, AND TESTING PERSONNEL."

c. U. S. Nuclear Regulatory Commission, Regulatory Guide 1.85, "MATERIAL CODE CASE ACCEPTABILITY ASME SECTION III DIVISION 1."

d. TVA-NUCLEAR QUALITY ASSURANCE MANUAL (NQAM)

   1. Part I, Section 2.8, Revision 0, "IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS."

   2. Part II, Section 2.3, Revisions 0 and 1, "REPAIRS AND REPLACEMENTS OF ASME SECTION XI COMPONENTS."

   3. Part II, Section 3.2, Revisions 0, 1, 2, and 3, "PLANT MODIFICATIONS: AFTER LICENSING."

   4. Part III, Section 2.1, Revisions 0 and 1, "PROCUREMENT OF MATERIALS, COMPONENTS, SPARE PARTS, AND SERVICES."

   5. Part III, Section 2.2, Revisions 0 and 1, "RECEIPT INSPECTION, HANDLING, AND STORAGE OF MATERIALS COMPONENTS," AND SPARE PARTS."

6. Part III, Section 2.3, Revisions 0 and 1, "ISSUING OF MATERIALS, COMPONENTS, AND SPARE PARTS."

e. 10 CFR 21, "REPORTING OF DEFECTS AND NONCOMPLIANCE."

f. TVA General Construction Specification G-62, "MATERIAL DOCUMENTATION AND ACCEPTABILITY REQUIREMENTS FOR ASME SECTION III APPLICATIONS."

The following site-specific requirements and/or criteria were reviewed for most of the Procedural Control issues evaluated at each site:

WBN:

a. WBN Final Safety Analysis Report (FSAR)

b. ASME Boiler and Pressure Vessel Code, Section III, "NUCLEAR POWER PLANT COMPONENTS," 1971 Edition through summer 1973 Addenda.

c. TVA ASME Section III Quality Assuance Manual, Section 3.8, Revisions 3 through 6.

d. WBN Construction Specification N3M-868, Section 3.4, Revision 2, dated 02/04/85.

e. Quality Control Instruction No. WBNP-QCI-1.06, "RECEIVING," Revision 0, dated 03/11/83 through Revision 2, dated 01/09/87, titled "RECEIVING AND STORAGE."

f. Quality Control Instruction No. WBNP-QCI-1.46, "MATERIAL UPGRADING," Revision 0, dated 01/19/84 through Revision 2, dated 11/25/85.

g. Quality Control Procedure No. DEC-QCP-1.6, "RECEIPT, INSPECTION, STORAGE, AND WITHDRAWAL OF PERMANENT MATERIAL," Revision 0, dated 01/11/74.

h. Quality Control Procedure No. WBNP-QCP-1.6, "RECIEPT, INSPECTION STORAGE, AND WITHDRAWAL OF PERMANENT MATERIAL," Revision 0, dated 06/17/75 through Revision 8, dated 12/06/78. Title changed on Revision 9, dated 04/19/82 through Revision 21, dated 12/01/86 to "RECEIPT INSPECTION OF SAFETY-RELATED ITEMS."

i. Quality Control Procedure No. WBNP-QCP-1.50, "TRANSFER OF HEAT NUMBER," Revision 0, dated 04/05/82 through Revision 1, dated 06/02/82. Title changed on Revision 2, dated 09/15/82 through Revision 5, dated 06/01/84, to "TRANSFER OF TRACEABILITY IDENTIFICATION," and again on Revision 6, dated 07/27/84 to "MATERIAL VERIFICATION AND VALIDATION." Also, Addendum No. 1, dated 08/08/86.

j. Quality Control Procedure No. WBNP-QCP-4.10-22, "TRANSFER OF HEAT NUMBER/MATERIAL IDENTIFICATION," Revision 0, dated 01/12/82.

k. WBN Field Instruction (WBFI) M-8, "INSTRUCTION FOR PREPARING DOCUMENTATION OF ASME CODE SYSTEMS," Revision 21, dated 06/16/80.

l. WBNP, ADMINISTRATIVE INSTRUCTION, AI-5.4, "MATERIAL ISSUE, TRANSFER, AND TRACEABILITY."

m. WBNP, ADMINISTRATIVE INSTRUCTION, AI-5.6, "MATERIAL STORAGE HANDLING AND SHIPPING REQUIREMENTS FOR WATTS BAR NUCLEAR PLANT."

SQN:

a. SQN Final Safety Analysis Report (FSAR)

b. ANSI B31.7, (1969), 1970 Addenda and 1971c Addenda, "NUCLEAR POWER PIPING CODE."

c. ASME BOILER AND PRESSURE VESSEL CODE, Section XI, "RULES FOR INSERVICE INSPECTION OF NUCLEAR REACTOR COOLANT SYSTEMS."

d. SQN Construction Specification No. N2M-865, "FIELD FABRICATION, ASSEMBLY EXAMINATION, AND TEST FOR PIPE AND DUCT SYSTEMS."

e. SNP Inspection Instruction No. 30 (II-30), "RECEIPT INSPECTION," Revision 0, dated 05/04/77 through Revision 7, dated 09/20/82.

f. SNP II-39, "HEAT CODE TRANSFER AND ASTM DESIGNATOR TRANSFER," Revision 0, dated 05/04/77 through Revision 2, dated 12/11/78.

BLN:

a. BLN Final Safety Analysis Report.

b. ASME Code, Section III, 1974 Edition through summer 1974 Addenda.

c. ASME Code Section II, 1974 Edition, "MATERIAL SPECIFICATIONS."

d. Quality Assurance Program Policy (QAPP)-7, Revisions 0 through 6, "CONTROL OF PURCHASED ITEMS AND SERVICES."

e. BNP-Quality Control Procedure (QCP)-10.3, Revision 13, "PREPARATION AND REVIEW OF FIELD PROCUREMENT DOCUMENTS."

BFN:

a. BFN Final Safety Analysis Report (FSAR)

b. ASME Code Section III, 1965 Edition, "NUCLEAR VESSELS."

c. DESIGN ANALYSIS REPORT (DAR)

d. "SAFETY EVALUATION OF THE TENNESSEE VALLEY AUTHORITY BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, & 3, "DOCKET Nos. 50-259, 50-260, & 50-296 (SER), dated 06/26/72.

e. USA Standard Code for Pressure Piping (USAS) B31.1.0, 1967 Edition, "POWER PIPING."

f. General Electric (GE) Design Specification No. 22A1406, Revision 2, dated 04/28/70, "PRESSURE INTEGRITY OF PIPING AND EQUIPMENT PRESSURE PARTS."

g. TVA General Construction Specification No. G-27, "QUALITY CONTROL FOR CONSTRUCTION OF PIPING SYTEMS FOR BOILING WATER REACTOR NUCLEAR POWER PLANTS," dated 12/12/68.

h. TVA General Construction Specification No. G-28, Revisions 0 through 8, "CONSTRUCTION OF PIPING SYTEMS FOR BOILING WATER REACTOR NUCLEAR POWER PLANTS," dated 12/13/68 through 09/15/86. |R2

i. BFN Construction Quality Assurance Manual, dated 07/24/70 and revised 11/03/72.

j. BFN Construction Procedure No. BF-34, "ON-SITE MARKING AND COLOR CODING OF PIPING FABRICATION AND LOOSE MATERIAL PARTS," Revision 5, dated 01/09/73.

k. BFN Construction Procedure No. BF-45, "WELD QUALITY ASSURANCE PROGRAM FOR PIPING," Revision 0, dated 06/17/70 through Revision 6, dated 01/17/74.

l. BFN Construction Procedure No. BF-47, "QUALITY ASSURANCE PROGRAM FOR INSTALLATION OF PRINCIPLE PIPING SYSTEMS AND DOCUMENTATION," Revision 4, dated 09/04/73.

m. BFN Construction Procedure No. BF-48, "INSTALLATION REQUIREMENTS FOR PERMANENT PROCESS INSTRUMENTS AND CONTROLS," Revision 0, dated 10/19/70 through Revision 2, dated 10/04/72.

n. BFN Quality Assurance Procedure DEC-QCP-BF-126, "TRANSFER OF QUALITY ASSURANCE RECORDS," Revision 0, dated 09/22/76.

2.2.1 Heat Code as Related to Material Control for Construction:

2.2.1.1 WBN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the WBN evaluation of this issue:

a. QUALITY CONTROL INSTRUCTION WBNP-QCI-1.43, "HEAT CODE REPORT PREPARATION", Revision 0, dated 03/08/85 through Revision 1, dated 05/17/85.

b. QUALITY CONTROL INSTRUCTION WBNP-QCI-4.03, "PROCESS CONTROL, WELDING SURVEILLANCE, AND WELD PROCEDURE ASSIGNMENTS", Revision 0, dated 10/08/80 through Revision 7, dated 04/11/86.

c. QUALITY CONTROL PROCEDURE WBNP-QCP-4.13-FU & VM, "FITUP AND VISUAL MECHANICAL", Revision 0, dated 05/16/83, through Revision 9, dated 02/04/87.

d QUALITY CONTROL PROCEDURE WBNP-QCP-4.50, "FABRICATION OF CODE ITEMS", Revision 0, dated 08/13/84.

2.2.1.2 SQN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the SQN evaluation of this issue:

a. SNP CONSTRUCTION PROCEDURE NO. G-3, "ERECTION OF PIPING AND INSTRUMENT LINES" (G-3), Revision 0, dated 02/14/77.

b. SNP CONSTRUCTION PROCEDURE NO. M-7, "ERECTION AND DOCUMENTATION REQUIREMENTS FOR PIPING SYSTEMS WITHIN THE SCOPE OF THE QUALITY ASSURANCE PLAN" (M-7), Revision 0, dated 08/25/72 through Revision 15, dated 01/02/80.

c. SNP CONSTRUCTION PROCEDURE No. P-12, "RECEIPT, INSPECTION, STORAGE, AND WITHDRAWAL OF PERMANENT MATERIAL" (P-12), Revision 0, dated 12/12/72 through Revision 13, dated 11/19/84.

d. SUPPLEMENT A TO SNP CONSTRUCTION PROCEDURE NO. P-12, "RECEIPT, INSPECTION, STORAGE, AND WITHDRAWAL OF NAVCO MATERIAL ON TVA CONTRACT 71C38 - 92615" (P-12A), Revision 0, dated 05/28/75, through Revision 2, dated 04/23/76.

e. SUPPLEMENT B TO SNP CONSTRUCTION PROCEDURE NO. P-12, "RECEIPT, INSPECTION, STORAGE, AND WITHDRAWAL OF NAVCO MATERIAL ON TVA CONTRACT 76K53 - 91880" (P-12B), Revision 0, dated 03/23/76.

f. SNP CONSTRUCTION PROCEDURE NO. W-3, "WELD PROCEDURE ASSIGNMENT AND WELDING SURVEILLANCE" (W-3), Revision 0, dated 01/31/77 through Revision 3, dated 12/04/78.

g. SNP CONSTRUCTION PROCEDURE NO. P-31, "IDENTIFICATION AND MARKING OF PERMANENT MATERIAL" (P-31), Revision 0, dated 05/04/77 through Revision 2, dated 12/17/79.

h. SNP CONSTRUCTION PROCEDURE NO. P-34, "HEAT NUMBER VALIDATION" (P-34), Revision 0, dated 06/13/77 and Revision 1, dated 12/13/78.

i. SNP INSPECTION INSTRUCTION NO. 32, "INSPECTION OF MATERIALS IN STORAGE" (II-32), Revision 0, dated 05/04/77 through Revision 10, dated 04/21/82.

j. SNP INSPECTION INSTRUCTION NO. 35, "ISSUE INSPECTION" (II-35), Revision 0, dated 03/15/77 through Revision 3, dated 05/26/78.

k. SNP INSPECTION INSTRUCTION NO. 36, "ORIENTATION AND ALIGNMENT" (II-36), Revision 0, dated 02/04/77 through Revision 9, dated 02/16/83.

l. SNP INSPECTION INSTRUCTION NO. 74, "FITUP AND CLEANLINESS" (II-74), Revision 0, dated 02/14/77, through Revision 6, dated 07/28/82.

m. SNP STANDARD OPERATING PROCEDURE NO. 001, "PREPARATION OF SNP STANDARD OPERATING PROCEDURES" (SOP-001), Revision 4, dated 12/21/79.

n. SNP STANDARD OPERATING PROCEDURE NO. 310, "REQUISITION FROM AND RETURN OF PERMANENT MATERIAL TO THE WAREHOUSE" (SOP-310), Revision 4, dated 11/08/79.

o. SNP STANDARD OPERATING PROCEDURE NO. 320, "LOCATING AND CATALOGING PERMANENT MATERIAL FOR ENGINEERING CONTROL" (SOP-320), Revision 0, dated 09/06/79.

p. SNP STANDARD OPERATING PROCEDURE NO. 312, "LOCATION AND CONTROL OF MATERIAL FOR PRIORITY ACTIVITIES" (SOP-312), Revision 2, dated 11/08/79.

q. SNP STANDARD OPERATING PROCEDURE NO. 600, "LOCATION AND CONTROL OF MATERIAL FOR PRIORITY ACTIVITIES" (SOP-600), Revision 1, dated 01/04/79.

r. SNP STANDARD OPERATING PROCEDURE NO. 601, "RECEIPT INSPECTION OF PERMANENT PLANT MATERIAL" (SOP-601), Revision 2, dated 07/13/78.

2.2.1.3 BLN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the BLN evaluation of this issue:

a. BLN Construction Specification Number N4G-889, Revisions 0 and 1, "IDENTIFICATION OF STRUCTURES, SYSTEMS, AND COMPONENTS COVERED BY THE BELLEFONTE NUCLEAR PLANT QUALITY ASSURANCE PROGRAM".

b. Mechanical Design Standard DS-M13.1.2, Revision 0, "HEATING, VENTILATING, AND AIR-CONDITIONING STANDARD QUALITY REQUIREMENTS FOR PROCUREMENT OF SAFETY-RELATED HVAC SYSTEM COMPONENTS".

c. BLN Quality Assurance List (Q-List), Revision 0, "Q-LIST GENERAL NOTES".

d. BLN General Design Criteria Number N4-50-D754, Revision 1, "THE CLASSIFICATION OF PIPING, PUMPS, VALVES, AND VESSELS".

e. BNP-Quality Control Procedure, 1.1, Revisions 1 through 17, "RECEIVING INSPECTION".

f. BNP-Quality Control Procedure, 7.9, Revisions 0 through 20, "FITUP AND CLEANLINESS".

g. BNP-Quality Control Procedure 10.9, Revisions 11 and 12, "MATERIAL IDENTIFICATION AND MARKING".

h. BNP-Quality Control Procedure, 10.12, Revisions 9 and 10, "MATERIAL ISSUE CONTROL".

i. NCR 3932R, Revision 1, dated 02/02/82.

j. Division of Engineering and Construction (DEC)-QCP-1.6, Revision 0, "RECEIPT, INSPECTION, STORAGE, AND WITHDRAWAL OF PERMANENT MATERIAL".

2.2.1.4 BFN:

Other than those previously listed as generic, no other requirements or criteria were found to be applicable to the BFN evaluation of this issue.

2.2.2 Heat Code as Related to Material Control for Nuclear Power:

2.2.2.1 WBN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the WBN evaluation of this issue:

a. "WATTS BAR QUALITY ASSURANCE MANUAL FOR ASME SECTION III NUCLEAR POWER PLANT COMPONENTS, (WB-NCM)".

b. Quality Assurance Program Procedure, DNC QAPP-8, "IDENTIFICATION AND CONTROL OF ITEMS".

c. WBNP, ADMINISTRATIVE INSTRUCTION, AI-5.2, "RECEIPT INSPECTION OF MATERIALS, COMPONENTS, AND SPARE PARTS".

d. WBNP, MODIFICATIONS AND ADDITIONS INSTRUCTION, MAI-6, "CONTROL OF WELD DOCUMENTATION, UNIT 0".

e. WBNP, ADMINISTRATIVE INSTRUCTION, AI-9.4.2, "CONTROL OF WELD DOCUMENTATION".

f. WBNP, ADMINISTRATIVE INSTRUCTION, AI-8.8, "CONTROL OF MODIFICATION WORK AFTER UNIT LICENSING".

g. WBNP, ADMINISTRATIVE INSTRUCTION, AI-9.5, "MATERIAL MARKING AND SERIAL NUMBER TRANSFER".

2.2.2.2 SQN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the SQN evaluation of this issue:

a. SNP-STANDARD PRACTICE - SQA45, "QUALITY CONTROL OF MATERIAL AND PARTS AND SERVICES".

b. SNP ADMINISTRATIVE INSTRUCTION AI-11, "RECEIPT INSPECTION, NONCONFORMING ITEMS, QA LEVEL/ DESCRIPTION CHANGES AND SUBSTITUTIONS".

c. SNP ADMINISTRATIVE INSTRUCTION AI-19 (Part IV), "PLANT MODIFICATIONS: AFTER LICENSING".

d. SNP ADMINISTRATIVE INSTRUCTION AI-36, "STORAGE, HANDLING, AND SHIPPING OF QA MATERIAL".

e. SNP MODIFICATIONS AND ADDITIONS INSTRUCTION, "CONTROL OF WELD DOCUMENTATION AND HEAT TREATMENT".

2.2.2.3 BLN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the BLN evaluation of this issue:

"MECHANICAL MAINTENANCE HEAT OR BATCH LOTS (HOBLOTS) BY CODE," Computer Program, dated 09/10/86.

2.2.2.4 BFN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the BFN evaluation of this issue:

a. Standard Practice BFA28, "PLANT MODIFICATIONS AFTER ISSUANCE OF OPERATING LICENSE AND BEFORE COMMERICAL OPERATION".

b. Standard Practice BF-8.3, "PLANT MODIFICATIONS AND WORK PLANS" , Revision 0, dated 08/01/80.

c. Standard Practice BF-6.2, "QUALITY CONTROL OF WELDING ACTIVITIES", Revision 0, dated 04/09/86.

d. Modification and Addition Instruction, MAI-22, "WELDING QUALITY ASSURANCE FOR MODIFICATIONS AND ADDITIONS AT BROWNS FERRY NUCLEAR PLANT", Revision 0, dated 02/20/86.

e. Site Director Standard Practice, SDSP-13.1, "QUALITY CONTROL OF WELDING", Revision 0, dated 12/11/86.

2.2.3 Changed Heat Numbers:

In addition to the generic requirements or criteria previously listed, no other requirements or criteria were found to be applicable to the WBN evaluation of this issue.

2.2.4 Use of Non-Code Material:

2.2.4.1 WBN:

The requirements and criteria applicable to the WBN evaluation of this issue are listed in sections 2.2.1.1, 2.2.2.1 and 2.2.5.1 of this report.

2.2.4.2 SQN:

The requirements and criteria applicable to the SQN evaluation of this issue are listed in sections 2.2.1.2 and 2.2.2.2 of this report.

2.2.4.3 BLN:

The requirements and criteria applicable to the BLN evaluation of this issue are listed in sections 2.2.1.3, 2.2.2.3 and 2.2.5.2 of this report.

2.2.4.4 BFN:

The requirements and criteria applicable to the BFN evaluation of this issue are listed in sections 2.2.1.4 and 2.2.2.4 of this report.

2.2.5 Material Upgrading/Reclassification:

2.2.5.1 WBN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the WBN evaluation of this issue:

a. "CASES OF ASME BOILER AND PRESSURE VESSEL CODE", Case N-242.

b. "CASES OF ASME BOILER AND PRESSURE VESSEL CODE", Case N-242-1.

c. QUALITY CONTROL INSTRUCTION QCI-1.6, "MATERIAL UPGRADING", Revision 0, dated 01/19/84 through Revision 2, dated 11/22/85.

2.2.5.2 BLN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the BLN evaluation of this issue:

a. Standard Operating Procedure (SOP): Quality Control and Records Unit (QCRU) - SOP-012, Revision 1, "UPGRADING OF MATERIAL".

b. SOP: Office and Civil Engineering Units (O & CEU) - SOP-118, Revision 0, "O&CEU MATERIAL CONTROL UPGRADING OF MATERIAL".

2.2.6 Unvalidated Heat Numbers for Structural Steel:

2.2.6.1 WBN:

In addition to the generic requirements or criteria previously listed, no other requirements or criteria were found to be applicable to the WBN evaluation of this issue.

2.2.6.2 SQN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the SQN evaluation of this issue:

a. "TENNESSEE VALLEY AUTHORITY EMPLOYEE CONCERNS TASK GROUP PROCEDURE ECTG M.2 PROGRAM PLAN FOR SWEC AND NSRS ISSUES", Revision 0, dated 08/28/86.

b. SNP CONSTRUCTION PROCEDURE NO. P-31, "IDENTIFICATION AND MARKING OF PERMANENT MATERIAL" (P-31), Revision 0, dated 05/04/77 through Revision 2, dated 12/17/79.

c. SNP CONSTRUCTION PROCEDURE NO. P-34, "HEAT NUMBER VALIDATION" (P-34), Revision 0, dated 06/13/77 and Revision 1, dated 12/13/78.

d. The memorandum dated March 15, 1985, from the Director of NSRS to the Manager of Construction and the Manager of Engineering (Q01 850315 015).

e. The memorandum dated April 16, 1985, from the Manager of Construction to the Director of NSRS (C01 850416 007).

f. The memorandum dated May 15, 1985, from the Manager of Construction to the Director of NSRS (C01 850515 005) and the postscript dated May 16, 1985, (C01 850516 005).

g. The memorandum dated May 20, 1985, from the Director of NSRS to the General Manager (Q01 850520 050).

h. The memorandum dated May 21, 1985, from the Project Manager, SQN OC to the Assistant to the Manager of Construction (C23 850521 008).

i. The memorandum dated May 28, 1985, from the Manager of Construction to the Director of NSRS (C01 850529 007).

j. The memorandum dated July 8, 1985, from the Director of NSRS to the General Manager (Q01 850709 055).

k. The memorandum dated July 8, 1985, from the Director of NSRS to the Manager of Construction (Q01 850709 054), and postscript dated July 16, 1985, (C01 850716 001).

1. The memorandum dated July 23, 1985, from the Manager of Construction to the Director of NSRS (CO1 850723 004).

2.2.7 Material Received by Inappropriate Personnel:

2.2.7.1 WBN:

In addition to the generic requirements or criteria previously listed, no other requirements or criteria were found to be applicable to the WBN evaluation of this issue.

2.2.7.2 BFN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the BFN evaluation of this issue.

SITE DIRECTOR STANDARD PRACTICE, BF 16.4, "MATERIAL, COMPONENTS, AND SPARE PARTS RECEIPT HANDLING, STORAGE, ISSUING, RETURN TO STOREROOM AND TRANSFER", Revision 2, dated 07/14/86, is applicable to the BFN evaluation of this issue.

2.2.8 Warehouse Access:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to WBN evaluation of this issue.

a. TVA Topical Report TR75-1A Table 17D-2.

b. U.S. NUCLEAR REGULATORY COMMISSION, REGULATORY GUIDE 1.38, "QUALITY ASSURANCE REQUIREMENTS FOR PACKAGING, SHIPPING, RECEIVING, STORAGE, AND HANDLING OF ITEMS FOR WATER-COOLED NUCLEAR POWER PLANTS".

c. AMERICAN NATIONAL STANDARD REACTOR PLANTS AND THEIR MAINTENANCE, "PACKAGING, SHIPPING, RECEIVING, STORAGE AND HANDLING OF ITEMS FOR NUCLEAR POWER PLANTS (During the Construction Phase)", ANSI N45.2.2-1972.

d. QUALITY CONTROL PROCEDURE WBNP-QCP-1.36, "STORAGE AND HOUSEKEEPING", Revision 0, dated 07/01/82 through Revision 10, dated 04/01/86.

e. QUALITY CONTROL INSTRUCTION QCI-1.36, "STORAGE AND HOUSEKEEPING", Revision 0, dated 07/25/80 through Revision 13, dated 04/01/86.

2.2.9 Verification of Material Discrepancy:

2.2.9.1 WBN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the WBN evaluation of this report:

QUALITY CONTROL INSTRUCTION WBN-QCI-1.02, "CONTROL OF NONCONFORMING ITEMS", is applicable to the WBN evaluation of this issue.

2.2.9.2 BLN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the BLN evaluation of this issue:

a. BNP-QUALITY CONTROL PROCEDURE BNP-QCP-10.4, "CONTROL OF NONCONFORMANCES AND SIGNIFICANT CONDITION REPORTS."

b. NCRs (34) initiated by the BLN Welding Quality Control Unit (WQC) between November 1983 and January 1985 pertaining to hanger installations.

c. NCRs (43) initiated by the BLN Hanger Quality Control Unit (HQC) between October 1983 and January 1985 pertaining to hanger installations.

2.2.10 Material Personnel - Search for Defective Material:

2.2.10.1 WBN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the WBN evaluation of this issue:

a. NRC Office of Inspection and Enforcement Bulletin (IEB) 83-07, "APPARENTLY FRAUDULENT PRODUCTS SOLD BY RAY MILLER, INC".

b. NRC Inspection Reports 50-390/85-03 and 50-391/85-04.

2.2.10.2 SQN:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the SQN evaluation of this issue:

a. Nuclear Regulatory Commission (NRC) Office of Inspection and Enforcement Bulletin (IEB) 83-07, "APPARENTLY FRAUDULENT PRODUCTS SOLD BY RAY MILLER, INC." including supplement 1.

b. The memorandum from the Chief, Nuclear Engineering Support Branch, to the Manager of Nuclear Licensing (A27 840228 006), dated February 24, 1984.

c. The memorandum from the Manager, Nuclear Licensing, to the Director of Nuclear Power and the Chief, Nuclear Engineering Support Branch (A27 830819 003), dated August 19, 1983.

d. The memorandum from the Director of Nuclear Power, to the Manager Nuclear Licensing (L16 840224 884), dated March 2, 1984.

e. The memorandum from the Chief, Nuclear Engineering Support Branch, to the Manager of Nuclear Licensing (A27 840321 011), dated March 20, 1984.

f. The letter from the Manager, Nuclear Licensing, to the Regional Administrator, Region II, United States (U.S.) NRC (A27 840322 014), dated March 22, 1984.

2.2.11 Procedural Control of Issued Instrumentation:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the WBN evaluation of this issue:

a. WATTS BAR NUCLEAR PLANT ADMINISTRATIVE INSTRUCTION AI-1.13, "10 CFR 50.49 ENVIRONMENTAL QUALIFICATIONS PROGRAM".

b. WATTS BAR NUCLEAR PLANT ADMINISTRATIVE INSTRUCTION AI-9.2, "MAINTENANCE REQUESTS AND EQUIPMENT MAINTENANCE HISTORY".

2.2.12 Control of NDE Material:

In addition to the generic requirements or criteria previously listed, the following requirements or criteria were found to be applicable to the WBN evaluation of this issue:

a. BNP-QUALITY CONTROL PROCEDURE BNP-QCP-7.4, Revisions 0 through 6, "LIQUID PENETRANT EXAMINATION".

b. NCR 4487, Revision 0, dated 08/15/85

2.3 Justification of Evaluation Process:

The concerns in this subcategory report, Procedural Control, address the procedural adequacy, effectiveness or the lack of procedures which pertain to the 12 issues identified in section 1.1. The following is the justification of evaluation process:

a. Upper-tier documents were identified and reviewed to determine the requirements established relative to each issue.

b. Site procedures were reviewed to determine if they adequately incorporated the requirements of the upper-tier criteria.

c. Searches for documents (i.e., NCR's audits, evaluations, memorandums site inspection records, vendor certifications) were performed to obtain additional information relative to the issues.

d. Plant observations were performed to determine if site procedures were implemented.

e. Interviews were conducted with site personnel to determine if they were knowledgeable of the procedure requirements relative to their job assignment.

f. Interviews were conducted with various individuals to gain additional knowledge relative to the issues.

g. Random sample reviews of field installed material were performed to obtain data relative to the material traceability issues.

3.0 FINDINGS:

3.1 Heat Code as Related to Material Control for Construction:

3.1.1 Generic Applicability:

Of the four concerns addressed in this issue three are site specific to WBN, and one concern is site specific to SQN. Therefore, this issue was initially evaluated at WBN and SQN. Due to the findings of the evaluation performed at SQN, it was determined that additional evaluations at WBN were necessary. This issue was also determined generic to the material traceability, identification and verification programs for BLN and BFN.

3.1.2 Site-Specific - WBN:

a. A request, dated March 20, 1986, was sent to QTC for any additional information on the concerns addressed by this issue. This report reflects all known pertinent information received from QTC.

b. The ECTG files were reviewed to obtain any additional information that would assist in the evaluation of this issue. This report does not reflect all available pertinent information.*

* All information necessary for the evaluation has been taken into account.

c. A review of the upper-tier criteria revealed the following information:

The FSAR does not contain a definitive statement of the applicable Code of Record (Edition and Addenda) for Nuclear Class I, II, and III (TVA Class A, B, and C/D) construction activities at WBN, with the exception of the Reactor Coolant System (RCS) piping which is defined in Table 5.2-1 as, "ASME III 1971 Ed. thru winter 71" and includes either code case "1423-1" as stated in section 5.2.1.4 or code case "1423-2" as stated in Table 5.2-8.

The Codes and Standards and Materials Engineering Branch (NEB), Knoxville was contacted to determine the Code of Record. They stated that the Code of Record for piping, excluding the RCS, is ASME 1971 Edition through Summer 73 Addenda, and this is based upon the date for the principal piping contract (Contract 74C38-83015, dated February 14, 1974). A review of the following procedures confirmed this information.

TVA ASME Section III Quality Assurance Manual, Section 3.8, Revision 3 through 6.

TVA Construction Specification N3M-868, Section 3.4, Revision 2.

A review of the Code of Record, ASME Section III, 1971 Edition through Summer 73 Addendum, revealed the requirements for material traceability as follows;

Class I components, Subsection NB-2151 states, in part,

> The identification of pressure-retaining material shall consist of marking the material with the applicable specification and grade of material, heat number or heat code of the material and any additional marking required to facilitate traceability of the reports of the results of all

tests and examinations performed on the material except that, for those materials for which Materials Manufacturer's Certificates of Compliance (COC) with the material specification may be provided, heat number identification need not be indicated either on the material or the Certificates. Alternatively, a marking symbol and/or code may be used which identifies the material with the Materials Certification and such symbol and/or code shall be explained in the certificate.

Class II components, Subsection NC-2150, states,

"The requirements for material identification shall be the same as stated in NB-2150."

Class III components, Subsection ND-2150, states,

"All material shall be marked in accordance with the marking requirements of the material specification."

WBN is committed, in section 3.2.1 of the FSAR, to the requirements of 10 CFR 50 Appendix B, "QUALITY ASSURANCE CRITERIA FOR NUCLEAR POWER PLANTS AND FUEL REPROCESSING PLANTS", Criterion VIII; which requires material, parts and components to have identification maintained throughout their fabrication, erection, installation and use either on the items or on records traceable to the items.

d. A review of WBN construction site procedures revealed the following information:

The site procedures used for the marking identification of received material did/do not require pressure retaining material to be marked traceable to its CMTR. Although various marking methods were utilized during the period of construction, the material was/is at best only required to be traceable to its procurement document rather than its CMTR. Additionally, the site procedures have evolved into a dependence upon the heat number/code as the traceability link between the material and its documentation.

The site procedures used for the material identification/verification, at installation, of pressure retaining material did/do not require the marking identification to be verified traceable to its CMTR. These procedures rely upon the heat number/code as the traceability link between the material and its CMTR. The verification/validation acceptance criteria provided in WBNP QCP 1.50, section 7.1.1 states,

> "Heat numbers and heat codes are valid if they match the proper acceptable CMTR or if listed in the DCU [Document Control Unit] heat code printout."

Site procedure WBN-QCI 1.43, governing the heat code printout defines a heat code/number as:

> "A unique number assigned by a manufacturer or vendor that identifies a certified test report of chemical and physical properties, NDE [Non-Destructive Examination], and heat treatment requirements of material."

A review of the heat code printout provided by DCU titled "RIMS HEAT CODE PROGRAM", run dated 09/23/86, revealed that heat numbers/codes are not unique and do not provide traceability between the material and its documentation. Additionally, WBN-QCI-1.43 requires the Heat Code Report maintained by RIMS to list the "receiving document number (209)" that corresponds to the material. The heat code printout provided by DCU does not provide this required information.

e. Interviews were conducted with 11 persons (one Welding Engineer, seven Mechanical Engineers, and three Welding Inspectors) who were involved with the inspections and/or verifications of material during the construction of WBN. The following is a list of questions (Q.1 through Q.3a) that were asked the interviewees and their responses (A.1 through A.3a).

Questions Asked:

(Q.1) What methods were used to verify material at fit-up inspection?

(Q.2) Was verification covered by procedures? If so, what were they?

(Q.2a) What did the procedure require for material verification?

(Q.3) What was verified during material verification?

(Q.3a) Was the material marked with TVA Class, ASME Class, heat number, schedule, specification and grade? If not, how did you know?

Interviewee A:

(A.1) Called vault to verify that heat number/code was acceptable (Good). Material Spec. and grade were checked by the weld map for acceptability.

(A.2) Yes. Could not recall procedure numbers. However, stated the procedure in effect at that time may be stated on the Field Weld Sheets.

(A.2a) Heat number verification, spec. and grade verification.

(A.3) Heat number, spec. and grade.

(A.3a) Material was stamped with spec. grade and heat with vendor markings.

Interviewee B:

(A.1) Material was verified in the field using sketch drawings and Weld Data Sheets. Material was inspected to see if, spec., grade, pressure rating, and schedule agreed with the sketch drawing and Weld Data Sheet. Heat numbers were verified by calling the Quality Control Record Vault, to determine if the heat number was in their

log (hand written log). The verified heat number was recorded on the Weld Data Sheet. Personal log books were kept by the inspector for previously approved heat numbers for future acceptance of like material.

(A.2) No.

(A.2a) Do not recall.

(A.3) Heat number, schedule, spec. and grade.

(A.3a) Yes, but only the heat number was transferred when material was divided.

Interviewee C:

(A.1) Schedule and diameter of material were inspected per the subassembly drawings. Heat numbers were verified by calling the vault for verification prior to assembly. Personal logs were kept by the inspector for material heat numbers previously approved (verified by vault) for future reference. If the same type material with a heat number previously verified was inspected it would be accepted.

(A.2) Yes. Did not recall procedure number.

(A.2a) Schedule, diameter, heat verification, and sub-assembly dimensions.

(A.3) Heat number and size.

(A.3a) Yes, material was stenciled with heat number by warehouse, material was also marked with vendor markings (Heat, schedule and size). Heat number was the only description transferred when material was divided.

Interviewee D:

(A.1) Start with weld operation sheet to tell you what should be installed. Verify heat number or mark number, if DRAVO. To verify heat number, would call the vault and ask if that was a good heat number.

(A.2) Do not remember.

(A.2a) Do not remember.

(A.3) Heat number.

(A.3a) Stenciled or etched, if Class I. sometimes it had paint stick markings.

Additional Comment:

The heat number would give you class, schedule, grade and type of material.

Interviewee E:

(A.1) Mechanical did not do fit-up inspections. Fit-up inspections were performed by a welding discipline. Mechanical did perform, at installation, a material verification inspection.

(A.2) Material was covered by a procedure which was initiated in 1980. Did not recall the procedure number.

(A.2a) Heat number verification, Code Class, type, grade, size and schedule.

(A.3) ASME Class, heat number, schedule, spec. and grade.

(A.3a) Yes, material was required to be marked with these markings.

Interviewee F:

(A.1) Material was verified by use of the Weld Data Sheet and sketch drawings. Material size, type, grade and spec., was checked to the drawing. Heat numbers were verified by calling the vault. Type, grade and spec., was also verified by calling the vault. Heat numbers for acceptable material was indicated on the Weld Data Sheet, by the inspectors. Previously approved heat numbers were written in the inspectors personal log for future reference for like material acceptance.

(A.2) No

(A.2a) Do not recall.

(A.3) Heat number, schedule, spec. and grade.

(A.3a) Yes. However, when material was cut only the heat number was transferred.

Interviewee G:

(A.1) Did not recall much about material verification.

(A.2) WBFI-M8

(A.2a) Transfer of heat number from material to Weld Data Sheet. Verify material spec. and grade with the Weld Data Sheet.

(A.3) Spec. and grade.

(A.3a) Yes.

Interviewee H:

(A.1) Would check dimensions and heat numbers. Would call vault to see if they had material certifications. In some cases inspectors would verify class. It depended on the

situation and person doing the work. Would verify paper prior to signing Weld Operation Sheet. Sometimes would call and ask if it was a good heat and the vault would say it was good, no reference to any other specs. except heat number or heat code.

(A.2) No procedure for verification of material, only cleanliness.

(A.2a) Check NCR 2824 and 2968 for not verifying class.

(A.3) The heat number was verified and sometimes TVA Class, ASME Class, schedule, spec. and grade.

(A.3a) Yes, sometime would still have vendor markings and other times verify TVA blunt nose stencil.

Interviewee I:

(A.1) Does not recall the requirements for material verification. Suggest that the applicable procedure and Weld Data Sheets be retrieved from Document Control Unit to obtain information needed.

(A.2) No reply.

(A.2a) No reply.

(A.3) No reply.

(A.3a) No reply.

Interviewee J:

(A.1) The Weld Operation Sheet was used as a means to verify grade, spec., schedule and size of material at installation. Heat numbers were indicated on the Weld Data Sheet by the inspector. The inspector called the office

(Welding QC) for verification of material heat number, spec., grade, TVA Class, schedule and size. The office would call vault for material verification. Heat number logs were used when available (when the Heat Log program was implemented).

(A.2) QCI 4.03 was used for material verification. Did not know when the procedure came into effect. (Replaced Green Sheets).

(A.2a) Heat number, TVA class, spec, grade schedule, and size.

(A.3) TVA class, Heat number, schedule, spec and grade.

(A.3a) Yes, (Vendor or Warehouse markings).

Interviewee K:

(A.1) The pipe assembly serial number or heat number was placed on the Weld Operation Sheet by the inspector. The serial number or heat number would be verified by calling the vault. The responsible discipline would perform heat number verification. Weld Operation Sheets were used for material verification along with sketch drawings. Shop fabrication sheets (Green Sheets) did not have information such as spec., grade, and schedule (only heat numbers). Field Weld Sheets did provide information such as spec., grade, and schedule. Subassembly numbers were used in lieu of heat numbers on Field Weld Sheets.

(A.2) WBFI-M8 and QCP 4.03 for welding.

(A.2a) Required heat number indication on Weld Operation Sheet (WBFI-M8)..

(A.3) Heat number and subassembly number.

(A.3a) Yes. Markings were in ink or paint. Markings were not required to be on the drawings but on traceable documents.

f. A review of a portion of the material identified on 37 TVA WBN weld map sketches, consisting of 15 for Unit 1 and 22 for Unit 2, on TVA Class "A" Systems (Chemical Volume Control System, 62, and Safety Injection System, 63,) was performed to determine if material with the proper certification was installed.

The reviewed Weld Map Sketches are as follows:

Unit 1	Unit 2
SK 406-7 SH 3 R5	SK 406-12 SH3 R1
SK 406-7 SH 112 R7	SK 406-12 SH12 R2
SK 406-7 SH 21 R7	SK 406-12 SH21 R2
SK 406-7 SH 29 R6	SK 406-12 SH29 R1
SK 406-9 SH 1 R4	SK 406-13 SH1 R4
435-6 SH 1 R9	SK 406-14 SH11 R3
SK 435-6 SH3 R3	SK 406-14 SH16 R6
SK 435-6 SH4 R18	435-12 SH1 R4
SK 435-7 SH6 R4	435-12 SH3 R6
SK 435-7 SH16 R20	435-12 SH4 R9
SK 435-7 SH17 R7	435-12 SH9 R5
SK 435-8 SH6 R9	SK 435-13 SH2 R5
SK 435-8 SH9 R6	SK 435-13 SH6 R6
SK 435-8 SH14 R18	SK 435-13 SH16 R8
SK 435-9 SH2 R15	SK 435-13 SH17 R5
	435-14 SH6 RR4
	SK 435-14 SH9 R4
	SK 435-14 SH13 R3
	435-14 SH14 R7
	SK 435-15 SH7 R5
	SK 435-15 SH13 R8
	435-15 SH14 R5

This review was limited to a small sample of accessible, 1-inch through 2-inch, TVA Class A Pressure Boundary Materials. This review consisted of 139 items, 68 for Unit 1 and 71 for Unit 2.

The heat codes used for the material identification of these 139 items were tabulated and consisted of 47 heat codes. A copy of the construction "RIMS [Records Information Management System] Heat Code Program" (RHCP), run dated 09/23/86, was reviewed to determine if these heat codes were traceable to their CMTRs.

This review revealed the following information:

- Class I and II or lesser material was listed with identical heat codes, material description and no marks to distinguish between classes.
- Material with identical heat codes was listed with differing material descriptions, (e.g., size, schedule, or pressure class).
- Not all heat codes were listed.

The RHCP does not contain information relative to the receiving documentation (TVA 209s) as required by WBN QCI 1.43, section 6.1.1.5. Therefore, all CMTRs for the 47 heat codes were requested from RIMS.

A review of these CMTRs revealed the following information.

- Of the 47 heat codes for which CMTRs were requested, the material referenced on the CMTR was designated as various classes, as follows:

Single Class (I, II or III)	23 of 47 (48.9%)
Multiple Class	14 of 47 (29.8%)
No Class	4 of 47 (8.5%)
No CMTR	6 of 47 (12.8%)

- CMTRs were obtained for only 41 of the 47 heat codes (87.2%).
- CMTRs for 11 of the 41 heat codes (26.8%) identified the identification markings that are to be found on the material, in accordance with the requirements of the Code of Record, (i.e., ASME Section III, Subsection NB 2151).

Although, some of these CMTRs contained both the marking and explanation of the marking to be found on the material, it was found that CMTRs for different classes of material had identical markings. Therefore, for the CMTRs reviewed, traceability between the CMTR and the material or vice versa was not always possible.

Several deficiencies on CMTRs were observed during this review. Listed below are some examples.

- CMTRs ("C7361", "M-7780") had COCs attached to them that "certified" the material in some cases to a higher code classification (e.g., Class I instead of Class II, etc.) or differing material specifications (e.g., ASME SA instead of ASTM A). Apparently in these cases the COCs were the bases for the Code Class information listed in the RHCP. While COCs may be included in the certification package for pressure-retaining material greater than 3/4 inch nominal pipe size, the CMTR attesting to the proper Code Class and Material Specification, etc., is required by the Code of Record, (i.e., ASME Section III, Subsection NB 2130).

- CMTRs ("DGF", "DBT") did not state the results of the tests and/or examinations performed on the material as required by the Code of Record, (i.e., ASME Section III, Subsection NB 2130).

- CMTRs ("JI", "GB") certified material to Edition and Addenda other than the Code of Record.

- CMTRs ("EDQ", "KF") have conflicting statements concerning the material's heat treatment.

- CMTR ("454062") does not meet the requirements of the Code of Record, (i.e., ASME Section III, Subsection NB 2110(a), footnote 1), regarding Material Manufacturer's certification of material to ASME.

- CMTRs ("686553", "AAZ") have improper (missing initials and date) hand-written notations regarding material specification and certification.

The lack of material traceability to its CMTR through identification marking on the material, required by the Code of Record, ASME Section III, 1971 Edition through the Summer 1973 Addenda, or on records traceable to the installed material, required by 10 CFR 50 Appendix B, Criterion VIII, was identified on NCR 2968R. The recommended resolution to NCR 2968R as well as its subsequent revisions and additional NCRs (No. 2824R, No. 4567R, No. 5087, No. 5925, No. 5964, No. 6369, No. 6634,

No. 6687, and No. 6834) and their subsequent revisions, relative to this subject, sought only to ensure that records existed or were created that indicated the questionable material (pipe, fittings, etc) was Class I, rather than bring the material and material control procedures into compliance with the Code of Record and Regulatory requirements.

g. The findings of this evaluation were discussed with other evaluators of this category. The evaluation of issue 3.5.2, Site-Specific - WBN, "Material Upgrading/ Reclassification" of this subcategory report was considered in conjunction with this evaluation.

Conclusion:

This was found to be a class D issue at WBN.

The perceived problem, as derived from the subject concerns, that there is a lack of credibility of the methods used by Construction personnel (i.e., dependence upon the heat number/code) for the verification of properly certified Pressure Boundary Materials, at installations at WBN, is factual as a result of the conditions determined to exist by this evaluation.

With the exception of the RCS piping, the FSAR does not contain a definitive statement of the applicable Code of Record (Edition and Addenda) for Nuclear Class I, II and III (TVA Class A, B, and C/D) piping construction activities at WBN.

WBN is committed by its Code of Record (ASME Section III, 1971 Edition through the Summer 73 Addenda) and 10 CFR 50 Appendix B, to the use of Nuclear Class Piping Components, the proper certification and identification of which is maintained throughout their fabrication, erection, installation, and use.

The site procedures did not provide adequate measures to ensure these code and regulatory requirements were met.

The individuals involved in the material identification/ verification process indicated a reliance upon the heat number for material identification/verification; however, since heat numbers are not unique to Nuclear Class, Pressure Class or material description, they cannot be relied upon for adequate material identification/verification.

3.1.3 Site-Specific - SQN:

a. The ECTG files were reviewed to obtain any additional information that would assist in the evaluation of the perceived problem as related by the concerns. This report reflects all known available pertinent information.

The review of the WBN-ECTG report MC-40703-WBN, "Material Control, Procedural Control, Heat Code", revealed that several Nonconforming Condition Reports (NCRs) have been written because material with identical heat numbers and descriptions for Class I and also other code classes was installed in Class I systems, at WBN.

The following NCRs were closed at WBN:

NCR	Initiation Date
2968R R0-R6	02/07/81 - 11/02/83
4567R R0-R1	01/06/83 - 02/04/83
5087 R0-R2	09/13/83 - 03/21/85
5925 R0	02/01/85
5964 R0-R2	02/21/85 - 02/27/85
6102 R0	06/03/85

A review of these NCRs revealed that NCR 5087 R1 had been made generically applicable to SQN. Information obtained from the Site Licensing personnel revealed that this NCR had received a preliminary review onsite at SQN and remains open.

b. A review of the upper-tier criteria revealed the following information:

- The FSAR, Revision 3, does not contain a clear definition of the applicable Code of Record for Nuclear Class I, II, and III construction activities at SQN. Discussions with personnel in the Codes and Standards and Materials Engineering Group of the Nuclear Engineering Branch (NEB), Knoxville, confirmed this situation.

They revealed, the applicable Code of Record is American National Standards Institute (ANSI) B31.1.0 for design and ANSI B31.7 (1969) and 1970 Addenda for the fabrication, inspection, and test requirements of Nuclear Class I, II, and III (TVA Class A, B and C/D) piping systems and agreed that a revision to the FSAR section 3.2.2.5 is necessary to clarify this situation. The FSAR currently states, |R2

> "The piping has been designed to ANSI B31.1.0 Code requirements. Fabrication, inspection, and test requirements of ANSI B31.7, including B31 Code Case 115, have been used in lieu of the applicable nuclear code cases for all piping systems except the primary coolant loops and the pressurizer surge line piping. B31 Code Case 115 accepts ASME Code, Section III as meeting B31.7 requirements."
>
> Note: The Code entitled United States of America Standard (USAS) B31.7-1969 was changed by the ANSI B31.7-1970 addenda to ANSI B31.7-1969 and is referred to as such in this report.

Since the applicable code requirements for the primary coolant loop construction activities are defined as USAS B31.1 and there is no clear distinguishing boundary between these loops and their branch lines, the Chemical Volume Control System (CVCS) and Safety Injection System (SIS) piping material included in this report has been evaluated based upon the applicable Code of Record for construction activities, ANSI B31.7 (1969) and 1970 Addenda including, the ANSI B31.7c-1971 Addenda, paragraph 1-723, for materials identification and certification, per SQN Construction Specification NO. N2M-865, "FIELD FABRICATION, ASSEMBLY EXAMINATION, AND TEST FOR PIPE AND DUCT SYSTEMS", Revision 3, dated 04/12/77.

The Code of Record, ANSI B31.7 (1969), 1970 Addenda and 1971c Addenda, paragraph 1-723, for material identification and certification, states in paragraph 1-723.1.3(a),

> ". . . identification of pressure-retaining material shall consist of marking the material with the applicable material specification and grade, heat number, or heat code of the material, and any additional marking required to facilitate traceability of the reports of the results of all tests and examinations performed on the material.
>
> Alternatively, a marking symbol may be used which identifies the material specification number and grade, and a marking code may be used which identifies the material heat number with the Certified Materials Test Report. The Certified Materials Test Report shall contain an explanation of both the symbols and the code."

- SQN is committed, in section 3.1.2.1 of the FSAR, to the requirements of 10 CFR 50 Appendix B, "QUALITY ASSURANCE CRITERIA FOR NUCLEAR POWER PLANTS AND FUEL REPROCESSING PLANTS", which states in Criterion VIII,

> "Measures shall be established for the identification and control of materials, parts, and components, including partially fabricated assemblies. These measures shall assure that identification of the item is maintained by heat number, part number, serial number or other appropriate means, either on the item or on records traceable to the item, as required throughout fabrication, erection, installation, and use of the item. These identification and control measures shall be designed to prevent the use of incorrect or defective material, parts, and components."

c. A review of site procedures used during the construction of SQN revealed the following:

- The site procedures used for the marking identification of received material revealed that only one procedure, M-7, Revision 0, dated 08/25/72 provided methods for the material to be traced to the certification record, as per the code. Later revisions of M-7 and additional associated procedures, were developed that required received materials to be marked, so that, at best, materials could only be traced back to the procurement contract. The procedures governing "heat number validation" upon material receipt (i.e., P-31, P-34, and II-39) do not contain a method for material identification and marking traceable to the CMTR.

- The site procedures used for the material identification/verification at installation revealed that only one procedure, M-7, Revision 0, dated 08/25/72, required the material certification to be on hand and be acceptable. Later revisions only required the material to be listed on the Weld History Record, which was then certified to be in accordance with applicable drawings, codes, and specifications, by signature.

  Site procedure II-74, Revision 0, dated 02/14/77, required examination and verification of acceptable material identification, heat number, material specification and grade, and ASME Classification, with the provision that all material used shall have mark and/or heat number, which was certified, by signature, on the data sheet or equivalent data card.

  Site procedure II-74, Revision 1, dated 05/12/77, required the examination and verification of only the material identification, with the provision that material used shall have mark and/or heat number, which was certified, by signature, on the data sheet or equivalent data card.

  Site procedure II-74, Revision 3, dated 11/07/78, and subsequent revisions, required examination and verification that the component identification was as specified on the applicable weld map, with a provision that piping material required heat number verification, which was certified, by signature, on the data sheet or equivalent data card.

Note: No site procedure could be found to describe the heat number verification process.

Note: No site procedure could be found governing the accuracy of the information or the use of the HNSP. Only a User's Guide was found, describing how information should be encoded.

- The Standard Operating Procedures (SOPs) were reviewed to gain additional information relative to material control. A review of SOP-001, Revision 4, paragraph 5.A defines an SOP as:

  ". . . A procedure or detailed instruction written as a guide for craft and/or engineering section activities of operations but not written to include QA requirements or commitments. . . . "

  These SOPs were reviewed for information only rather than as QA implementing documents; however, the guidelines presented in them did not provide for material marking and identification traceable to the CMTR.

  Note: The Records Information Management System (RIMS) personnel stated that Standard Operating Procedures (SOPs) were not considered Quality Assurance (QA) documents; consequently, their latest revisions are the only ones available (maintained in RIMS).

d. Interviews were conducted with 13 persons (one Mechanical Supervisor, two Mechanical Engineers, two QC record reviewers, and eight Construction Welding Inspectors), who were involved with the inspections and/or verifications of material during the construction of SQN. These interviews revealed the following information:

Interviewee A:

Interviewee was a construction Quality Control Record Unit (QCRU) reviewer. Interviewee said, "July 31, 1977, was the approximate date the weld review group was formed to input information that was available onsite into a computerized program. This contract information was used to develop a heat code or heat sort printout for material received with CMTRs, MTRs [Material Test Reports], or COCs [Certificates of Compliance]. Material for SQN procured by Quality Engineering Branch Contracts by Knoxville and inspected at the factory were not always encoded because Knoxville received all of the CMTRs, COCs and other related documentation. The information encoded in the printout consisted of the heat number, sometimes the class of material, if known, the 209 number [receiving report], the contract number, and a description of the material. Interviewee did not know of a procedure governing the use of the printout or for its control. There was a User's Guide and other information compiled to aid in the encoding process involved. When interviewee began working in the QCRU, part of the responsibility of the group was to review the weld cards (SNP-II-74). When the cards were received they were checked for the following. All blanks were filled in or N/A, the welder was certified to the process used, the inspector was certified to the inspection procedure, and that both components' heat numbers were in the printout.

If the heat numbers were in the printout it meant that there was either a COC or CMTR or some kind of documentation."

Note: During the interview it was revealed there was some problem with some people not knowing the difference between a CMTR and a COC.

According to ANSI B31.7c-1971, paragraph 1-723.1.2, a CMTR states,

> ". . . the actual results of all required chemical analyses, mechanical tests, examinations (including radiographic film), and other tests, the time and temperature of heat treatments performed on the materials, . . . any examinations and tests required by the material specifications which have not been performed . . . the manner in which the material is identified including the specific marking. . . ."

while a COC states,

> ". . . the material complies with the applicable material specification . . . ."

Interviewee said, "There was not a requirement for the reviewer of the data card to check for class, size, type or grade of the material. When the review of the cards was complete the heat numbers were then written on the weld map. The heat code printout was up-dated, usually once a week."

Interviewee B:

Interviewee was a Construction Welding Inspector. Interviewee said, "I do not remember very much about the program that was used at that time except that they [welding inspectors] recorded the information, heat numbers of the material welded together, on a data card. They wrote the heat number down which was on the material and then wrote it down on the data card. They verified the heat numbers against the printout, but, I do not remember if they were required to check to see if it was the correct code class."

Interviewee C:

Interviewee was a Construction Welding Inspector. Interviewee said, "There was a procedure used before SQN II-74. An (M-7), where code welds were controlled on what was called a Weld History Record. It contained all information needed to track the work. I think the information on the Weld History Record was then transferred to the data card. They used the weld map to determine what material was to be used but there was not a requirement that they go back to the printout to see if what the fitters had was the correct code class. We did check to see if the material was in the printout."

Interviewee D:

Interviewee was a Construction Welding Inspector. Interviewee said, "I verified the material was correct by checking the heat sort printout. Some of the material had the code class marked on it with a pink paint stick. If we could not find the class in the printout or if it wasn't marked on the pipe we would rely on the craft to tell us if it was the right material."

Interviewee E:

Interviewee was a Construction Welding Inspector. Interviewee said, "I verified material by use of the II-74 data card." The question was asked, "If the interviewee checked the class of the material before signing the card?" Interviewee said, "No, I only wrote down the number of the material that was used. I did not use the printout, I think Record Review checked this later because if we made a mistake they would send the card back." Interviewee stated again, "I didn't use the printout, I only checked the weld maps and filled out the data card."

Interviewee F:

Interviewee was a Construction Welding Inspector. Interviewee said, "We verified heat numbers by checking to see that they were on the material being used, we then wrote this number down on the data

card, QCRU reviewed the cards and I think they checked to see if the number was in the printout. We [welding inspection] did not do any checking to see if the material was the correct code class, I did not use the heat sort printout. I only wrote down the heat number that was on the material. Before we used the data cards we verified material on a weld history record under a different procedure. I do remember, one case, where I found some schedule 40 material with the same heat number as schedule 80, but this was changed out."

Interviewee G:

Interviewee was a Construction Welding Inspector. Interviewee said, "The fitters would have a piece of material with a mark number and/or heat number written on it. I would log the heat number down on the Weld History Record. Later, we used data cards to log the material down on." The question was asked, "Did you check to see if the material was the right class and type or grade?" Interviewee said, "Inspectors were not required to check the class but sometimes the class was written on the material with a pink paint marker. I only checked to see if it was in the printout which was kept in the pipe shop. If it was in the printout it was considered good. Sometimes it would not be in the printout and we would call the Mechanical Engineer, over the system, if the engineer said the material was good, I would sign the card."

Interviewee H:

Interviewee was a Construction Mechanical Engineer. Interviewee did not know of any official system or process used to verify that additional checks other than inspection, were performed to ensure that the correct class of material was used. Interviewee stated, "That an employee who worked in Welding did a lot of checking of material to see if it had a CMTR. There was a printout in Welding and when the inspectors called in, the employee would look it up to see if it was in the printout, if not, the employee would check to see if it was good material.

Good means it has a CMTR. The program changed as did the procedure throughout construction. This was due to recognizing a need for better control. I have a high degree of confidence that material used was of the correct class but do not know of the special programs or procedures that assured this. My feeling is based on very good and confident Engineers and Craftsmen, that took pride in doing the best job possible."

Interviewee I:

Interviewee was a Construction Mechanical Supervisor. Interviewee relied on the HNSP whenever a question of material verification came up. National Valve and Manufacturing Company (NAVCO) supplied pipe had unique serial or mark numbers on it. Some TVA loose material had TVA mark numbers and is identified this way; however, material bought on Indefinite Quantity Term (IQT) contracts did not have mark numbers, only heat numbers.

Interviewee J:

Interviewee was a Construction Welding Inspector. Interviewee stated, "I was connected with the program in some way, shape, or form and correct class verification of material was not used, inspectors only checked to see if the material's heat number was in the printout, if it was, it was considered good material and used in any code system. I feel SQN is required to use code material and all Class A must have a CMTR for Class A or material must be up-graded, which requires a CMTR and an NDE [Nondestructive Examination], PT [Penetrant Test], minimums."

Interviewee K:

Interviewee was a Construction Mechanical Engineer. Interviewee stated, "We found material installed at SQN, that we did not have CMTRs for and the manufacturer supplied them at a later date. There were cases where no CMTR could be obtained and this material was cut out and removed [replaced with different material]. The vendors started supplying CMTRs with some material no matter how it was

requested. SQN has also received CMTRs for material that they may not have even received. Loose Material, referred to as LM sheets designated what material was to be installed at what location. However, during construction it was learned these could not be relied upon for accuracy, due to warehousing lack of control in issuing material. Prior to QC [Quality Control] becoming involved in issue of material, approximately December, 1974, warehousing personnel would pick up a like fitting and write the needed LM number on it and issue it." Interviewee further stated, "SQN operated under the principle that if they, SQN, had a CMTR or MTR for a particular heat number, it was considered good for any product or type piece of material that was made out of it. There was a lot of material that was installed that SQN did not have a CMTR for and I contacted the manufacturer to obtain a CMTR, if one could not be obtained, the material was cut out. CMTRs for Class A were not looked at as being unique to the actual material that was received."

Interviewee L:

Interviewee was part of a Construction task force set up to correct heat codes on weld documentation. The following is a summary of interviews with this person.

If the weld documentation material identification (heat code) did not agree with the heat code on the adjacent weld documentation the interviewee was directed by supervisory personnel to analyze and correct erroneous and discrepant weld documentation/heat numbers, as required. Interviewee stated, "Inspectors were used to reverify, discrepant heat codes. If the heat number could not be read in the field, the supervisors' instructions were to change the weld documentation so that both documents would agree, with the information on the document with the latest date."

Interviewee changed approximately ten to twenty discrepant heat codes per day, from 1977 through 1979. These were lined through, initialed and dated by the interviewee, based upon, inspectors information, or personal judgement that the heat code number had been incorrectly written, (e.g., character transposition or omission) based upon how the heat code appeared in the HNSP.

Note: Interviewee expressed doubt that all the heat code numbers to be rechecked were actually field verified.

Interviewee stated, "When weld documentation was lost or could not be located the inspectors were requested to check the field installed material, if no identifying markings were found, new documentation was constructed from the best available information, obtained from the following: inspectors' memory, inspection log sheets or Operation Checklist."

Interviewee M:

Interviewee was a Construction Welding Inspector. Interviewee stated, "I was working second shift as an inspector, there was some Class A fabrication and installation of pipe being performed in unit number 1, Reactor Building." The question was asked, "Do you know the location where this material was installed?" Interviewee said, "It was 2" schedule 160 pipe, Chemical Volume Control System, unit number 1, in the raceway of the Reactor Building about three feet off the crane-wall, up near the ceiling."

Note: This is the location of some of the Class "A" material covered in the construction portion of this ECTG random sample review, discussed later in this section. |R2

Interviewee said, "When I checked the heat number on the pipe it was listed as Class "B" and I would not sign it off. The question was asked, "How did you know it was Class "B"?" Interviewee said, "That was the way it was listed in the heat number printout.

When I objected to signing the fit-up off [Weld Data Sheet] I was taken off the job and someone else was put on it; however, I think that the pipe has later been upgraded to Class "A" and there should not be a problem with it." The question was asked, "What all did you check to verify that the correct material was used?" Interviewee said, "I verified the heat number by the printout and the lead inspector checked our work at the end of the day to see if the heat numbers were good."

The question was asked, "Was anything else checked to verify the material?" Interviewee said, "I checked the heat number." The question was asked, "You did check schedule, type and grade, didn't you?" The interviewee said, "Yes." The interviewee was asked, "How did you check the type of material?" Interviewee said, "I checked to see if it was P1 or P8, P1 is carbon steel and P8 is stainless steel." The question was asked, "Does type 316 or type 304 mean anything to you?" Interviewee said, "No." The question was asked, "Does A105 or SA105 have a meaning to you?" Interviewee said, "No, I only checked to see if it was P1 or P8."

The question was asked, "Were there any other markings on the pipe, except for the heat number?" Interviewee said, "Sometimes there were pink paint markings; but, I used the factory ink markings for the heat number check." The question was asked, "Have you ever heard of an LM number?" Interviewee said, "I sure have, but inspectors were not allowed to use them, if we did our supervisor would chastize us in front of the whole group. We were only allowed to use heat numbers and we would get a letter if we [fouled] up." The question was asked, "Have you ever seen a multiple listing in the heat code printout?" Interviewee said, "No."

e. A review of material identified on 16 TVA SQN weld maps, consisting of 8 for Unit 1 and 8 for Unit 2, on Class "A" Systems (Chemical Volume Control System, 62, and Safety Injection System, 63) was performed to determine if material with the proper certification was installed.

The reviewed Weld Map Drawings are as follows:

Unit 1	Unit 2
1-CVC-500-1W	2-CVC-500-1W
1-CVC-501-1W	2-CVC-501-1W
1-CVC-501-2W	2-CVC-501-2W
1-CVC-502-1W	2-CVC-502-1W
1-CVC-502-2W	2-CVC-502-2W
1-CVC-503-1W	2-CVC-503-1W
1-CVC-509-1W	2-CVC-509-1W
1-SI-500-1W	2-SI-500-1W

This review was limited to a small sample of drawings for 1 inch through 2 inch, TVA Class "A" pressure boundary materials.

The heat codes used for material identification shown on these drawings were tabulated and consisted of 69 heat codes, identifying 517 items. A copy of the construction HNSP (run dated 04/25/84) was reviewed to determine if these heat codes were traceable to their CMTRs. From references listed in the HNSP for these heat codes, TVA Receiving Reports (TVA-209s), containing material quantities and documentation received, were obtained.

Note: In some cases the TVA-209 reference was in error, omitted or did not contain the material documentation.

A review of the TVA-209s and their attached documentation revealed:

- Class "A" and "B" or lesser material was received with identical heat codes, material description, and no marks to distinguish between classes.
- Material with identical heat codes was received with differing material descriptions, (e.g., size, schedule, or pressure class).
- Some material was identified by a Loose Material (LM) Number (e.g., NAVCO Piping), and some was not (e.g., Capitol Pipe & Steel Products). LM

numbers are not unique to the heat number/code, pressure class, material description or product form, and in most cases are not referenced on the CMTR, filed with the TVA-209.

- Some material had additional markings identifying it as acceptable for Class "A" use.

Therefore, a comprehensive walkdown of the piping on the referenced drawings was performed by Modifications Unit personnel to determine what, if any, additional markings were on the installed material.

Results of this walkdown differed significantly from the heat code information on the Weld Maps; therefore, a detailed review of the weld documents for these drawings was performed, comparing the documented material identification information with that on adjacent weld documents and information obtained from the piping systems walkdown. This review, consisting of 573 weld documents, revealed that 65% of the documented welds contained material identification discrepancies (e.g., incomplete heat numbers, disagreement with walkdown information, illegible entries on weld documents, missing weld documents, disagreement between adjacent weld documents).

This review of documentation related to the 517 items installed, per the referenced weld maps, revealed that 7 of the 517 items (1.4%) were identified by markings, on them, traceable to their CMTR.

The following list of examples is presented as representative of some of the findings of this evaluation; however, it must not be considered comprehensive in nature.

Example A:

"CMC" is used as the heat code for material identification of one of the components on the weld document for weld number 2CX-01114A 1, on weld map 2-CVC-501-2W. "CMC" is listed in the HNSP and refers to items of various heat codes, classes, and material descriptions, manufactured by Colonial Machine Co.

However, "CMC" is not a heat code; rather, it is the manufacturer's identification code and stands for Colonial Machine Company.

Example B:

"CCI" is a heat code for a 2" 6000# socket weld (S/W) coupling (cplg.), Schedule (Sch) 160 Bore, A182 F304, for which there are two entries in the HNSP, one each for Class "A" and "B". The material identified in the HNSP as Class "A" was received on 10/02/75, on TVA-209 #76-2823. The CMTR filed with this TVA-209 identified the fittings as having been Liquid Penetrant Tested and as Nuclear Class I-TVA Class "A"; however, no special identification markings were denoted on the CMTR, traceable to the fittings. The material identified in the HNSP as Class "B" was received on 08/21/75, on TVA-209 #76-1379. The CMTR filed with this TVA-209 identified the fittings as Nuclear Class III-TVA Class "B"; again, no special identification markings were denoted on the CMTR, traceable to the fittings. Approximately 40 of these fittings are installed, per the walkdown performed for this evaluation. One example of installation is weld map 2-CVC-503-1W, weld numbers 2-CX-01256 and 2-CX-01257.

Example C:

"CZC" is a heat code for 2"X3/4" 6000# inserts, A182 F304, for both Sch 160 bore and a special 0.375 inch bore. The HNSP revealed three references to TVA-209s, one for Class "A" and two for Class "B". The material identified in the HNSP as Class "A" was received on 10/02/75, on TVA-209 #76-2235. The CMTR filed with this TVA-209 identified the fittings as having a special bored inside diameter (ID) of 0.375 inch, as having been Liquid Penetrant Tested and as Nuclear Class I-TVA Class "A"; however, no special identification markings were denoted on the CMTR, traceable to the fittings. The material identified in the HNSP as Class "B" was received on 03/17/75, on TVA-209s #75-5643 and #75-5674. The CMTR's filed with these TVA-209s identified the fittings as having a Sch 160 bore and as Nuclear Class II; again, no

special identification markings were denoted on the CMTRs, traceable to the fittings. Approximately 10 of these "CZC" fittings are installed, per the weld documentation for the referenced weld map drawings; however, the walkdown performed for this evaluation identified only two.

Note: The FSAR in paragraph 3.2.2.1 states in part, "...Branch piping 3/8-inch inside diameter or smaller, or protected by a 3/8-inch diameter or smaller orifice, is exempted from Class A..."

The use of the 3/8-inch diameter or smaller orifice is not consistently identified on the weld documents for material identification.

An example of installation is Weld Map 1-CVC-502-2W; weld numbers 1-CX-02143 and 1-CX-02144 1. These weld documents do not denote this fitting as having a special 3/8-inch bore, as required by the weld map. The field walkdown revealed this fitting is a 2"X3/4" S/S reducing insert stamped "CZC".

Another example is Weld Map 2-CVC-502-1W; weld number 2-CX-01265 identifies the material as a 2"X3/4" reducing insert with the heat code "CNC" which has been lined through, initialed and dated, and changed to "CZC". Adjacent Weld number 2-CX-01266 identifies the material as a 2"X3/4" special flow insert, with heat code "CZC".

Example D:

"CCF" appears on the marked up copy of Weld Map 2-CVC-500-1W and is identified as a 2"X3/4" reducing insert 6000# S/W. "CCF" is not listed in the HNSP. The weld documentation for 2-CX-01020 and 2-CX-01021 were reviewed to determine what is documented as installed. Weld document for 2-CX-01020, (dated 04/16/79) denotes a 2"X3/4" 6000# insert with the heat code "CNC". Adjacent weld document for 2-CX-01021, (dated 04/11/79) denotes a 3/8" special "rest", with the heat code "CNC".

Note: Weld, number 2-CX-01021, has been cut out and reinstalled two additional times, creating weld documents 2-CX-01021 1 and 2-CX-01021 2.

Weld document for 2-CX-01021 1, (dated 05/11/79) denotes a 3/4" Special Flow Restrictor with heat code "CVC", this heat code was lined through, initialed and dated (05/30/79), and changed to "CCV".

Weld document for 2-CX-01021 2, (dated 11/17/79) denotes a 2"X3/4" insert S/S (flow restrictor) with the heat code "CCV".

The field walkdown revealed that no identification markings were on this fitting.

Note: The heat code for the fitting was initially identified as "CNC", later changed to "CVC", and then changed again to "CCV"; however, the field walkdown revealed no identification markings.

Example E:

"CNC" is a heat code for 2"X3/4" 6000# and 3000# reducing inserts, bored for Sch 160 and Sch 40, respectively. "CNC" is also the heat code for other material descriptions. From references in the HNSP two TVA-209s were found, TVA-209 #75-6874 and #75-6875, both were received on 05/27/75. The CMTRs filed with these TVA-209s revealed the material to be 2"X3/4" 6000# reducing inserts, Sch 160 bore, as having been Liquid Penetrant Tested and as Nuclear Class I-TVA Class "A"; however, no special identification markings were denoted on the CMTR, traceable to the fittings. Approximately three of these fittings were installed per the weld documentation. Examples of installation are:

Weld Map 2-CVC-500-1W; weld number 2-CX-01059 and adjacent weld number 2-CX-01060 both identify the material as a special reducing insert, with heat code "CNC".

Weld Map 2-CVC-502-1W; weld number 2-CX-01158 and adjacent weld number 2-CX-01159 both identify the material as a reducing insert (special 3/8" ID. flow restrictor), with heat code "CNC".

Weld Map 2-CVC-503-1W; weld number 2-CX-01245A and adjacent weld number 2-CX-01245B both identify the material as a 2"X3/4" reducing insert, with heat code "CNC".

Note: No documentation could be found showing any 2"X3/4" 6000# reducing inserts, with a special 3/8" bore, with the heat code "CNC", as having been received.

Example F:

"S4HDY" is a heat code for 2"-6000#, S/W, 45° ells, ASTM A182-F304. The HNSP contains four entries for this heat code; two for Class "A", one for Class "B", and one with no Class. The Class "A" entries reference TVA-209 #76-0399, received on 07/21/75. A review of the documentation filed with this TVA-209, revealed there were CMTRs filed with it that identified the fittings as NUCLEAR CLASS 2 and stated the specific markings were, "(L) 2" 6000# WOG A182F304 S4HDY"; and also as NUCLEAR CLASS 1, having been Liquid Penetrant inspected, and having specific markings, "(L) 2" 6000# WOG A182F304 S4HDY PTB". One of the CMTRs also referenced TVA-209 #75-7057.

A review of TVA-209, #75-7057 revealed that this material was received on 06/05/75. The CMTRs filed with the TVA-209 identified the fittings as NUCLEAR CLASS 2 and having specific markings, "(L) 2" 6000# WOG A182F304 S4HDY". One of the CMTR's contained the following handwritten notation,

"6 PIECES WITH HEAT NO S4HDY SHALL BE UPGRADED TO CLASS A. THE UNIQUE HEAT NO SHALL BE DESIGNATED AS S4HDYPT. UPGRADE TEST TO BE LIQUID PENETRATE [SIC] ON ALL ACCESSIBLE SURFACES INSIDE AND OUT PER. . ."

Note: Engineers' and Inspector's names omitted in this quotation.

Note: S4HDY PTB is in the HNSP; however, S4HDY PT is not.

Note: Specific provisions in ANSI B31.7 or site procedures governing the manner in which material was to be upgraded and documented to a higher Nuclear Classification were not found.

An example of installation is Weld Map 1-CVC-503-1W; weld number 1-CX-02161 2 and adjacent weld number 1-CX-02162 2. Weld documents for these welds denote this fitting as a 2" 6000# 45° Ell, with heat code "S4HDY". The field walkdown revealed this fitting is "S4HDY".

The manufacturer of this fitting, when contacted for an explanation of the marking code shown on this fitting, revealed the following:

- "S4HD" denotes the heat number of the fitting identifying its chemical and physical analysis.
- "Y" denotes the heat treatment received by that particular batch of fittings.
- Had the fitting been Liquid Penetrant Tested it would have been stamped, "PTA", "PTB", etc, identifying the technician who performed the test.
- The markings on the fittings do not provide traceability to its CMTR.

Example G:

"S4MAR" is a heat code for a 2" 6000# 90° Ell S/W A182 F304. From a reference in the HNSP, TVA-209 #76-5529, dated 02/13/76, was found. A review of the CMTR filed with this TVA 209 revealed no NUCLEAR CLASS, and the specific markings on the fittings are, "(L) 2" 6000# WOG A182 F304 S4MAR & S4KTR".

Weld Map 2-CVC-503-1W; weld number 2-CX-01250 revealed the material identification to be 2" 6000# 90° with the heat code "S4MAR", adjacent weld number 2-CX-01251 revealed the material identification to be 2" 6000# 90° L A182 with the heat code "S4HXM".

The field walkdown revealed the material identification to be "S4MAR PTA".

Example H:

"AX" appears on the marked up copy of Weld Map 1-CVC-502-1W and is identified as a 2" 6000# S/W 90° ell. "AX" is not listed, by this material description, in the HNSP. No CMTR could be found for this material.

Weld number 1-CX-02091 2 revealed the material identification to be 2" Sch 160, 90° ell A182 with the heat code "S4KNAX" which was lined through, initialed and dated, and changed to "AN"; this was lined through, initialed and dated, and changed to "AX". Adjacent weld number 1-CX-02092 2 revealed the material identification to be 2" 6000# 90° Ell, A182 with the heat code "AX".

The field walkdown revealed the material identification to be "S4KNAX-PTA".

Example I:

"M8963" appears on the marked up copy of Weld Map 2-SI-500-1W as 1-1/2" Sch 160 S.S. A376 TP 304 pipe. The HNSP revealed one entry identified as Class "A" referencing TVA-209 #75-5836. This TVA-209 revealed that an undetermined quantity of this material was received. The CMTR filed with this TVA-209 did not reveal the quantity that was tested nor any specific material identification markings traceable to the material.

Example J:

During the Weld Document Review performed on Weld Map 1-CVC-502-2W the weld documents for weld numbers 1-CX-02113 and 1-CX-02116 could not be found. The weld documents were not located on the microfilm rolls and the weld tabulation sheet had been "whited out".

Note: These were the only two weld documents of the 573 reviewed that could not be located; however, during the search for these documents it was learned that a document audit was not performed verifying their existence, prior to the system transfers to Nuclear Power.

Example K:

"Class Change Discrepancies"

Inconsistencies in denoting changes from Class "A" to Class "B" were discovered during the weld map review for Class "A" material installations. TVA flow Diagram 47W813-1, Revision 27, "Flow Diagram Reactor Coolant System", and 47W809-1, Revision 27, "Flow Diagram Chemical and Volume Control System", were reviewed to determine the accurate locations of these Class changes.

This review revealed the following:

- The 1" supply line to the "Excess Letdown Heat Exchanger" from the "Loop Number 3 Cold Leg" is shown on 47W813-1, Revision 27, as changing from Class "A" to Class "B" at the Cold Leg, upstream of valve 68-579; however, when the continuation of this line is followed on to 47W809-1, Revision 27, there is another change from Class "A" to Class "B" noted, downstream of valve 68-579.

- Note number 8 on 47W813-1, Revision 27, and note number 9 on 47W809-1, Revision 27, states, "Special transition piece (3/8" I.D. Flow Restrictor) required for transition from Class A to Class B pipe." There are several locations on these drawings where these notes are referenced and no clear statement of Class change is made.

Consequently, this has resulted in the piping systems being installed in a manner not depicted by the Flow Diagrams and according to the FSAR, Section 3.2.2.1

> " . . . whose failure could cause a loss of reactor coolant which would not permit an orderly reactor shutdown and cooldown, assuming that makeup is only provided by the normal makeup system . . . ."

Example L:

"BVK24H", "BVM13Z", and "BVK24C" appear on several weld maps as heat codes for 2" Sch 160 A376 TP304 S/S pipe.

The field walkdown revealed that, in most cases, the factory markings and TVA paint stick markings have been removed. The following are examples of discrepancies that exist between those that can be read and the weld documentation.

TVA Weld Map 1-CVC-503-1W; weld document 1-CX-02160 1 identifies this material as, A376 2" Sch 160 pipe with the heat code "BVM13Z". Adjacent weld document 1-CX-02161 2 identifies this material as, A376 2" Sch 160 pipe with the heat code "BVK24C". The field walkdown revealed this material to have heat code "BVK24C" marked on the pipe with a paint stick and factory markings "BVM13Z" etched on the pipe.

TVA Weld Map 1-CVC-502-2W; weld document 1-CX-02114A identifies this material as, 2" Sch 160 S/S pipe, LM 34-13, with the heat code "BVK24H". Adjacent weld document 1-CX-02115 identifies this material as 2" Sch 160 S/S pipe, LM 34-13, with the heat code "BVM13Z", which has been lined through, initialed and dated, and changed to "BVK24H". The field walkdown revealed this material to have heat code "BVM13Z" (Factory Mark).

Conclusion:

This was found to be a class D issue at SQN.

The perceived problem, as derived from the subject concerns, that there is a lack of credibility of the methods used by Construction personnel (i.e., HNSP) for the verification of properly certified Pressure Boundary Materials, at installation at SQN, is factual because of conditions determined to exist as a result of this evaluation.

The FSAR does not clearly define the applicable Code of Record for Nuclear Class I, II, and III piping systems nor does it define the applicable Code of Record for the primary coolant loops and pressurizer surge line piping; however, SQN is committed by its Code of Record and 10 CFR 50 Appendix B, to the use of Nuclear Class Piping Components, the identification of which is maintained throughout their fabrication, erection, installation, and use. The site procedures, with the exception of the initial issue of SNP-CP-M7, did not provide adequate measures to ensure these commitments were met.

The individuals involved in the material identification verification process lacked an understanding of the significance of why, or the manner in which, all Nuclear Class Piping Components should be identified. Although a variety of methods were employed to verify the identification of the installed material, no consistent method was developed, except the reliance upon the heat code/number. Heat codes/numbers at SQN were considered good; "if it was in the HNSP", "been used before", or "if it existed on the material"; however, since heat codes/numbers are not unique to Nuclear Class, Pressure Class or material description, they cannot be relied upon for adequate material identification.

In most instances the Nuclear Class Piping Components, installed at SQN, do not comply with the requirements of the Code of Record and 10 CFR 50 Appendix B, for identification and control of these components during their fabrication, erection, installation, and use. This noncompliance has resulted in the receipt, storage, and installation of material that cannot be traced to the CMTR, attesting to its suitability for the Nuclear and/or Pressure Class in which it is installed.

3.1.4 Site-Specific - BLN:

a. The expurgated files were reviewed to obtain any additional information that would assist in the evaluation of the perceived problem on material control. This report reflects all known available pertinent information.

b. A review of the upper-tier criteria revealed the following information:

A review of the Code of Record, ASME Section III, 1974 Edition through summer 74 Addendum, revealed the requirements pertaining to this issue as follows:

Subsection NA-3451, "SCOPE OF RESPONSIBILITY FOR QUALTIY ASSURANCE," states in part;

"(a) The Installer shall be responsible for surveying and qualifying the Quality System Programs of his suppliers of subcontracted services, including nondestructive examination contractors . . . ."

Subsection NA-3740, "RESPONSIBILITY FOR COMPLIANCE WITH THIS SECTION", states in part;

* * *

"(b) The Material Supplier shall be responsible for maintaining records showing traceability of the materials and shall compile and forward to the Purchaser copies of Certified Materials Test Reports received from the Material Manufacturer and any others performing subcontracted services covering the material purchased. The Material Supplier shall issue a Certified Materials Test Report which compiles the reports from the Material Manufacturer and any other performing subcontracted services. The manner in which this shall be done shall be provided for in his Quality System Program."

Subsection NA-3766.6, "IDENTIFICATION AND MARKING OF MATERIAL PRODUCED", states in part;

"Measures shall be established for controlling the identification of material throughout the manufacturing processes and shipment.

* * *

(1) The identification of material shall consist of marking the material with the applicable specification and grade of material, heat number or heat code of the material, and any additional marking required by this Section to facilitate traceability of the reports of the results of all tests and examinations performed on the material. Alternatively, a marking symbol or code may be used which identifies the material with the materials certification and such symbol or code shall be explained in the certificate."

Subsection NA-3767.5, "CERTIFICATION BY MATERIAL SUPPLIER", states;

* * * This symbol is used to indicate that a portion of the referenced document is not being repeated.

"When permitted by his Quality System Program (NA-3740), the Material Supplier shall provide a Certified Materials Test Report for those operations performed by him or by his subcontractor."

Subsection NA-3767.5, "CERTIFIED MATERIAL TEST REPORT", states in part;

"The Material Manufacturer's or Material Supplier's Quality System Certicate (Materials) number and expiration date shall be shown on the Certified Materials Test Report covering materials manufacturered or supplied under the provisions of the Certificate."

Subsection NB-2150, "MATERIAL IDENTIFICATION", states in part;

"The identification of pressure retaining material and materials welded there to shall meet the requirements of NA-3766.6. Materials for small items shall be controlled during manufacture and construction so that they are identifiable as acceptable materials at all times. . . ."

A review of BLN's FSAR revealed that BLN's Code of Record is not defined as required by 10 CFR 50.34, "CONTENTS OF APPLICATIONS; TECHNICAL INFORMATION". 10 CFR 50.34 requires, as a minimum, the principle design, as outlined in Appendix A, the principle design criteria/design bases to be included in the FSAR. Criteria I, "OVERALL REQUIREMENTS," of Appendix A states in part;

" . . . . Where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency. . . ."

Also, this review revealed that BLN's FSAR did/does not reference ASME Code Case N-242-1, as required by Regulatory Guide 1.85, nor does the FSAR identify the components for which Code Case N-242-1 was/is used. This Code Case is applicable to and addressed in the "Material Upgrading/Reclassification".

c. A review of BLN site procedures pertaining to material control revealed the following information:

QAPP-7, section 7.2.4, required the BLN Construction Organization to prepare, maintain, and control appropriate records in order to provide evidence of the purchased items and services program execution. Site procedure BNP-QCP-1.1 evolved over the years, both in terms of scope and responsibility from its inception in the mid 1970's until the early 1980's. It defined the BLN requirements for the receipt and issuance of material. Other site procedures (BNP-QCP-7.9, BNP-QCP-10.9, and BNP-QCP-10.12) also contained material requirements and criteria. From the early 1980's to the present, little change to material control implementation has occurred as a result of procedural revisions, which were actually refinements that occurred during the mid 1970's. Also, other steps were being performed that were not included in any procedures.

Revision 0, of BNP-QCP-1.1 was first issued in June 1975. Code material received before that date was inspected to procedure DEC-QCP-1.6, revision 0, and a Receiving Inspection Checklist (RIC), (an attachment to BNP-QCP-1.1). This was done for ASME code items only. Revision 0 of BNP-QCP-7.9 was also issued in June 1975.

Initial installation of ASME code material began in June 1975 and was controlled/documented by Manufacturing and Installation Quality Plans (MIQPs) which contained instructions, checklists, signoffs, etc., and very thoroughly tracked the work that was to be done.

Revision 11, of BNP-QCP-10.9 "MATERIAL IDENTIFICATION AND MARKING" subsection 6.6, "MECHANICAL MATERIAL", required in part;

> "Mechanical material shall be identified by a mark letter system as determined by the Responsible Engineering Unit (REU) or by the design mark number as specified in the applicable Bill of Material."

and

"ASME Code mechanical material shall be identified in accordance with applicable portions of Table 1. Verification shall be by the application of a unique symbol by the responsible Quality Control Unit (RQC), prior to issue."

Table 1 of BNP-QCP-10.9 required material identification of ASME Pressure Retaining Material greater than 3/4-inch to be by BLN mark number, material specification and grade, code class, and heat number/code. For Pressure Retaining Material 3/4-inch and under, the only required identification is the BLN mark number.

During interviews with site personnel (See subsection d. which follows), the BLN mark number system was determined to not always be accurate. The most common discrepancy was, and still is, duplicate mark numbers being assigned to different material. One example found during a random review of BLN's Mark Number Printout was mark number EDWW. The mark number had been assigned to one inch 90 degree ells received as both ASME Class I and Class II.

Revision 19 of BNP-QCP-7.9, "FITUP AND CLEANLINESS", requires the Welding Quality Control (WQC) inspector to perform the following G-29M weld inspections, in part:

Subsection 6.2.2.7, of BNP-QCP-7.9 "Verifies that all material is properly identified in accordance with Material Identification Verification Instructions for Code Components (Attachment H)."

Attachment H requires the WQC inspector to verify material identification for ASME components for TVA SUPPLIED PIPE AND FITTINGS as follows:

- All TVA supplied stock pipe and fittings over 3/4-inch outside diameter (O.D.):

  (a) Are marked with material specification, type, code class and heat number or heat code symbol.

* * *

- All TVA supplied stock pipe and pipe fittings 3/4-inch O.D. and less:

  (a) Are marked with BNP number or heat number.

* * *

The present heat code printout being used contains errors. BLN management recognized the problem and documented it through the issuance of NCR 3932, Revisions 0 and 1. This NCR required a review of all QA contracts against the printout. However, only the receiving documentation had been corrected and no correlation of these corrections with the responsible engineering discipline, which used the material identified on the discrepant documents, had been performed. (See QA/QC Subcategory Report 80100). As a result of the NCR, a program was developed by the BLN N-5 Unit that enabled the identification of the location of all installed material, by heat number, in ASME code systems. Any deviations found were to be handled on a case-by-case basis.

Other QA material existed at BLN that was not contained within the scope of BLN ASME Code of Record boundaries. Material required for the Auxiliary Building Trained Access Air Conditioning (VE) and the Control Building Environmental Control (VK) systems required full QA, in accordance with BLN Construction Specification N4G-889 (Section 3.2.3.1), even though the systems were classified as non-code (ANSI B31.1s or B31.5s). N4G-889 originally did not define the boundaries of QA, Limited QA [QA(L)], and non-QA material. However, Revision 1 of the specification corrected this shortcoming and listed procedures/systems within QA and QA(L) boundaries as a ready reference and starting point for this determination.

A problem with non-ASME QA material occurred when site management did not distinguish between QA and non-QA material. When identical QA and non-QA materials were received, both were assigned the same site mark number and were stored together (see Material Control Subcategory Report 40400 - Storage and Handling). Also, the heat code printout has no entry that designates the difference between QA and non-QA material. Some findings indicated that the ability to determine the

type of material being issued from warehouse storage was indeterminate. These problems occurred due to the BLN site management philosophy regarding material. If the material was not intended for use in an ASME Section III system, it did not receive a QA classification. This was based on the fact that the upper-tier documents did not clearly define the QA requirements of non-ASME code items, especially where QA(L) was applied.

Additionally, some QA requirements on B31.1s (or B31.5s) seismic category 1(L), both 1(L)A and 1(L)B, piping were required because those piping systems could affect the quality of structures, systems, and components to an extent commensurate with their importance to safety. These systems are determined on a case-by-case (system-by-system) basis, and the Mechanical Design Standard DS-M13.1.2 requires Certificates of Compliance/Conformance (COCs) for the material as a minimum. Not all B31.1 material received at BLN has been received with COCs.

d. Interviews pertaining to material control conducted with various persons at BLN revealed the following information:

Interviewee A

This interviewee is a welding QC inspector at BLN. The questions and answers were as follows; "What did you verify at fitup?" Interviewee said, "At fitup I verify spec. and grade, schedule, ASME class and heat number." "How did you verify these? Were they marked on the material?" Interviewee said, "On ASME Material above 3/4 inch, the material is required to be marked with all this information, and in most cases it is. Material which is not marked would be rejected unless the heat was on the material and that heat number was in the heat number printout and met the requirements on the fitup card. ASME material 3/4 inch and under only had BLN mark number (sometimes heat number), I will call the field office and verify the BLN mark number on the material with the description in the mark number printout and fitup card."

Interivewee B

This interviewee is a welding QC inspector at BLN. The questions and answers were as follows; "What did you verify at fitup?" Interviewee said, "I verify material in accordance with QCP-7.9 Attachment H." Was the material marked with all the information to verify on the material?" Interviewee, "No, not always as long as I had a heat number with an inspctors stencil next to it and the heat number was a good heat number in the printout then I accepted it." "What do you mean by a good heat number?" Interviewee, "The heat number on the material found in the heat number printout with the same description as the material on the fitup card." Is the heat number on the fitup card?" Interviewee, "No, the heat number is what I put on the fitup card at the time of verification." The interviewee then located and showed the evaluator a copy of a fitup card.

Interviewee C

This interviewee is an engineer in the materials unit at BLN. The questions and answers were as follows; "Who assigns the BLN mark number and what procedure covers the issue of BLN mark numbers?" Interviewee, "We (materials unit) issue the BLN mark numbers and there's not a procedure governing the issue of numbers." "Are you aware of any problems with the assignment of BLN mark numbers?" Interviewee, "Yes, in the beginning CO-OP students assigned mark numbers and sometimes were not always accurate. Sometimes, we found duplication of mark numbers on different material." "Have all these errors been found?" Interviewee, "No, QA is performing a contract review which should identify all BLN discrepancies."

Interviewee D

This interviewee is a QC receiving inspector at BLN. The questions and answers were as follows; "What is the difference between B31.1 and B31.1s, and how is this material treated upon receipt?" Interviewee, "There is no differences, in fact, if both types of material are received together they will normally have the same heat number. We (BLN) don't treat the material different. In fact this

material is stored together and has the same BLN mark number." "Have you found problems with the BLN mark number and if so, please describe them?" Interviewee, "Yes, they duplicate numbers when assigning mark numbers. One day I would receive some 3/4 inch fittings and the next day receive 2 inch fittings, and both would be assigned the same mark number. We (receiving inspectors) would catch the obvious ones but I'm sure some are still wrong. The contract review should catch those that are still wrong. Also, it has got better through the years, in the beginning it was bad, but now we seldom find a error."

Interviewee E

This interviewee is a Q.A. engineer at BLN. The questions and answers were as follows; "What is this contract review that Q.A. is performing?" Interviewee, "We (BLN Q.A.) are reviewing BLN's contracts, receiving reports and the heat number printout to find and correct errors in documentation. This review was the result of NCR 3932 R1." "What type errors are you finding?" Interviewee, "Errors in quality level, description, spec. and grade, mark number and heat numbers." "Is this review being performed throughout all associated documentation?" Interviewee, "No." "You are not looking at weld cards?" Interviewee, "No."

Interviewee F

This interviewee was a mechanical engineering unit supervisor at BLN. The questions and answers were as follows; "What is the difference between B31.1 and B31.1s?" Interviewee, "B31.1 is non-QA material and B31.1s is limited QA." "If this material is different why does it have the same BLN mark number?" Interviewee, "I don't know, you need to talk to my boss. We (BLN) have been doing what the hell design has told us since I have been here, and we've done nothing wrong. You need to talk with Design."

Interviewee G

This interviewee was a mechanical engineer in the BLN Design Project. The questions and answers were as follows; "What is meant by the use of B31.1 non-QA and B31.1s QA?" Interviewee, "Systems which are seismically qualified specify B31.1s material to insure the quality of the material. I don't know where it is written down that the requirements are B31.1s. I was just told to specify B31.1s for material in seismicaly qualified systems. I have never liked this method for insuring the quality of material."

Interviewee H

This interviewee was a mechanical engineer in the BLN Design Project. The questions and answers were as follows; "What is meant by the use of B31.1 non-QA and B31.1s QA?" Interviewee, "B31.1s is for material which is seismicaly qualified." What does this mean to you the designer?" Interviewee, "I don't know, my supervisor told me to specify it that way to procurement. I guess it means something to procurement (Maybe documentation requirements). I asked the same question when I came to BLN Design Project and no one could tell me then."

e. A random sample review of a portion of the material identified on 12 TVA BLN weld map sketches (consisting of 9 for unit 1 and 3 for unit 2, on ASME Class 1 systems) was performed to determine if material with the proper certification was installed.

The reviewed weld map sketches are as follows:

Unit 1	Unit 2
WM1NV-8	WM2ND-9
WM1NV-9	WM2NK-2
WM1NV-10	WM2NK-3
WM1NV-11	
WM1NV-12	
WM1ND-9	
WM1ND-10	
WM1NK-2	
WM1NK-3	

This review was limited to a small sample of accessible, 1-inch through 2-1/2-inch, TVA-BLN Class A and B pressure boundary materials. This review consisted of 78 items, 49 for unit 1 and 29 for unit 2.

Of the 78 examples evaluated, 70 (90 percent) were traced back to a CMTR.

This review revealed ASME Class I and II pressure boundary material listed in the heat number printout, with identical heat numbers/codes, material description and no marks (on the material or correct data on documents traceable) to distinguish between classes.

Of the 78 examples evaluated, three in unit 1, (6 percent - Heat Number 58931) were found to be ASME Class 2 material, without documentation attesting to an upgrade. No discrepancies for unit 2 were found.

Additionally, the review of the 78 example CMTRs revealed the following discrepancies:

- No certification attesting to the Class (Heat Numbers U4TG-H1, BWC6F, BVB14H, BXE19C and BWC6A)
- ASME Class I test results are not shown on CMTR, which is required by ASME Section III Sub-Section NA-3767.5. (Heat Numbers BWC6A LEY4SD and BWC6F)
- CMTRs do not have the manufacturer's or supplier's Quality System Certificate (QSC) number and expiration date shown, as required by ASME Section III Sub-Section NA-3767.6. (Heat Numbers LEY4SD, U4TF-H1, and BWC6F)
- Some CMTRs certify material received to an edition of the ASME code other than that of BLN's Code of Record. There is no evidence of a documented review (ASME Section II and Section III) to determine if this material is acceptable for use at BLN.

Conclusion:

This issue was found to be a class D issue at BLN.

The perceived problem that there was/is a lack of creditability of the methods used in the Construction Program, Heat Number Sort Printout, for verification of properly certified Pressure Boundary Materials, at installation was factual and presents a problem for which corrective action is required as result of this evaluation.

The BLN FSAR does not clearly define the BLN Code of Record, as required by 10 CFR 50.34. Also, BLN's FSAR does not reference ASME Code Case N-242-1, as required by Regulatory Guide 1.85, nor does the FSAR identify the components for which Code Case N-242-1 was used.

The BLN Construction program, mark number system, for controlling the traceability of ASME Code material was inadequate to verify that the proper material was installed. Traceability to the material's CMTR attesting to it's suitability for use either through marking on the material, as required by the Code of Record, or on records traceable to the item, as required by 10 CFR 50 Appendix B, Criterion VIII, did/does not exist. Specific cases illustrating material traceability discrepancies were identified.

In addition to traceability deficiencies for ASME Code material, some ANSI B31.1s (or B31.5s) Seismic Category I piping now requires full QA as outlined in revision 1 of N4G-889. Revision 0 of N4G-889 did not adequately define the QA requirements of B31.1s (or B31.5s) pipe such that B31.1 QA material was allowed to be stored and assigned the same BLN site mark number as B31.1 non-QA material. Also, COCs were not always received with B31.1s (or B31.5s) 1(L) piping material when required by DS-M13.1.2 (ie. piping systems VE and VK).

3.1.5 Site-Specific - BFN:

a. The ECTG expurgated and unexpurgated files were reviewed to obtain any additional information that would assist in the evaluation of this issue. This report reflects all known available pertinent information.

b. A review of the upper-tier criteria revealed the following information:

A review of the Code of Federal Regulations (10 CFR 50), Part 50.55a 1971 through 1984, revealed the available options for the Code of Record for Piping Materials at BFN were contained in paragraph (d); which states, in part:

(d) Piping:

(1) For construction permits issued before January 1, 1971, for reactors not licensed for operation, piping which is part of the reactor coolant pressure boundary shall meet the requirements set forth in:

(i) The American Standard Code for Pressure Piping (ASA B31.1), Addenda, and Applicable Code Cases or the USA Standard Code for Pressure Piping (USAS B31.1.0), Addenda, and Applicable code Cases or the Class I Section of the USA Standard Code for Pressure Piping (USAS B31.7) in effect on the date of order of the piping, and

(ii) The nondestructive examination and acceptance standards of ASA B31.1 Code Cases N7, N9, and N10, except that the acceptance standards of Class I piping of the USA Standard Code for Pressure Piping (USAS B31.7) may be applied.

A review of BFN's Design Analysis Report (DAR) dated 11/02/66 revealed the following:

"Design and Fabrication Code Requirements

The ASME and ASA Codes formulate established and accepted criteria for the design, fabrication and operation of components of pressure systems. The reactor primary system is designed and fabricated to meet the following as a minimum:

a. Reactor Vessel - ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Subsection A.

b. Pumps - ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Subsection C.

c. Piping and Valves - ASA-B-31.1, Code for Pressure Piping and ASME Boiler and Pressure Vessel Code, Section I."

A review of BFN's FSAR revealed that the FSAR defines BFN's Code of Record within the system descriptions as follows:

"4.3 Reactor Recirculation System

* * *

4.3.4 Description

* * *

The recirculation system piping is of all-welded Type 304 stainless steel construction and is designed and constructed to meet the requirements of the USA Standard Code for Pressure Piping, Power Piping, USAS B31.1.0, 1967 edition, and the additional requirements of GE design and procurement specifications. . . .

* * *

4.7 Reactor Core Isolation Cooling System

* * *

4.7.5 Description

* * *

The RCICS piping within the drywell up to and including the outer isolation valve is designed in accordance with the USA Standard Code for Pressure Piping, USAS B31.1.0, 1967 edition, plus ASME Boiler and Pressure Vessel Code, Section I, 1965 edition. Oter piping is designed in accordance with the USAS B31.1.0, 1967 edition, as applicable. . . .

4.8 Residual Heat Removal System (RHRS)

* * *

4.8.5 Summary Description

* * *

The system piping and main system pumps are designed in accordance with the requirements of USAS B31.1.0, 1967 edition, as augmented by GE specifications (listed on the RHR P&ID, Figure 7.4-6a). The system is constructed and tested in accordance with TVA construction specification G-28, which is based on ANSI B31.1 and GE specifications. . . ."

A review of BFN's Safety Evaluation Report (SER) dated 06/26/72, revealed the following:

"4.2 Reactor Coolant Pressure Boundary - Design

* * *

Reactor coolant system piping was designed, fabricated and inspected in accordance with the USAS B31.1.0 - 1967 Power Piping Code. Additional nondestructive inspection requirements were applied in accordance with the requirements of the Power Piping Code Cases N2, N7, N9 and N10. . . ."

A review of BFN's Construction Quality Assurance Manual (CQAM) dated 07-24-70, revealed it was written to give site personnel, procedures and guidelines within which work was to be performed. For more information see the review of site procedures (subsection c).

A review of the codes specified for BFN revealed the following:

- "USA Standard Code for pressure piping USAS B31.1.0-1967"; this code was found to have no material differences for the different classes of pressure boundary material.

- "USAS B31.1.0 - Power Piping Code cases N2, N7, N9 and N10"; the only material differences found within these code cases is an additional nondestructive examination (NDE) requirement for specific pressure boundary material.

- "American Society of Mechanical Engineer (ASME) Boiler and Pressure Vessel Code Section I Power Boiler" 1965 edition; this code applied to pressure boundary material and valves within a boiler and "on boilers up to the required valve or valves on all outlets..." which limits the scope to BFN class A & B components. This code also was found not to have additional material requirements, other than what the material specifications required.

- "ASME Boiler and Pressure Vessel Code Section III Nuclear Vessels" 1965 edition; this code only pertains to BFN's pressure vessel and its penetration piping. Therefore, this code was excluded from the material evaluation.

A review of General Electric's (GE) "Piping Design Specification" 22A1406 R2 revealed the following Design Requirements:

"4.0 DESIGN REQUIREMENTS

4.1 Piping. Piping, including equipment pressure parts other than valves and pumps (listed separately in paragraphs which follow), shall be designed in accordance with the requirements included herein.

4.1.1 Codes. Piping shall be designed in accordance with the latest issue of the USAS B31.1.0 Code for Power Piping (excluding Nuclear Code Cases) and to the additional requirements of this design specification. Where conflicts occur between USAS B31.1.0 and the requirements of this design specification, the requirements of this design specification shall take precedence."

These requirements of this specification are for the design, fabrication, inspection, and examination for pressure piping and equipment, for which GE prepared the design specification for and was listed on the parts and identification (P&ID) sheets.

Paragraph 4.1.1, GE excludes the Nuclear Code Cases from their design. The evaluator corresponded with GE, for BFN, to determine why this exception was taken. BFN is handling this response in their corrective action.

A review of General Construction Specification G-27 - "QUALITY CONTROL FOR CONSTRUCTION OF PIPING SYSTEMS FOR BOILING WATER REACTOR NUCLEAR POWER PLANTS", revealed the following:

This specification established the documentation requirements for the Class A, B, C, D, and E piping systems, and does not cover traceability. However, there are review and inspection requirements and only one of those pertains to material.

"5.1 General Fabrication and erection shall be reviewed and witnessed to see that requirements of the design specification are met."

A review of General Construction Specification G-28 - "CONSTRUCTION OF PIPING SYSTEMS FOR BOILING WATER REACTOR NUCLEAR POWER PLANTS", revealed the following:

Revision 0, dated 12-13-68, required traceability for all pressure boundary material for TVA Classes A, B, C, D & E. Through interviews and research, this evaluation found that the designers felt there should be size limitations on traceability, due to some sizes being impossible to trace. At that time, there were no standards governing traceability throughout the piping industry. Therefore, TVA revised G-28 on 02-27-70 to incorporate size limitations with respect to tracing pressure boundary material:

"2.2 Generic Requirements

Each part of fabricated piping assembly, fitting, or equipment shall be marked as required by applicable codes and standards. Parts over 2-inch nominal size for Class A and B systems and parts over 4-inch nominal size for Class C, D, and E systems shall include additional marking as necessary to identify the part with materials certifications, materials tests, and with reports of all tests and examinations performed on the part and its components. Marking shall be adequate to identify the part when completely installed in the final erected assembly.

Properly identified materials certifications, mill reports, chemical analysis, and mechanical property reports shall be maintained for all pressure containing parts and welded attachments."

In summary, the size limitations were put under the marking requirements. Marking the material is a vital link in tracing the material back to it's certification for all pressure boundary material. For the specified classes, BFN was required to maintain material certifications to insure the quality of the products.

Appendix B to 10 CFR 50 was issued in the Federal Register, Volume 35, number 125 on June 27, 1970, which is after the construction permits (Unit 1 and 2, 05/10/67 and Unit 3, 07/31/68) were issued for BFN. Although, laws are not retroactive, TVA committed to Appendix B in Revision 31, of BFN's Final Safety Analysis Report (FSAR) dated 07/01/72.

The following criterion in 10CFR50 Appendix B relates to this evaluation:

"VIII, IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

Measures shall be established for the identification and control of materials, parts, and components, including partially fabricated assemblies. These measures shall assure that identification of the item is maintained by heat number, part number, serial number, or other appropriate means, either on the item or on records traceable to the item, as required throughout fabrication, erection, installation, and use of the item. These identification and control measures shall be designed to prevent the use of incorrect or defective material, parts, and components."

c. A review of BFN construction site procedures revealed the following information:

Site procedures were not used for material control at BFN until mid-1970. Construction personnel used the General Construction Specifications for all material control functions up to the issue of Quality Control Procedure BF-45, dated June 17, 1970.

A review of Quality Control Procedure BF-45- "Weld Quality Assurance Recordkeeping for Piping", revealed the following:

This procedure defined the piping systems Weld Quality Assurance Documentation program. This procedure has the same material control requirements as General Construction Specification G-28.

"6.3.1 Component Identification Numbers - The NDT engineer, when so required by attachment 1, shall ascertain at weldjoint fitup that the correct components are installed and that the appropriate identification markings are on each component. For piping and valves over 2-inch nominal for class A and B system and over 4-inch nominal for

class C, D, and E systems, the identification is in the form of heat and/or mark numbers stenciled on the components. Enter these numbers in the appropriate spaces on the weld data sheet. For piping and valves under 2-inch nominal for class A and B systems and under 4-inch nominal for class C, D, and E systems, the identification is in the form of BF-34 color codes. Entry of the color code is not required on the weld data sheet."

d. Interviews were limited at BFN, due to construction being 10 to 20 years ago. There were a total of four interviews conducted that pertained to material verification under BFN's construction program. The following is a list of questions that were asked the interviewees and their responses.

Questions Asked:

What methods were used to verify material at fit-up?

What was verified during material verification?

How was the material marked and what was marked on it?

Was there a heat code/number printout used in material verification?

Interviewee A:

This interviewee was a mechanical engineer during the early phase of BFN construction, approximately 1969 to 1972.

The mechanical engineering unit performed the verification at fit-up. This consisted of verifying the TVA mark number (marked with paint stick on the material) is what the TVA drawings require. Did not verify specification and grade unless the mark number was illegible.

The interviewee stated that there had been a heat code/number printout generated, but it was used very little if any.

Interviewee B:

This interviewee was a welding inspector through the construction phase of BFN.

The mechanical engineering unit performed the verification at fit-up.

The interviewee did not think a printout was used for material verification and was not aware of a heat number printout being generated.

Interviewee C:

This interviewee was a mechanical engineer through construction phase of BFN.

The mechanical engineering unit was responsible for ensuring the correct material was installed based on the mark number being on the material.

The interviewee did recall a heat number printout being used by the mechanical engineering unit, but did not remember the details of how it was used. The interviewee thought this printout was thrown away years ago.

Interviewee D:

This interviewee worked in the mechanical engineering unit during the construction phase of BFN in the timeframe of 1969 through the mid-1970s.

The mechanical engineering unit performed the verification of material. The interviewee said, material was identified and traced by TVA mark numbers based on the design bill of materials specifications. Also, the mark number was on the material for the most part when received on site. When material was received without a mark number, the system engineer would determine if the material was as specified by the contract. Then the engineer would put the mark number on the material. The interviewee stated the material was issued from the warehouse by TVA mark number.

The interviewee did not recall a heat code printout being used at BFN.

e. A random material review was performed on TVA Class A, B, C & D pressure boundary material to determine if design and upper-tier requirements were met. This review consisted of a total of 148 examples: 44 examples in unit 1, 61 examples in unit 2 and 43 examples in unit 3. Of the 148 examples, 147 were traced back to certifications attesting to the materials' chemical and physical properties. Two examples were verified as not meeting the design requirements. Six examples had design discrepancies pertaining to NDE requirements. A review of the respective Bill of Materials for these six examples revealed the indicated NDE requirements to be unclear (such as, the same BFN mark number being specified with different NDE requirements).

Conclusion:

This was found to be a class E issue at BFN.

The perceived problem, as derived form the subject concerns, that there is a lack of credibility of the methods used by Construction personnel (i.e., HNSP) for the verification of properly certified Pressure Boundary Materials, at installation at BFN, was found to be not factual by this evaluation.

However, side issues were identified as follows:

- BFN's Nuclear Steam Supply System contractor (GE) took exception to the Nuclear Code Cases, to which BFN committed in the questions and answers of their FSAR, and 10 CFR 50.55a (d), January 1, 1984 and earlier. This commitment was accepted by the NRC in BFN's SER dated 06/26/72, paragraph 4.2.

- Conflicts between design documents were found in the areas of NDE. It was found not to be clear as to what the design requirements are regarding NDE, after reviewing design bills of material and BFN's Principle Piping Contract.

- There were two isolated material discrepancies which were contributed to human error.

The only side issue that would impact this evaluation is the issue of additional requirements regarding NDE, after DNE defines these requirements and incorporate them into their material control program. Also, there needs to be an evaluation to determine if past material program practices met these requirements.

3.2 Heat Code as Related to Material Control for Nuclear Power:

3.2.1 Generic Applicability:

The three concerns addressed in this issue are site specific to WBN and were initially evaluated at WBN and determined generic to SQN and BLN. Due to the findings of the evaluation performed at SQN, it was determined that additional evaluations at WBN were necessary. It was also determined that this issue was generic to the material traceability, identification and verification program for BFN.

3.2.2 Site-Specific - WBN:

a. A request, dated March 20, 1986, was sent to QTC for any additional information on the concerns addressed by this issue. This report reflects all pertinent information received from QTC.

b. The ECTG expurgated and unexpurgated files were reviewed to obtain any additional information that would assist in the evaluation of this issue. This report reflects all known available pertinent information.

c. A review of the upper-tier criteria revealed the following information:

Appendix B to 10 CFR 50 Section VIII states that;

> "Measures shall be established for the identification and control of materials parts and components including partially fabricated assemblies. These measures shall assure that identification of the item is maintained by heat numbers, part numbers, serial numbers, or other appropriate means, either on the item or on records traceable to the item, as required throughout fabrication, erection, installation and use of the item. These identification and control measures shall be designed to prevent the use of incorrect or defective material, parts and components."

10 CFR Part 21, Paragraph 21.1 indicates that material traceability is required, by any individual director or responsible officer of a firm constructing, owning, operating or supplying the components of any facility, for reportability purposes when the facility, activity, or basic component supplied to such facility or activity fails to comply with the Atomic Energy Act of 1954. 10 CFR Part 21, Paragraph 21.3 (a) (1) defines,

> "'Basic Component,' when applied to nuclear power reactors means a plant structure, system, component or part thereof necessary to assure (i) the integrity of the reactor coolant pressure boundary, (ii) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (iii) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposure comparable to those referred to in [Section] 100.11 of this chapter."

A review of WBN Code of Record, ASME 71 Edition Summer 73, (Section NB-2150 and NC-2150), revealed that Class I and II components require traceability and that,

> "identification of pressure retaining material shall consist of marking the material with the applicable specification and grade of material, heat number or heat code of the material and any additional markings required to facilitate traceability of the reports of the results of all test and examinations performed on the material. Alternately, the marking symbol and/or code may be used which identifies the material with the Material Certification and such symbol and/or code shall be explained in the certificate".

Section ND-2150 states that Class III material shall be marked in accordance with the marking requirements of the material specification."

10 CFR 50.55a was reviewed to determine the applicable Code of Record for the construction of Watts Bar Nuclear Plant. It was determined through the review of 50.55a that ASME 71 Edition through Summer 73 addenda, as stated in the Nuclear Component Manual (NCM), Note 1, Page 1, is acceptable as the Code of Record for WBN.

WBN Final Safety Analysis Report, Section 3.2.2 states that TVA Classes of fluid system components for WBN that perform a safety related function are A, B, C, or D. (These systems are safety related and require traceability for reportability purposes per 10 CFR Part 21.)

Nuclear Components Manual section 3.7, "MATERIAL CONTROL AND IDENTIFICATION," subsection 2.3.2, paragraph C, requires material to be identified to its certified material test report by a heat code where required by the Code.

Nuclear Quality Assurance Manual, Part I section 2.8, "IDENTIFICATION AND CONTROL OF MATERIALS PARTS & COMPONENTS", subsection 4.1.2, states that material identification of the item shall be

> "maintained by heat number, part number, serial number, or other appropriate means, either on the item or on records traceable to the item, as required throughout fabrication, erection, installation, and use of the item to preclude use of incorrect or defective items."

Nuclear Quality Assurance Manual Part III Section 2.3, "ISSUING OF MATERIALS, COMPONENTS, AND SPARE PARTS", subsection 2.2, paragraph 2.2.4 requires traceability be maintained for Level I and Level II items and 10CFR21 applicable items not assigned a QA Level. This shall be accomplished as follows:

- "Receipt documentation shall be filed with the associated contract by contract number or procuring document number."

- "The contract number or procuring document number shall be indicated for stored items on a tag which is attached to the item or their containers."

- "When items are withdrawn from Power Stores, the contract number shall be entered on the 575 form."

- "Each work instruction shall reference (By unique 575 number) the 575 used to withdraw material for that work."

Paragraph 2.2.5 states that, "Following issuance the responsible maintenance or modification supervisor is responsible for:"

- "Care of the item to prevent degradation or damage prior to and during installation."

- "Indicating the unique 575 number on the applicable work instruction for QA Level I and II items and 10CFR21 applicable items not assigned to QA Level."

Paragraph 2.2.6 states that it is the responsibility of the user of the materials, components and spare parts to verify correct identity before installation. When identification or traceability to acceptance documentation for such item is lost, the item shall be non-conformed.

d. A review of WBN Nuclear Power site procedures revealed the following information:

Administrative Instruction 5.4 Revision 10, dated 08/10/84 Section 6.1.3 "MATERIAL ISSUE, TRANSFER AND TRACEABILITY" states that the 575 originator shall be responsible for specifying on the form, the applicable work authorization document for which the item or part is requisitioned, description of the material needed, CSSC or Non-CSSC, Shop, Job or Work Order Number. Section 6.1.4 states that the Power Stores unit shall add the receipt date and contract number to the 575 for Level I and Level II items.

Administrative Instruction AI 5.6 Revision 3, dated 12/03/84, "MATERIAL STORAGE HANDLING AND SHIPPING REQUIREMENTS FOR WATTS BAR NUCLEAR PLANT," Section 5.4 states that Power Stores shall establish an identification system whereby the association between any CSSC material, component, or spare part and its quality assurance documentation is maintained. As a minimum, this system shall include the Materials Automated Management Systems (MAMS) TVA Item Identification Code (TIIC); the procurement document number; the receipt date (for QA Level I and II items); and applicable manufacturer heat number, lot, or individual serial number. Identification and segregation methods shall be maintained for storage of items assigned Level I and II Quality Assurance surveillance by using Quality Stores Ledger Card (TVA 6124B) and Bin Description Card (TVA 6509A) to denote that Quality Assurance requirements and assignments have been made for that item.

Administrative Instruction AI 8.8, Rev 12, dated 10/24/86, "CONTROL OF MODIFICATION WORK AFTER UNIT LICENSING", Section 5.0, states that all modification work will be controlled by the modification manager and accomplished by an approved workplan. Section 5.2, indicates that workplans shall be prepared by a cognizant engineer and shall consist of 10 sections which include data inspection sheets and a material traceability section. Section 5.2.7, Data Sheet Section, states that the data sheet section contains all data sheets that were required to document inspections of the work performed. The data sheets are not required to be in the workplan before approval but will be inserted as the work progresses. Section 5.2.9, Material Traceability Section, states that this section will document QA Levels I and II material used in performing the work. Documentation can be either by including the copy of the purchasing form (575Ns or contract) or by a material list providing a brief description of material, procurement document, and any other pertinent information. Section 5.2.2.2, paragraph F, Material Requirements, states that

modification material shall be listed on attachment G (Modification Material List) by the cognizant engineer or craft foreman. For material acquired from construction, the construction contract or requisition number shall be listed. For material (QA Level I or II only) acquired from Power Stores the Form 575. Form 4421 or Form 144 number shall be listed.

Modification and Additions Instruction (MAI)-6 Rev 1, Control of Weld Documentation, dated 02/01/85, applies to all welds and heat treatment performed on all piping that is classified TVA Class A, B, C and D and Class 1 Vessels/Structures. Appendix B, Section 4.0 states that component identification (Material Verification) shall be completed by the Cognizant Engineer previous to the weld being made. Identification shall consist of a brief description, procurement document number/date and other information as known.

Administrative Instruction - (AI) 9.4.2, Revision 10, dated 02/14/87 Control of Weld Documentation (superseded MAI-6) Section 6.0 Inspection and Acceptance, subsection 6.5 states that material identification shall be completed prior to the weld being made. Identification shall consist of the heat number (for material purchased from DNE on a 575N) or 575N number (for material bought out of Power Stores) and a brief description of the material.

Example: HT. No. BA 70 2" Pipe A106

Material ID is only required for ASME code material and AWS structural QA material.

Note: When welding to existing components a description and notification "existing" shall be satisfactory.

Section 6.6 states in part; QC shall verify that the new material installed or being installed is the correct heat number as listed under the material ID on data sheet A. Material that is indicated as being existing does not have to be QC verified.

e. A review of two workplans revealed the following information:

- Review of WP 10688, Retube CCS Heat Exchanger B with new AL-GX tubes.

TVA Class C. Modification Material List was included in the workplan which included a brief description of the material used and the construction contract number (833661) as required per AI 8.8. Review of contract 833661 and the receipt documentation revealed that tubing for the heat exchanger had been received on three different dates.

- Review of WP4879, Remove 10" valve and replace with 10" pipe.

  TVA Class C, Material Modification List was included in the workplan. However, the construction contract number for the material was not indicated on the form as required by AI 8.8. Further review of the Weld Data Sheet indicated that the required information for material verification (procurement document number) was not indicated by the cognizant engineer as required per MAI-6. Although the construction 575 was included in the work plan, the construction contract number was not indicated. Heat number 173309 was indicated on the Weld Data Sheet and construction 575. Review of the Materials Receipt/Certification documentation revealed that 10" pipe (HT 173309) was only received on contract 821594, RD613447 on 07/31/78.

Conclusion

This was found to be a class D issue at WBN.

For Class I and II material the ASME Code requires that material identification consist of markings to facilitate traceability of the reports of the results of all tests and examinations performed on the material. Alternately, a marking symbol and/or code may be used which identifies the material with the materials certification. WBN NCM requires material to be identified to its Certified Material Test Report (CMTR) by a heat code, where required by the Code. The requirement of WBN NQAM, Section 2.2.4 to place the contract number on the 575 when material is requisitioned

from Power Stores does not allow traceability to the/its CMTR as required by the Code and NCM. Partial shipments, of like items which are received on different dates, to be credited to one contract line item cannot be traced to the/its CMTR by this method.

Although, AI 5.4 and 5.6 require the receipt date to be placed on the Bin Description Card at the time of storage and the 575 at the time of issue; these procedures do not require that like items be separated in storage by receipt date. This does not allow traceability to the/its CMTR as required by the upper-tier documents.

AI 8.8 requires that the purchase form (575 or contract) or a material list with a brief description of material, procurement document, and any other pertinent information be included in the workplan, for material traceability. However, like items received on different dates on the same contracts are not identified by receipt date; therefore, upper-tier traceability requirements are not adequately addressed, by AI 8.8.

AI 9.4.2, which superseded MAI-6 requires that material identification consist of heat number (construction material purchased on 575) or 575 number (material purchased from Power) and a brief description. This requirement does not provide for material to be traceable to the/its CMTR, as required by upper-tier documents, because of the lack of the requirements to separate material in storage by receipt date.

The review of WP 4879 revealed that the Modification Material Sheet and Weld Data Sheet did not identify the procurement/contract number as required per site procedures.

The review of WP 10688 revealed that the material used was received by construction on three different dates. Markings on the Modification Material List in the workplan do not provide traceability of the material to the/its certification documentation as required by the Code of Record and the NCM.

3.2.3 Site-Specific - SQN

a. The ECTG expurgated and unexpurgated files were reviewed to obtain any additional information that would assist in the evaluation of this issue. This report reflects all known available pertinent information.

Three reports were reviewed and the following information was obtained:

- A review of the WBN-ECTG report MC-40703-WBN, "Material Control, Procedural Control, Heat Code", revealed that it contained no information applicable to the Nuclear Power evaluation at SQN, other than the NCRs discussed in section 3.1.3a of this ECTG report.

- A review of the GCTF report for Employee Concern Number EX-85-023-001, Revision 0, revealed that it presented a brief summary of a review of the site procedures used for material traceability and transfer of heat numbers; however, it did not verify the actual implementation of these procedures.

  The conclusions of the report (GCTF) are not valid. Although, SQN does transfer heat numbers with QC verification and uses the TVA-575, rather than a computer program for material traceability; the TVA-575 method used provides traceability only to the material's procurement document, rather than its CMTR. This determination is based upon the findings contained in section 3.2.3 of this ECTG report.

- A review of the GCTF report for Employee Concern Number EX-85-023-001, Revision 1, revealed that it presented a summary of a review of the site procedures used for material traceability and transfer of heat numbers; however, it did not verify the actual implementation of these procedures.

  The validation of the concern as stated in the conclusions of the report (GCTF) is correct; however, the conclusion, that "Even though Sequoyah's program is not equal to Constructions, it does meet all the upper-tier requirements for traceability.", is not concurred with. The

recommendation for a Quality Assurance survey to ensure the plant procedure implementation, is of little value, until the procedures are revised to include verification of acceptable material, in addition to, witnessing transfer of identification markings. These determinations are based upon the findings contained in section 3.2.3 of this ECTG report.

b. A review of the upper-tier criteria revealed the following information:

- NQAM, "PLANT MODIFICATION: AFTER LICENSING", Part II, Section 3.2, Revision 0, dated 06/24/86 and its immediate predecessor document dated 03/31/86, and "REPAIRS AND REPLACEMENTS OF ASME SECTION XI COMPONENTS", Part II, Section 2.3, Revision 0, dated 06/20/86 and its predecessor documents dated back to 04/12/86, contain the requirement that modifications of the Critical Structures, Systems, and Components (CSSC) of TVA Nuclear Plants, including SQN, be controlled in accordance with the requirements of ASME Section XI, IWA-7000, which states in paragraph IWA-7210(a).

  "Replacements shall meet the requirements of the edition of the Construction Code to which the original component or part was constructed. . . ."

  However, "PLANT MODIFICATION: AFTER LICENSING", Part II, Section 3.2, dated 08/06/82 through 12/23/85, did not include the requirement to meet ASME Section XI.

- TVA-NQAM, "IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS", Part I, Section 2.8, Revision 0, dated 06/18/86 was reviewed. This is the original issue of this document and it contains the requirement for programs and procedures for the identification and control of items in accordance with 10 CFR 50 Appendix B, Criterion VIII.

- TVA-NQAM, "PROCUREMENT OF MATERIALS, COMPONENTS, SPARE PARTS, AND SERVICES", Part III, Section 2.1, Revision 0, dated 06/20/86 and its predecessor documents dated back to 11/24/82, incorrectly define the Code of Record for SQN as "*ANSI B31.7C-1971 addenda".

  The preceding revisions of this document, dated 04/17/81 through 10/18/82, defined the Code of Record for SQN as "*NSI B31.7 - 1971 addenda."

- TVA-NQAM, "RECEIPT INSPECTION, HANDLING, AND STORAGE OF MATERIALS, COMPONENTS, AND SPARE PARTS", Part III, Section 2.2, Revision 0, dated 06/20/86 and its predecessor documents dated back to 04/18/79, require that all CSSC items be traceable only to their procurement document; however, they do not adequately establish the controls to ensure that all CSSC items received, are properly marked and identified, traceable to their CMTR, as per the Code of Record.

- TVA-NQAM, "ISSUING OF MATERIALS, COMPONENTS, AND SPARE PARTS", Part III, Section 2.3, Revision 0, dated 06/18/86 and its predecessor documents dated back to 05/12/80, contain requirements for issuing of CSSC items, the traceability of which is maintained only to the contract or procurement document.

c. A review of site procedures for marking identification and verification of Nuclear Class Piping Components used for modification of CSSC items, at SQN, revealed the following:

- SNP ADMINISTRATIVE INSTRUCTION AI-19 (Part IV), "PLANT MODIFICATIONS: AFTER LICENSING" (AI-19), Revision 0, dated 03/11/83 through Revision 18, dated 07/07/86, contains requirements for the preparation and execution of a "workplan" to control modifications performed, at SQN. Modifications falling under the jurisdiction of ASME Section XI (CSSC items) are required by AI-19, to be performed in accordance with the Code of Record. AI-19, provides instructions for the engineer to obtain the Code of Record for piping systems from,

* Underline added to reflect discrepancy and differences in quoted Code of Record.

" . . . paragraph 5.0 of General Construction Specification N2M-865, Field Fabrication, Assembly, Examination, and Tests for Pipe and Duct Systems . . . ."

AI-19 also defines the Construction Code of Record as ANSI B31.7 (1969) and 1970 Addenda; however, it mistakenly omits the ANSI B31.7c-1971 addenda, paragraph 1-723, for material identification and certification.

The "MATERIAL TRACEABILITY SECTION" of AI-19 does not contain requirements for material to have marking identification traceable to its CMTR, as required by the Code.

- SNP ADMINISTRATIVE INSTRUCTION AI-11, "RECEIPT INSPECTION, NONCONFORMING ITEMS, QA LEVEL/DESCRIPTION CHANGES AND SUBSTITUTIONS" (AI-11), Revision 0, dated 04/22/76 through Revision 37, dated 06/20/86 was reviewed. This procedure, requires that material markings agree with the TVA purchase contract or work order authorizing procurement, rather than being marked traceable to the CMTR, as required by the Code.

  AI-11, Revision 33, dated 08/06/85 through Revision 37, dated 06/20/86, states, "Certification - A manufacturer's Mill Test Report (MTR) or CMTR is acceptable in lieu of a manufacturer's COC. A computer printed MTR or facsimile from the material manufacturer is acceptable as a CMTR whether signed or unsigned." This description for certification does not agree with the requirements of the Code of Record.

  AI-11, Revision 33, dated 08/06/85 through Revision 37, dated 06/20/86, Attachment 3, section IV, provides the method for transfer of markings (heat and contract number) on 1" and larger QA Level I pressure retaining material used in TVA Class A, B, C, or D systems. The QA inspector indicates acceptance of the marking transfer by stamping the material next to the heat and contract number or marking QA and initialing.

- SNP ADMINISTRATIVE INSTRUCTION AI-36, "STORAGE, HANDLING, AND SHIPPING OF QA MATERIAL" (AI-36), Revision 0, dated 12/30/83 through Revision 9, dated 03/07/86, establishes, for the power stores section, an adequate method of maintaining, prior to issue, positive identification between CSSC material and its "Quality Assurance Documentation"; providing, "Quality Assurance Documentation" is defined as its CMTR.

- SNP-STANDARD PRACTICE - SQA45, "QUALITY CONTROL OF MATERIAL AND PARTS AND SERVICES" (SQA45), Revision 0, dated 01/05/83 through Revision 21, dated 06/23/86 was reviewed. Revision 0, dated 01/05/83 through Revision 17, dated 09/27/85 did not contain a specific section on material traceability. Revision 18, dated 11/21/85 through Revision 21, dated 06/23/86 contained a specific section on material traceability; however, the material is required to be traceable only to the procurement document.

- SNP MODIFICATIONS AND ADDITIONS INSTRUCTION, "CONTROL OF WELD DOCUMENTATION AND HEAT TREATMENT" (M&AI-1), Revision 0, dated 04/26/79 through Revision 11, dated 10/30/86, was reviewed.

  Revision 0, dated 04/26/79 through Revision 2, dated 08/04/80, contained no provisions for material identification and/or traceability.

  Revision 3, dated 03/26/82 through Revision 8, dated 11/09/84, Appendix B, paragraph 4.0, provided direction for completion of the weld data sheet as follows:

  > "Component Identification (Material Verification) shall be completed by the originator/planner previous to the weld being made. Identification shall consist of a brief description procurement document number/date and other information as known.

Note: When welding to existing components a description and notation 'existing' shall be satisfactory. If the inspector is not satisfied with the description provided, additional information may be added by the inspector."

Revision 9, dated 08/05/85 through Revision 11, dated 10/30/86 contain the following definition in paragraph 4.10;

"Material Traceability by Heat Number/Code: Identification of piping and fittings by heat number/code for QA Level I pressure retaining materials used in TVA Class A, B,C, and D systems greater than 3/4-inch and bolting 1-inch and above."

and in Appendix B, paragraph 4.0, provided expanded direction for completion of the weld data sheet as follows;

". . . For prefabricated items too small to put material traceability number on (i.e., short section of small pipe in a fitting) the documentation from the weld data sheet will be used for the next weld in completing the material verification part of the data sheet."

The identification and traceability requirements described above do not provide adequate material description traceability to the CMTR, as required by the Code.

d. Interviews conducted with persons performing inspections and/or verifications of material during modifications at SQN revealed the following:

Interviewee A

The question was asked, "What do you do when you are requested to witness a heat number transfer?" Interviewee said, "If it has a heat number or contract number we witness its transfer. If it doesn't have a contract number we only check to see if the heat number is on it and transfer it. If the workplan does not have a 575 for the material, I will not transfer the number."

The question was asked, "Do you verify the class of material when it is installed, and please explain what you do when verifying material identification for a code weld?" Interviewee said, "I don't check the class of material when it is installed and I don't think the 575 has it on it. I look to see if the 575 agrees with what is written in the material section, this is written in, either by the craft or the engineer, if it is the same I sign the weld sheet. Sometimes if the heat number is not on the weld sheet I will put it on it. I don't sign the weld sheet unless there is a 575 for the material. I am not responsible for verifying anything, I just sign the sheet."

Interviewee B

The question was asked, "What do you do when you are requested to witness a heat number transfer?" Interviewee said, "It needs a heat number on the material. If it is in the workplan there is a 575. If the heat number is inked on the pipe, we would write the heat number on the section cut off. If the heat number is not on the 575 we transfer the number that is on the pipe. Until last year the procedure for transferring heat numbers was lacking, shakey. After the heat number is written on the other piece, I would initial it with a paint stick."

The question was asked, "Have you ever had an occasion to transfer a heat number without a 575?" Interviewee said, "If it had a factory heat number I would not need a 575."

The question was asked, "What is required to perform material verification on Code piping systems, for a weld fit-up sheet?" Interviewee said, "I check the heat number on the pipe and then check the workplan and 575. If there was a 575, I would list the material, a short description, plus the heat number on the sheet. If we were welding to an existing piece, I would log, existing piece. If a heat number is used in the workplan a lot, I don't go back and check it each time, because I can tell that other inspectors have already checked this."

The question was asked, "How do you verify that the correct class of material is installed?" Interviewee said, "I don't; that is the engineer's responsibility. He is directing the craft as what to do."

e. A review of material identified in two workplans (WP), one each for Unit 1 and Unit 2, for a Class "A" System (Reactor Coolant System, 68) was performed to determine if material with the proper certification was installed. The reviewed WPs are for modifications performed on the pressurizer power operated relief valve piping; WP 10688 (unit 1) and WP 10478 (unit 2).

This review was limited to two WPs because of the small number of modifications to TVA Class "A" pressure boundary material.

- Review of WP 10688:

This review revealed four documented welds, weld numbers F-25A, F-25B, F-29A and F-29B, which were reviewed for their material identification.

Weld Data Sheet (WDS) for weld number F-25A identifies the installed material as 3" sch 160, SS pipe; however, the adjacent WDS for weld number F-25B identifies this material as 3" sch 160, pipe, SS, with the heat number/code N7212. A field walkdown was performed by Modifications Unit personnel, to determine the identification markings, if any, on the installed material. The walkdown revealed this material to be identified with the heat number/code N7212.

TVA-575 number D/C 0599, contained in the WP, identifies this material as 3" sch 160, SS pipe, Class I, and references shipping ticket number G234493, item number 5. This shipping ticket revealed item number 5 to be 100-at. of 3" sch 160 SS pipe having heat numbers/codes N3307, N7212, *N1046, N3207, *N1046, RD-739894, item number 1, (RD represents Request for Delivery). RD-739894, item number 1, is identified as 100-fat. of 3" sch 160 SS pipe Class I with heat numbers/codes N1046, N3207, N3307, *N2438, and N7212. The CMTR filed with RD-739894 revealed this material to be Class "C".

* Numbers underlined above to emphasize inconsistencies of number listings on the two documents.

WDSs for weld numbers F-29A and adjacent weld number F-29B identify another piece of installed material as 3" sch 160, SS pipe with the heat number/code N7212. Following the identical traceability path outlined in the preceding paragraph this material is also Class "C".

Note: This is a Class "A" system in which Class "C" material is installed.

WDSs for weld numbers F-25B and F-29B identify that 3" 2500# SS flanges, with the heat number/code CUS35102 for F-25B and **CVS35102 for F-29B, are installed. The field walkdown revealed both the F-25B and F-29B flanges to be identified as, 3" Flange, S160, 2500, SA182, F-304, **CUS35102.

TVA-575 number D/C 1108, contained in the WP, identifies these flanges as, 3", 2500#, SA182, F304 or F316, Sch 160 bore, WN, ASME Section III, CL1, RF, and references RD-809043, Item 6, QA I. RD-809043, item number 6, is identified as 4 each, 3" Flanges, Stainless Steel, ASME SA-182, F304 or F316, Schedule 160 bore, ASME Section III, Class I, 2500#. The CMTR filed with this RD identifies these flanges as 3" 2500#, R. F. weld neck, Sch 160, SA-182, F-304, Section III CL I, having the heat number CUS. NAVCO Drawing Number A7263, Revision 9, referenced in this workplan, specifies that Class "A" flanges used are to be A-182 F-316 stainless steel.

Note: The material specifications (F-304) of the installed flanges do not meet the material specifications (F-316) as stated on the NAVCO drawing.

Note: The material identifications on the Weld Data Sheets are not, by themselves, sufficient to identify the installed material.

** Underline added to denote discrepancy between WDS and actually installed material.

- Review of WP 10478:

This review revealed there are no TVA-575s for the pipe or flanges. From the documentation, WDSs, RDs, Shipping Ticket, etc., found in the WP, there is no way to identify the pipe and flanges installed. A field walkdown was performed by Modifications Unit personnel to determine what, if any, identification markings were on the pipe and flanges in the Class "A" installation. The walkdown revealed the material installed between weld number F-25A and F-25B to have the following identification markings, HT-4801, 2RC-20A, F-35-20?, and serial number 256?.

Note: NAVCO drawing A7548, Revision 9, and the weld map, included in the WP, depict these identification markings (2RC-20A and F-35) as possibly being assigned to other locations.

The walkdown revealed the material installed between weld number F-30 and F-30E to have the following identification markings, HT-N3207. Shipping Ticket number G234493 (included in the WP) references RD-739894, item 1, for 3" pipe with the heat number N3207. The CMTR filed with this RD revealed this pipe to be Class "C".

The field walkdown revealed the two Class "A" flanges to have the following identification markings, 3" Flange, SAC, 3W, 2500, E16, SA-182, *F-304, 34541, 1009, S160, C1 IA. Traceability to the CMTRs for these flanges is not provided in the workplan.

Note: The material specifications (*F-304) of the installed flanges do not meet the material specifications (*F-316) as stated on the NAVCO drawing.

Note: The material identification on the Weld Data Sheets, and the documentation contained in the WP are not sufficient to identify the installed material.

* Underline added to denote material differences.

Note: The weld map contained in the WP shows a 6" spool piece by TVA with the heat number M2415, installed between weld numbers F-24C and F-24D. The Construction HNSP revealed this heat number to be for 6" pipe, (*A312 T304), Class "A". The NAVCO drawing A7548, Revision 9, specifies this pipe to be, (*A376 TP316), Class "A". A CMTR, obtained from the SQN QC Record Vault, for this heat number/code (M2415) revealed the Material Specification and Class to be as follows:

"HIGH TEMPERATURE SERVICE PIPE
STAINLESS
SMLS, CRO304/304H, EF, CD, AW
ASTM-A-312-77
ASME-SA-312
ASTM-A-376-76
ASME-SA-376
PICKLED
ASME SECTION III 1977 EDITION THRU
SUMMER ADDENDA 1977 CLASS 2 . . . . "

While this pipe was outside the scope of this WP review, verification of the acceptability of the installed material must be made.

Conclusion:

This was found to be a Class D issue at SQN.

The perceived problem, as derived from the subject concerns, that there is a lack of credibility of the methods used by Nuclear Power personnel (i.e., TVA-575) for the verification of properly certified Pressure Boundary Materials, at installation at SQN, is factual because of conditions determined to exist as a result of this evaluation.

The TVA-NQAM does not accurately define the requirements for the development of material identification and control procedures, necessary to ensure compliance with the applicable Code of Record and 10 CFR 50, Appendix B, Criterion VIII, for the repair and/or replacement of ASME Section XI Components, at SQN. ASME Section XI, IWA 7210(a) states,

"Replacements shall meet the requirements of the edition of the Construction Code to which the original component or part was constructed."

* Underline added to denote material differences.

The Site Procedures do not provide a positive documented traceability path between the material installed, or divided into two or more pieces, and its CMTR.

Inspectors interviewed lack an understanding of the significance of why, or the manner in which, material identification verification at installation or material division into two or more pieces is performed and documented.

The modifications performed on ASME Section XI Components, at SQN, do not comply with the requirements of the Code of Record and 10 CFR 50, Appendix B, for identification and control of these components throughout their fabrication, erection, installation, and use. This noncompliance has resulted in the receipt, storage, and installation of material other than what was specified.

3.2.4 Site-Specific - BLN:

a. The expurgated files were reviewed to obtain any additional information that would assist in the evaluation of the perceived problems on heat code.

No pertinent information was found to exist. The evaluation of this issue was obtained by a review of site procedures, interviews with site personnel, and information obtained from other evaluations concerning material control.

b. A review of related procedures was performed in order to determine the requirements and responsibilities in relation to heat code requirements.

No site procedures controlling heat code requirements were found. A Nuclear Power heat code program called "HOBLOTS" was found to exist. It listed the heat numbers of material received and contained such information as procurement number and item description. These listings were extremely lacking compared to that found in the construction heat code program. However, since Nuclear Power at BLN had not performed any work on ASME code items, an actual problem did not exist.

Based on the Code of Record and regulatory requirements identified in the BLN evaluation for "Heat Code as Related to Material Control for Construction, this program will need revamping before being placed into service in the future. Specific items needing to be added are (1) material specification, (2) material size, (3) material grade, and (4) material class along with any other specific ASME requirements. It should be noted that no site procedure existed which established or controlled BLN Nuclear Power's heat code program "HOBLOTS".

c. Conducted interviews to determine the procedures and processes used in the verification of materials.

An interview with the Power Stores supervisor indicated that no site procedures existed controlling the heat code program. A computer program "HOBLOTS" was initiated as a guide to find pertinent information on some installed ASME equipment and components. The pertinent information included such items as contract numbers, special identification markings, description, etc.

Conclusion:

This issue was found to be a class B issue at BLN.

The perceived problem that BLN Nuclear Power should upgrade its heat code program to construction's standard was factual, but not a problem. Since BLN Nuclear Power had not performed any work on ASME code items, no problems existed at the time of the ECTG evaluation. However, before any work on an ASME code item begins, the heat code program will need to be established to meet the standards defined in the BLN FSAR.

3.2.5 Site-Specific - BFN:

a. The ECTG expurgated and unexpurgated files were reviewed to obtain any additional information that would assist in the evaluation of this issue. This report reflects all known available pertinent information.

b. A review of the upper-tier criteria revealed the following information:

Appendix B to 10 CFR 50 Criterion II "Quality Assurance Program states in part;...

> The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety. Activities affecting quality shall be accomplished under suitably controlled conditions. Controlled conditions include the use of appropriate equipment; suitable environmental conditions for accomplishing the activity, such as adequate cleanness; and assurance that all prerequisites for the given activity have been satisfied. ...

Appendix B to 10 CFR 50 Criterion III "Design Control" states in part; ...

> Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components. . . .

Appendix B to 10 CFR 50 Criterion IV "Procurement Document Control" states;

> Measures shall be established to assure that applicable regulatory requirements, design bases, and other requirements which are necessary to assure adequate quality are suitably included or referenced in the documents for procurement of material, equipment, and services, whether purchased by the applicant or by its contractors or subcontractors. To the extent necessary, procurement documents shall require contractors or subcontractors to provide a quality assurance program consistent with the pertinent provisions of this appendix.

Appendix B to 10 CFR 50 Criterion V "Instructions, Procedures, and Drawings" states;

> Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Appendix B to 10 CFR 50 Criterion VI "Document Control" states;

> Measures shall be established to control the instance of documents, such as instructions, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality. These measures shall assure that documents, including changes, are reviewed for adequacy and approved for release by authorized personnel and are distributed to and used at the location where the prescribed activity is performed. Changes to documents shall be reviewed and approved by the same organizations that performed the original review and approval unless the applicant designates another responsible organization.

Appendix B to 10 CFR 50 Criterion VII "Control of Purchased Material, Equipment, and Services" states in part; ...

> Documentary evidence that material and equipment conform to the procurement requirements shall be available at the nuclear power plant or fuel reprocessing plant site prior to installation or use of such material and equipment. This documentary evidence shall be sufficient to identify the specific requirements, such as codes, standards, or specifications, met by the purchased material and equipment. ...

Appendix B to 10 CFR 50 Criterion VIII "Identification and Control of Materials, Parts, and Components" states;

> Measures shall be established for the identification and control of materials, parts, and components, including partially fabricated assemblies. These measures shall assure that identification of the item is maintained by heat number, part number, serial number, or other appropriate means, either on the item or on records traceable to the item, as required throughout fabrication, erection, installation, and use of the item. These identification and control measures shall be designed to prevent the use of incorrect or defective material, parts, and components.

Appendix B to 10 CFR 50 Criterion X "Inspection" states in part;

> A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity. Such inspection shall be performed by individuals other than those who performed the activity being inspected. ...

A review of the Code of Federal Regulations (10CFR50), Part 50.55a 1971, through 1984 revealed the Code of Record for Piping Materials at BFN:

"(d) Piping. (1) For construction permits issued before January 1, 1971, for Reactors not Licensed for Operation, piping which is part of the Reactor Coolant Pressure Boundary shall meet the requirements set forth in: (i) The American Standard Code for Pressure Piping (ASA B31.1; Addenda, and Applicable Code Cases or the USA Standard Code for Pressure Piping (USAS B31.1.0), Addenda, and Applicable code Cases or the Class I Section of the USA Standard Code for Pressure Section of the USA Standard Code for Pressure Piping (USAs B31.7) in effect on the date of order of the piping, and (ii) The Nondestructive Examination and Acceptance Standards of ASA B31.1 Code Cases N7, N9, and N10, except that the Acceptance Standards of Class I piping of the USA Standard Code for Pressure Piping (USAs B31.7) may be applied."

A review of Revision 31 of BFN's FSAR revealed the following:

"Our current interpretation of 10 CFR 50 would require that we maintain the shop and field records for systems in Table D.0-1 (List of CSSC systems) such as:

1. Weld records including a record of the weld procedure used, welding materials used, record of the welder performing each weld, the method of examination, frequency of examination, and a record of examinations and inspections that have been performed.

2. Materials records traceable to each pressure containing component of the system greater than 4-inch nominal pipe size.

3. Quality Assurance Checklist and documented evidence that components were manufactured to the QA requirements of 10 CFR 50 Appendix B.

4. Quality Assurance Checklist and documented evidence that components were installed to the QA requirements of 10 CFR 50, Appendix B.

Those systems are identified in Table D.0-1 of the FSAR as falling in the Quality Assurance Program, but they are not previously included in the program as requiring documentation. However, they have been added and all future work in these areas after July 1, 1972, will have the necessary documentation."

A review of the Nuclear Components Manual, Section 3.7, "MATERIAL CONTROL AND IDENTIFICATION", subsection 2.3.2, paragraph C, revealed the requirements for material to be identified to its certified material test report by a heat code where required by the code of the respective plant.

A review of the Nuclear Quality Assurance Manual, Part I, Section 2.8, "IDENTIFICATION AND CONTROL OF MATERIALS PARTS & COMPONENT", subsection 4.1.2 revealed that material identification of the item shall be maintained by heat number, part number, serial number or other appropriate means, either on the item or on records traceable to the item, as required throughout fabrication, erection, installation, and use of the item to preclude use of incorrect or defective items.

A review of Nuclear Quality Assurance Manual Part III, Section 2.3, "ISSUING OF MATERIAL COMPONENTS, AND SPARE PARTS", subsection 2.2, paragraph 2.2.4 requires traceability to be maintained for Level I and Level II items and 10CFR21 applicable items not assigned a QA Level. This shall be accomplished as follows:

- Receipt documentation shall be filed with the associated contract by contract number or procuring document number.

- The contract number or procuring document number shall be indicated for stored items on a tag which is attached to the item or their containers.

- When items are withdrawn from Power Stores, the contract number shall be entered on the 575 form.

- Each work instruction shall reference (By unique 575 number) the 575 used to withdraw material for that work.

Section 2.2.5 stated that following issuance the responsible maintenance or modification supervisor is responsible for:

- Care of the item to prevent degradation or damage prior to and during installation.

- Indicating the 575 (unique) number on the applicable work instruction for QA Level I and II items and 10CFR21 applicable items not assigned to QA Level.

Section 2.2.6 stated that it is the responsibility of the user of the material, component and spare parts to verify correct identity before installation. When identification or traceability to acceptance documentation for such item is lost, the item shall be non-conformed.

c. A review of Site procedures revealed the following information:

There were various procedures which controlled the process of modifications of CSSC components at BFN. The following summary covers all applicable procedures (including references) issued by Nuclear Power.

- Standard Practice BFA28, "PLANT MODIFICATIONS AFTER ISSUANCE OF OPERATING LICENSE AND BEFORE COMMERICAL OPERATION".

- Standard Practice BF 8.3, "PLANT MODIFICATIONS AND WORK PLANS", Revision 0, Dated 08/01/80.

- Standard Practice BF-6.2, "QUALITY CONTROL OF WELDING ACTIVITIES", Revision 0, Dated 04/09/86.

- Modification and addition instruction, MAI-22, "WELDING QUALITY ASSURANCE FOR MODIFICATIONS AND ADDITIONS AT BROWNS FERRY NUCLEAR PLANT", Revision 0, Dated 02/20/86.

Site Director Standard Practice, SDSP-13.1, "QUALITY CONTROL OF WELDING", Revision 0, Dated 12/11/86.

Standard Practice BFA28, was the first issued procedure covering modifications under operations program. Through a document review, this procedure was determined to have been issued in 1972 or 1973. It gave the Modification Unit of Nuclear Power the over all responsibility for all modifications, even though construction personnel did the actual work until construction disbanded in 1976. BFA28 did not address verification and traceability; but, verification and traceability was accomplished by construction's procedures for the work which construction performed.

Standard practice BF 8.3, Revision 0, dated 08/01/80, did not address material verification and traceability.

Standard practice BF 6.2, Revision 0, dated 04/09/86, states the following pertaining to material verification and traceability:

"5.2 Procedure

5.2.6 Component Identification Numbers

The craft foreman shall, at weld joint fitup, obtain component identification numbers and enter them on the weld data sheet, (mat'l ID) to document each component welded to the other as applicable.

5.2.7 Material Verification

The QC inspector shall ascertain and document at weld joint fitup that the correct components are installed. This is accomplished by comparing component ID numbers to materials purchased on Form TVA 575 or transferred per BF 168 or BF 184 in the work instruction and that material is as specified on the drawings."

Modification and Addition Instruction MAI-22, R0, Dated 2-20-86, states the following pertaining to material verification and traceability:

"6.2 Weld Inspection Records

* * *

The cognizant engineer will fill in the plant, unit, weld number, work instruction number, nom. pipe size/sch., thickness, welding map number, and NA (not applicable) all inspections not required by the work instruction. . . .

* * *

Material Verification - The QC inspector (or cognizant engineer for non-CSSC) shall ascertain at weld joint fitup that the correct components are installed. This is accomplished by comparing component ID numbers to materials purchased on form TVA 575 in the work instruction and that material is as specified in the work instruction.

Site director standard practice, SDSP-13.1, Revision 1, Dated 12-11-86, states the following pertaining to material verification and traceability:

"6.3 Workplans and Maintenance Request Involving Welding

* * *

6.3.2.7 Material Verification

The QC Inspector/(Foreman when SDSP-13.8 is specified) shall ascertain and document at weld joint fitup that the correct components are installed. This is accomplished by comparing component ID numbers to materials purchased on Form TVA 575 or transferred per BF-168 or BF-184 in the work instruction and that material is as specified on the drawings. . . ."

Therefore, until BF 6.2 was issued, BFN Nuclear Power did not have in place a verification and traceability program in which BFN could insure compliance with 10 CFR 50 Appendix B criterion VIII. Additionally, the verification and traceability requirements of the recent procedures do not provide adequate traceability to the CMTR. They only allow traceability back to the procurement documents through the TVA 575, which does not always contain the material certifications.

d. Interviews were conducted with cognizant design engineers, maintenance engineers and Q.C. inspectors, who were involved with CSSC pressure boundary material being installed at BFN..

Interviewee A

Interviewee was a design engineer. Interviewee could not determine the design basis (ASME or ANSI B31.1) for the modification performed under WP 9775. There were no design calculations found for this modification. Also, there were no bills of material issued covering the material to be installed under this modification. Interviewee stated, "It is a common occurrence at BFN, design procures material without a bill of material for replacement material."

Interviewee B

Interviewee was a design engineer. Interviewee vaguely remembers design calculations. He stated that, for modifications, the design calculations are done on scrap paper and usually discarded after the modification is completed, unless the system engineer keeps the calculations as his personal files. Interviewee was not able to locate design calculations for WP 9775.

Interviews with other personnel did not yield any data relevant to the evaluation.

e. A review of material identified in two workplans (WP) and one maintenance request (MR) for TVA class "A" and "B" (ASME III Class I per General Construction Specification G-28) systems was performed to determine if material with the proper certifications and traceability to those certifications, was installed.

- WP 9775-Unit 1

  This review revealed a conflict between original construction weld documentation and WP documentation. The WP documents weld numbers the same as original construction's weld numbers, without changing original Weld Data Sheets.

  No Weld Data Sheets could be retrieved for welds identified on a weld map contained in the WP, except for the originals from life of plant storage. This WP also contained a 575 without proper component identification numbers listed for the pressure boundary material.

  The WP made references to ASME Designs on TVA Form 45s, (informal memorandum) from DNE to the Site. Through various interviews with cognizant DNE engineers, it was found that neither TVA Bill of Materials nor documented Design Calculations were issued for this modification. Also it was revealed that this is a common occurrence at BFN. Consequently, this evaluation could not ascertain the Code to which this modification was designed. This is in violation of 10 CFR 50 Appendix B, Criteria III and V.

  After this review was completed, the evaluation tried to ascertain the certification for the material listed on the 575. This was not achieved due to "Lost Records" in the Document Control Unit (DCU). Therefore, BFN has material installed without proper certification, which is in violation of 10 CFR 50 Appendix B, Criterion VII.

- MR #A-183066-Unit 2

  This review revealed traceability to exist. However, the material does not meet the design requirements. TVA Bill of Material 47BM406 sheet 1 of 9 specifies this material to be completely examined by ultrasonic testing (UT). The installed material was bought on Contract 85PK7-986764 which did not require UT examination of the material. Consequently, this material did not receive the UT required by the designer, which resulted in violation of 10 CFR 50 Appendix B Criteria II, IV and X.

- WP #9650-Unit-3

  This review revealed no weld documentation nor 575s attesting to the identification of the pressure boundary material used in this modification.

  NOTE: The above WPs and MR were completed without revising the original weld maps. This violates 10 CFR 50 Appendix B, Criterion VI.

Conclusion:

This was found to be a class D issue at BFN.

The perceived problem, as derived from the subject concerns, was that there is a lack of credibility of the methods used by Nuclear Power personnel for the verification of properly certified pressure boundary materials, at installation at BFN, is factual because of conditions determined to exist as a result of this evaluation.

The TVA-NQAM does not accurately define the requirements for material identification and control procedures, necessary to ensure compliance with 10 CFR 50 Appendix B, Criterion VIII, "Identification and Control of Materials, Parts, and Components".

The site procedures did not provide a positive documented traceability path between the material installed, and its CMTR.

The modifications performed on CSSC components, at BFN, do not comply with the requirements of 10 CFR 50 Appendix B, for identification and control of these components throughout their fabrication, erection, installation, and use. This has resulted, potentially, in the receipt, storage, and installation of material other than what was required and/or documentation received.

3.3 Changed Heat Numbers:

3.3.1 Generic Applicability:

The concern addressed in this issue is site specific to WBN and the evaluation revealed that this concern was not factual. Therefore, this issue is not generic to other TVA Nuclear Plant Sites.

3.3.2 Site-Specific - WBN:

a. A request, dated March 20, 1986, was sent to QTC for any additional information on concern number WI-85-091-010. No response was received from QTC on this concern.

b. The expurgated and unexpurgated files were reviewed to obtain any additional information that would assist in the evaluation of the perceived problem as related by the concern. No additional information was found.

c. Interviews were conducted with 29 persons, consisting of 12 Civil and Mechanical Engineering personnel, eight QC personnel, and nine craft personnel. None of the persons interviewed had any knowledge of heat numbers being changed without QC's knowledge.

d. Discussions with evaluators in this and other categories revealed no information relative to heat numbers being changed without QC's knowledge.

Conclusion:

This was found to be a class A issue.

No supporting facts were found indicating that heat numbers had been changed without QC's knowledge; therefore, the perceived problem is not factual.

3.4 Use of Non-Code Material:

3.4.1 Generic Applicability:

The "technical" concern addressed in this issue is site-specific to WBN; however, the NRC requested TVA in March 1986 (A02 860321 016) to evaluate the "technical" concern at all four TVA sites. Due to the fact that all four TVA nuclear sites are committed to different Codes of Record, the terms "non-code" and "certain areas" must be defined for each site. These terms are defined in the site-specific sections that follow.

3.4.2 Site-Specific - WBN:

The "technical" concern was directed at a perceived problem of non-code materials being used in certain areas at WBN. For WBN, the term "non-code" applies to any material not intended for use in ASME Section III, Code applications, except for material upgraded in accordance with the requirements of G-62. The term "certain areas" applies to all ASME systems.

The evaluation for this issue is based on the evaluations performed and documented in sections 3.1.2, 3.2.2, and 3.5.2 (Heat Code as Related to Material Control for Construction, for Nuclear Power, and Material Upgrading) of this report. A summary of the evaluations of these sections is as follows:

Heat Code as Related to Material Control for Construction

- WBN has been/is committed by its Code of Record and 10 CFR 50 Appendix B, to the use of Nuclear Class Piping Components.

- Proper certification and identification of the material was/is to be maintained throughout the fabrication, erection, installation, and usage phases.

- WBN site procedures did not provide adequate measures to ensure that the Code of Record and regulatory requirements had been met.

- WBN site personnel involved in the material identification/verification process relied upon the heat number for material identification/verification. This was an inadequate practice since heat numbers are not unique to Nuclear Class, Pressure Class, or material description.

Heat Code as Related to Material Control for Nuclear Power

- ASME Code requirements for Class I and II material states that material shall consist of markings to facilitate the traceability of reports for the results of all tests and examinations performed on the material.

- WBN NQAM, Section 2.2.4 requires the contract number to be on TVA Form 575 when requisitioning material from Power Stores. This practice does not allow traceability of the material to the/its CMTR since partial shipments, like items received on different dates and credited to the contract via item numbers, cannot be traced to the/its CMTR.

- Four WBN Administrative Instructions (AI-5.4, 5.6, 8.8, and 9.4.2) contain requirements for material traceability that do not comply with code and regulatory requirements. These instructions require the receipt date to be placed on the storage description documents at the time of storage and on the TVA Form 575 at time of issue. They do not provide requirements for like items received on different dates to be stored separately by receipt date. This does not provide traceability to the appropriate CMTR as required by the upper-tier documents. A review of several work control documents confirmed these weaknesses.

Material Upgrading/Reclassification

- Reclassification of material procured to ASME Section III was found to have been done properly. However, upgrading of material that was procured without ASME Section III/QA requirements being met was found to have been done improperly. Upgrading was performed in accordance with ASME Section III Code Cases N-242 and N-242-1. Prior to the issuance of these Code Cases, upgrading was accomplished only on DNE's approval. The Code Cases did not apply to WBN and WBN did not obtain approval for their use.

  Upgraded material at WBN was deficient because:

(1) Material was overlooked that required upgrading.

(2) After material was upgraded, it was not validated in accordance with site procedures.

(3) Some of the material upgrading was not in compliance with ASME Section III.

(4) Acceptability for use determinations were not performed for material received and certified to a Code edition other than the WBN Code of Record.

- A statement indicating that "all heat numbers met Code Class II requirements" was added to CMTRs. This is an acceptable means for certifying that the material has been upgraded; but the statement, by itself, cannot be used to upgrade material. During the time period the statement was used, no procedure existed which allowed its usage. NCM Section 3.8, revision 3 (dated August 2, 1984), to the present revision, provides acceptance for this method of certification as a past practice. Also, no WBN site procedure has existed to insure the an upgraded heat number is not received at a later date as a lower class material and then installed as if it was upgraded material.

- The Office of Nuclear Power (ONP) had not upgraded any material at the time of the evaluations performed for this report. If ONP intends to upgrade material in the future, a proceduralized material upgrading program must be implemented.

- ASTM material without proper upgrading, was found to be installed in ASME systems.

Conclusion

This issue was found to be a Class D issue at WBN.

The perceived problem that WBN was constructed with non-ASME materials in ASME systems was found to be factual based on the evaluations and conclusions utilized from the other WBN material control issues. Corrective actions for the other issues address the material control/upgrading programs at WBN such that further corrective actions for this issue are not necessary.

3.4.3 Site-Specific - SQN:

The "technical" concern, as determined to be generically applicable to SQN, was directed at a perceived problem of non-code materials being used in certain areas at SQN. The term "non-code" applies to any material not intended for use in the systems covered by the SQN Code of Record. Also, the term "certain areas" applies to the systems addressed by the SQN Code of Record. The SQN Code of Record is defined in section 3.1.3 of this report.

The evaluation for this issue is based on the evaluations performed and documented in sections 3.1.3 and 3.2.3 (Heat Code as Related to Material Control for Construction and for Nuclear Power) of this report. A summary of the evaluations of these two sections is as follows:

Heat Code as Related to Material Control for Construction

- SQN has been/is committed by its Code of Record and 10 CFR 50 Appendix B, to the use of Nuclear Class Piping Components even though the SQN FSAR does not clearly define the Code of Record.

- SQN site procedures, except for the initial issue of SNP-CP-M7, did not provide adequate measures to ensure that the above listed commitments were met.

- SQN site personnel involved in the material identification/verification process lacked an understanding of the significance of why, or the manner in which, all Nuclear Class Piping Components should be identified. No consistent method, except the reliance upon the heat code/number method, was found. Since heat codes/numbers are not unique to Nuclear Class, Pressure Class or material description, they cannot be relied upon for adequate material identification.

Heat Code as Related to Material Control for Nuclear Power

- SQN Code of Record and 10 CFR 50 Appendix B requirements, for the repair and/or replacement of ASME Section XI Components, were not accurately defined in the TVA NQAM with respect to the development of material identification and control procedures.

- SQN site procedures do not provide a positive documented traceability path between the material installed, or divided into two or more pieces, and its CMTR.

- Inspectors interviewed displayed a lack of understanding of the significance of why or the manner in which, material identification/verification at installation or material division into two or more pieces was performed and documented.

Conclusions:

This issue was found to be a Class D issue at SQN.

The perceived problem that SQN was constructed with non-B31.7 materials in ANSI B31.7 systems was not totally found to be factual or non-factual. Cases of noncompliance with the requirements of SQN's Code of Record and 10 CFR 50 Appendix B, for identification and control of Nuclear Class Piping Components during fabrication, erection, installation, and use were found pertaining to original installations and modifications to those installations. The noncompliances have resulted in the receipt, storage, and installation of material that cannot be traced to the/its CMTR. Further corrective actions are not necessary since the corrective actions for the other two issues ("Unvalidated Heat Numbers for Structural Steel" and "Verification of Material Discrepancy") address SQN's material control program.

3.4.4 Site-Specific - BLN:

The "technical" concern, as determined to be generically applicable to BLN, was directed at a perceived problem of non-code materials being used in certain areas at BLN. The term "non-code" applies to any material not intended for use in ASME Section III, Code applications, except for material upgraded in accordance with the requirements of G-62. The term "certain areas" applies to all ASME systems.

The evaluation for this issue is based on the evaluations performed and documented in sections 3.1.4, 3.2.4, and 3.5.3 (Heat Code as Related to Material Control for Construction, for Nuclear Power, and Material Upgrading/Reclassification) of this report. A summary of the evaluations of these sections is as follows:

Heat Code as Related to Material Control for Construction

- The BLN FSAR did/does not define the BLN Code of Record, as required by 10 CFR 50.34, and the FSAR did/does not reference ASME Code Case N-242-1, as required by Regulatory Guide 1.85. Also, the components that the Code Case was used on were not referenced.

- The BLN mark number system utilized by construction to control the traceability of ASME Code material was found to contain errors and discrepancies.

- The BLN construction program did/does not maintain traceability to the material's CMTR attesting to it's suitability for use; either through markings on the material, as required by the Code of Record, or on records traceable to the item, as required by 10 CFR 50 Appendix B, Criterion VIII.

- Specification N4G-889, Revision 0, did not adequately define the QA requirements of ANSI B31.1s (or B31.5s) piping material; therefore, B31.1 QA material was allowed to be stored with and assigned the same BLN site mark number as B31.1 non-QA material.

Heat Code as Related to Material Control for Nuclear Power

- No site procedures could be found controlling heat code/number traceability for ASME piping systems.

- A Nuclear Power heat code program called "HOBLOTS' was found to exist but no controlling procedure describing the program existed.

- No physical work or modifications had been performed on any ASME components by Nuclear Power personnel. Before any physical work or modifications are performed, the total heat code/number program should be revamped to meet all of the ASME Code and 10 CFR 50 Appendix B requirements.

Material Upgrading/Reclassification

- The BLN FSAR does not contain a definitive statement of the applicable Code of Record for Nuclear Classes I, II, and III for construction activities.

- The FSAR also does not reference Code Case N-242-1 or the components for which the Code Case has been used, as required by Regulatory Guide 1.85.

- No upgrading program existed during the early stages of construction activities, but a Certification of Examinations/Tests (CET) form (based on ASME requirements) was completed by a construction engineer. This form was then attached to the original Receiving Inspection Checklist (RIC) form and stored in the BLN Master File Vault. In March 1978, an SOP (QCRU-SOP-012) was initiated to control material upgrading. This program utilized the CET and RIC form program along with the addition of other requirements. In June 1982, another SOP (O&CEU-SOP-118) superceded the old SOP due to a change in the responsibility for the maintenance of mechanical material. In mid-1983, all material upgrading stopped and any deviations were handled by NCRs referred to design.

- Not all programs utilized by BLN complied with ASME Section III, Code requirements. A CMTR attesting to the upgraded material and to certify that the material was manufactured and supplied under an ASME QA Program was not required.

- A review of CMTRs revealed that material received, that had been certified to a later edition of the ASME Code, had not been properly documented as being in compliance with BLN's Code of Record.

- ASTM material was found to be installed in ASME systems without being properly upgraded.

Conclusions:

This issue was found to be a class D issue at BLN.

The perceived problem that BLN was constructed with non-ASME materials in ASME systems was found to be factual, based on the evaluations and conclusions utilized from the other BLN material control issues. Corrective actions for the other issues address the entire material control/upgrading programs at BLN such that further corrective actions for this issue are not necessary.

3.4.5 Site-Specific - BFN:

The "technical" concern was directed at a perceived problem of non-code materials being used in certain areas at BFN. As stated in section 3.1.5 of this report, BFN's Code of Record is ASME Section III, for the reactor vessels (Subsection A) and for pumps (Subsection C) and USAS B31.1.0 for piping and valves. The term "non-code" applies to material not intended for use in the applications listed above and the term "certain areas" applies to the systems covered by BFN's Code of Record.

The evaluation for this issue is based on the evaluations performed and documented in sections 3.1.5 and 3.2.5 (Heat Code as Related to Material Control for Construction and for Nuclear Power) of this report. A summary of the evaluations of these sections is as follows:

Heat Code as Related to Material Control for Construction

- General Construction Specifications G-27 and G-28 established documentation and material traceability requirements, respectively, for all pressure boundary material for TVA Classes A, B, C, D, and E. These specifications were used by construction personnel until mid-1970 when site procedures were issued to control quality.

- Quality Control Procedure BF-45 defined the piping systems Weld Quality Assurance Documentation program and contained the same material control requirments found in G-28. These requirements were for all pressure boundary material and required material certifications to insure the quality of all piping components.

- General Electric provided a piping design specification for the design, fabrication, inspection, and examination for pressure piping and equipment. G.E. specified that the piping design was to be in accordance with the latest issue of USAS B31.1.0 Code, but excluded the Nuclear Code Cases specified in BFN's FSAR.

- A random sample of material documentation was reviewed. A total of 148 examples were reviewed with two examples being found that did not meet design requirements and six examples being found having design discrepancies. Additional NDE requirements were also unclear. The remainder of the samples were found to comply with code requirements such that the discrepancies were considered to be isolated cases.

Heat Code as Related to Material Control for Nuclear Power

- The TVA-NQAM does not accurately define the requirements for material identification and control procedures, necessary to ensure compliance with 10 CFR 50 Appendix B, Criterion VIII.
- The BFN site procedures did not provide a positive documentation program to ensure a traceable path between the installed material and the/its CMTR.
- The modifications performed on CSSC components do not comply with the requiremetns of 10 CFR 50 Appendix B, for the identification and control of these components through their fabrication, erection, installation, and usuage. This noncompliance has resulted in the receipt, storage, and installation of material other than what was required.

Conclusion:

This issue was found to be a class D issue at BFN.

The perceived problem that BFN was constructed with non-code materials in code systems was found to be not factual; but, modifications to those systems was found to be deficient. The issue then becomes factual, based on the evaluations and conclusions from the BFN material control issue for Nuclear Power and the isolated deficiencies identified in the BFN material control issue for Construction. The corrective actions for the other two issues address the material control program at BFN such that further corrective actions for this issue are not necessary.

3.5 Material Upgrading/Reclassification:

3.5.1 Generic Applicability:

The two concerns addressed by this issue are site-specific to WBN. From the findings of the WBN evaluation this issue was found to be factual and determined generic to BLN, since BLN was also to be constructed to ASME Section III requirements.

3.5.2 Site-Specific - WBN:

a. A request dated March 20, 1986, was sent to QTC for any additional information on Concern Number IN-85-012-001. A response, dated March 21, 1986, was received from QTC which contained the following information:

"Please reference ERT Investigation Report to Concern No. IN-85-012-001 dated 12/14/85."

b. A review of ERT report, IN-85-012-001, dated December 14, 1985, found the investigation reviewed general and specific upgrading/reclassifying practices which occurred between 1975 and 1982 and listed findings of discrepancies. The NSRS made four recommendations transmitted by TVA memorandum from Director of Nuclear Safety Review Staff, to Plant Manager Watts Bar Nuclear Plant dated January 2, 1986, which were developed from ERTs report.

WBN replied to the ERT report and NSRS recommendations with a response transmitted by TVA memorandum from Project Manager WBN, to Site Director WBN dated February 27, 1986 and corrected for clarity March 21, 1986. The areas in which WBN agreed with ERT and/or NSRS findings/recommendations, WBN initiated corrective action as deemed necessary. In areas of disagreement, justification was provided in WBN's response to the NSRS recommendations.

The Employee Concerns Task Group (ECTG) reviewed the NSRS recommendations, ERT report and WBN's response. The findings are addressed in the following subsections, 1.(b), 2.(b), 3.(b), and 4.(b) of this section.

1. NSRS recommendation Q-85-012-001-01:

This NSRS recommendation states;

"Review of specific material upgrade CMTRs - Review the specific CMTRs, upgrade sheets, receiving reports, and weld history records associated with the material noted on the attachment to this investigation and the Nonconforming Condition Reports (NCR) referenced in the investigation. Take appropriate action to correct the discrepancies and documentation."

(a) In response to NSRS recommendation Q-85-012-001-01, WBN compiled a detailed response, which disputed or concurred with each ERT finding on a finding-by-finding basis, and responded to the NSRS recommendations. Listed below are the highlights of WBN's responses:

(1) WBN upgraded upon approval from Division of Nuclear Engineering (DNE), in accordance with ASME Section III Code Cases N-242 and N-242-1, which is described in the Quality Assurance Manual for ASME Section III Nuclear Power Plant Components (NCM), Section 3.7 R8, Section 3.8 R0. Prior to these Code Cases WBN upgraded material only on DNE's approval.

(2) WBN received ASME Section III material that has been certified to other editions and addenda than WBN's code of record. DNE also allows this through General Construction Specification No. G-62 (G-62) for material documentation and acceptability requirements for ASME Section III applications, Appendix B, table B.1. Site Engineering and Quality Control Units are jointly responsible for ensuring material installed in ASME Code systems is acceptable in accordance with G-62, Appendix B, table B.1 when the material was not supplied to the Code of Record for the site.

(3) Before Quality Control Procedure WBNP-QCP-1.50, "MATERIAL VERIFICATION AND VALIDATION," Site Engineering (Mechanical and Welding) did the final material verifications before installation for ASME Section III. "These verifications were accomplished by a review of certified mill test reports, certificates of compliance, the

existing Heat Number/Code Printout, DCU [Document Control Unit] personnel and documents located in warehouse. The verification of heat number/code was accomplished by comparing the heat number/code on the item with one of the above methods."

(4) The ERT report identified discrepancies within WBN NCRs pertaining to material that had been upgraded. These discrepancies consisted of material installed in Class I systems with lesser Class certifications, and from the documentation it could be ascertained that the material had been upgraded. Also, there were missing Nondestructive Examination (NDE) reports for material that had been upgraded to Class I. WBN initiated NCRs 6687 R0 and 4567 R0 to address these discrepancies.

(b) ECTG's evaluation findings relative to NSRS recommendation Q-85-012-001-01 are as follows:

(1) A review of upper-tier documents revealed that the NCM, Section 3.8, N3M-868, and G-62 allow upgrading in accordance with ASME Code Cases N-242 and N-242-1. It was found that these Code Cases do not apply to WBN, because both Code Cases state:

"Reply: It is the opinion of the Committee that until the rules of Section III, NCA-3800 are clarified, the following alternative rules may be used for the acceptance of metallic materials which may not have been manufactured or supplied in complete conformance with the rules of NCA-3800 (or NA-3700) and which are used in the construction of items for which the Code in effect is Winter 1973 Addendum or later."

The Code of Record for WBN, as defined in section 3.4 of N3M-868 Revision 2, dated 02/04/85, is ASME 1971 Edition through Summer 1973 Addendum. Therefore, the NCM, N3M-868 and G-62 are in error, in allowing the use of ASME Code Cases N-242 and N-242-1 for upgrading material at WBN.

ASME Code Cases N-242 and N-242-1 allow, with stipulated requirements, upgrading of material procured with Quality Assurance (QA) specified but which is not in complete compliance with NCA-3800 (or NA-3700). This evaluation found cases (listed below) where WBN upgraded material procured without specifying requirements for the vendor to have a QA program in compliance with ASME Section III, by using the ASME Code Cases and G-62. The following two contract examples are only a portion of the material that received upgrading without QA being specified on the procurement documents.

ASTM NON-QA MATERIAL THAT WAS UPGRADED

CONTRACT NO.	HEAT NO.	UPGRADE TO ASME CLASS
74C52-83128-3	ES	2
75C52-83109-1	M75252	2
75C52-83109-1	W73915	2
75C52-83109-1	L82720	2
75C52-83109-1	N92543	2
75C52-83109-1	T64291	2
75C52-83109-1	D43570	2
75C52-83109-1	W73898	2
75C52-83109-1	78R091	2
75C52-83109-1	K74845	2
75C52-83109-1	M91300	2
75C52-83109-1	80R114	2
75C52-83109-1	D81912	2
75C52-83109-1	D81896	2
75C52-83109-1	E86618	2
75C52-83109-1	D82091	2
75C52-83109-1	M90276	2
75C52-83109-1	K89037	2
75C52-83109-1	H85022	2
75C52-83109-1	W73941	2
75C52-83109-1	M90291	2
75C52-83109-1	J70214	2
75C52-83109-1	W92076	2
75C52-83109-1	M92348	2
75C52-83109-1	M92325	2
75C52-83109-1	D82163	2
75C52-83109-1	E86618	2
75C52-83109-1	D81518	2
75C52-83109-1	D81896	2
75C52-83109-1	L83224	2
75C52-83109-1	L83311	2
75C52-83109-1	L83313	2
75C52-83109-1	T84035	2
75C52-83109-1	T84030	2
75C52-83109-1	W93856	2
75C52-83109-1	T84036	2
75C52-83109-1	T84060	2
75C52-83109-1	D82268	2
75C52-83109-1	M35527	2
75C52-83109-1	M34705	2

(2) A number of times ERT questioned whether or not material received and certified to an edition of the code other than the WBN Code of Record had been reviewed to determine the acceptability of the material for use at WBN.

Through interviews with two cognizant individuals in the material receipt and inspection unit, it was found WBN only reviews material certifications for compliance with ASME Boiler and Pressure Vessel Code, Section II. The method used by WBN to determine if material certified to later editions and addenda meet WBNs Code of Record is: to compare the certifications with Appendix B, Table B.1 of G-62. This method only verifies that material conforms to ASME Section II. Before G-62 (March 10, 1980) this evaluation was not required by TVA procedures or specifications, nor documented as determined through these interviews. A review of various CMTRs found no evidence that this review had been performed.

The only time material is checked to insure compliance with the appropriate Class of ASME Section III (WBN's Code of Record) is when the material is upgraded through the provisions of QCI-1.46 and G-62. Again before G-62 (March 10, 1980) this evaluation was not required by TVA procedures or specifications, nor required to be documented. Although on occasion it was found to be documented by the cognizant engineer at the time of the upgrade.

(3) A review of site procedures revealed site engineering did material verification at installation in accordance with "WBNP Field Instruction WBFI M-8". Since April 5, 1982 QC has been performing material verification in accordance with WBN-QCP-1.50. Both were and are inadequate, because the method of verification is solely by heat number/code. In most cases the ASME Class was verified only through the Heat Code Printout; which allows material with the same heat number/code to be listed with different ASME Classes. This portion of this evaluation overlaps issue 3.1 "HEAT CODE AS RELATED TO MATERIAL CONTROL FOR CONSTRUCTION", 3.1.2 "Site-Specific - WBN".

(4) The ERT evaluation performed a review of random CMTRs and determined that the physical properties for heat numbers ENZB, EOIM, and EOKI were unacceptable. However, a check of the physical properties as listed on the CMTR for these heat numbers against the requirements listed in the 1971 edition of ASME Section II, specification SA-105, revealed that all requirements had been satisfied.

WBN initiated a program prior to the Employee Concerns Special Program (ESCP) to identify all the pressure boundary material that was received as different TVA classes having the same heat number/code. The method WBN used was to identify identical heat number/codes listed with different classes in the Heat Code Printout. WBN performed a search for these heat number/code using the Weld Data Sheets. Suspect material was identified on NCRs (2968, 4567, and 5087) by TVA weld number.

The ERT Evaluation identified discrepancies within these NCRs. WBN initiated corrective action (NCR 6687) on these discrepancies. However, WBN's corrective action was/is inadequate because, only items identified by ERT were corrected. Because of WBN's lack of a complete plant evaluation and documentation, of all material that should have been upgraded and material that had been upgraded improperly, to ASME Section III classes, several items were not identified.

Listed below are 25 items found by ECTG, during a two system random sampling of material, that were received as different TVA classes and having the same heat number/code, but without proper documentation (shown on a NCR) to prove material class:

	Example No.	Description	Heat Number	Weld No.
	14	2" Pipe	459025	1-062B-T118-16
	15	2" Pipe	BXD28H	1-062B-T118-18
	17	2" Pipe	BXD28H	1-062B-T118-20
	236	1-1/2" Pipe	432607	1-063B-T058-15C1
	96	3/4" Tee	EU	1-062B-T176-5C1
**	137	3/4" Tee	L412A	1-062B-T194-3
	176	1-1/2" Pipe	686533	1-063B-T029-1C3
	128	3/4" Pipe	9A1122	1-062B-T185-8
	155A	2" Boss	JJ	1-063B-T026-1
	317	1-1/2" Pipe	B2265	1-063B-T113-15
	172A	1-1/2" Boss	CAG	1-063B-T028-1
	132	3/4" Pipe	686413	1-062B-T185-12
	103	3/4" Pipe	92588	1-062B-T176-14
**	452	3/4" Pipe	04930A	2-062B-T329-9
**	457	3/4" Pipe	04930	2-062B-T336-1
**	463	3/4" 90° ELL	DU-1	2-062B-T336-7
**	464	3/4" Pipe	04930-A	2-062B-T336-8
**	466	3/4" Pipe	04930A	2-062B-T336-10
**	467	3/4" 90° ELL	DU-1	2-062B-T336-12
	580A	1-1/2" Boss	62811	2-063B-T095-1
**	492	3/4" 90° ELL	M178	2-062B-T348-5
	556	2"x3/4" RED	AAZ	2-063B-T114-9
	564	2" Pipe	M7780	2-063B-T092-5C1
	480	2" 45° ELL	PY	2-062B-T346-8
**	636	2" 45° ELL	WY-1	2-063B-T141-4

**Markings of upgrading on the material, without documented evidence of upgrading.

This ECTG evaluation also found that DNE was and still is waiving the requirement for NDE examination of all internal and some external surfaces (Reference TVA memorandums NEB 830421 285, NEB 821221 294 and NEB 830324 286). Therefore, these memorandums are in direct conflict with ASME Section III, NB-2540 "EXAMINATION AND REPAIR OF FORGINGS AND BARS" and sub-article NB-2541 "REQUIRED EXAMINATIONS", which states;

> NB-2540 EXAMINATION AND REPAIR OF FORGINGS AND BARS
>
> NB-2541 Required Examination
>
> "Forgings and bars shall be examined by the ultrasonic method in accordance with NB-2542, except forgings or sections of forgings which have coarse grains or configurations which do not yield meaningful examination results by ultrasonic methods shall be examined by radiographic methods in accordance with NB-2573. In addition, all external surfaces and accessible internal surfaces shall be examined by a magnetic particle method in accordance with NB-2545 or a liquid penetrant method in accordance with NB-2546. Forged flanges and fittings (such as elbows, tees and couplings) shall be examined in accordance with the requirements of NB-2550."

Interviews with individuals within TVA's Codes and Standards Group revealed that DNE was waiving these requirements on the basis that this is a reinspection. But, WBN cannot be certain that this material received the required NDE from the manufacturer, because WBN lost traceability to the material certification attesting to the performance of NDE, before the material was installed. Therefore, WBN cannot reinspect an item that may have never been examined in accordance with ASME Section III, sub-Article NB-2541.

A review of the documentation for NCR 6687 addressing upgrading showed that WBN did not comply to ASME Section III, sub-article NB-2541 on "TVA-WBNP NDE Surface Evaluation Data Sheet." Several data sheets that were reviewed showed that areas of material covered by hangers were not examined and in some cases it was noted that "All areas are inaccessible."

DNE waived the NDE requirement in a memorandum dated December 21, 1982 (NEB 821221 294) paragraph C, to WBN making reference: "that for two-inch NPS and smaller pipe sizes, the area of the ID surface accessible for inspection is minimal, and is fully enclosed within the radiographs required for category B welds by NB-5220." "ASME Section III sub-article NB-5220 - Category B Vessel Welds and Similar Circumferential Butt-Welded Joints (Girth Butt Welds) In Piping, Pumps and Valves", states:

> "Circumferential butt-welded joints, as defined in NB-3351.2, shall be radiographed and the weld surfaces and adjacent base material for at least 1/2 inch on each side of the weld examined by either the magnetic particle or liquid penetrant method."

However, the examples referenced in this memorandum are socket weld fittings which fall under category D welds, ASME sub-article NB-5250 "FILLET AND SOCKET WELDS", which do not require radiography. "NB-5250 FILLET AND SOCKET WELDS", states:

> "Fillet and socket welds shall be examined by either the magnetic particle or liquid penetrant method."

Consequently, this material would not have received the radiography, nor could WBN be assured that the NDE as required by ASME Section III, sub-article NB-2541 was performed on this material.

2. NSRS recommendation Q-85-012-001-02

"Review of additional material upgrade CMTRs - Review a random sample of additional upgrade CMTRs to verify that the upgrading was accomplished per procedure. Report results of this review in response to this investigation."

(a) In response to NSRS Q-85-012-001-02, WBN investigated an additional ten CMTRs, which the NSRS investigation did not include. Listed below are the heat numbers WBN investigated.

1. 6LD0 - 4", sch 80 45 E11, SA 234 WBP
2. W3600 - 4", LR 90 E11, std, SA 234 WBP
3. L448 - 2", 3000# Tee, A350-LF/SA 350-LF
4. BJ73 - 1 1/2", 3000# Union nut, A105/SA105
5. BK60 - 1 1/2", 3000# Union, male, A105/SA105
6. BH82 - 1 1/2", 3000# Union, female, A105/SA105
7. L04582 - 2", sch 40 pipe, A106/SA106
8. HE6252 - 1", sch 40 pipe, A106/SA106 Gr. B
9. HA5699 - 1 1/4", sch 40 pipe, A106/SA106 Gr. B
10. JA1252 - 1", sch 40 pipe, A106/SA106 Gr. B

"All 10 items meet material requirements in accordance with ASME Code Section II."

(b) The ECTG's evaluation findings relative to NSRS recommendation Q-85-012-001-02 are as follows:

A review of numerous CMTRs, which had been upgraded and/or reclassified, and their associated heat analysis were reviewed. This was in addition to the 10 in section (a) above. This review revealed that all of the heats met the requirements of ASME Section II. All upgrades were performed in accordance with WBN-QCI-1.46 "Material Upgrading" and G-62.

3. NSRS recommendation Q-85-012-001-03

"Review of material control instructions - Review the material control procedure currently in effect to verify that it contains provisions to prevent recurrence of the receipt, storage, and upgrade discrepancies identified during this investigation. Justify acceptance of previous methods and documentation of upgrading."

(a) In response to NSRS recommendation Q-85-012-001-03, WBN replied:

"Material control procedures currently in effect are: (1) Quality Assurance Manual for ASME Section III Nuclear Power Plant Components (NCM), Section 3.7, "Material Control and Identification" and Section 3.8 "Material Certification and Supply," (2) WBN-Quality Control Instruction 1.46, Material Upgrading, (3) WBN-Quality Control Procedure 1.06, "Receipt Inspection of Safety-Related Items," WBN-Quality Control Instruction 1.36, "Storage and Housekeeping," (4) WBN-Quality Control Procedure 1.50, "Material Verification and Validation," and (5) General Construction Specification G-62, "Material Documentation and Acceptability Requirement for ASME Section III Applications." These procedures were reviewed as part of the investigation

performed and found to contain provisions to prevent recurrence of receipt, storage and upgrading discrepancies identified in this report. Acceptance of previous methods of upgrading are addressed in the NCM manual, Section 3.8."

(b) For ECTGs findings relative to NSRS recommendation Q-85-012-001-03, refer to section c, "A review of WBN's upper-tier criteria", and section d, " A review of WBN's site procedures" found later in this issue evaluation.

4. NSRS recommendation Q-85-012-001-04

"Revision of FSAR - Revise the FSAR to include all applicable code cases utilized in material upgrading."

(a) WBN's response to NSRS recommendation Q-85-012-001-04 is as follows:

"Revision to FSAR is not required."

"Section III ASME Cases N-242 and N-242-1 as approved in NRC Regulatory Guide 1.85 specifically refer to Section NCA-3800 (NA-3700) of the ASME Code for Winter 1973 Addenda and later editions. The Code of Record for WBN is 1971 Edition through 1973 Summer Addenda for construction installation of ASME Code Classes 1, 2, 3, MC and CS components. Code Cases N-242 and N-242-1 are not required for WBN when materials for the project were procured before April 10, 1980. The Code Cases may be used as described in the Quality Assurance Manual (NCM), Section 3.8, revision 6, "Material Certification and Supply." NCR 2968R, R6, dated November 2, 1983 was generated to identify ASTM A-240 TP 304 stainless steel plate that was machined into a pressure retaining transition insert installed within an ASME Section III Class 1 boundary."

"The NCR was forwarded from the site to OE [Office of Engineering] for approval of corrective action. The corrective action returned to the site from OE referenced Code Case N-242-1 and also stated that NDE would be required. Subsection NB-2250 of the ASME Code lists the NDE requirements that apply to the transition spool piece identified on NCR 2968R, R6. A liquid penetrant examination on all external surfaces is one method of satisfying Class 1 requirements. This examination was performed and documented on NDE Report number 66440 by a certified NDE Level II inspector. The transition spool piece identified on NCR 2968R has been inspected in accordance with all applicable requirements to the ASME Code of Records for WBN."

(b) The ECTG's evaluation findings relative to NSRS recommendation Q-85-012-001-04 are as follows:

WBN's response to the NSRS recommendation, also indicates that the ASME Code Cases N-242 and N-242-1 do not apply to WBN's Code of Record. Although, it does state that the Code Cases may be used as described in the Quality Assurance Manual (NCM), Section 3.8, Regulatory Guide 1.85 specifically states that if accepted and used "applicants should identify in their Safety Analysis Report the components and supports for which the Code Case is being applied and should specify the respective paragraphs of the Code Case." The ECTG evaluation did not find this documented (except on ASME Section III Code Data Report N-5 forms) nor did ECTG find a reference to ASME Code Cases N-242 and N-242-1 in WBN's FSAR.

c. A review of WBN's upper-tier criteria pertaining to material upgrading revealed the following:

- A review of Code of Federal Regulations, Title 10, Part 50 (10 CFR 50), both past and present, revealed there are no specific regulations governing material upgrading. The following requirements were found pertaining to this evaluation:

  10 CFR 50.55a(2) states in part:

  "Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements of the ASME Boiler and Pressure Vessel Code..."

  10 CFR 50 Appendix B - CRITERION - V. "INSTRUCTIONS, PROCEDURES, AND DRAWINGS", states:

  "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

  10 CFR 50 Appendix B, CRITERION - VIII., "IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS", states:

  "Measures shall be established for the identification and control of materials, parts, and components, including partially fabricated assemblies.

  These measures shall assure that identification of the item is maintained by heat number, part number, serial number, or other appropriate means, either on the item or on records

traceable to the item, as required throughout fabrication, erection, installation, and use of the item. These identification and control measures shall be designed to prevent the use of incorrect or defective material, parts, and components."

10 CFR 50 Appendix B, CRITERION - XV., "NONCONFORMING MATERIALS, PARTS, OR COMPONENTS", states:

"Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation. These measures shall include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations. Nonconforming items shall be reviewed and accepted, rejected repaired or reworked in accordance with documented procedures."

10 CFR 50 Appendix B, CRITERION - XVII., "QUALITY ASSURANCE RECORDS", states:

"Sufficient records shall be maintained to furnish evidence of activities affecting quality. The records shall include at least the following: Operating logs and the results of reviews, inspections, tests, audits, monitoring of work performance, and materials analyses. The records shall also include closely-related data such as qualifications of personnel, procedures, and equipment. Inspections and test records shall, as a minimum, identify the inspector or data recorder, the type of observation, the results, the acceptability, and the action taken in connection with any deficiencies noted. Records shall be identifiable and retrievable. Consistent with applicable regulatory requirements, the applicant shall establish requirements concerning record retention, such as duration, location, and assigned responsibility."

- U. S. Nuclear Regulatory Commission, Regulatory Guide 1.85 - This regulatory guide lists those ASME Section III Code Cases oriented to materials and testing that are generally acceptable to the NRC staff for implementation in the licensing of light-water-cooled nuclear plants. The Code Case that applies to this evaluation is N-242-1 and it is listed as acceptable to the NRC with the following stipulation:

  "Code Case N-242-1 is acceptable subject to the following condition in addition to those conditions specified in the Code Case: Applicants should identify in their Safety Analysis Reports the components and supports for which the Code Case is being applied and should specify the respective paragraphs of the Code Case."

- Final Safety Analysis Report for WBN - This document was found to have no additional information pertaining to material upgrading. Also, there is no reference to ASME Code Case N-242-1 as required by Regulatory Guide 1.85.

- OEDC Quality Assurance Manual for ASME Section III Nuclear Power Plant Components (NCM) - Section 3.8 of this document allows the use of the ASME Code Case N-242-1 for upgrading material which does not meet WBN's Code of Record (1971 Edition, up to and including the Summer 1973 Addenda). Through various interviews with cognizant DNE codes and standards specialists, it was found that the ASME Code Committee would not permit the use of ASME Code Case N-242-1 for plants prior to NA-3700 Winter 73. However, through an interview with individuals within TVA's Codes and Standards Group, it was indicated "a similar code case could be prepared for this situation that would be accepted by the committee." The NCM, section 3.8 Revision 3, dated August 2, 1984, attempted to provide a blanket approval for the "certification" of the practices used to upgrade/reclassify material that was procured prior to April 10, 1980 using Code Case N-242-1.

- Nuclear Quality Assurance Manual (NQAM) - Presently, the NQAM does not address upgrading of material. Interviews conducted with cognizant individuals within WBN's Mechanical Maintenance Section, Modifications Section and the Materials Unit revealed that they have not performed material upgrades, nor have the procedures to do so. All material upgrades are performed through DNC and DNE.

- American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, 1971 Edition, up to and including the Summer 1973 Addenda - A review of this document found: WBN's Code of Record ASME Section III 1971 Editions through Summer of 1973 permits the upgrading/reclassifying of material through sub-article NB-2122(a), which states in part:

  "Any examination, repair, test or treatment required by the material specification or by this article may be performed by either the materials manufacturer, the component manufacturer or the installer as provided in NB-4121."

  Sub-Article NB-4121, "MEANS OF CERTIFICATION", states:

  "The Manufacturer and/or Installer of a Class I component or of any part of such a component shall certify, by application of the appropriate Code symbol and completion of the appropriate Data Report in accordance with NA-8000, that the materials used comply with the requirements of NB-2000 and that the fabrication and/or installation comply with the requirements of NB-4000."

Interviews/meetings were conducted with cognizant DNE and Stone and Webster Code specialists and revealed that upgrading/reclassifying can be done at WBN as long as all the requirements of the Code are met. If ASME Code Case N-242-1 is used at WBN, it can only be used to upgrade material procured with Quality Assurance specified; but which is not in complete compliance with NCA-3800 (or NA-3700) for situations such as those requirements in Code Case N-242-1, paragraphs 5.1 thorough 5.6. Accordingly, the Quality Assurance Program must be

surveyed and qualified by TVA as the NA Certificate Holder per NA-3451(a) and NX-2600 and must be maintained and used by the Material Manufacturer. However, documented evidence from the vendor certifying use of the QA program, normally in the form of a vendor's QA Program statement on the material CMTR or COC, is not required when the Code Case is invoked.

- TVA Construction Specification G-62 (originated March 10, 1980) - A review of this document revealed that it references the use of ASME Code Cases N-242 and N-242-1 for use at WBN.

In addition, it was determined the two following requirements of the Code Case, and G-62, were not complied with prior to 1983:

- NCR's were not generated until 1983 to upgrade material when QA procurements were not specified [see paragraph 3.0 of Code Case N-242-1, which references NCA-3867.3 and General Construction Specification G-62, Attachment 3, Section C-IIb-1(a)]. Also see 10 CFR 50, Appendix B, Criterion XV.

- Presently, it cannot be ascertained that upgraded, non-QA material was reviewed to ensure that no welding was performed on the material or, if there was, to verify that the welding was performed in accordance with ASME, Section IX, and NCA-3800, per paragraph 3.0, of Code Case N-242-1, which references NCA-3866.4(b), "CONTROL OF MANUFACTURING PROCESS - WELDING."

d. A review of WBN's site procedures pertaining to material upgrading found that until January 1984 when WBN-QCI-1.46 R0, "MATERIAL UPGRADING" was issued, there were no site procedures covering upgrading. This is in direct conflict with 10 CFR 50, Appendix B, Criterion V. As a result there was no developed instructions on how

material should be upgraded/classified, and several different methods were employed up through 1982.

A review of site instruction WBN-QCI-1.46, Revision 2, "MATERIAL UPGRADING," revealed that presently it is used at WBN to reclassify/upgrade material and is based on G-62 and NCM, Section 3.8, "MATERIAL CERTIFICATION AND SUPPLY." This procedure is in direct conflict with ASME Section III, because Section III sub-article NB-2122(a) allows upgrading of Non-QA material to Section III QA material by the installer using the provisions of NCA-3867.4 (F) which requires testing of the material, and WBN-QCI-1.46 does not require testing of the material.

This review also found that WBN-QCI-1.46 is vague when detailing the documentation requirements for traceability. For example, sections 6.1.5 and 6.1.6, state:

> "For material upgraded to a class that requires nondestructive examination (NDE) testing, (class A, etc.), enter the heat number with a dash one (-1) suffix on attachment A to uniquely identify the material."
>
> "Enter the quantity of material upgraded on attachment A. Enter "ALL" if all material in stock is upgraded."

The requirement for a (-1) suffix is not adequate because various vendors that were interviewed said that they could supply other than ASME Section III class 1 material with a (-1) suffix as a part of the materials heat code/number. Also the Heat Code Printout, which is used to verify the material shows several heat code/number with only a (1) in lieu of (-1). The following is a sample of some:

Heat Number	ASME Class
AAZ1	1
AAZ1	2
BL91	2
E48701	3
E08531	*

*Not ASME material, but listed in the heat printout.

WBN-QCP-1.46 does not require marking the upgraded material with the ASME class to which the material was upgraded to correspond with the identification markings on the TVA upgraded CMTR.

The requirement to enter "ALL" on the certification could allow material to be received after the upgrade has been performed, with the same heat code/number but a lesser class, and be installed as upgraded material without being upgraded.

The upgraded material was upgraded with additional NDE being performed for ASME Class I, but without marking (revised heat code/number or other serialization) the material that has been installed, nor have the records traceable to the material been changed. If this material had been validated in accordance with WBNP-QCP-1.50, "MATERIAL VERIFICATION AND VALIDATION" paragraph 6.1.1, which states:

> "Verify that heat numbers or heat codes correspond to the Certified Material Test Report (CMTR) or are listed in the Heat Code Printout."

the revised heat code/number would correspond to the heat code/number listed on the revised CMTR. Additionally, the revised heat numbers are not on the weld data sheets to establish traceability.

WBN upgraded most of the loose material 2" and under in TVA Class A (ASME Class I) systems, because construction did not maintain traceability and segregation of Class A and Class B material with the same heat code/numbers.

e. Due to a lack of information and clarity on concern number IN-85-493-003, a number of interviews were conducted with various individuals in construction to determine if stainless steel pipe was cut then PT'd and upgraded (per procedure) without the heat number being transferred. Thirteen individuals were interviewed; one from Welding Quality Control (WQC), three from Mechanical Quality Control (MQC), one from the Code Date Group, four from the Mechanical Engineering Unit (MEU), and four from the Construction Superintendent's Office (CSO). None of the individuals interviewed knew of a case where pipe was cut without transferring a heat number except for some pipe installed in a TVA class "G" (non-code) system which would not involve upgrading, and traceability is not required.

f. From discussions with evaluators in this and other categories it was found that the Quality Assurance Category overlaps this evaluation in the area of non-QA material being upgrading for use in QA System. (See QA/QC Subcategory Report 80100 - "QA Management and Policy).

Conclusion:

This was found to be a class D issue at WBN.

No facts were found to support the claim that a section of pipe has been cut then PT'D and upgraded (or reclassified) without a heat number being transferred. This could not be determined to be factual.

It has been determined that reclassification of material procured to ASME Section III was not a problem; however, upgrading of material that was procured without ASME Section III/QA requirements being met was not properly performed.

WBN and DNE upgraded in accordance with ASME Code Cases N-242 and N-242-1 without these Code Cases being applicable to WBN.

The upgrading that was done at WBN, is inadequate because:

- Material was overlooked that requires upgrading.
- Material received and certified to an edition of the code other than the WBN Code of Record has not been reviewed to determine the acceptability of the material for use at WBN.
- After material was upgraded it was/is not validated in accordance with site procedures.
- Some of the upgrading of material is not in compliance with ASME Section III.
- The statement, "All heats meet Code Class 2 requirements," added to a CMTR is an acceptable means for certifying that the material has been upgraded, but this statement, by itself, can not be used to upgrade material. At the time this statement was used, there were no site/upper-tier criteria in existence; however, NCM Section 3.8, Revision 3 (dated August 2, 1984) and later revisions provided acceptance for this method of certification only as a past practice. There is no procedure in effect at WBN to insure the upgraded heat number is not received as a lesser class and installed as upgraded material.

WBN ONP was found not to be performing upgrades of material. However, if ONP is required to upgrade material in the future, they will need to implement a proceduralized material upgrading program.

3.5.3 Site-Specific - BLN:

a. The ERT Investigation Report, Number IN-85-012-001, for WBN, was reviewed for any information that pertained to BLN. This subcategory report reflects all known available pertinent information learned from that ERT report.

b. A review of the upper-tier criteria, to determine the requirements governing the upgrading of material, revealed the folloiwng information:

A review of BLN's FSAR revealed it does not contain a definitive statement of the applicable Code of Record (Edition and Addenda) for Nuclear Classes I, II, and III for construction activities. Therefore, this evaluation was conducted using the ASME Code of Record specified in Appendix B of G-62 (ASME 1974 Edition, Summer 1974). A review of G-62 revealed that Code Case N-242-1 was being utilized until the requirements of ASME Section IT, NCA-3800 were revised (Code Case N-242-1 was issued as a revision of NCA-3800). BLN's FSAR does not reference Code Case N-242-1, as required by Regulatory Guide 1.85, nor does the FSAR identify the components for which Code Case N-242-1 was used.

A review of the Code of Record, ASME Section III, 1974 Edition through Summer of 74 Addendum, revealed the following requirements pertaining to this evaluation:

"NA-3450 RESPONSIBILITY FOR QUALITY ASSURANCE

NA-3451 SCOPE OF RESPONSIBILITY FOR QUALITY ASSURANCE

(a) The installer shall be responsible for surveying and qualifying the Quality System Programs of his suppliers of subcontracted services including non-destructive examination contractors . . . ."

"NA-3767.4 Certification of Materials

* * *

(c) Certification by Manufacturer or Installer
The Manufacturer or Installer shall complete all operations not performed by the Material Manufacturer and shall provide a Certified Materials Test Report for all operations performed by him or his subcontractors. The Manufacturer or Installer shall certify that the contents of his report are correct and accurate and that all operations performed by him or his subcontractors are in compliance with the requirements of the material specification and

this Section. Alternatively, the Manufacturer or Installer shall provide a Certified Materials Test Report for those operations being performed and at least one Certified Materials Test Report from each of his subcontractors for operations they performed. Material identification, including any marking code, shall be described in the Certified Materials Test Report."

A review of General Construction Specification G-62 and NCM, Section 3.8 revealed that these documents were originally issued in March 1980 and March 1982, respectively. Prior to these dates, no upper-tier criteria were found to exist.

A review of 10 CFR 50 Appendix B, Criterion V revealed that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings and shall be accomplished in accordance with these instructions, procedures, or drawings. Also, these instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

c. A review of BLN construction site procedures pertaining to material upgrading revealed the following information:

- Until March 27, 1978 there were no site procedures governing upgrading at BLN.

- Standard Operating Procedure QCRU-SOP-012, "O&CEU MATERIAL CONTROL UPGRADING OF MATERIAL", Revision 0, dated 03/27/78, states in part;

  "6.2 There are some necessary conditions that must exist before ASTM or other material may be considered for upgrading to ASME application. These are:

  1. The material specifications (ASTM vs. ASME) must be identical or must specify absolute differences that may be evaluated through the examination of the material specification or the material itself.

  2. Certified materials test reports (CMTRs) must be available and must contain all results required by the ASME material specification.

3. Additional requirements of ASME Sections for Class 1, 2, or 3 application must be fulfilled."

"6.4.2 Determine that the supplier of material is an acceptable material supplier of ASME Material in accordance with the ASME Code."

- Standard Operating Procedure Q&CEU-SOP-118, "O&CEU MATERIAL CONTROL UPGRADING OF MATERIALS", Revision 0, dated 06/15/82 (which replaced SOP-012), changed upgrading responsibilities. The general requirements stayed the same, but both procedures lacked the requirements of BLN's Code of Record (ASME Section III 74 Edition through summer 74) such as: verify the material being upgraded was manufacturered under a QA program, and not requiring BLN to provide a CMTR for those operations BLN performs to upgrade material.

d. Interviews were conducted with five persons performing and/or cognizant of material upgrades at BLN. These interviews revealed that BLN had performed very few upgrades (approximately 170), and that presently, material upgrades are nonconformed and the material is then evaluated to the requirements of G-62.

e. A random review of the upgrading of ten items was performed. This review revealed that none had been properly performed in accordance with the requirements of ASME Section III 1974 Edition.

- Some examples reviewed were certified to a latter code and was not documented as being in compliance with BLNs Code of Record (ASME Section III).

- None of the examples reviewed were found to have CMTRs attesting to the upgraded material, as required by ASME Section III sub-section NA-3767.4(c). R2

- Some examples were found not to have certification attesting the material was manufactured and supplied under an ASME Section TTI Q.A. Program.

Conclusion:

This issue was determined to be a class D issue at BLN.

The perceived problem was found to be factual. The BLN FSAR does not contain a definitive statement of the applicable Code of Record for Nuclear Classes I, II, and III for

construction activities at BLN. The FSAR also does not reference Code Case N-242-1 nor the components for which the Code Case is being used, as required by Regulatory Guide 1.85. In addition, by not establishing an adequate procedurally based upgrading program from as early as 1976, 10 CFR 50 Appendix B, Criterion V was not complied with such that material installed in safety-related systems may not be in compliance with applicable codes and standards.

3.6 Unvalidated Heat Numbers for Structural Steel:

3.6.1 Generic Applicability:

The concern addressed in this issue is site-specific to SQN. The original perceived problem as derived from the concern was evaluated at WBN and found not to be generically applicable to other TVA plant sites.

3.6.2 Site-Specific - WBN:

a. A request, dated March 20, 1986, was sent to QTC for any additional information on concern number XX-85-027-X02. No response was received from QTC on this concern.

b. A review of the ECTG expurgated files revealed the number of an NSRS report, which was, "(NSRS) Report Number XX-85-027-X02". A copy of an Employee Response Team (ERT) Investigation Report Number XX-85-027-X02 which was presumed to have been the NSRS report was obtained from the ECTG files.

A review of the ERT Investigation Report for Concern Number XX-85-027-X02 revealed that the concern was not substantiated at SQN, and stated:

> "Documented evidence and evidence gathered through the interview process could not support the alleged impedance of material inspectors to perform receipt inspections or the validation process of acceptable material heat numbers as required by approved TVA procedures."

The specifics of the ERT report were only relative to the SQN evaluation and did not aide in the WBN evaluation.

c. A review of site procedures, to determine the requirements for validation of heat numbers, revealed the following information:

Site procedure WBN-QCP 1.06, governing the receipt inspection of safety-related items, requires that identification and markings be in accordance with contract and site procedural requirements. Section 7.1.2 of this procedure states;

> "Validate markings in accordance with reference 3.5 (WBN-QCP 1.50)."

Site procedure WBN-QCP 1.50, governing material verification and validation, states in section 6.1.1;

> "Verify that heat numbers or heat codes correspond to the Certified Material Test Report (CMTR) or are listed in the heat code printout."

Validation of heat numbers/codes are signified by the inspector applying a unique identification symbol adjacent to the heat number/code, as per WBN-QCP 1.50 section 6.1.2. However section 6.1.2.1 of this procedure states;

> "Heat numbers or codes validated as part of a documented inspection do not require application of the inspector's unique identification symbol."

d. Interviews conducted with four Construction and three Nuclear Power materials personnel revealed no known instances of material inspectors being prevented from validating heat numbers/codes of material received on site, as required by the procedures.

> Note: Any potential intimidation or harassment of the CI is being handled by the Inspector General Office by Concern Number HI-85-005-001.

Conclusion:

This was found to be a class E issue at WBN.

The original perceived problem as furnished on the concern sheet (K-form) by QTC states;

> "Material inspectors were not allowed to validate heat numbers of structural steel received onsite as required by procedure [.] Heat number 7438383 is an example. Sequoyah."

This perceived problem was found not to be factual at WBN.

However, the perceived problem as derived from the SQN evaluation of this issue (see section 3.6.3 Site-Specific - SQN of this report) is the CI's actual concern, which states;

> "Heat numbers for QA material (steel) may be entered into the 'log book' without Certified Material Test Reports (CMTRs) being in the record vault. Heat No. 7438383 was provided as an example. He stated that he had not been able to locate CMTRs for three other heat numbers in the past but that he did not remember those numbers."

The evaluation of this perceived problem (i.e., programmatic inadequacies) is addressed in (section 3.1 "Heat Code as Related to Material Control for Construction", specifically section 3.1.2 "Site-Specific - WBN'). That evaluation found this issue to be class D at WBN.

3.6.3 Site-Specific - SQN:

a. A review of the expurgated files revealed the number of an NSRS report, which was, "(NSRS) Report Number XX-85-027-X02."

b. A review of the ECTG working file revealed an Employee Response Team (ERT) Investigation Report number XX-85-027-X02 and associated correspondence. This correspondence indicates that NSRS Report number XX-85-027-X02, is in fact the ERT Investigation Report number XX-85-027-X02.

ERT Investigation Report number XX-85-027-X02 was written to address the perceived problem as stated in concern number XX-85-027-X02 and it contained the following conclusion:

> "This concern is not substantiated. This conclusion is based on the following:
>
> (1) Interviews of the other material inspectors provided no evidence to support an impedance of inspectors to validate heat numbers as directed in the approved procedures.

(2) Material heat numbers randomly extracted from the H.N.S. [Heat Number Sort] satisfactorily proved themselves to be adequate in that proper certified material test reports were readily available for all numbers picked.

The discrepancy noted in the observation section of this report requires further evaluation by TVA."

This conclusion, "This concern is not substantiated", is concurred with. Basis number (1) is agreed with, see section 3.6.3 e., of this subcategory report. Basis number (2) is not agreed with due to the results of the heat code evaluation performed at SQN, see section 3.1.2, of this subcategory report and the following inquiries,

A Certified Material Test Report (CMTR) for each of the eleven heat numbers (7439599, 7438383, 31B246, 3457, 4464622, 52795, 56434, 59139, 59569, K6024, and M2026), including the example heat number 7438383 given by the Concerned Individual (CI), referenced in the ERT report was requested from the Document Control Unit (DCU). Only four (7439599, 7438383, 4464622, and 52795) of the eleven requested CMTRs were obtained from the DCU, one of these four was the example heat number 7438383 given by the CI. However, one heat number (3457) referenced in the ERT report is not listed in the HNSP.

These DCU personnel were again requested to conduct a thorough search for CMTRs for these eleven heat numbers and to ascertain whether or not they could be considered to be "readily available". This search revealed the following:

- CMTRs were found for only the following eight heat numbers: 7439599, 7438383, 31B246, 4464622, 52795, 59569, K6024, and M2026.

- DCU personnel did not consider any of the CMTRs to be "readily available", and they stated, "it was a very difficult and time consuming process to locate these CMTRs."

- CMTRs for the following three heat numbers, 3457, 56484, and 59139, could not be found.

  NOTE: The above inquiries were utilized to determine whether or not a CMTR could be found for the subject heat numbers. ECTG report MC-40703-SQN programmatically addresses the methods employed to establish and maintain material traceability to the CMTR and the results of the lack of this traceability. Also, see section 3.1.3 of this subcategory report.

The discrepancy noted in the observation section of the ERT Report is:

> there is nothing adequately describing the use, methods of maintenance or controlled distribution of the HNSP, as required by 10 CFR 50, Appendix B, Criterion V.

This discrepancy became an NSRS recommendation (Q-85-027-X02-01) to SQN. SQN's response, which is contained in the ECTG working files, was as follows:

> " . . . generation of a new procedure to control a document no longer in use at SQN is not justified."

SQN's "Corrective Action Response Evaluation" was "accepted" by NSRS and ERT report XX-85-027-X02 closed. The NSRS acceptance transmittal is maintained in the ECTG working files.

SQN's response to, and NSRS's closure of, this discrepancy is not concurred with because it did not address SQN's violation of 10 CFR 50 Appendix B, Criterion V, which states:

> "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactory accomplished."

The HNSP was used during a portion of the construction activities, at SQN, as the primary method of material verification, at installation, and also during the review for acceptability of the weld record documents. The HNSP remains available for use and, in fact, is used today as an aid in locating CMTRs for heat numbers. The results of a lack of procedure governing the HNSP and its use are addressed in section 3.1.3 of this subcategory report.

NOTE: Although no specific timeframe can be established for this concern, it was determined to be construction related due to ERT report references to Construction Procedures and the concurrence of the CI with the results of the subject investigation, as stated in the report, ". . . The CI was contacted to discuss results of the subject investigation and does not have any further questions in the area."

c. A review of the NSRS unexpurgated file revealed that several investigations into concerns raised by this CI had been performed; the results of which failed to satisfy the CI. Consequently, as stated in NSRS Report No. I-84-34-SQN (Q01 850315 052) a team of NSRS investigators met with the CI, in December 1984:

"The NSRS objectives were to (1) obtain a precise and complete definition of the employee's concerns, whether it was the restatement of previously evaluated concerns or identification of new concerns, and (2) to evaluate, indepth, all items of concern as identified in (1) above, regardless of whether or not it had been previously evaluated, to determine the validity of the concerns and, if valid, the safety significance of the concern."

The concerns were documented and concurred with, by the CI, as follows:

"Concern No. 1

Individual 'A' has not been following QA procedures since 1977, and also, individual 'B' (the concerned employee) has not been allowed to follow QA procedures during the same time period. The following three examples were provided to support this allegation.

Example A - Cable reels were not meggered upon rereeling for the reels documented on Data Sheet 6 of Inspection Instruction (II)-32, 'Inspection of Material in Storage and Housekeeping Conditions,' for report Nos. MIG-828, -827, 710, -755, -756, and -757.

Individual B stated that the 'Data Sheet 6s' of II-32 for these MIG reports were not in the Material Inspection Group trailer and he did not know whether they were in the Quality Control Records Unit or not.

Example B - Cable identification information may not have been transferred properly when cables were rereeled. In some cases cable catalog numbers were used on the II-32 Data Sheet 6s instead of cable reel numbers (SNP numbers) as required by the procedures. The concerned employee stated that this violation occurred during the 1981 through July 1982 timeframe.

Example C - A reel of cable with TVA mark No. 'WDU' was transferred to SQN from Watts Bar Nuclear Plant (WBN). TVA mark No. WDU is class 1E cable at SQN, where as it is non-class 1E at WBN. Individual B was concerned that this reel of cable may have been used in a class 1E system. Individual B provided a form TVA 45D dated January 13, 1983, to the investigation team on this subject.

Concern No. 2

Quality assurance training was not always received as documented on the SQN Report of Training or Instruction form. He alleged that these records were altered by the instructors or clerks after the

training sessions were completed and forms signed by the alleger. The alleged alteration dealt with addition/expansion of the description of instruction or training given. He provided documents dated July 18, 1983, and June 27, 1983, to illustrate this allegation.

Concern No. 3

Heat numbers for QA material (steel) may be entered into the 'log book' without Certified Material Test Reports (CMTRs) being in the record vault. Heat No. 7438383 was provided as an example. He stated that he had not been able to locate CMTRs for three other heat numbers in the past but that he did not remember those numbers."

These concerns and their related conclusions and recommendations identified as a result of the NSRS investigative actions (referred to as NSRS "classical" investigations) are required to be evaluated and closed by the ECTG "Other Site" Category Evaluation Group in accordance with; "TENNESSEE VALLEY AUTHORITY EMPLOYEE CONCERNS TASK GROUP PROCEDURE ECTG M.2 PROGRAM PLAN FOR SWEC AND NSRS ISSUES", Revision 0, dated 08/28/86.

However, concern No. 3 is directly related to concern number XX-85-027-X02 and therefore is evaluated in this report.

It is apparent that the concern as stated by QTC in concern number XX-85-027-X02 was derived by combining statements in the CI's concern Nos. 1 and 3. Concern No. 1 deals with incidents of impediment to following QA procedures:

". . . individual 'B' (the concerned employee) has not been allowed to follow QA procedures. . . "

while concern No. 3 deals with program inadequacies:

"Heat numbers for QA material (steel) may be entered into the 'log book' without Certified Material Test Reports (CMTRs) being in the record vault . . . ."

Having requested and obtained a CMTR for heat number 7438383, NSRS stated they could not substantiate the specific allegation of concern No. 3. However, in order to have a higher level of confidence in the HNSP they requested CMTRs for five additional randomly selected heat numbers (428990, 434221, 19047, 2-TW-67-426, and 1815533). CMTRs were obtained for all of these except 2-TW-67-426. As a result of the review of these and "other documents" in conjunction with their interviews, NSRS compiled a historical synopsis of the usage of the Heat Number Sort program and reached the following conclusion:

> "The specific allegation was not substantiated; however, there appear to be inconsistencies in the implementation of the compilation of required materials certification as well as ambiguity in the program established to control it . . ."

The portion of the conclusion dealing with the nonsubstantiation of the "specific allegation" is not concurred with because the allegation that heat numbers may be entered into the "log book" without CMTRs being in the record vault is valid. However, the balance of the conclusion is agreed with.

The NSRS report (I-84-34-SQN) also contained the following recommendation:

> "As a result, the investigators could not confidently determine (1) the purpose(s) for which the Heat Number Sort was generated, (2) the specific administrative controls designed and practiced to maintain the integrity and adequacy of the program, and (3) the complete scope of application and utilization of the printout.

Therefore, it is NSRS's recommendation that a search of documents/files/procedures be made so that a history of the Heat Number Sort can be reconstructed to include the following:

(1) The purpose/reason the Heat Number Sort was generated.

(2) Those management controls designed and implemented to administer the program.

(3) The function the program was designed to serve and the function it has been serving, if different.

(4) The confidence OC [Office of Construction] management has with the available information in the program (Heat Number Sort printout).

NSRS further recommends that appropriate actions be taken to obtain CMTRs for items listed for example 4 [2-TW-67-426]."

This recommendation is concurred with; however, it has yet to be adequately addressed as shown by the following correspondence:

A memorandum dated March 15, 1985, from the Director of NSRS to the Manager of Construction and the Manager of Engineering (Q01 850315 051) requested OC:

". . . to provide NSRS with the actions taken or planned to resolve these issues within 30 days of the date of this memorandum."

A memorandum dated April 16, 1985, from the Manager of Construction to the Director of NSRS (C01 850416 007) requested a 30-day extension to permit a more thorough investigation of the issues, including the recommendation, raised by the NSRS report.

A memorandum dated May 15, 1985, from the Manager of Construction to the Director of NSRS (C01 850515 005) requested an additional ten working days to complete their response to the recommendation. A postscript dated May 16, 1985, (C01 850516 005) directed the SQN OC that:

"A response to I-84-34-SQN-03 [the NSRS recommendation] is to be drafted and reviewed by OC QAB [Quality Assurance Branch] by the end of business on May 28. I will not request another extension for this item."

A memorandum dated May 20, 1985, from the Director of NSRS to the General Manager (Q01 850520 050) supplied the status of the recommendation response as:

". . . Awaiting OC's completion of research".

A memorandum dated May 21, 1985, from the Project Manager, SQN OC to the Assistant to the Manager of Construction (C23 850521 008) stated:

"I can understand your desire not to request an additional extension. The reason for both previously requested extensions was that we have informally coordinated drafts with NSRS.

We have not thus far been able to provide words satisfactory to them. SQN grew through the maturation of 10CFR50. What was acceptable no longer is. The heat code printout was in fact used as a quality assuring mechanism but in fact never had any formal controls applied to it. This was considered acceptable at that point in time and the mechanism was in fact an improvement over what had been done before. The challenge is to gain understanding of that condition without exerting a massive record review program."

A memorandum dated May 28, 1985, from the Manager of Construction to the Director of NSRS (C01 850529 007) contained the following response to the recommendation:

"We have studied the subject NSRS investigation and herein provide the following responses:

<u>Recommendation I-84-34-SQN-03, Availability of the Material Certification and Requirements for Heat Number Sort Printout Entries</u>

A search of documents/files/procedures has been made as well as discussions with personnel who were involved with the Heat Number Sort Program. The following information is supplied in answer to the four areas mentioned in the NSRS report.

1) The purpose/reason the Heat Number Sort was generated.

The HNSP was developed to provide a quick reference for document reviewers to verify heat numbers recorded on QA inspection records. For example, before weld data sheets were filed in the records storage vault a record reviewer would verify by way of the HNSP that the material used was appropriate. If a record was received bearing a number which was not in the HNSP the record was rejected and researched.

2) Those management controls designed and implemented to administer the program.

There were no formal management controls placed on the HNSP. A Sequoyah Heat Number User's Guide was published and used for providing basic instructions on how to enter data into the program.

3) The function the program was designed to serve and the function it has been serving, if different.

Same as 1.

4) The confidence QC management has with the available information in the program.

QC management is confident that the information in the program was/is sufficiently accurate to statistically support a reasonable assurance that the plant was constructed in accordance with applicable codes and standards.

It must be remembered that the SQN QA program grew and matured with the 10 CFR 50 QA program. It is understood and accepted that the SQN QA program would not meet todays standards but it did meet the standards of the time.

Weed Instrument Company was contacted on March 28, 1985 and appropriate documentation was received for the items listed in example 4 of your basic report."

A memorandum dated July 8, 1985, from the Director of NSRS to the General Manager (Q01 850709 055) supplied the SQN OC response to the recommendation (C01 850529 007) along with the following comment:

> "We do not find the response satisfactory and plan to investigate this issue ourselves in the near future."

A memorandum dated July 8, 1985, from the Director of NSRS to the Manager of Construction (Q01 850709 054) contained the following:

> "We have reviewed your response to NSRS recommendation I-84-34-SQN-03, Availability of the Material Certification and Requirements for Heat Number Sort Printout Entries, and do not find it satisfactory. We plan to investigate this matter further ourselves in the near future.
>
> Please provide us with copies of all SQN procedures since the inception of the Heat Number Sort Printout that controlled or referenced this program for any and all applications. These procedures should include all that could have been in effect since then as well as those deleted or inactivated. Our intent is to determine the historical background of the program as well as its potential/perceived/actual application. We appreciate your cooperation on this matter and expect the results of the historical review by August 1, 1985."

A postscript dated July 16, 1985, (C01 850716 001) directed an addressee to:

> ". . . assemble the requested information (what is available) and prepare response for . . . [The Manager of Construction's] . . . signature ASAP."

A memorandum dated July 23, 1985, from the Manager of Construction to the Director of NSRS (C01 850723 004) contained the following:

"We have performed a review of SQN's Quality Program to identify any procedures referring to or controlling the Heat Number Sort Printout and were unable to identify any such interfacing quality program procedures. We have attached a Program User's Guide to assist you. Please be advised that this guide and the HNSP are not and never were a part of the Quality Program at Sequoyah."

No further correspondence concerning this recommendation was found; thus leaving the matter unresolved.

d. Site Procedures governing the validation of heat numbers, consisted of the following:

SNP Inspection Instruction No. 30, "RECEIPT INSPECTION" (II-30), Revision 0, dated 05/04/77 through Revision 7, dated 09/20/82.

SNP Construction Procedure No. P-34, "HEAT NUMBER VALIDATION" (P-34), Revision 0, dated 06/13/77 and Revision 1, dated 12/13/78.

SNP Inspection Instruction No. II-39, "HEAT CODE TRANSFER AND ASTM DESIGNATOR TRANSFER" (II-39), Revision 0, dated 05/04/77 through Revision 2, dated 12/11/78.

SNP Construction Procedure No. P-31, "IDENTIFICATION AND MARKING OF PERMANENT MATERIAL" (P-31), Revision 0, dated 05/04/77 through Revision 2, dated 12/17/79.

These procedures require that heat numbers be validated; either at receipt of material into the warehouse (II-30 and II-39) or upon division of the material into two or more pieces, after issue from the warehouse (P-34). A valid heat number is defined in II-39 as follows:

"The heat number or heat code shall be considered valid if the number or code marked or stamped on the material agrees with that on the applicable material certification or if the heat number or heat code has been previously validated."

These procedures provide methods to permanently mark the material with a validation confirmation mark; but, they do not require a permanent mark.

Markings of a nonpermanent nature would probably, with the passage of time, become partially or totally obliterated; thus giving the illusion of its having never been validated, when the item is viewed in the field.

NOTE: No site procedure could be found governing the accuracy of the information or the use of the HNSP, only a User's Guide was found describing how information should be encoded.

e. Interviews conducted with eight materials inspection personnel, active during the construction phase of SQN, revealed no known instances of material inspectors being prevented from validating heat numbers/codes of material received on site, as required by the procedures.

NOTE: Any potential intimidation or harassment of this CI is being handled by the Inspector General's Office by concern number HI-85-005-001.

Conclusions:

This was found to be a class D issue at SQN.

The perceived problem as originally evaluated (i.e., incidents of impediment in following QA procedures) was in error; however, the perceived problem as presently stated (i.e., programmatic inadequacies) was determined to be valid based upon the findings contained in this report. Contrary to the requirements of 10 CFR 50, Appendix B, Criterion V, the Heat Number Validation process and HNSP used for heat number documentation accountability/retrievability, were/are not sufficiently controlled by QA procedures.

The results of the lack of procedural control to ensure that only properly certified materials were used during and subsequent to construction activities at SQN, is addressed in section 3.1.3 of this subcategory report.

3.7 Material Received by Inappropriate Personnel:

3.7.1 Generic Applicability:

There are two concerns comprising this issue. Concern number IN-85-988-001 is site-specific to WBN and Concern number BFN-85-008-001 is site-specific to BFN. The perceived problem was derived from a combination of the content of both concerns; however, the specifics of each concern was addressed only at the appropriate site. The site-specific evaluations revealed that these concerns were not factual. Therefore, this issue is not generic to other TVA Nuclear Plant Sites.

3.7.2 Site-Specific - WBN:

a. A request, dated March 20, 1986, was sent to QTC for any additional information on concern number IN-85-988-001. No response was received from QTC on this concern.

b. A review of the ECTG expurgated and unexpurgated files revealed no additional information.

c. A review of the upper-tier criteria revealed the following information:

A review of WBN Topical Report, TVA-TR75-1A, Revision 9, Table 17D-1, "QUALITY ASSURANCE STANDARDS FOR DESIGN AND CONSTRUCTION (REGULATORY GUIDANCE) APPLICABLE TO THE BELLEFONTE AND WATTS BAR NUCLEAR PLANTS", (Sheet 5), revealed that WBN is committed to Regulatory Guide 1.58, Revision 1, September 1980 - "QUALIFICATION OF NUCLEAR POWER PLANT INSPECTION, EXAMINATION, AND TESTING PERSONNEL" and conforms fully except as noted: Note number 2 states;

> "We [TVA] determine initial capability from the following criteria as defined in our procedure: candidates education, experience, training, examination, and/or capability demonstration. On-the-job participation in the work discipline is required for all candidates."

A review of Regulatory Guide 1.58 revealed, in part that the requirements for qualification of nuclear power plant inspection, examination, and testing personnel that are included in ANSI/ASME N45.2.6-1978, "QUALIFICATIONS OF INSPECTION, EXAMINATION, AND TESTING PERSONNEL FOR NUCLEAR POWER PLANTS", are acceptable to the NRC Staff.

A review of ANSI/ASME N45.2.6-1978, revealed that there are no requirements or recommendations stipulating any differences between engineers and engineering aides, for receipt inspections.

d. A review of site procedures revealed that the responsibility for performing WBN construction receipt inspections for all permanent material was first designated to the Responsible Engineering Unit (REU) per DEC QCP 1.6, Revision 0, dated January 17, 1974, "RECEIPT, INSPECTION, STORAGE AND WITHDRAWAL OF PERMANENT MATERIAL". DEC QCP 1.6 was superseded by WBN QCP 1.06, Revision 0, dated June 17, 1975, "RECEIPT INSPECTION OF SAFETY-RELATED ITEMS". Receiving inspections were performed by the REUs until QCP-1.06, Revision 9, dated April 19, 1982, designated this responsbility to the Materials Inspection Unit (MIU). Revision 10 of QCP 1.06, dated September 1, 1982, established the requirements for the REU's to provide additional or special insepction requirements to complete the receiving inspections. The REUs are still responsible for this function, according to current site procedure QCP 1.06, Revision 19, dated April 7, 1986.

e. From interviews conducted with supervisors in the Mechanical, Electrical, Civil, and Instrumentation Units; no problems were found relative to engineering aides versus engineers performing a review of material at receipt. The supervisors also expressed a high level of confidence in the engineering aides and felt they were very qualified. An interview conducted with an engineering aide who performed most of the material inspections from 1972 until 1982, when the Material Inspection Unit was implemented, revealed; that before material with overages or technical discrepancies were accepted the responsible system engineer was contacted for concurrence.

f. WBN Construction Personnel Office was contacted and four receiving inspectors' service reviews were obtained. A review of these records revealed that engineering aides performed receipt inspections at a fully adequate level.

g. Through a random selection process, nine TVA Form 210's "OVER, SHORT, DAMAGED OR DEFECTIVE REPORTS" were selected and reviewed, and it was determined engineering aides have performed this function. Nine other TVA 210's, with substituted material approved by an Engineering Aide or an Engineering Associate, were randomly selected. These materal substitutions were reviewed by either an Engineer in the appropriate units, (Electrical, Mechancial, and Instrumenation) or by WBN Codes and Standards Section; their determination was that all substitutions were acceptable.

Conclusion:

This was found to be a class A issue at WBN.

This evaluation has shown no upper-tier criteria or procedural requirements have been violated and that the engineering aides' review of material received on site was adequate.

3.7.3 Site-Specific - BFN:

a. The NSRS files were reviewed to obtain any additional information that would assist in the evaluation of the perceived problem on material control. This report reflects all known available pertinent information.

b. The ECTG expurgated and unexpurgated files were reviewed to obtain any additional information that would assist in the evaluation of this issue. This report reflects all known available pertinent information.

c. A review of site procedures pertaining to receiving material revealed the following:

Site Director Standard Practice, BF 16.4, Revision 2, dated 07/14/86, MATERIAL, COMPONENTS, AND SPARE PARTS RECEIPT HANDLING, STORAGE ISSUING, RETURN TO STOREROOM AND TRANSFER"; this procedure required the QC receipt inspector, at time of receipt, to verify the material meets all the documentation requirements of the procurement document; and if the material doesn't meet these requirements it will be handled as nonconforming material. It also states that if the QC inspector finds minor discrepancies, he may request the cognizant engineer to resolve these discrepancies. It then becomes the responsibility of the congizant engineer to disposition this material. This process is handled on TVA BFN Form BF-187, "MATERIAL DISCREPANCY REPORT."

d. Interviews were conducted with four QC Inspectors and two QA Managers. None of the interviewees were aware of any receipt inspections being reassigned, to allow acceptance of nonconforming material.

Conclusion:

This was found to be a class A issue at BFN.

This evaluation found no supporting facts to indicate the perceived problem existed at BFN.

3.8 Warehouse Access:

3.8.1 Generic Applicability:

The concern addressed in this issue is site specific to WBN and the evaluation revealed that this concern was not factual. Therefore, this issue is not generic to other TVA Nuclear Plant Sites.

3.8.2 Site-Specific - WBN:

a. A request, dated March 20, 1986, was sent to QTC for any additional information on Concern No. IN-85-369-005. A response, dated March 25, 1986, was received from QTC which contained the following information:

"Investigation report issued by Public Safety on 07/05/85 and revised complete on 08/27/85."

b. From a review of the ECTG files a copy of the ERT INVESTIGATION REPORT for Concern No. IN-85-369-005, prepared by Public Safety, was obtained.

A review of this report revealed that the control of the physical access to the warehouse was considered to be fully adequate.

c. A review of the upper-tier criteria revealed the following information:

- WBN Topical Report, TVA-TR75-1A, Revision 8, Table 17D-2, "QUALITY ASSURANCE STANDARDS FOR DESIGN AND CONSTRUCTION (REGULATORY GUIDANCE) APPLICABLE TO THE WATTS BAR NUCLEAR PLANT", (Sheet 1) revealed that WBN is committed to Regulatory Guide 1.38 "QUALITY ASSURANCE REQUIREMENTS FOR PACKAGING, SHIPPING, RECEIVING, STORAGE, AND HANDLING OF ITEMS FOR WATER COOLED NUCLEAR POWER PLANTS", Revision 2, May 1977.

- A review of Regulatory Guide 1.38 revealed, in part, that the requirements included in ANSI N45.2.2-1972, "PACKAGING, SHIPPING, RECEIVING, STORAGE, AND HANDLING OF ITEMS FOR NUCLEAR POWER PLANTS DURING THE CONSTRUCTION PHASE", are acceptable to the NRC Staff.

- A review of ANSI N45.2.2-1972 for the requirement governing the control of access to storage areas revealed in section 6.2.1 that;

"Access to storage areas shall be controlled and limited only to personnel designated by the responsible organization."

d. A review of site procedures revealed that both QCP-1.36 "STORAGE AND HOUSEKEEPING", Revision 0 through Revision 10, Section 7.1.1 and QCI-1.36 "STORAGE AND HOUSEKEEPING", Revision 0 through Revision 13, section 6.1.1, state;

"Access to the storage area is controlled and limited to authorized personnel."

e. Through interviews of warehouse personnel and field observations, there is good evidence of control of the warehouse storage area. Regular checks of the main warehouse and storage yards are conducted by a Public Safety Officer. The perimeters of the storage areas are fenced. All A, B, and C level, metal warehouses are locked and controlled by warehouse personnel. The main warehouse is locked during off shifts and access is controlled by warehouse personnel, during the hours it is open for service. During off shifts, the main warehouse yard is controlled by locked metal gates. During regular service hours, vehicular and personnel traffic is controlled by an electric gate. Anyone entering is required to stop and sign in with a warehouse clerk posted at the gate.

f. Discussions with other evaluators of the category "Material Control" revealed that during their evaluation of storage related concerns, physical access to the warehouse was found to be controlled.

Conclusion:

This was found to be a class E issue at WBN.

The perceived problem as derived from the subject concern, that access to the warehouse is uncontrolled, is not factual. However, a side issue was identified which is, access is not limited to authorized personnel as required by upper-tier criteria and site procedures.

3.9 Verification of Material Discrepancy:

3.9.1 Generic Applicability:

The concern addressed in this issue is site-specific to BLN. It was evaluated at WBN and found not to be generic to other TVA Nuclear Plant Sites. However, since it is site-specific

to BLN an evaluation was performed there. The BLN evaluation found the issue to be not factual and determined not generic to other TVA Nuclear Plant Sites.

3.9.2 Site-Specific - WBN:

a. A request, dated March 20, 1986, was sent to QTC for any additional information on Concern Number XX-85-068-004. No response was received from QTC on this concern.

b. A review of the ECTG files was performed in March 1986, no additional information was obtained. A second review of the files was performed in September 1986 in preperation for the BLN site evaluation. This review revealed the identification of the conflicting units at BLN to be the Hanger Quality Control Unit (HQC) and the Welding Quality Control Unit (WQC). A third review of the files was performed in January 1987 and no further information was found.

c. A review of WBN site procedures revealed them to be very detailed in specifying the sequence of actions for their implementation and the verification of corrective action.

d. BLN site personnel were contacted and it was learned that the Procedures Unit at BLN had been assigned to evaluate employee concerns at that site. The Procedures Unit replied," they had been informed that the NSRS was to investigate this concern". The Procedures Unit could furnish no further information.

Note: No NSRS investigation could be found for this concern.

e. Because of the initial lack of identification of specific units alleged to have conflicts at BLN, the WBN evaluation was approached from a generic view.

Interviews were conducted with ten WBN DNC personnel, six in the Engineering Unit, one in the Material Inspection Unit, and three in Quality Control Unit. All personnel interviewed were familiar with WBN-QCI-1.02 R15, "CONTROL OF NONCONFORMING ITEMS", and had no problems with implementation of the QCI, at WBN.

f. This evaluation was coordinated with other evaluators in this subcategory. From a discussion with the evaluator who performed the BLN site-specific evaluation of this issue it was learned that the ECTG files contained additional information. Therefore, the files were reviewed again. This review revealed the identification of the conflicting units at BLN. (See 3.9.2 b.).

Conclusion:

This was found to be a class A issue at WBN.

Since the initial WBN evaluation included interviews with the departments identified as a result of the BLN evaluation, no additional evaluation was performed at WBN. The initial evaluation found no evidence to indicate any conflicts existed between departments at WBN, concerning procedural violations in the verification of material discrepancy nonconformance reports. Therefore, this issue was determined not factual at WBN.

3.9.3 Site-Specific - BLN:

a. A review of the expurgated files revealed that the conflict described in the concern was between Hanger Quality Control (HQC) and Welding Quality Control (WQC). All other information had been purged from the expurgated files.

b. A review of BLN site procedure BNP-QCP-10.4 displayed an adequate site program for the identification, documentation, and correction of deficient conditions.

c. Reviewed all NCRs (34) initiated by WQC between November 1983 and January 1985 and all NCRs (43) initiated by HQC between October 1983 and January 1985, pertaining to hanger installations. No information was found that indicated that a conflict had occurred nor that any procedures had been violated. Additionally, each unit maintained files/notes on the NCRs (including the initial write-up and other information); none identified any conflicts or procedural violations.

d. Four current HQC and three current WQC personnel were interviewed pertaining to the perceived problem. All seven individuals indicated that they did not know of any conflicts occurring between HQC and WQC or any other BLN site units. Any disagreements would have been resolved before the NCRs were closed, but none were identified.

Conclusion:

This issue was found to be a class A issue at BLN.

The perceived problem was found to be not factual; based on the review of 77 NCRs initiated by HQC and WQC and the interviews with seven current HQC and WQC individuals, no supporting facts were found that supported the perceived problem at BLN.

3.10 Material Personnel - Search for Defective Material:

3.10.1 Generic Applicability:

The concern addressed in this issue is site-specific to SQN. It was originally evaluated at WBN and was found not to be generic to WBN or other TVA Nuclear Plant Sites. However, the site-specific evaluation performed at SQN determined this issue to be factual and generically applicable to all TVA Nuclear Plants (BFN, BLN, SQN and WBN) including canceled plants (HTN, PBN, and YCN) because these canceled nuclear plants are potential material suppliers to the other TVA sites.

3.10.2 Site-Specific - WBN:

a. A request, dated March 20, 1986, was sent to QTC for any additional information on concern number XX-85-027-X04. No response was received from QTC on this concern.

b. A review of the ECTG files revealed an investigation of this concern had been performed at SQN and ERT Interim Report XX-85-027-X04 issued.

A review of ERT Interim Report XX-85-027-X04 revealed that it does not fully address the concern as to why, or if, material personnel were not given an opportunity to verify if material was received onsite from Ray Miller, Inc. The specifics of the ERT report were only relative to the SQN evaluation and did not aide in the WBN evaluation.

c. No upper-tier document could be found relative to the reporting requirements of NRC Inspection and Enforcement Bulletins (i.e., IEB 83-07, "APPARENTLY FRAUDULENT PRODUCTS SOLD BY RAY MILLER, INC.").

d. A review of site procedure WBNP QCI-1.49 "FORMAL AND INFORMAL RESPONSES TO NRC INSPECTOR-IDENTIFIED AND TVA-REPORTED ITEMS", Revision 5, revealed in section 1.1 that;

> "This instruction establishes controls for coordination of information derived from NRC. . . and to track commitments resulting from responses of all types."

e. From interviews conducted with WBN Nuclear Licensing Unit (NLU) personnel it was revealed that the Nuclear Engineering Support Branch (NEB), in Knoxville, was responsible for performing the primary material search, which was performed through contract and document research. It was further revealed that WBN site personnel only aided by supplying information, when requested by NEB. The cognizant NEB engineer responsible for assuring that all TVA Nuclear Plants identified all Ray Miller, Inc., material, confirmed this was how the WBN investigation was performed. From these interviews no supporting facts were found to indicate WBN had received material from Ray Miller, Inc., or that any employee was impeded in the search for this material.

From an interview with WBN NUL it was learned IEB 83-07 for WBN was closed by NRC in Inspection Reports 50-390/85-03 and 50-391/85-04 (Reference page 6, Section B, of memorandum (A02 850226 001).

f. From discussions with the CEG-H and evaluators of the Category "Material Control" it was determined that due to the subsequent evaluation performed at SQN the original conclusion for WBN;

> "Through interviews and research no supporting facts were found to indicate WBN had received material from Ray Miller, Inc., or that any employee was impeded in the search for this material."

was in error. Facts were found during the SQN evaluation indicating WBN had received Ray Miller, Inc., material. However, nothing was found to indicate that any employee was impeded in the search for this material.

Conclusion:

This was found to be a class E issue at WBN:

From the evaluation performed at WBN no facts were found to indicate WBN had received material from Ray Miller, Inc., or that any employee was impeded in the search for this material. However, subsequent to this evaluation, an evaluation of this issue was performed at SQN. From the findings of the SQN evaluation it was determined that WBN had received Ray Miller, Inc., material that was not reported to NRC.

3.10.3 Site-Specific - SQN:

a. A review of the ECTG working files, expurgated files, and NSRS unexpurgated files revealed no additional information.

b. A review of ERT Interim Report No. XX-85-027-X04 revealed that the concern grew out of the TVA investigation into whether or not any material from a certain vendor (Ray Miller, Inc.), identified by IEB 83-07, had been received at SQN.

The ERT report does not adequately address the perceived problem that material personnel were not allowed to determine whether or not receipt of Ray Miller, Inc., material and the subsequent reporting to Knoxville of no such material being on site, occurred at SQN.

The ERT report states,

"A complete investigation was not conducted and a conclusive statement relative to substantiation cannot be provided . . . ."

However, based upon the information presented in several Nonconforming Item (NCI) reports and the TVA response to IEB 83-07, it concluded;

". . . a need to re-evaluate the material control and accounting program relative to Ray Miller, Inc., material at the Sequoyah Nuclear facility."

This conclusion is valid; however, part of the basis for the ERT conclusion is in error, in that the referenced NCIs, are for Ray Miller, Inc., material purchased on contracts that are outside the required time frame (1975 through 1979). This ECTG evaluation also revealed the TVA response to IEB 83-07 to be in error. The NCIs referenced by the ERT report are as follows:

NCI NO.	CONTRACT NO.	CONTRACT DATE
N2-80-1210	80PK2 - 304432	07/23/80
N2-81-1251	80PK7 - 307141	09/19/80
N2-81-1252	80PK7 - 307141	09/19/80
N2-83-1887	80PK2 - 304432	07/23/80
N2-83-1888	80PK2 - 289063	07/22/80
N2-83-1889	80PK7 - 307141	09/19/80
N2-83-1890	80PK6 - 323787	09/28/81
N2-83-1897	82PK6 - 323787	09/28/81
N2-83-1901	80PK7 - 307141	09/19/80
N2-83-1902	80PK2 - 289063	07/22/80

c. A review of IEB 83-07, "APPARENTLY FRAUDULENT PRODUCTS SOLD BY RAY MILLER, INC.", revealed that TVA must file a report on the receipt and disposition of all Ray Miller, Inc., material received during the timeframe 1975 through 1979. This report must contain information about Ray Miller, Inc., material whether identified through an apparently fraudulent data file supplied with the bulletin, or identified by TVA's own initiative. The report must contain the identification of all Ray Miller, Inc., material installed in safety-related systems along with its safety-significance evaluation and the disposition of all Ray Miller, Inc., material that remained in stock.

d. Interviews were conducted with NRC personnel to gain a clearer perspective concerning the scope and reporting requirements of IEB 83-07. These interviews revealed the following:

- The timeframe of interest is January 1975 through December 1979.
- Reporting is required for any item installed in a safety-related system along with its safety-significance evaluation.
- Reporting the disposition of any material that remained in stock is required.
- Any reporting of material received outside the timeframe requires complete reportability of material on that contract.

e. Interviews conducted with TVA personnel involved in the search for Ray Miller, Inc., material at TVA Nuclear Plant Sites, including SQN, did not reveal any instances of material personnel not being given an opportunity to verify whether or not defective material had been received on site from Ray Miller, Inc. However, interviewees indicated that possibly a report of no material being on site was made to Knoxville. Interviewees further revealed that documents (both formal and informal) describing the search and reporting process for Ray Miller, Inc., material were stored in the Quality Services Branch (QSB) Library, in Chattanooga.

f. A review of the documentation associated with TVA's response to IEB 83-07 revealed the following:

- A memorandum from the Manager, Nuclear Licensing, to the Director of Nuclear Power and the Chief, Nuclear Engineering Support Branch (A27 830819 003), dated August 19, 1983, designated the responsibilities for preparation of the TVA response, for certain plants, to the specific actions required of them by IEB 83-07. The Division of Nuclear Power (DNP) was designated to be the lead organization in developing the SQN-related response to the bulletin. NEB was designated to be the lead organization for the WBN and Bellefonte Nuclear Plant (BLN) response.

- A response to IEB 83-07 for all TVA nuclear plants was outlined in a memorandum from the Chief, Nuclear Engineering Support Branch, to the Manager of Nuclear Licensing (A27 840228 006), dated February 24, 1984. This memorandum identified only one instance of Ray Miller, Inc., material used in a safety-related system, at BLN, and none for other TVA nuclear plants, including SQN. This response was written for all TVA nuclear plants even though DNP was to respond for SQN.

- The SQN-related response to IEB 83-07 was outlined in a memorandum from the Director of Nuclear Power, to the Manager, Nuclear Licensing (L16 840224 884), dated March 2, 1984. This memorandum identified five instances of Ray Miller, Inc., material installed in safety-related systems, at SQN. Two were in Critical Systems, Structures and Components (CSSC) applications and three were in non-CSSC applications.

- A response, superseding memorandum No. A27 840228 006, to IEB 83-07 for all TVA nuclear plants was outlined in a memorandum from the Chief, Nuclear Engineering Support Branch, to the Manager of Nuclear Licensing (A27 840321 011), dated March 20, 1984. This memorandum identified four instances of Ray Miller, Inc., material installed in safety-related systems at TVA nuclear plants. Two of these items were for SQN and the others were for BLN and Yellow Creek Nuclear Plant (YCN). Again, this memorandum was written for all TVA nuclear plants even though DNP was to respond for SQN and did.

- TVA's official response to IEB 83-07 for SQN and other TVA nuclear plant sites, is outlined in a letter from the Manager, Nuclear Licensing, to the Regional Administrator, Region II, United States (U.S.) NRC (A27 840322 014), dated March 22, 1984. This letter contains only the items identified by the NEB memorandum (A27 840321 011) and does not include items identified in the DNP memorandum (L16 840224 884) discussed previously.

In summary, although no evidence was found that a report was made to Knoxville, it is believed that this portion of the concern stems from a memorandum (A27 840228 006) issued by NEB, from Knoxville, indicating that no Ray Miller, Inc., material was supplied to or installed in any safety-related system, at SQN. This memorandum was superseded by a memorandum (A27 840321 011) identifying only two instances of Ray Miller, Inc., material having been installed in safety-related systems, at SQN. These memorandums are contrary to a DNP memorandum (L16 840224 884) identifying five instances of Ray Miller, Inc., material having been installed in safety-related systems, at SQN. Although DNP was responsible for the SQN related response (A27 830819 003), the NEB response memorandum (A27 840321 011) became the basis for TVA's response to IEB 83-07. This has resulted in identified Ray Miller, Inc., material installed in safety-related systems, at SQN, that has not been reported to NRC.

g. A review of TVA's response (A27 840322 014) to IEB 83-07, dated March 22, 1984, and associated documentation revealed the following:

- The two items identified in TVA's response (A27 840322 014) to IEB 83-07 for SQN are Ray Miller, Inc., material purchased and received on contracts that are outside the 1975 through 1979 timeframe (i.e., 80PK2 - 289063 and 80PK7 - 307141).

- The following contracts for Ray Miller, Inc., material purchased and received, both directly and indirectly, during the 1975 through 1979 timeframe were not dispositioned or addressed in TVA's response (A27 840322 014) to IEB 83-07.

SQN	78K80 - 772426
SQN	78K82 - 779675 - 1
SQN	79K82 - 782908
SQN	79K88 - 780547
SQN	79P87 - 272960 - 02
WBN	78K87 - 556304
WBN	78P82 - 235168
WBN	79P82 - 269979

- A TVA memorandum from the Head, Procurement Program Group to the Quality Engineering Branch (OQA 840210 703), dated February 10, 1984, contained a list, of secondary companies identified as having potentially supplied material from Ray Miller, Inc., resulting from an evaluation of IEB 83-07, Supplement 1. The results of this evaluation, including the response from Goulds Pumps, Inc., (L16 840323 194) were omitted from TVA's response (A27 840322 014) to IEB 83-07.

- TVA's evaluation of SQN contract No. 79P88-1613 (identified in IEB 83-07, Attachment 1, page 259 of 277) is omitted from TVA's response (A27 840322 014) to IEB 83-07. SQN is identified as both the "buyer" and "delivery point" for this contract with the "order date", 03/02/79.

Conclusion:

This was found to be a class E issue at SQN.

This evaluation revealed the search for Ray Miller, Inc., material at SQN included site "Material Personnel". No supporting facts or indications were found, that:

> ". . . materials personnel were not given an opportunity to verify whether or not defective material had been received on site, from a certain manufacturer (Ray Miller, Incorporated) . . ."

Therefore, this portion of the perceived problem is not valid.

Even though no report was found, the remaining portion of the perceived problem:

> ". . . a report to Knoxville that the material was not on site was made without input from materials personnel."

is believed to be valid. This conclusion is based upon interviews with TVA personnel and memorandum (A27 840228 006) issued by NEB, from Knoxville, indicating that no Ray Miller, Inc., material was supplied to or installed in any safety-related system, at SQN.

While the material on contract No. 80PK2-289063 and 80PK7-307141 was not subject to the reporting requirements of IEB 83-07, the fact that TVA has reported the status of a portion of this material requires that the status of all material on these contracts be reported to NRC. Due to this deficiency and the fact that the status of material on several contracts, falling within the timeframe 1975 through 1979, was not reported, it is concluded that a re-evaluation of the identification and subsequent reporting of Ray Miller Inc., material be made.

3.11 Procedural Control for Issued Instrumentation:

3.11.1 Generic Applicability:

This issue was site-specific to WBN and was factual. However, it did not present a problem; therefore, this issue was only evaluated at WBN.

3.11.2 Site-Specific - WBN:

a. A review of the ECTG working files did not reveal any additional information.

b. A review of available information for the Employee Safety Concern No. 223 revealed that the concerned individual's (CI) concern had been addressed by the Instrumentation Maintenance Section supervisor. The resolution of the concern was that only non-CSSC instruments and parts would be stored in the Turbine Building storage area in the future. In addition, a sign was fabricated and installed on the door of the storage cage that stated "No Storage of CSSC Material Allowed". Evidence was found that indicates this issue was resolved to the concerned individuals satisfaction.

c. A review of the upper-tier criteria was performed to determine the requirements for tracking of instruments and parts, it revealed the following information:

The Code of Federal Regulations 10 CFR 50.49 requires a record of the qualifications to be maintained in an auditable form for electric equipment. This record must be maintained for the entire period an item is installed in the plant or is stored for future use. The record will permit verification of each item important to safety covered by 10 CFR 50.49 and that it is qualified for its application. In addition, the record will permit verification that an item meets the specified performance requirements when subjected to the conditions predicted to be present when it must serve its intended safety function up to the end of its qualified life.

d. A review of site procedures was performed to determine whether or not the appropriate criteria were implemented, it revealed the following information:

Administrative Instruction (AI) 1.13 (10 CFR 50.49 ENVIRONMENTAL QUALIFICATIONS PROGRAM), Revision 0, is an instruction describing the program for maintaining compliance of 10 CFR 50.49 for Watts Bar Nuclear Plant (WBN). This instruction requires the maintenance records to ensure traceability of whole devices or piece-parts replacement to the procurement records. In addition, it requires the procurement records to maintain traceability to the qualification documentation.

AI-9.2 (MAINTENANCE REQUESTS AND EQUIPMENT MAINTENANCE HISTORY), Revision 17, establishes the method and responsibility for initiating, planning, scheduling, performing, tracking, and documenting maintenance at WBN. This instruction requires the unique equipment identifier (i.e., maintenance history record file code) to be added for all Maintenance Requests (MRs) for CSSC, non-CSSC limited Quality Assurance (QA) and all significant non-CSSC equipment. This unique equipment identifier will identify the component that was repaired or replaced. In addition, AI-9.2 requires that material for use in maintenance to have been issued in accordance with AI-5.4, "MATERIAL ISSUE, TRANSFER, TRANSFER AND TRACEABILITY".

AI-5.4 states that, "traceability between items and documentation shall be maintained for QA Levels I and II items and 10 CFR 21 applicable items not assigned a QA Level:. In addition, AI-5.4 states:

"Normally, traceability will be accomplished as follows:

- The receipt documentation shall be filed with the associated contract, by the contract number, or procuring document number.

- The contract number or procurement document number and receipt date shall be indicated for stored items. Power Stores Unit (PSU) will tag or mark the material or material container with the contract number or procurement document number.

- When items are withdrawn from PSU, the contract number or procurement document number and date received shall be entered on the 575N by PSU; also the heat or lot number of the item issued, if applicable.

- The 575N or procurement document number shall be entered on the back of the applicable maintenance request (MR) or instruction data package."

AI-9.2 also requires the craftsman or foreman, for QA Level I and II items, to enter the 575N number that was used to purchase replacement parts in the "Material Procurement" section of MRs. If a 575N is not used, the procurement document number will be recorded. The procurement document may be the TVA shipping ticket, field purchase order, request for shipment of materials, TVA contract (item number and revision level), purchase requisition or transfer requisition. In addition, if parts are borrowed from other installed plant equipment, they will have the borrowed equipment identifier recorded on a MEL (Multiple Equipment List). If the parts are borrowed from the same piece of equipment, a MEL is not required. However, a form 6436D (MR supplement) must be completed whenever a part/component is replaced even if a MEL is used.

The above mentioned 6436D is designed to collect nameplate data on a component and its subcomponents. The 6436D is required for the following:

- Replacement of a Nuclear Plant Reliability Data (NPRD) reportable component.
- Replacement of a Class 1E component, subcomponent, or part.
- Replacement of any CSSC plant process equipment package having a unique equipment identifier, including "borrowed" equipment.
- Verifying component installation at time of transfer.
- Providing data to the equipment information system (EQIS) data base, if incomplete.

The 6436D has two sections which are the component section and the subcomponent section. The component section of the 6436D will be completed for component replacement, equipment transfer and/or corrections to the EQIS data base. This section will contain the following:

- Name of manufacturer
- Manufacturer's serial number, if applicable
- Manufacturer's part or model number
- The TIIC (TVA Item Identification Code) number for the component

The subcomponent section of the 6436D is used for 1E equipment only. This section is designed to collect data on subcomponents or piece-parts of the components. These items do not have unique identifiers. The subcomponent section will contain the following:

- Description of the item.

- The manufacturers name if known; otherwise, the name of the manufacturer of the component. In addition, the "qualified life" will be entered for 1E equipment, if known.

- Manufacturer's serial number, if applicable.

- Manufacturer's part or model number.

- The TIIC number for the piece-part or subcomponent.

The 6436D is completed and attached to the MR by the craftsman or foreman during work performance. This is a time when the information is readily accessible. Then the completed forms will be reviewed and dated by the planner. On MRs for equipment transfers or with EQIS data base corrections, the responsible section engineer will provide any additional information required to complete the EQIS data base. Then the completed forms will be removed by the Document Control Unit (DCU) after computer indexing and routed to the appropriate NCO (Nuclear Central Office) group.

This evaluation revealed that site procedures implemented upper-tier criteria for tracking of instruments and piece-parts.

e. A review of 20 MRs was performed to determine if instruments, piece-parts and other items could be traced to procurement and certification documentation and this review revealed that traceability had been maintained. However, one case was found where QA Level I tubing had been received without a certified mill test report or certificate of compliance. The tubing in question was 3/16-inch by 0.035 inch thick, stainless steel, ASME-213 (American Society of Mechanical Engineers) and type 316 with the heat number 20179. The documentation in the contract called for heat number 408734. This tubing was issued as QA Level I material and installed.

f. Interviews revealed that this concern was part of the old employee concern program. The CI was concerned that CSSC parts were being stored in areas not qualified for CSSC storage. The instrument storage area on the Turbine Building deck, Elevation 755 was specifically mentioned. There is no way to determine which instruments were stored there because there was no tracking (inventory) system used. After review of the area and the storage procedures by the Instrument Maintenance Section, it was determined that the only requirements that were not met were dust and pest control.

NOTE: The storage aspects of this concern is addressed in Subcategory Report "Storage and Handling, 40400".

The area was purged of all CSSC equipment. The total time for storage of CSSC instruments was approximately one year.

Conclusion:

This was found to be a class E issue at WBN:

From the findings above it was concluded that the perceived problem had been factual, and addressed by line management prior to the Employee Concerns Task Group (ECTG). Although no method was used to track (inventory) instruments in the subject field storage, the method of traceability used allows for traceability from point of installation to procurement and certification documentation.

A side issue of tubing received and installed without a correct CMTR or COC was identified. The following methodology was utilized in the evaluation of this side issue.

a. Reviewed upper-tier and site procedural requirements for material identification markings during Receipt, Storage, Issuance and Installation.

b. Reviewed purchase requisitions, certification documentation, ledger cards/computer printouts and Storeroom Requisitions (575s) to determine reliability of material identification markings and traceable documentation.

c. Verified markings on material in stock and in field against CMTR marking identifications.

The following is a summary of findings for the side issue:

a. NQAM Part III, Section 2.2, "Receipt Inspection, Handling, and Storage of Material, Components, and Spare Parts"; Section 5.2.5 (verification of certification and documentation) states that: as part of the receipt inspection, the receipt inspector shall review and verify manufacturing documentation and material certification of physical properties as follows:

- Manufacturing Documentation--Assurance that the item received was fabricated, tested, and inspected prior to shipment in accordance with applicable code, specification, and/or drawings as required by the procurement documents

- Physical Properties--Assurance that physical properties conform to the specified requirements and that chemical and physical test reports meet the procurement document requirement.

Section 5.2.8 states that items shall not be placed in stock until receipt inspection has proved them to be acceptable. Material, components, and spare parts for the CSSC considered to be defective or which do not have complete documentation shall be handled as nonconforming material in accordance with NQAM, Part 1, Sections 2.15 and 2.16.

Section 5.4.6.5 (Identification for Storage), requires the Power Stores Section to establish an identification system whereby the association between any CSSC material, component, or spare part and its quality assurance documentation is maintained. As a minimum, this system shall include the MAMS TVA Item Identification Code (TIIC) for stock items; the ECN or DCR number as applicable for modification items; the contract number or procurement document number for QA Levels I and II items, excluding non-ASME bolting and applicable manufacturer's heat, lot, or individual serial number.

NQAM Part III, Section 2.3, "Issuing of Material, Components and Spare Parts," Section 2.2 (Issue of Material, Components, and Spare Parts for In-Plant Use), Paragraph 2.2.1 states that the Power Stores Section supervisor shall establish methods to ensure that the issue of all materials, components, and spare parts for use in the CSSC is properly documented, the storeroom inventory updated, and requisitions initiated for replacement spares if necessary. These methods shall include recording the MAMS TVA Identification Code (TIIC) and applicable manufacturers heat, lot, or individual serial number on the 575.

Paragraph 2.2.6 indicates that it is the responsibility of the user of the materials, components, or spare parts to verify correct identity before installation.

AI 5.2, "Receipt Inspection of Materials, Components and Spare Parts", Section 5.4 states that the QC Inspector is responsible for stamping on applicable material, a QC identification code by the heat number on QA Level I and II items. Section 6.5 (Verification of Certification and Documentation) states that the QC Inspector shall review and verify manufacturers documentation and material certifications and physical properties. Paragraph 6.8.3 states that material, components, and spare parts for the CSSC considered to be defective or which do not have complete documentation shall be handled as Nonconforming Material.

A review of AI 5.4, Material Issue Transfer and Traceability, Section 6.0, paragraph 6.1.1 indicated that only material, components, and spare parts items that have been accepted per AI 5.2 may be issued. Paragraph 6.2.1 indicates that one of the means of accomplishing traceability is that when items are withdrawn from Power Stores Unit (PSU), Procurement Document Number and date received shall be entered on 575N by PSU; also Heat or Lot Number of item issued, if applicable.

A review of AI 5.6, section 3.5 (Identification and Marking), paragraph 3.5.1 (Identification for Storage) revealed that power stores shall establish an identification system whereby the association between CSSC material, component, or spare part and its quality assurance documentation is maintained. As a minimum, this system shall include the MAMS TVA Identification Code (TIIC); the contract number or procurement number (for Level I and II items); and applicable manufacturer's heat, lot, or individual serial number.

A review of AI 8.8, "Control of Modification work after Unit Licensing," Section 5.2.2.2.1, paragraph D5, revealed that instructions for modification work which may effect the functioning of safety-related equipment shall contain hold points for inspection as appropriate in the work sequence to ensure quality and conformance with work instructions. These hold points shall be established by the supervisor or the person preparing the instruction as required by the situation. (Ref. AI 7.1 "Quality Control (QC) Inspection Program") Inspection hold points shall clearly specify to what the inspectors signature attests.

b. A review of procurement, issuing, work and accompanying documentation revealed three instances where the incorrect heat numbers were placed on the storeroom requisition (575) by the Power Stores Clerk. 575 (628509367) indicated that 3/16" Stainless Steel Tubing, SA-213, Type 316 TIIC ARY-541B, Heat # 20179 was issued from power stores on contract 270084 for use in the RVLIS system on Maintenance Request (MR) 534167. Review of the manufacturer's certification documentation revealed that the heat number for the 3/16" Stainless Steel Tubing issued on 575 #628509367 was 408734. 575 (628503385) indicated that 1"O.D. Stainless Steel Tubing, SA-213, Type 316, TIIC BBD-862X, Heat #466162 was issued from power stores on contract 342555 for use in system 270 on work generating document A-485139. Review of the manufacturer's certification documentation revealed that the heat number for the

1"O.D. Stainless Steel Tubing issued on 575 628503385 was 466166. 575 (628705307) indicated that 1 1/2" Socket Weld Pipe Cap SA-105, TIIC AHG-096N, Heat #YCM28 was issued from power stores on contract 358751 for use in system 70 on Work Plan E6591-2. Review of the manufacturer's certification documentation revealed that the heat number for the 1 1/2" Pipe Cap issued on 575 628705307 was CM28.

c. A review of certification documentation for one 3 inch Butt Weld, SCH 80, Gr WPB. SA-234, Pipe Tee, TIIC ACY-281V, received on contract 347739 revealed two different heat numbers. The supplier's Certificate of Compliance (COC) indicated the heat number for the 3" Pipe Tee as W8107-TT. The manufacturer's Certified Material Test Report indicated the material heat number as W8107.

Review of 575 (628703332) revealed that two 4" 90° Ells, Butt Weld, SCH 40, SA-234, Gr WPB, TIIC ALV-489H, HT DA6W were issued from Power Stores on Contract 373889. Review of the Power Stores Ledger Card indicated that 4" 90° Ells were not received on contract 373889 as indicated on 575 (628703332).

Review of RD 613945, Item 585, indicated that 1/2" Stainless Steel Pipe, SA-376, Type 304, SCH 80 was requisitioned for use. Material Certification indicate that SA-376 material was received. However power stores ledger cards indicate that a incorrect TIIC Number AQF-085M was assigned to the material which identifies the material as SA-312.

<u>The following is a conclusion for evaluation of the side issue:</u>

Through review of material storeroom requisitions and manufacturers certification documentation, it is evident that problem areas do exist in which the correct material identification markings are not transcribed onto the material tags and storeroom requisitions by the Power Stores Clerk. Also one case was revealed in which the material heat number on the Certificate of Conformance and Certified Material Test Report did not agree. Review of site procedures and upper-tier document requirements

indicate that only the power stores clerk is responsible for the material identification markings placed on the material identification tags and on storeroom requisitions. The procedures do not specifically require a Quality Assurance (QA) material identification verification by the QA inspector at the time of issuance of the material from storage or at the time of installation.

3.12 Control of NDE Material:

3.12.1 Generic Applicability:

Employee concern BNPQCP 10.35-2 was site-specific to BLN. Due to the findings of the evaluation performed at BLN, additional evaluations at BFN, SQN, and WBN were determined not to be required.

3.12.2 Site-Specific BLN:

a. A review of the expurgated files revealed that the concern had been resolved to the satisfaction of the CI.

b. A review of the upper-tier criteria revealed the following:

Quality Assurance Program Policy (QAPP)-7, section 7.2.4, required the BLN construction site to prepare, maintain, and control appropriate records in order to provide evidence of the purchased items and services program execution. Site procedure BLN-QCP-10.3 was established to fulfill this requirement.

c. A review of the BLN construction site procedures revealed the following information:

Site procedure BLN-QCP-10.3 had been revised to show that NDE materials were to be procured as "safety-related." A line item was added to all three procurement forms ("Purchase Requisition", "Request For Delivery," and "BNP - Field Purchase Order") used by construction, requiring either "Safety-Related," "Limited QA," or "Nonsafety-Related" to be indicated. This was found to have been completed after a review of all of the NDE procurement records had been performed.

d. The review of the NDE procured material consisted of reviewing all material before and after May 22, 1984, only one contract was found in which the material was specified as "nonsafety-related." The supplier has subsquently provided TVA with documentation that the material was acceptable for "safety-related" applications. Procurement of NDE material since May 22, 1984, has been and continues to be acceptable with respect to the indication of "safety-related" aspects of the materials usage. This assures that the supplier is evaluated for a QA program, if required, and that the documentation is properly stored. The one exception case found during this detailed review, and properly nonconformed (NCR 4487) through the usuage of established site procedures, was turned up in the site ledger records. From this, a cross reference system was instituted in the RIMS system to facilitate the retrieval of documentation by "lot number", for future reviews.

Conclusion:

This issue was found to be a class C issue at BLN:

The perceived problem that the purchase and subsequent control of NDE materials at BLN appears to be inadequate was factual. However, corrective action for the problem was initiated before the evaluation of the issue was undertaken by ECTG. All NDE procured material had been reviewed with only one deficiency being found. The deficiency was documented by the use of existing site procedures.

4.0 COLLECTIVE SIGNIFICANCE

The Final Safety Analysis Report is the governing document defining the requirements for the as-built condition of a nuclear plant. It serves as the basis for licensing by the NRC and provides information important to public safety. Inaccurate or incomplete information in the FSAR has the potential to introduce questions about the licensing basis for a nuclear power plant. All FSARs include ASME/ANSI codes as reference standards and these codes have material identification requirements, but these can vary depending upon the Code of Record invoked by the respective FSAR. This review showed that code requirements were not made adequately clear in the SQN, WBN, and BLN FSARs, causing uncertainity about whether TVA had adequately met traceability commitments. R2

Verification of properly certified Pressure Boundary Material and life of plant traceability to Certified Material Test Reports is intended to ensure the integrity of material in critical systems. The actual impact on plant safety is minimized by the construction, preoperational, and startup tests and by surveillance and inspection programs during plant operation. The absence of some traceability does not mean that safety has been unacceptability compromised; however, it can contribute to an indeterminate situation that must be resolved by other means. Installed material, whose traceability to referenced records cannot be fully verified, requires further evaluation to ensure it meets code requirements or to be otherwise certified as suitable for service. Generally, the problem in the TVA plants is one of documentation deficiencies rather than hardware deficiencies, although some hardware deficiencies were also encountered. R2

Thus far, nothing has arisen from the investigations in this subcategory to indicate that plant safety has been compomised by installation of unsuitable material. However, some major deficiencies in materials control practices were determined to require supplemental evaluation to address potential technical problems and, in some instances, corrective measures were found necessary.

5.0 CAUSES

5.1 Heat Code as Related to Material Control for Construction and Nuclear Power (Issues 1.2.1 and 1.2.2)

Procedural Control for Issued Instrumentation (Issue 1.2.11)

Use of Non-Code Material (Issue 1.2.4)

Material Upgrading/Reclassification (Issue 1.2.5)

Unvalidated Heat Numbers for Structural Steel (Issue 1.2.6)

The overall cause for the problems identified in these issues was a failure by TVA to define the upper-tier criteria including applicalble codes, standards, and regulatory requirements. This in turn resulted in a failure to recognize a need to develop and maintain an adequate material identification and control program with respect to nuclear piping components and material.

This cause was further expanded by both TVA and its suppliers relying upon material manufacturer's heat numbers/codes alone as unique identification for traceability.

5.2 Warehouse Access (Issue 1.2.8)

The problem identified as a side issue at WBN, was determined to be caused by a failure to comply with site procedures.

5.3 Material Personnel - Search for Defective Material (Issue 1.2.10)

The problem identified as a generic side issue was determined to be caused by TVA's failure to develop an adequate program to address NRC Bulletin IEB 83-07, "APPARENTLY FRAUDULENT PRODUCTS SOLD BY RAY MILLER, INC."

6.0 CORRECTIVE ACTION

6.1 Corrective Action Already Taken

Two issues had corrective actions taken to correct deficiencies before the evaluations were performed by ECTG. These corrective actions are as follows:

6.1.1 Procedural Control for Issued Instrumentation

WBN ONP changed the storage area such that only non-CSSC instruments and parts would be stored in the Turbine Building storage cage in the future. A sign has been installed at the door to the storage cage that states, "No storage of CSSC Material Allowed." These actions resolved the issue to the satisfaction of the CI.

6.1.2 Control of NDE Material

BLN Construction site procedure BNP-QCP-10.3 was revised requiring DNE materials to be procured as "safety-related." All three construction procurement forms were changed, by the addition of a line item, requiring either "Safety-Related", "Limited QA", or "Nonsafety-Related" material to be marked indicating its intended use. These changes were made after a review of all NDE procurement records had been performed. Only one deficiency was found and was documented/corrected by NCR 4487.

6.2 Corrective Action from CATDs

6.2.1 Heat Code as Related to Material Control for Construction.

Watts Bar

- Pressure Boundary Material, installed or available for use at WBN is not traceable to its CMTR, attesting to its suitability for use, either through markings on the material, as required by the Code of Record, or on records traceable to the item, as required by 10 CFR 50, Appendix B, Criterion VIII.

  CATD 40700-WBN-08 R0 (QR)

  Line Management's response:

  The subject CATDs [CATD 40700-WBN-02 through 14, and 17] have identified 14 problems in the area of material control. Fact Reports/Sheets [included in Section 3.0, "Findings," of this subcategory report] summarize the problems and describe the evaluation methodology used to assess material control at WBN. The Division of Nuclear Engineering (DNE) has issued CAQRs WBN 870950 and WBN 870951 documenting the deficiencies CATD Numbers 40700-WBN-08 through 14 pertaining to Heat Code as Related to Material Control for Construction. These CAQRs will identify the specific areas of non-compliance and ensure that all corrective actions and actions to prevent recurrence with respect to this issue are completed.

  To address these problem areas:

  1. TVA will perform an in-depth review of TVA upper-tier requirements and implementing specifications and procedures to identify program deficiencies and weaknesses. TVA will make necessary corrections to bring all WBN procedures pertaining to material control into compliance with ASME Code and associated regulatory commitments.

  2. TVA will also utilize a statistical sampling program to demonstrate the adequacy of the presently installed pressure boundary material. The sampling plan will be submitted to the Nuclear Regulatory Commission (NRC) prior to performing work. The sampling plan will be of sufficient size so that TVA can demonstrate, with a high confidence, the suitability for service of all

loose material installed in Code Class systems at WBN. DNE will assess the adequacy of those items that do not meet ASME Code or regulatory requirements. The results of these evaluations and assessments will be transmitted to NRC and appropriate licensing amendments will be made as necessary.

- The Site procedures used for material/verification of Pressure Boundary Material during both receiving and installation activities at WBN did/do not require the material marking identification to be verified traceable to its CMTR, attesting to its suitability for its use.

  CATD 40700-WBN-09 R0 (QR)

  Line Management's response:

  See Line Management's response to CATD 40700-WBN-08 above.

- Personnel responsible for Pressure Boundary Material identification/verification activities at both receiving and installation do not consistently verify the materials traceability to its CMTR.

  CATD 40700-WBN-10 R0 (QR)

  Line Management's response:

  See Line Management's response to CATD 40700-WBN-08 above.

- NCRs written due to the lack of Pressure Boundary Material traceability to its CMTR have been improperly dispositioned by seeking to create a piece of "paper" indicating that the material had been subjected to Non-Destructive Examination (NDE); rather than ensuring the installation of Pressure Boundary Material identified/verified traceable to its CMTR, either on the item or on records traceable to the item.

  CATD 40700-WBN-11 R0 (QR)

  Line Management's response:

  See Line Management's response to CATD 40700-WBN-08 above.

- With the exception of the Reactor Coolant System (RCS) piping, the Final Safety Analysis Report (FSAR) does not contain a definitive statement of the applicable Code of Record (Edition and Addenda) for Nuclear Class I, II, and III (TVA Class A, B, and C/D) piping construction activities at WBN.

  CATD 40700-WBN-12 R0 (QR)

  Line Management's response:

  See Line Management's response to CATD 40700-WBN-08 above.

- The Final Safety Analysis Report (FSAR) contains conflicting information as to which code case (i.e., Section 5.2.1.4 says "1423-1" and Table 5.2-8 says "1423-2") is applicable to the Reactor Coolant System (RCS).

  CATD 40700-WBN-13 R0 (QR)

  Line Management's response:

  See Line Management's response to CATD 40700-WBN-08 above.

- The "RIMS HEAT CODE PROGRAM" is not in the format nor does it contain the information specified by WBN-QCI-1.43 in that it fails to list the receiving document number (TVA 209) for the item.

  CATD 40700-WBN-14 R0 (QR)

  Line Management's response:

  See Line Management's response to CATD 40700-WBN-08 above.

<u>Sequoyah</u>

- The FSAR and associated documents do not clearly define the applicable code editions and addenda of ANSI B31.7 used in the fabrication, erection, installation, and use of Nuclear Class Piping Components.

CATD 40703-SQN-01 R2 (QR)

Line Management's response:

The FSAR will be clarified. A SQN engineering requirements specification will be written under the master specification program to provide a baseline for the requirements. Other affected lower tier documents such as N76A10, N2M-865, etc., will be revised as appropriate to clearly reflect the applicable code requirements.

Problem Identification Report (PIR) No. SQNNEB8638 has been issued to track this to completion.

- Some Nuclear Class Piping Components installed at SQN do not comply with the requirements of ANSI B31.7 or 10 CFR 50, Appendix B, Criterion VIII, for their identification and control during fabrication, erection, installation, and use. This noncompliance has resulted in the receipt, storage and identification of material that cannot be traced to the CMTR attesting to its suitability for the Nuclear and/or Pressure Class in which it is installed.

CATD 40703-SQN-02 R0 (QR)

Line Management's response:

Large bore piping will be assessed and acceptability for service documented or replaced.

For small bore piping, 2-inch NPS and less, an analysis will be performed to determine whether or not the ANSI B31.7 40 percent stress reduction can be met for Class A applications. If the 40 percent stress reduction cannot be applied and compliance to B31.7 shown, then acceptability for service will be demonstrated or the material replaced.

Condition Adverse to Quality Report (CAQR) No. SQP 870627 has been issued to track this to completion.

TVA ACTION ONLY COMPLETED
DATE: 10-22-87

Bellefonte

- Bellefonte Nuclear Plant (BLN) Project (site) does not segregate QA procured material from non-QA procured material (B31.1). This material is then installed in B31.1s Seismic Category 1 Systems (VE and VK) which are "QA" systems (N4G-889, paragraph 3.2.3.1 states: "Mechanical components identified as BLN piping class 31.1s, 31.5s, or CQ S and designated as Seismic Category 1 requires full QA"). Site management feels, based upon previous discussions with design, that this does not require QA material. Their position is that if it is not ASME Section III Code material, it is not QA material. (Non-code means non-QA) Mechanical Design Standard DS-M13.1.2, Table 1, Note 7, states in part: ". . . identification and control of material is required; . . . QA Program covering items cited above is required." Where do the QA Program Requirements begin and does the QA Program include procuring safety-related B31.1 piping material from a vendor with an approved QA Program. This is not clearly delineated in DNE documents.

CATD 40700-BLN-01 (QR)

Line Management's response:

CAQR BLF870193 has been written to address the concern that DNE and DNC controlling documents do not adequately define the NQAM requirements for QA(L). At this time, no specific deficiencies have been identified. However, a review of DNE and DNC controlling documents will be performed to verify any deficiencies or weaknesses. Once the review is complete, any corrective actions, as appropriate, will be identified and implemented. The schedule for completing corrective action on the CAQR will be tracked in TROI.

CAQR BLF870193 - Description of Condition: DNE and DNC controlling documents do not adequately define requirements for the NQAM, Part 1, Section 1.3, "Limited Quality Assurance Program Requirements." Limited quality assurance is required for seismic Category I(L) and special programs/features as defined in the referenced NQAM section, however, procurement document control, identification and control of purchased items, inspection and records control requirements have not been adequately addressed or implemented.

(Reference CATD 40400-BLN-07)

- BLN's Code of Record is not clearly defined in the FSAR as required by 10 CFR 50.34.

  CATD 40700-BLN-02 R0 (QR)

  Line Management's response:

  BLN FSAR System Description Sections will be reviewed and revised to clearly reflect the Code of Record for each ASME class.

  BLN FSAR section 3.9.7 will be expanded to include a summary table of non-RCPB code compliance (RCPB code compliance and code cases are found in section 5.2.1).

- BLN is using incorrect and inadequate methods to verify the proper material being installed.

  Pressure Boundary Material, installed at BLN, is not traceable to its CMTR attesting to its suitability for use; either through markings on the material, as required by the Code of Record, or on reliable records traceable to the item, as required by 10 CFR 50, Appendix B, Criterion VIII.

  CATD 40700-BLN-05 R0 (QR)

  Line Management's response:

  The WBN ECTG has issued numerous CATDs identifying noncompliance with the ASME code and associated regulatory commitments relative to material control (traceability, verification, and upgrading). As a result of the numerous CATDs generated and management review, a CAQR has been initiated to DNE with the following recommended corrective action:

  1. Verify and establish where deficient, the ASME code requirements for the BLN project.

  2. Perform an in-depth review of BLN's project upper tier requirements and implementing specifications and procedures identifying deficiencies and weaknesses.

3. Make the necessary corrections to bring all BLN project procedures into compliance with upper tier requirements (ASME code and associated regulatory commitments).

4. Use statistical sampling methods to quantify the extent of noncompliance and therefore determine the amount of noncompliance evaluation for DNE to disposition in order to maintain licensability of the Bellefonte project (ASME code and regulatory requirements).

The specific issues and/or deficiencies identified within the following listed WBN ECTG CATDs will be addressed and resolved to completion under CAQR No. BLP 870365, R0.

CATD No. 40700-BLN-04
40700-BLN-05
40700-BLN-06
40700-BLN-07

- BLN has ASME Class 2 material installed in ASME Class 1 systems.

CATD 40700-BLN-06 R0 (QR)

Line Management's response:

See the Line Management's response for CATD 40700-BLN-05 above.

- BLN has material installed in ASME systems without proper certifications and documentation as required by ASME.

CATD 40700-BLN-07 R0 (QR)

Line Management's response:

See the Line Management's response for CATD 40700-BLN-05 above.

Browns Ferry

- During an ECTG material control evaluation, it was discovered that an exception was taken to the Nuclear Code Cases of USAS B31.1.0 Code for Power Piping in the G.E. Design Spec. 22A1406, R2. This is in direct conflict with the BFN FSAR (Amendment 13, Q4.1.3-1/QA.1.3-2), SER (6-26-72, Para. 4.2), and 10 CFR 50.55a (d), January 1, 1984. Specific issue deals with the lack of additional NDE requirements on material under 4" nominal pipe size.

  CATD 40700-BFN-01 (QR)

  Line Management's Response:

  The discrepancy identified by the Employee Concerns Task Group (ECTG) material control evaluation is that the GE Piping Design Specification 22A1406 R2 excludes the Nuclear Code Cases of ASA B31.1 for Power Piping. This exclusion is apparently in direct conflict with the BFN FSAR (Amendment 13.Q4.1.3-1/Q4.1.3-2), SER (06/26/72, paragraph 4.2), and 10 CFR 50.55a(d), 1971.
  The only deviation from the Code Cases is concerned with the exclusion of additional nondestructive examination (NDE) requirements on material 4" and under. Because the Design Specification 22A1406 is a GE document, TVA requested assistance from GE to respond to the following issues:

  1. Provide an explanation as to why GE took exception to the Nuclear Code Cases in GE's Specification 22A1406.

  2. Identify Class A and B pressure boundary pipe and fittings under 4" that were supplied by GE, if any.

  3. Identify any cast pressure boundary components supplied by GE.

  The GE response to these issues is attached.

  In GE's response, three points were identified by GE as to why the Nuclear Code Cases were excluded from Specification 22A1406:

a. The B31.1.0 Nuclear Code Cases were written in the early 1960s to provide requirements for nuclear piping applicable to ASA B31.1.0-1955.

b. The piping code of record for BFN USAS (ANSI) B31.1.0-1967; the Code Cases were never specifically revised to apply to the B31.1.0-1967 Power Piping Code, nor were the Code Cases updated to reflect increasing knowledge in the area of NDE.

c. The GE Design Specification 22A1406 was written to include state of the art NDE techniques and requirements for that time. Specification 22A1406 includes requirements which are generally more extensive and in more detail than those of Nuclear Code Cases.

In addition, the GE response pointed out that Specification 22A1406 is a generic design specification and served as a design guide for preparing design documents. The actual GE documents used for purchase requirements are 22A1216 and 21A2100. The NDE requirements specified in these specifications are generally consistent with those of the B31.1.0 Nuclear Code Cases.

Code Case N-7 addresses NDE requirements for welds in stainless steel materials and specifies that welds will be examined by the fluid penetrant method if the size or configuration does not permit a meaningful radiograph. Meaningful and practical radiographs generally cannot be obtained from branch connections 4" nominal pipe size and less. Therefore, Specification 22A1406 is not in conflict with Code Case N-7.

Code Case N-10 specifies NDE requirements for statically cast austenitic butt welding fittings. According to the referenced response, GE did not supply cast pipe or fittings for BFN systems. Therefore, Specification 22A1406 has not excluded any NDE requirements specified in Code Case N-10.

DNE engineering has reviewed the GE response and agrees with its findings. Based on this evaluation, DNE concludes that there is no direct conflict between the Specification 22A1406 and the B31.1.0 Nuclear Code Cases. Therefore, the GE Design Specification 22A1406 is to be accepted as is.

Corrective Action

Accept as is. The construction of BFN was underway before the "Amendment to 10 CFR 50, Codes and Standards Rule for Construction Permits Issued Before July 1, 1970" was issued (later this amendment was known as 10 CFR 50.55a). First issued in 1971, 10 CFR 50.55a was an accumulation of the Codes and Standards that were utilized by the industry for nuclear plants under cnstruction at that time. For BFN, review of this draft amendment to 10 CFR 50 resulted in considerable correspondence between TVA and the AEC on the subject of the Nuclear Codes Cases. The only standards for nuclear piping in existence prior to 1969 was the B31.1 Code as supplemented by the B31.1 Nuclear Code Cases. Design and construction of BFN utilized this approach except that up-to-date GE supplementing requirements were used in place of the B31.1 Nuclear Code Cases.

In light of the above, the subject of the AEC Question 4.1.3 (p. Q4.1.3-1/4.1.3-2) will be included in the BFN FSAR, with reference to the GE Design Specifications which supplement the B31.1 Code in significantly greater detail, and use much more up-to-date technology than the Nuclear Code Cases.

All CAP work is scheduled under CAQRBFF870088 and CAQRBFF870089.

- The principle piping contract (testing and inspection schedule) required PT or MT for all forgings; however the bills of material specified mark numbers with PT or MT for forgings larger than 2 1/2" NPS' and also specified these identical mark numbers with no additional NDE required. It is not clear what the design requirements are regarding NDE. DNE has been made aware of this problem and is currently addressing it. Specific examples have been provided to DNE by ECTG.

CATD 40700-BFN-02 (QR)

Line Management's response:

1. DNE (MEG-Knoxville) shall provide a matrix of material NDE requirements on the basis of design commitments made for Browns Ferry Nuclear Plant. This matrix will include the acceptance criteria for the forged materials identified in this CATD.

2. DNE (MEG-BFN) shall prepare a detailed plan to review material documentation to establish a high level of assurance for adequacy of forged piping materials in TVA piping classifications A, B, C, D and E.

3. Any discrepancies discovered during the review of material documentation will be described on CAQR's to ensure technical resolution.

This concern is addressed by PIRBFNNEB8710.

- The bills of material specified mark numbers with PT or MT forgings larger than 2 1/2" NPS' and also specified these identical mark numbers with no additional NDE required. It is not clear what the design requirements are regarding NDE. DNE has been made aware of this problem and is currently addressing it. Specific examples have been provided to DNE by ECTG.

CATD 40700-BFN-03 (QR)

Line Management's response:

See the Line Management's response for CATD 40700-BFN-02 above.

- The design requirements, per the bill of material and drawings 47W465-2 and 47W400-1, specify "brittle fracture control applies (AEC criteria 35)" for this 2" piping. ECTG evaluation verified that the installed piping is ASTM A-106 without impact testing instead of ASTM A-333 which requires testing. Note that the current revision to BFN-FSAR exempts components with nominal pipe size 6" diameter and less. [paragraph 4.2.4.10 (B)]

CATD 40700-BFN-04 (QR)

Line Management's response:

The concern of CATD No. 40700-BFN-04 is addressed by PIRBFNNEB8708. The installed piping is ASTM A-106 without impact testing. Since the location and environment of this steam drain is subjected to temperatures well above nil ductility transition temperature, ASTM A-106 does not exhibit brittle fracture. The BFN FSAR does not require impact tests for material with nominal wall thickness of less than 1/2". Since the installed piping has nominal wall thickness of 0.344", no impact testing is required. Based on this, accept material as is. Revise drawing 47BM456-7 sheets 35 and 36, drawing 47BM435 sheet 7, and drawing 47W400-200 to include a note indicating that:

> ASTM A-333 Grade 1 or ASTM A-106 Grade B may be used for Mark No. 47W456-157 based on the PIRBFNNEB8708 resolution.

All CAP work has been scheduled.

The design requirement, per the bill of material and drawings 47W465-2, specify "brittle fracture control applies *(AEC Criteria 35)" for this 6" pipe. ECTG evaluation verified that the pipe installed is ASTM A-106 without impact testing instead of ASTM A-333 which requires impact testing. Note that the current revision to BFN-FSAR exempts components with nominal pipe size 6" diameter and less. [paragraph 4.2.4.10 (B)]

CATD 40700-BFN-05 (QR)

Line Management's Response:

The design requirements on the Bill of Material and Drawing 47W456-2, specify "Brittle Fracture Control Applies *(AEC Criteria 35)" for this 6" piping. Employee Concerns Task Group (ECTG) evaluation verified that the installed piping is ASTM A-106 without any impact testing being performed. See Licensee Reportable Event Determination (LRED) 86-1-625. Please note that the current revision to BFN FSAR exempts components with nominal pipe size 6-inch diameter and less (Para. 4.2.4.10(B)).

* AEC Criteria 35 is now reflected in Criteria 31 of 10 CFR 50, Appendix A.

The concern of CATD 40700-BFN-05 is addressed by PIRBFNNEB8709. The installed piping is ASTM A-106 without impact testing. The BFN FSAR clarifies the brittle fracture control requirements in AEC Criteria 35. Impact tests are not required for material with a nominal pipe size of 6 inch diameter and less, regardless of thickness, therefore, the use of ASTM A-106 Grade B without impact testing is acceptable for this application. Furthermore, since the location and environment of this piping indicates that it is subjected to temperatures well above nil ductility transition temperature, the ASTM A-106 will not exhibit brittle fracture. To provide clarity of the design requirements for materials, affected drawings will be revised to allow the use of ASTM A-106 Grade B as an alternative to ASTM A333 Grade 1.

6.2.2 Heat Code as Related to Material Control for Nuclear Power

Watts Bar

- Incorrect TIIC number (AQF-085M) has been assigned to piping material. Material, item 585 on RD 613945, was received as SA-376. The material identification for the TIIC number is for SA-312.

CATD 40700-WBN-15 R0 (QA)

Line Management's response:

Subject material, TIIC AQF-085M, is shown on the MAMS data base as QA N/R. Power Stores ledger cards had not been changed. On August 19, 1987, Power Stores typed their ledger cards to match data base. Only one issue was made against subject receipt. 575 number 62-85-05775 was issued for use in a Non-CSSC application. A form 2652 will be prepared by the Materials and Procurement Services Group (MPS) to establish an initial stock TIIC for procurement of SA-312 piping material as QA Level I.

EFTD 3-10-88

- The following material/documentation discrepancies have been identified and require corrective action:

  a. 3/16" diameter, SA-213, type 316, stainless steel tubing was procured on contract 270084 and issued from Power Stores on Storeroom Requisition (575) Number 6285-09367. This material was used on MR534167 for installation in the RVLIS system. The heat number on the 575 (and material in stock) is 20179 while the heat number on the receiving documentation is 408734.

  b. 3" diameter Tee, butt weld, schedule 80, SA-234, Gr. WPB was received on contract 347739. The receiving documentation listed the heat number as W8107 on the CMTR while it was listed as W8107-TT on the COC.

  c. 1 1/2" diameter pipe cap, socket weld, 3000#, SA-105 was received on contract 358751 and issued from Power Stores on Storeroom Requisition (575) Number 6287-05307. This material was used on WP-E6591-02 for installation in system 70. The heat number on the 575 is YCM28 while the heat number on the CMTR is CM28.

  d. 1" diameter (OD), SA-213, type 316, stainless steel tubing was procured on contract 342555 and issued from Power Stores on Storeroom Requisition (575) Number 6285-03385. This material was used on WGD A-485139 for system 270. The heat number on the 575 is 466162 while the heat number on the CMTR 466166.

  e. 4" diameter 90° elbows, butt weld, schedule 40, SA-234, Gr. WPB were issued from Power Stores on Storeroom Requisition (575) Number 6287-03332. The 575 listed the material as supplied by contract 373889. The Power Stores ledger card/computer printout does not list this type material as being received on this contract.

  CATD 40700-WBN-16 R0 (QR)

  Line Management's response:

a. Subject Material either received an incorrect Receipt Inspection or due to the size of the material, was individually tagged incorrectly after receipt. Currently there is a balance of this material in stock of 140 feet. The Materials and Procurement Services Group (MPS) will perform a review to see if a plant Non-QA application exists. If so, MPS will downgrade this material to QA N/R and establish an initial stock. If no Non-CSSC applications exist for this material, the subject shipment will be surplused and material which will meet correct plant requirements will automatically be reordered. Subject material was received in 1979. Since that time, receipt inspection responsibilities have been assigned to qualified QA Inspectors, per AI-5.2, Par. 5.0, for this type of material which should improve the correctness of receiving.

   MPS will initiate a request to Mechanical Maintenance Section for a review of the installed material used on MR534167. If the heat number on material installed cannot be traced to the receipt package, MPS will recommend that this material be replaced or other disposition as deemed prudent by Mechanical Maintenance.

b. This item was re-assigned to the Site QA Organization since it was initially inspected by a QC Inspector. QC has initiated CAQR number WBP870768 to resolve this problem.

c. Subject TIC is AHG-096N. No material remains in Power Stores stock from subject receipt. MPS will initiate a request to Modifications Section for a review of installed material used on WP-E6591-02. If the material in place is installed such that the heat number can be verified in place, the 575 will be changed and re-entered into the RIMS tracking system with correct heat number. If heat number cannot be verified on installed material, replacement material is available in Power Stores for modifications issue for correction. Modifications will be reminded to verify correct identity of material per AI-5.4, Par. 6.4.2 prior to installation.

d. Subject TIIC is BBD-862X. No material remains in Power Stores from subject shipment. 575 number 62-85-03385 shows a quantity of 207 feet issued, the total quantity received on contract 342555. The 575 indicates the material was issued for a Non-CSSC application. This material was receipt inspected by a QA inspector at time of receipt. Since there is a high probability that the heat number on the 575 (466162) was transposed at time of issue, Power Stores will change the 575 to read heat number 466166 and re-enter into RIMS for traceability.

e. Subject TIIC is ALY 489H. Correct contract number is 373888. Balance of material in Power Stores Bin RT14-92 is clearly marked contract number 373888. Either the items issued was unclear or the contract number was transposed at time of issue. 575 number 62-87-0332 has been changed to read contract number 373888. New RIMS number 84-3422 shows that this correction has been made. This item is considered complete.

Sequoyah

- The TVA-NQAM does not accurately define the applicable code edition and addenda of ANSI B31.7, nor does it provide for the preparation of site procedures to insure compliance with the code requirements for material identification and control during the receipt, storage, and installation activities of the repair and/or replacement of ASME Section XI Piping Components, at SQN.

  CATD 40703-SQN-03 R0 (QR)

  Line Management's response:

  The NQAM will be reviewed to determine if references to applicable code edition and addenda are accurate. It shall not define the code editions and addenda, this will be done in the engineering requirements specifications as part of the master specification program. Further, the NQAM will be reviewed to assure it requires SQN to issue procedures to comply with code requirements for material identification and control during receipt, storage, and installation activities of the repair and/or replacement of ASME Section XI Piping components at SQN.

PIR No. SQNNEB8638 has been issued to track this to completion.

- The Site Procedures do not provide a documented traceability path between the Nuclear Class Piping Components installed and their CMTR.

CATD 40703-SQN-04 R0 (QR)

Line Management's response:

The following plant implementing procedures require revision to provide additional verifications to ensure unquestionable control and traceability of the material. The revisions will be made to the procedures generally as shown below:

1. SQA162 - Revise to include changes made to DPM N76A10 for clarifying when CMTRs are required and to require traceability between the CMTR and contract line item.

2. AI-11 - Revise to require verification of traceability between CMTR and related contract line item in addition to contract number and heat number and to include QC verification of any additional marking.

3. AI-36 - Revise to include the addition of the "code class" to required marking/tagging and QC verification of the Power Stores markings/tagging.

4. SQM2 or SQM3 - Revise to require that when code class material is needed by the maintenance activity that specific instructions on material requirements (i.e., type, grade, and code class) be included in the WR/MR or maintenance instruction. (Bill of material and drawings required for review of cycle).

5. AI-19, Part IV - Revise to require that when material is needed by the modification activity that specific instructions be given in the workplan on material required (i.e., type, grade, and code class). (Bill of material and drawings required for review cycle).

6. SQA45 - Revise to include code class to items recorded on the form TVA 575.

7. M&AI-1 - (1) Revise to reflect that traceability also must be to the CMTR for the item; (2) revise Data Sheets A and B to require material verification by a QC inspector (as required by the NQAM, Part II, Section 6.1); (3) revise to clearly state QC material verification requirements (e.g., add instruction to verify proper material type and code class by reviewing work instruction, description on form TVA 575, and markings/tagging on the item); and (4) revise text and Weld Data Sheets to include the following for material ID:

   - Contract Number
   - Item Number
   - Heat Number

   Corrective Action Report (CAR) No. SQ-CAR-86-064 has been issued to track this to completion.

- Inspectors lack an understanding of the significance of why, or the manner in which Nuclear Class Piping Component identification verification at receipt, storage, and installation is performed and documented.

  CATD 40703-SQN-05 R0 (QR)

  Line Management's response:

  AI-14 is being revised to require inspectors to receive the required training to ensure that nuclear class piping component material identification verification is performed and documented, in accordance with the applicable code requirements, throughout their receipt, storage, and installation at SQN.

  CAR No. SQ-CAR-86-064 has been issued to track this to completion.

- The modifications performed on ASME Section XI Piping Components at SQN do not comply with the requirements of ANSI B31.7 and 10 CFR 50, Appendix B, Criterion VIII, for identification and control of these components throughout their fabrication, erection, installation, and use. This noncompliance has resulted in the receipt, storage, and installation of material other than what was specified.

  CATD 40703-SQN-06 R0 (QR)

  Line Management's response:

  All modifications performed on ASME XI piping components at SQN will be addressed, and if found not to meet ANSI B31.7 and 10 CFR 50 Appendix B requirements, acceptability for service will be demonstrated or they will be reworked.

  COMPLETED DATE 8-4-88

  CAQR No. SQP 870627 has been issued to track this to completion.

- Nonconforming Condition Report (NCR) 5087 R1, identifying material with identical heat numbers and descriptions for Class I and also other code classes installed in Class I systems, at Watts Bar Nuclear Plant, and made generic to SQN, has remained open at SQN since 06/18/85.

  CATD 40703-SQN-07 R0 (QR)

  Line Management's response:

  Resolution of CATDs 40703-SQN-02-R0 and 40703-SQN-06-R0 will assure adequate resolution of this problem.

  CORRECTIVE ACTION COMPLETED DATE 9-9-88

  CAQR No. SQP 870627 has been issued to track these CATDs to closure.

- Inconsistencies in denoting class changes on TVA design drawings have resulted in the installation of piping systems in a manner not depicted by the Flow Diagrams and in violation of the Final Safety Analysis Report (FSAR), Section 3.2.2.1, which states in part;

". . . whose failure could cause a loss of reactor coolant which would not permit an orderly reactor shutdown and cooldown, assuming that makeup is only provided by the normal makeup system. . . "

CATD 40703-SQN-08 R0 (QR)

Line Management's response:

ECN No. L6784 was written August 25, 1986, to require system flow diagrams and physical piping drawings for all systems to be reviewed and revised as required to properly and clearly define all piping class breaks.

- Neither the Final Safety Analysis Report (FSAR) nor the Design Drawings contain a clear distinguishing boundary between the primary coolant loops and their branch lines.

CATD 40703-SQN-09 R0 (QR)

Line Management's response:

No corrective action required. A condition adverse to quality does not exist. DNE review has shown that a clear boundary exists - See Attachment A.

PIR No. SQMEB 8793 was issued to track this CATD to closure.

Attachment A:

The design drawings do contain a clear definition of the boundary between the primary coolant loops and their branch lines.

The primary coolant loops were supplied by Westinghouse as a part of their scope of supply in the NSSS contract. TVA supplied the branch lines.

DNE combined many Westinghouse drawings and details into a single set of drawings for the purpose of locating the piping within the reactor building and providing a clear definition of the loops and a detailed listing of all branch connections. This set of drawings are 47W304-1 and 47W304-2. The drawings clearly show the piping surge line. Both units are shown--each on a separate drawing.

The branch lines are detailed on TVA individual system drawing sets. These are orthographic drawings with details and sections showing the exact locations where the branch lines connect to the primary loops.

These othographic drawings are the ones used by DNE for construction purposes. The flow diagrams, used to demonstrate the flow paths, do not show where the loop piping and the branch piping boundary is.

DRAWINGS REVIEWED:

Orthographic Drawings

47W304-1 and 2	Reactor Coolant Piping
47W406-1 thru 15	Chemical and Volume Control Piping (CVCS)
47W432-1 thru 5	Residual Heat Removal Piping (RHR)
47W435-1 thru 26	Safety Injection Piping (SIS)
47W465-1 thru 7	Reactor Coolant Auxiliary Piping

Flow Diagrams

47W809-1 thru 4	CVCS
47W810	RHR
47W811-1 and 2	SIS
47W813-1	Reactor Coolant System

Examples of Specific Sections and Details which show the boundary:

Drawing	Section
47W465-1	Section B1-B1
47W465-2	Section F2-F2
47W465-3	Section C3-C3
47W406-8	Section L8-L8
47W406-13	Section K13-K13

Browns Ferry

An extensive effort has been completed to research and respond to the subject CATDs [40700-BFN-06 through -09]. While specific response is provided for each CATD, the subject CATDs are interrelated in that they are all concerned with material traceability and whether the design requirement of BFN has been met in the area of appropriate material usage.

The BFN design basis for piping materials is United States of America Standards Institute (American National Standard Institute) B31.1.0-1967 and General Electric (GE) design specification 22A1406. Based on this design committment, no supplemental nondestructive examination (NDE) is required for pipe materials used in the various BFN piping classifications. Therefore, BFN has no concern with conflicting design callout when different classes of pipe materials might be interchanged. Forgings have supplemental NDE requirements as a function of nominal size in BFN piping classifications in accordance with GE design specification 22A1406. CATD 40700-BFN-02 and -03 have been issued to resolve this concern.

The Materials tracking processes have been shown to provide for positive traceability although certain documents may not be contained in all the work plan packages. Traceability is provided through documentation contained in purchase contract files and by Nuclear Power Storeroom requisition (TVA Form 575N) files in the lifetime quality control documentation. A backup source of information is the set of modification files located in Modification Building (S21) Fabrication Shop. The documents will be microfilmed and placed in Document Control as lifetime records with a copy in Power Stores for research purposes. In addition, the good practices that were evident under previous programs are now part of the BFN formal procedural program. Detailed information is provided in the attached reports.

- BFN Material Control Procedure BF-6.2, "Quality Control of Welding Activities," does not adequately define the quality control of material verification and traceability at fit-up. This could result in violations to 10 CFR 50 Appendix B, Criteria V and VIII.

  CATD 40700-BFN-06 R0 (QR)

Line Management's response: |R2

Discussion

SP BF-6.2, paragraph 6.3.2.6 requires that "the craft foreman shall, at weld joint fitup, obtain component identification numbers and enter them on the weld data sheet to document each component welded to the other as applicable." This is to record welding data to assure compliance to the material requirements of the detailed welding procedure. The weld data sheet should not be used as a source document for material traceability.

Further, SP BF-6.2 paragraph 6.3.2.7 requires that "the QC Inspector shall ascertain and document at weld joint fitup that the correct components are installed. This is accomplished by comparing component ID number to materials purchased on TVA Form 575N or transferred per BF-184 or BF-184 in the work instruction and that material is as specified on the drawings."

TVA Form 575N is a document to control the issuance of all material components, and spare parts from Power Stores. SP BF-16.4 "Material, Components, and Spare Parts Receipt, Handling, Storage, Issuing, Return to Storeroom, and Transfer," describes a detailed procedure for the use of TVA Form 575N. This includes verification of the component traceability information such as description of the item requested, component and system in which the item is to be used, and applicable working document number (i.e., Work Plan, Engineering Change Notice, etc.).

Conclusion and Corrective Action Plan

Based on the previous discussion, there is no procedural inadequacy in SP BF-6.2 in the area of material verification during weld joint fitup. No corrective action is required. SP BF-6.2 is applicable to all work instructions approved prior to November 17, 1986. Site Director Standard Practice 13.1 has been issued and is effective for work instructions approved November 17, 1986 and later. Furthermore, SP BF-A6 dated February 9, 1973, shows the requirements in place for control of materials after issue from Power Stores through installation. This practice was in use through April 14, 1978; additionally, SP BF-Modification and Addition Instruction 15 dated

December 27, 1979, provided for material accountability from the time of material issue until installation. In conclusion, ample evidence exists that materials were required to be controlled in a manner to preclude incorrect material from being installed prior to present revision of SP BF 6.2.

1-13-88

- Some workplans at BFN do not provide documented traceability for CSSC pressure boundary material. This violates procurement and traceability requirements in 10 CFR 50 Appendix B, Criteria VII and VIII.

CATD 40700-BFN-07 R0 (QR)

Line Management's response:

Discussion

Work Plan 9775 - Unit 1: Nuclear Power Storeroom Requisitions (TVA Form 575N) contained within this work plan identified Purchase Contract 169430 for all material issued. The purchase contract file, which is a quality assurance document, contained material certifications and receiving reports. In addition, copies of the TVA Form 575Ns are maintained by Document Control under separate file.

Work Plan 9732 - Unit 1 and 9650 - Unit 3: Contains no TVA Form 575Ns attesting to the identification of the pressure boundary material used.

A review of the work plan called out the Bill of Material 47BM406-8 for the modification to be performed on Engineering Change Notice (ECN) P0235. The Bill of Material listed Contracts 826012, 826497, 826003, 825656, 152684 and two construction Contracts 90744 and 91750.

A check of these contracts revealed that the material was received against these contracts and issued using TVA Form 575N. Copies of TVA Form 575N were located in Power Stores and in documentation maintained in purchase contract files and ECN P0235 files in modifications.

The following occurred on these transactions. Division of Nuclear Engineering (DNE) developed ECN P0235 and a Bill of Material (47BM406-8) to install a four inch line between the reactor water

cleanup system and "A" feedwater line. Contract 826012 was initiated for the procurement of this material which was used to fabricate the installed line on unit 3. While TVA Form 575Ns were not in the work package file, there are documents in Power Stores and ECN files maintained in modifications that show these issues were made. The purchase contract file as referenced on the Bill of Material shows adequate traceabilty; additionally, the items were issued by mark number. Material issues were in fact correctly made and recorded against the ECN P0235, with copies of the TVA Form 575Ns placed in the ECN P0235 files. Work Plan 9650 for unit 3 was installed in 1979 and the remaining fabricated pipe pieces were returned to the warehouse in June 1980. These pieces were for Work Plan 9732, unit 1, and 9537, unit 2. Traceability existed for all material issued, with the TVA Form 575N identification of purchase contract. DNE procured all required material on Contract 826012, as substantiated by Bill of Material 47BM406-8 issued January 22, 1980. Documentation for material is maintained in contract files which contain the contract, receiving reports, and associated documentation including material certifications. Issues are recorded on TVA Form 575N which reference the contract, but are maintained by Document Control separate from the purchase contract files. Material was procured for the application, which in this instance is ECN P0235. The TVA Form 575Ns contain the contract numbers, and the contract files contain the material certification.

Conclusion

Modifications at Browns Ferry, including the work cited in this CATD, have been performed in a manner that provides adequate material traceability to meet the criteria of 10 CFR 50 Appendix B, Criteria VII and VIII. Material traceability is maintained in the following manner:

1. Procurements are made through use of DNE generated purchase contracts, or purchase contracts that are issued in conformance with DNE generated Bill of Materials.

2. Receiving inspection is performed and documented to assure that materials and required documentation conform to purchase contract requirements.

3. Materials quality documentation and receiving reports are quality assurance documents and are filed in the purchase contract file.

4. When material is issued for use, the work plan for which it is issued is documented on TVA Form 575N.

5. TVA Form 575Ns are filed in the work plan, or ECN package, or the purchase contract file depending on the timeframe for which the material was used.

6. A copy of the TVA Form 575N is also filed in Document Control under a separate filing system as a lifetime quality assurance record.

Based on the Records Systems as described, tracking of material may be accomplished by one of the following methods.

1. Work plans will identify material requirements as defined in the ECN. The ECN will list and/or describe the material requirements based on a Bill of Material. The Bill of Material often lists the purchase contracts. With this information, the contract files can be searched. The contract files will contain the receiving information and material documentation/certification as well as TVA Form 575N dependent on time frame involved. When TVA Form 575Ns are not contained in the purchase contract files, a search of the issue file maintained by Power Stores and Document Control can be initiated based on the receipt date, and a search made for the issue of material received against a particular contract. The TVA Form 575N will list the purchase contract the material was procured against. | R2

2. Work plan packages can be reviewed for activity dates involved, even if TVA Form 575Ns are not contained in work plan packages. With the date of receipt narrowed, a search of issues for that timeframe can be accomplished. From the TVA Form 575Ns' information, the purchase contract can be identified and reviewed, which will contain receiving reports and material certifications.

As a result of this investigation, and in order to enhance records retrievability, the set of Modifications files presently located in Modifications Fabrication Shop S21 will be secured by Document Control in a manner consistent with lifetime storage requirements.

- BFN performs modifications on CSSC systems without revising original Design and Construction Drawings and Documentation. Also, BFN performs modifications without appropriate Design Input Documentation. This is in violation of 10 CFR 50 Appendix B, Criteria III, V, and VI.

CATD 40700-BFN-08 R0 (QR)

Line Management's response:

Discussion

A. As a response to the Corrective Action Report, BF-CAR-87-0038, the project has already instigated a corrective action item to prepare the weld map program. This program shall address various concerns such as assigning unique weld numbers for modification and maintenance, and improving retrievability of weld documents for new work.

B. It was evident on the TVA Form 45 that DNE performed an evaluation of the material substitution from Material Specification SA-182,

Type 316L to SA-403, Type 316L on the basis of allowable stresses. Since the same allowable stresses are applicable to SA-403, Type 316L, no calculation is required for verification of the required minimum wall that was established for SA-182, Type 316L. |R2

Proposed Corrective Action

A. Assigning duplicated weld numbers and retrievability of weld documents does not impact on the weld quality. It is a lack of a weld map program and implementation of such a program (BF CAR-87-0038) that will resolve the concern described in the CATD.

B. No corrective action is required. Furthermore, pressure-temperature ratings for pipe could be used to estimate a pipe wall thickness as a function of the materials and operating conditions. The pressure - temperature rating for pipe is based on the minimum wall thickness requirements, and is a convenient design guide to avoid repetivite minimum wall calculations.

The current practice for BFN, relative to weld maps, is fully detailed in Site Director Standard Practice (SDSP) 13.13 and does ensure ongoing control/maintenance for these documents with a cross-reference to the relative work packages.

- Some CSSC pressure boundary materials are installed at BFN which do not meet the design requirements. This violates 10 CFR 50 Appendix B, Criteria II, IV, and X.

CATD 40700-BFN-09 R0 (QR)

Line Management's response:

Discussion

A. Design Requirements

Based on the review of TVA piping classifications, the reworked piping of the subject NR is

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classified as Class B. This confirms that the Bill of Material 47BM406, sheet of 1 of 9, which is applicable for class A and B in the reactor water cleanup system, is the correct one to be used.

Contrary to the supplemental UT in the Bill of Material, further engineering evaluation has determined that there is no UT requirement for Class B piping material in the design commitments for BFN. This design commitment was evaluated on the basis of the Code of Record in the Final Safety Analysis Report (FSAR), United States of America Standard Institute (USASI) B31.10-1967 included General Electric (GE) Specification 22A1406 and 22A1332. It was conlcuded that the UT requirements in Bill of Material 47BM406 for Class B tubular products exceeds the BFN design commitment.

B. Evaluation of Quality Program

The Purchase Request No. 968764 was issued to order the subject pipe with reference to the Bill of Material 47BM406, sheet of 2 of 9. This Bill of Material covers tubular products in TVA piping Class C which does not require supplemental UT inspection.

Division Procedures Manual (DPM) No. N76A10, "Purchase Specification for Critical Structures Systems and Components (CSSC) metallic materials" requires that "when ordering replacement parts or materials in accordance with the original requirements, the purchase specifications do not apply. Therefore, the originator is responsbile to ensure that all original requirements are met, and the requisition shall reference the source form which the requirements were extracted, i.e., original contract no., drawing, etc."

Based on our review of the work plan package, the applicable source documents such as Surveillance Instruction, 4.6.G, 16.0, pages 144, 197, 198, and Normal Operating Instruction R0294 provide

sufficient technical requirements to select the correct Bill of Material Sheet for the material procurement. However, we cannot determine how the Bill of Material for piping Class C was referenced in the purchase requisitions.

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Proposed Corrective Action

Due to inconsistency of material nondestructive examination (NDE) requirements in the Bill of Materials, the Division of Nuclear Engineering will provide a matrix of material NDE requirements on the basis of design commitments made for BFN. This matrix will be used to review Bills of Material to establish a classification A and B. This engineering output document will supersede other drawing requirements. This corrective action item is already identified in CATD No. 40700-BFN-02 and 40700-BFN-03.

6.2.3 Changed Heat Numbers

Since the issue was determined to be not factual, a CATD was not required.

6.2.4 Use of Non-Code Material

The evaluations for this issue were based on the evaluation of "Heat Code as Related to Material Control for Construction and for Nuclear Power" and "Material Upgrading/Reclassification." The corrective actions of these three issues along with the corrective actions for CATD 40700-NPS-01 (See section 6.2.13) will correct any discrepancies found relating to this issue.

6.2.5 Material Upgrading/Reclassification

Watts Bar

- ASME Section III Class I Material in TVA Class A systems which was upgraded has not been validated in accordance with WBNP-QCP-1.50. The revised Heat Code/Number on upgraded TVA CMTRs must be validated in accordance with paragraph 6.11, which states the Heat Code/Number must correspond to the Heat Code/Number listed on the revised CMTR or be listed in the heat code printout. Additionally the revised Heat Numbers are not on the weld data sheets to establish traceability.

CATD 40700-WBN-02 R0 (QR)

Line Management's response:

The subject CATDs [CATD 40700-WBN-02 through 14, and 17] have identified 14 problems in the area of material control. Fact Reports/Sheets (included in Section 3.0, "Findings," of this subcategory report) summarize the problems and describe the evaluation methodology used to assess material control at WBN. The Division of Nuclear Engineering (DNE) has issued CAQRs WBN 870950 and WBN 870951 documenting these deficiencies identified in CATD Numbers 40700-WBN-02 through 07 pertaining to Material Upgrading/Reclassification. These CAQRs will identify the specific areas of non-compliance and ensure that all corrective actions and actions to prevent recurrence with respect to this issue are completed.

To address these problems areas:

1. TVA will perform an in-depth review of TVA upper-tier requirements and implementing specifications and procedures to identify program deficiencies and weaknesses. TVA will make necessary corrections to bring all WBN procedure pertaining to material control into compliance with ASME Code and associated regulatory commitments.

2. TVA will also utilize a statical sampling program to demonstrate the adequacy of the presently installed pressure boundary material. The sampling plan will be submitted to the Nuclear Regulatory Commission (NRC) prior to performance work. The sampling plan will be of sufficient size so that TVA can demonstrate, with a high confidence, the suitability for servcie of all loose material installed in Code Class Systems at WBN. DNE will assess the adequacy of those items that do not meet ASME Code or regulatory requirements. The results of these evaluations and assessments will be transmitted to NRC and appropriate licensing amendments will be made as necessary.

- NCR 6687: WBN is not performing 100 percent liquid penetrant (PT) examination on upgrading material to Class 1. WBN only PTs accessible areas; and this is in direct conflict of ASME Section III, subsection NB-2541.

  CATD 40700-WBN-03 R0 (QR)

  Line Management's response:

  See the Line Management's response for CATD 40700-WBN-08 in section 6.2.1.

- Material has been installed in TVA Class A (ASME Class I) systems without proper upgrading and documenting of NDE as required by ASME Section III.

  CATD 40700-WBN-04 R0 (QR)

  Line Management's response:

  See the Line Management's response for CATD 40700-WBN-08 in section 6.2.1.

- The ASME committee did not allow the usage of ASME code cases N-242 and N-242-1 for WBN. Therefore, the NCM and G-62 are in error for allowing the use of ASME code cases N-242 and N-242-1 for upgrading material at WBN. The N-5 data reports for systems that these code cases were used to upgrade are in error. ASTM material procured prior to April 10, 1980 without QA applied to the procurement was upgraded to ASME section III/QA, through the provisions of ASME code cases N-242 and N-242-1. Regulatory Guide 1.85 requires if ASME code cases N-242 and N-242-1 are used the applicants shall identify in their FSAR the components and supports for which the code case is being applied.

  CATD 40700-WBN-05 R0 (QR)

  Line Management's response:

  See the Line Management's response for CATD 40700-WBN-08 in section 6.2.1.

- Prior to G-62 (March 10, 1980) material being upgraded was not verified as conforming to ASME sections II and III nor was this documented.

  Material received at WBN certified to a latter code is not compared to WBN's section III requirements for compliance.

  CATD 40700-WBN-06 RO (QR)

  Line Management's response:

  See the Line Management's response for CATD 40700-WBN-08 in section 6.2.1.

- WBN-QCI-1.46, "Material Upgrading," procedure allows WBN to put "all" as the Quantity on the upgraded CMTR and does not address the prevention of receiving material with the same heat number/code as material that previously was upgraded. Consequently this material could inadvertently be installed in a system of higher class without properly being upgraded.

  CATD 40700-WBN-07 RO (QR)

  Line Management's response:

  See the Line Management's response for CATD 40700-WBN-08 in section 6.2.1.

Bellefonte

- ASME Code Case N-242-1 is used in General Construction Specification G-62 for upgrading material at BLN. Regulatory Guide 1.85 requires, if Code Case N-242-1 is used, the applicant (BLN) must identify this Code Case and the components it is used on in their FSAR. BLN has not complied with this requirement.

  CATD 40700-BLN-03 RO (QR)

  Line Management's response:

  BLN FSAR Tale 3.9.7-1 will be revised to show the correct Code Case revisions and applicable components.

- Material upgrading procedures at BLN were and are inadequate.

  BLN's material upgrades were not reviewed and properly documented/certified in accordance with the requirements of ASME Sections II and III, to insure that the materials meet BLN's code of record.

  CATD 40700-BLN-04 R0 (QR)

  Line Management's response:

  See the Line Management's response for CATD 40700-BLN-05 in section 6.2.1.

6.2.6 Unvalidated Heat Numbers for Structural Steel

Sequoyah

- There was/is no controlling procedure, as required by 10 CFR 50, Appendix B, Criterion V, for the Heat Number Sort Printout (HNSP), which is still in use or available for use for heat number documentation accountability/retrievability.

  CATD 40705-SQN-01 R0 (QR)

  Line Management's response:

  The Heat Number Sort Printout (HNSP) is not used at SQN to control activities that affect quality. It is used to assist in locating certified mill test reports and other document search activities. Consequently, its use does not represent a potential for degradation of safety-related equipment at the present time nor in any future activities. Additionally, a stop work order was issued to require any installation of material on TVA Class A, B, and C/D pressure retaining piping components to be specifically approved by the Site Director. This approval requires that traceability of material be contained in a work package, which ensures proper traceability.

It is recognized that the HNSP has errors and omissions; however, the consequences of these errors and omissions have not adversely affected the plant safety as demonstrated by the Kelly and Landers report as related to pressure retaining material (See Executive Report, Ref. 1). The HNSP will be used in QA activities only as a tool in locating documentation for retrieval. When material verifications/searches are performed, hard copy documentation, microfilm, and/or physical verifications will be used to the extent necessary to ensure adequate material verifications/searches. The Site Director has issued directives (See reference 2 and 3) to ensure this; however, since the HNSP is not being used and will not be used for QA verification, a formal procedure addressing its use is not necessary.

The HNSP was not used for installation verification of civil items, structural plates and shapes. During construction, structural plates and shapes were verified at installation, only to assure heat number marking, because material was verified at receiving and heat numbers were maintained to identify the material as acceptable. Non-QA material did not have heat numbers and could not be used in QA application. At approximately 1975, all non-QA strucutral material was eliminated from the site to ensure only QA material was available and all further civil structural material was procured as Quality Level 1 which requires heat number traceability. Most structural material was input into the HNSP during the 1978 timeframe. This was done when the Materials Services Unit assumed responsibility for input to the program. All material with certification was eventually encoded into the HNSP as the certification was known to exist.

Structural material issued as pressure boundary attachments was initially issued by the civil group. After the material was received at the pipe shop, control and verification for pressure boundary attachments was handled in the same manner as for pressure retaining material. The evaluation of pressure retaining piping materials (see HCTTG Final Report, Ref. 4 and Executive Report, Ref. 1) which involved over 500 individual items

did not identify a single instance where the wrong material specification was installed as identified in the HCTTG Final Report (Ref. 4). The report identified problems with pipe class distinction but no instances where the wrong material specification was installed. Based on this evaluation and the fact that the installation verification process was the same, although not evaluated, there is no reason to believe that pressure boundary attachments verified by use of the HNSP were not the proper material specification.

Additionally, the heat numbers identified in the subject ECTG report for which CMTRS were not found (i.e., readily retrievable) have had certifications located at SQN. Appropriate certifications are readily retrievable in the permanent records storage vault in the plant office building.

References:

1. Memorandum from S. A. White to W. R. Brown, dated May 5, 1987, "Heat Code Traceability Issues at Sequoyah Nuclear Plant (SQN), dated April 21, 1987", (A02 870428 034)

2. Memorandum from H. L. Abercromie to W. E. Andrews, R. W. Olson, P. R. Wallace dated October 6, 1986, "Sequoyah Nuclear Plant (SQN) - Installation of the Modifications Performed on Nuclear Class I, II, and III (TVA Class A, B, and C/D) Pressure Retaining Piping Components," (S00 861006 802)

3. Memorandum from H. L. Abercromie to Those Listed, dated March 30, 1987 "SNP (SQN) - Employee Concerns Task Group (ECTG) Element Report No. MC-40705-SQN-R2 - Material Control Category" (S00 870327 804)

4. HCTTG Final Report, dated January 1987, "Material Traceability for Piping Systems - Sequoyah Nuclear Plant" (B25 870225 036) |R2

6.2.7 Material Received by Inappropriate Personnel

Since the issue was determined to be not factual, a CATD was not required.

6.2.8 Warehouse Access

Watts Bar

- Access to warehouse and yard storage areas is not limited to authorized personnel in accordance with WBN-QCP-1.36 R10, section 7.1.1, and WBN-QCI-1.36 R13, section 6.1.1.

CATD 40700-WBN-01 R0 (NQR: Nonquality - related)

Line Management's response:

An electric gate has been installed at the entrance to the warehouse yard that controls access to the warehouse yards. A material clerk is assigned to man the gate. The clerk checks all incoming/outgoing traffic for proper documentation of material returned and issued. Before entering the warehouse yards, authorized personnel are required to sign in at the warehouse gatehouse and state the approximate location and type of material to be issued. Also the time he/she entered and departed the warehouse yards is logged. Access to the warehouse yard is now limited to authorized employees which will be defined in a revision to the definition section of PMS-07. Reference SOP-PMS-07, paragraphs 6.1.6 and 6.1.9.

To improve the access control, this standard operating procedure (SOP) was written and implemented detailing the warehouse material clerk responsibilities. The initial training on SOP-PMS-07 (Processing of Storeroom Requisition, TVA 575) has been completed.

The revision to the procedure will clarify and specify who has the authority to authorize and who is authorized to enter the warehouse yards. A new training session will be held with the warehouse personnel once the revision is issued.

6.2.9 Verification of Material Discrepancy

Since the issue was determined to be not factual, a CATD was not required.

6.2.10 Material Personnel - Search for Defective Material

Sequoyah

- TVA's response to NRC for IEB 83-07 is inadequate in that it did not contain the identification of all Ray Miller, Inc., material installed in safety-related systems along with its safety-significance evaluation and the disposition of all Ray Miller, Inc., material that remained in stock.

  CATD 40709-SQN-01 R0 (QR)

  Line Management's response:

  CAQR No. CH5870013 is attached to ensure that the TVA Nuclear Safety and Licensing Staff performs a thoroughly documented evaluation of TVA's past actions relative to IEB-83-07 regarding Ray Miller material. The evaluation will address, but will not be limited to, the following:

  - Activities for all TVA plants, including cancelled plants, relative to information requested in IEB-83-07.
  - Identification of material installed in safety-related systems, along with safety significance.
  - Disposition of all Ray Miller material that remained in stock.
  - Specific problems identified in the ECTG Report.

  Any deficiencies identified as a result of the evaluation will result in a CAQR to ensure that a letter will be written to the NRC advising them that the previous response was in error, and that a revised response will be prepared and issued to the NRC.

Corporate

- TVA's response to NRC for IEB 83-07 is inadequate in that it did not contain the identification of all Ray Miller, Inc., material installed in safety-related systems along with its safety-significance evaluation and the disposition of all Ray Miller, Inc., material that remained in stock. This evaluation is determined generic to Browns Ferry Nuclear Plant, Bellefonte Nuclear Plant, Sequoyah Nuclear Plant, and Watts Bar Nuclear Plant due to the fact that TVA's response to IEB 83-07 is in error and must be re-evaluated. This re-evaluation must include Hartsville Nuclear Plants, Phipps Bend Nuclear Plant, and Yellow Creek Nuclear Plant because these canceled nuclear plants are potential material suppliers to other TVA sites.

  CATD 40709-NPS-01 R0 (QR)

  Line Management's response:

  See the line management's response for CATD 40709-SQN-01 above.

6.2.11 Procedural Control for Issued Instrumentation

- Inadequate verification of material identification markings during storage, issuance and installation. No second party verification to the marking of materials and material documentation (Storeroom requisitions, material identification tags) performed by power stores personnel during storage and issuing of QA material/components from storage. Also, material verification inspections at installation are only performed to the material's traceable documentation and not to the marking on the material and certification documentation.

  CATD 40700-WBN-17 R0 (QR)

  Line Management's response:

  The subject CATDs [CATD 40700-WBN-02 through 14, and 17] have identified 14 problems in the area of material control. Fact Reports/Sheets (included in Section 3.0, "Findings," of this subcategory report) summarize the problems and describe the evaluation methodology used to assess material control at WBN. The Division of Nuclear Engineering (DNE) has issued CAQRs WBN 870950 and

WBN 870951 documenting the deficiencies identified in CATD Number 40700-WBN-17 pertaining to a side issue of Procedural Control for Issued Instrumentation. These CAQRs will identify the specific areas of non-compliance and ensure that all corrective actions and actions to prevent recurrence with respect to this issue are completed.

To address these problem areas:

1. TVA will perform an in-depth review of TVA upper-tier requirements and implmenting specifications and procedures to identify program deficiencies and weaknesses. TVA will make necessary corrections to bring all WBN procedures pertaining to material control into compliance with ASME Code and associated regulatory commitments.

2. TVA will also utilize a statistical sampling program to demsonstrate the adequacy of the presently installed pressure boundary material. The sampling plan will be submitted to the Nuclear Regulatory Commission (NRC) prior to performing work. The sampling plan will be of sufficient size so that TVA can demonstrate, with a high confidence, the suitability for service of all loose material installed in Code Class systems at WBN. DNE will assess the adequacy of those items that do not meet ASME Code or regulatory requirements. The results of these evaluations and assessments will be transmitted to NRC and appropriate licensing amendments will be made as necessary.

6.2.12 Control of NDE Material

Bellefonte

Since the issue was determined to be factual and corrective actions being taken before the ECTG evaluation, a CATD was not required.

6.2.13 Generic Material Control

Corporate

Due to the number and similarities of problems encountered at all four nuclear sites and the 44 quality related CATDs issued by this ECTG subcategory identifying those problems, corporate level actions are necessary to resolve technical questions within the Material Control Program, at all sites.

- Contrary to the requirements of 10 CFR 50, Appendix B, Criterion VIII, the TVA Material Control Program did/does not ensure the receipt, storage, and installation of Critical Systems, Structures, and Components (CSSC) material that is properly certified and marked, identified, and verified traceable to its Certified Materials Test Report (CMTR), throughout the fabrication, erection, installation and use of the item.

  CATD 40700-NPS-01 R0 (QR)

  Line Management's response:

  The Division of Nuclear Engineering has initiated a Specification Improvement Program to upgrade the TVA nuclear engineering specifications. A set of Master Specifications are being developed to incorporate the top level engineering requirements under the control of the DNE discipline branches. Specific site applications of the Master Specifications will be contained in site-specific Engineering Requirements Specifications.

  The Master Specifications, MS-NEB-001, "Safety-Related Piping Installation, Modification, and Maintenance," and MS-NEB-015, "Procurement, Storage, Installation, Modification, and Maintenance of Materials," will document the TVA requirements relative to the Material Control Category CATDs. The formulation of these specifications will be coordinated with the sites to assure the resolutions of the issues of the specific CATDs are included where appropriate. Detailed

requirements for specific materials or generic classes of materials will be documented in Pre-engineering Replacement Items Specifications being developed by the DNE Replacement Items Program.

The complete set of specifications, i.e., Master Specification (MS), Engineering Requirements Specification (ER Spec), and Pre-Engineered Replacement Items Specifications, will require material identification and traceability consistent with the requirements of 10 CFR 50 Appendix B, Criterion VIII and code requirements as applicable to each site.

MSs and ER Specs are considered design output by ONP. Implementation of them by the or user organizations (Division of Nuclear Construction, Division of Nuclear Quality Assurance, Division of Nuclear Services, and the Nuclear Site Directors) will be controlled in accordance with the Nuclear Procedures Systems (NPS) requirements. An NPS standard is being developed that will mandate and provide administrative interdivisional control for the utilization of the specifications ONP-wide. At the division level, the user organizations will be required to develop their corporate procedures to fully implement the applicable master specification requirements. At the site level, all user organization procedures will be developed requiring complete implementation of all applicable ER Spec requirements.

The standard for the control and implementation of MSs and ER Specs will be developed by DNE and will be concurred by affected divisions. The standard will be applicable to all procedures involved in the procurement, fabrication, construction, modification and maintenance activities at each plant. The user organizations will be required by the standard to maintain compliance with ER Specs as they are revised over time.

7.0 ATTACHMENTS

Attachment A - Listing of Employee Concerns Indicating Safety Relationship and Generic Applicability

Attachmetn B - List of Evaluators

Attachment C - List of Evaluators by Issue

Attachment D - List of Concerns by Issue

LIST OF CONCERNS INDICATING SAFETY RELATIONSHIP AND GENERIC APPLICABILITY

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	B F	B L	S Q	W B	QTC/NSRS INVESTIGATION REPORT	P* S R	CONCERN DESCRIPTION	REFERENCE SECTION #	
BFN-85-008-001	MC	40700	BFN	Y	N	N	N		SS	DURING AN INTERVIEW CONTACT THE CI STATED THAT ON NUMEROUS OCCASIONS MATERIAL ARRIVED AT BFN WITHOUT CONFORMING TO CONTRACT REQUIREMENTS (DOCUMENTATION, SPECIFIED TOLERANCES, CORRECT MATERIALS, ETC). THE CI WOULD NOT ACCEPT THE MATERIAL AND HIS SUPERVISOR KEPT REASSIGNING THE WORK TO A DIFFERENT EMPLOYEE UNTIL SOMEONE WOULD SIGN ACCEPTANCE.	1.2.7, 3.7.2	IR2
BNPQCP 10.35-2	MC	40700	BLN	N	Y	N	N	THIS REPORT ADDRESSES ONLY THE PORTION OF THE CONCERN THAT IS UNDERLINED.	SR	PURCHASE AND SUBSEQUENT CONTROL OF NDE MATERIALS APPEAR TO BE INADEQUATE.	1.2.12, 3.12.1 and 3.12.2	IR2 I
	MC	40200		N	Y	N	N					
EX-85-023-001	MC	40700	WBN	Y	Y	Y	Y		SR	NUCLEAR POWER SHOULD UPGRADE ITS HEAT CODE PROGRAM TO CONSTRUCTION STANDARDS. THIS WOULD INCLUDE A COMPUTER PRINTOUT FOR THE TRACEABILITY OF ALL HEAT CODE ITEMS. THE CURRENT PROGRAM ETC. HAS TOO MANY HOLES IN IT. NO FURTHER DETAILS AVAILABLE.	1.2.2, 3.2.1 - 3.2.5	

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	B F	B L	S Q	W B	QTC/NSRS INVESTIGATION REPORT	P* S R	CONCERN DESCRIPTION	REFERENCE SECTION #	
IN-85-012-001	MC	40700	WBN	N	Y	N	Y	IN-85-012-001	SR	CI CONCERNED WITH THE METHOD USED AND APPROVED BY TVA WHEN MATERIAL MANUFACTURED TO AN ASTM MATERIAL SPECIFICATION WAS "UPGRADED" FOR USE IN AN ASME CODE SYSTEM. CI QUESTIONS THE PROCEDURE USED (IF ANY) AND THE PRACTICE OF AN INDIVIDUAL (NAME GIVEN) APPLYING THE FOLLOWING STATEMENT TO CMTR's. "ALL HEATS MEET CODE CLASS 2 REQUIREMENTS." CI SUPPLIED FILM COPIES OF 22 CMTR's (COPIES IN FILE) FROM DIFFERENT VENDORS/MANUFACTURERS WITH THIS CONDITION. CI STATED THAT THIS PRACTICE WAS USED ON THOUSANDS OF OTHER CMTR's. TIMEFRAME LATE 70's TO EARLY 80's.	1.2.5, 3.5.1 - 3.5.3	IR2
IN-85-369-005	MC	40700	WBN	N	N	N	Y	IN-85-369-005	NO	UNCONTROLLED ACCESS TO WAREHOUSE.	1.2.8, 3.8.1 and 3.8.2	IR2
IN-85-388-006	MC	40700	WBN	N	N	N	Y	I-85-159-WBN	SR	CIVIL ENGINEERING USE TO CHECK IN ALL STEEL MATERIALS AND MAINTAIN A LOG OF HEAT NUMBERS/HEAT CODES. THE CURRENT COMPUTERIZED HEAT NUMBER/HEAT CODE LOG WAS COMPILED WITH DATA TAKEN FROM FORM 209 (RECEIVING REPORT), AND MILL TEST REPORTS. HOWEVER, THE PRINTOUT CONTAINS NUMEROUS ERRORS AND IS INCOMPLETE. THE PRINTOUT WAS NEVER COMPARED TO THE HEAT NUMBER/HEAT CODE LOG COMPILED AND MAINTAINED BY CIVIL ENGINEERING PRIOR TO MATERIALS RECEIVING ASSUMING RESPONSIBILITY. HEAT NUMBER/HEAT CODE TRACEABILITY IS NOT SUFFICIENT.	1.2.1, 3.1.2	IR2

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	B F	B L	S Q	W B	QTC/NSRS INVESTIGATION REPORT	P* S R	CONCERN DESCRIPTION	REFERENCE SECTION #	
IN-85-493-003	MC	40700	WBN	N	N	N	Y		SR	STAINLESS STEEL PIPE WITH NO HEAT NO. (HAS BEEN CUT OFF WITHOUT HAVING HEAT NO. TRANSFERRED) WAS PT'D AND UPGRADED PER PROCEDURE. CI DECLINED TO PROVIDE ANY FURTHER INFORMATION. CONSTRUCTION DEPARTMENT CONCERN.	1.2.5, 3.5.1 - 3.5.3	IR2
IN-85-545-X07	MC	40700	WBN	Y	Y	Y	Y		SR	PRIOR TO 1981, THERE WAS NO HEAT NUMBER LOG OR DOCUMENTED TRACEABILITY. THE CURRENT HEAT NUMBER LOG IS INCOMPLETE, CONTAINS ERRORS AND IS USED FOR THE FINAL DOCUMENTATION REVIEW. (DEPT. KNOWN). CONSTRUCTION DEPARTMENT CONCERN. CI HAS NO FURTHER INFORMATION. NO FOLLOW UP REQUIRED.	1.2.1, 3.1.1 - 3.1.5	
IN-85-660-001	MC	40700	WBN	Y	Y	Y	Y	IN-85-660-001	NO	UNIT #1, MA, MODIFICATION, NUCLEAR POWER. REQUIRED PAPERWORK TO SUB-STANTIATE TRACEABILITY OF CLASS C AND ABOVE PIPING COULD BE MADE MORE EFFICIENT BY MAKING IT SIMPLER. THE COMPLEX SYSTEM NOW IN USE ALLOWS FOR POSSIBILITY OF ERROR AND DOES NOT PREVENT THE ILLEGAL USE OF A HEAT NUMBER BY THE CRAFT, I.E. CRAFT COULD BRING A PIPE WITH NO HEAT NUMBER, PUT ON A KNOWN GOOD HEAT NUMBER AND THEN CALL INSPECTOR FOR WITNESSING TRANSFER OF HEAT NUMBER.	1.2.1, 3.2.1 - 3.2.5	IR2

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	B F	B L	S Q	W B	QTC/NSRS INVESTIGATION REPORT	P* S R	CONCERN DESCRIPTION	REFERENCE SECTION #	
IN-85-825-001	MC	40700	WBN	N	N	N	Y		SR	THE QA LEVEL ITEMS WHICH REQUIRE TRACEABILITY (HEAT CODES) SHOULD BE CONTROLLED WITH A STRICTER PROGRAM. THERE SHOULD ALSO BE A COMPUTER PRINTOUT OF ALL TRACEABLE ITEMS.	1.2.1, 3.1.2, 1.2.2, 3.2.2	IR2
IN-85-988-001	MC	40700	WBN	N	N	N	Y		SR	ENGINEERING REVIEW OF MATERIAL RECEIVED ONSITE IS NOT ADEQUATE: WHEN "OVERAGES" COME IN, ENGINEERING AIDES SIGN THEM OFF UNCRITICALLY: ARE ENGINEERING AIDES EQUALLY UNCRITICAL OF TECHNICAL DISCREPANCIES? ENGINEERS SHOULD BE RESPONSIBLE FOR THIS FUNCTION INSTEAD OF ENGINEERING AIDES. CI HAD NO FURTHER INFORMATION. CONST. DEPT. CONCERN.	1.2.7, 3.7.2	
WBN-223	MC	40700	WBN	N	N	N	Y	THIS REPORT ADDRESSES ONLY THE PORTION OF THE CONCERN THAT IS UNDERLINED.	NO	THE INSTRUMENT SHOP STORAGE AREA, IN THE TURBINE BUILDING, IS NOT ENVIRONMENTALLY SUITABLE FOR CERTAIN INSTRUMENTATION AND PARTS. <u>INDIVIDUAL IS ALSO CONCERNED THAT THE PROCEDURE FOR TRACKING THE PARTS IS INADEQUATE.</u>	1.2.11, 3.11.1 and 3.11.2	IR2 I
	MC	40400		N	N	N	Y					
WI-85-008-002	MC	40700	WBN	Y	Y	Y	Y		SR	THE HEAT NUMBER REPORT IS BEING RE-VERIFIED AS NUMBEROUS ERRORS AND OMISSIONS HAVE BEEN DISCOVERED AFTER SYSTEMS HAVE BEEN TURNED OVER TO NUCLEAR POWER	1.2.1, 3.1.1 - 3.1.5	

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	B F	B L	S Q	W B	QTC/NSRS INVESTIGATION REPORT	P# S R	CONCERN DESCRIPTION	REFERENCE SECTION #	
WI-85-091-010	MC	40700	WBN	N	N	N	Y		SR	HEAT NUMBERS HAVE BEEN CHANGED WITHOUT QUALITY's KNOWLEDGE, CI HAS NO FURTHER INFORMATION, CONSTRUCTION DEPART. CONCERN.	1.2.3, 3.3.1 and 3.3.2	IR2
XX-85-027-X02	MC	40700	SQN	N	N	Y	Y	XX-85-027-X02	SS	MATERIAL INSPECTORS WERE NOT ALLOWED TO VALIDATE HEAT NUMBERS OF STRUCTURAL STEEL RECEIVED BY PROCEDURE HEAT NO. 7438383 IS AN EXAMPLE. SEQUOYAH	1.2.1, 3.1.1 - 3.1.4,1.2.6, 3.6.1 - 3.6.3	IR2
XX-85-027-X04	MC	40700	SQN	Y	Y	Y	Y	XX-85-027-X04	SS	MATERIALS PERSONNEL NOT GIVEN AN OPPORTUNITY TO VERIFY WHETHER OR NOT DEFECTIVE MATERIAL HAD BEEN RECEIVED ON SITE FROM A CERTAIN MANUFACTURER. (NAME KNOWN) A REPORT TO KNOXVILLE THAT THE MATERIAL WAS NOT ON SITE WAS MADE WITHOUT INPUT FROM MATERIALS PERSONNEL. NO FURTHER INFORMATION AVAILABLE	1.2.10, 3.10.1 - 3.10.5	
XX-85-068-004	MC	40700	BLN	N	Y	N	Y		SR	BELLEFONTE - CONFLICT BETWEEN DEPARTMENTS (KNOWN) IN VERIFICATION OF MATERIAL DISCREPANCY NONCONFORMANCE REPORTS BEFORE 1985. PROCEDURAL REQUIREMENTS (QCP) WERE NOT FOLLOWED. CI HAS NO FUTHER INFORMATION. NO FOLLOWUP REQUIRED.	1.2.11, 3.11.1 - 3.11.3	IR2

CONCERN NUMBER	CAT	SUB CAT	PLT LOC	B F	B L	S Q	W B	QTC/NSRS INVESTIGATION REPORT	P* S R	CONCERN DESCRIPTION	REFERENCE SECTION #
2850162001	MC	40700	WBN	Y	Y	Y	Y		SS	WATTS BAR NUCLEAR PLANT WAS CONSTRUCTED WITH NON-CODE MATERIALS IN CERTAIN AREAS.	1.2.1, 3.4.1 - 3.4.5

* PSR Code
SS Nuclear Safety Significant
SR Nuclear Safety-Related
NO Not Nuclear Safety-Related

6998T

LIST OF EVALUATORS

WATTS BAR NUCLEAR PLANT ISSUES

- ** Roy E. Grimes, Sr.
- Billy J. Hensley
- Charles W. Hutzler
- Richard A. Proffitt
- Margaret E. Selewski
- Frederick K. Smith
- Michael P. Waycaster
- ** John U. Weishaupt, Jr.

SEQUOYAH NUCLEAR PLANT ISSUES

- ** Roy E. Grimes, Sr.
- ** John U. Weishaupt, Jr.

BELLEFONTE NUCLEAR PLANT ISSUES

- Joseph P. Nieman
- Richard A. Proffitt

BROWNS FERRY NUCLEAR PLANT ISSUES

- Richard A. Proffitt
- Michael P. Waycaster

** NOTE: These evaluators did not totally agree with the contents of this report. The area of disagreement was primarily with respect to corrective actions supplied by line management and subsequently accepted by TVA and ECTG management. Due to this disagreement, these evaluators preferred not to sign the report. (See Report Cover Sheet)

LIST OF EVALUATORS BY ISSUE

- Heat Code as Related to Material Control for Construction

Watts Bar:	Roy E. Grimes, Sr. Billy J. Hensley Richard A. Proffitt Frederick K. Smith Michael P. Waycaster John U. Weishaupt, Jr.
Sequoyah:	Roy E. Grimes, Sr. John U. Weishaupt, Jr.
Bellefonte:	Joseph P. Nieman Richard A. Proffitt
Browns Ferry:	Richard A. Proffitt Michael P. Waycaster

- Heat Code as Related to Material Control for Nuclear Power

Watts Bar:	Roy E. Grimes, Sr. Charles W. Hutzler Frederick K. Smith Michael P. Waycaster John U. Weishaupt, Jr.
Sequoyah:	Roy E. Grimes, Sr. John U. Weishaupt, Jr.
Bellefonte:	Joseph P. Nieman Richard A. Proffitt
Browns Ferry:	Richard A. Proffitt Michael P. Waycaster

- Changed Heat Numbers

Watts Bar: John U. Weishaupt, Jr.

- Use of Non-Code Material

Evaluations were based upon the evaluations for "Heat Code as Related to Material Control for Construction and for Nuclear Power" and "Material Upgrading/Reclassification." The evaluators for this issue are those listed in the other three issues.

- Material Upgrading

  Watts Bar: Joseph P. Nieman
  Richard A. Proffitt
  John U. Weishaupt, Jr.

  Bellefonte: Joseph P. Nieman
  Richard A. Proffitt

- Unvalidated Heat Numbers for Structural Steel

  Watts Bar: Roy E. Grimes, Sr.
  John U. Weishaupt, Jr.

  Sequoyah: Roy E. Grimes, Sr.
  John U. Weishaupt, Jr.

- Material Received by Inappropriate Personnel

  Watts Bar: John U. Weishaupt, Jr.

- Warehouse Access

  Watts Bar: John U. Weishaupt, Jr.

- Verification of Material Discrepancy

  Watts Bar: John U. Weishaupt, Jr.

  Bellefonte: Joseph P. Nieman

- Material Personnel - Search for Defective Material

  Watts Bar: John U. Weishaupt, Jr.

  Sequoyah: Roy E. Grimes, Sr.
  John U. Weishaupt, Jr.

- Procedural Control for Issued Instrumentation

  Watts Bar: Margaret E. Selewski
  Michael P. Waycaster

- Control of NDE Material

  Bellefonte: Joseph P. Nieman

List of Concerns By Issue

Issue 1.2.1 - Heat Code as Related to Material Control for Construction

Concern Numbers IN-85-338-006
IN-85-545-X07
IN-85-825-001
WI-85-008-002
XX-85-027-X02

Issue 1.2.2 - Heat Code as Related to Material Control for Nuclear Power

Concern Numbers EX-85-023-001
IN-85-660-001
IN-85-825-001

Issue 1.2.3 - Changed Heat Numbers

Concern Number WI-85-091-010

Issue 1.2.4 - Use of Non-Code Material

Concern Number 2850162001

Issue 1.2.5 - Material Upgrading/Reclassification

Concern Numbers IN-85-012-001
IN-85-493-003

Issue 1.2.6 - Unvalidated Heat Numbers for Structural Steel

Concern Number XX-85-027-X02

Issue 1.2.7 - Material Received by Inappropriate Personnel

Concern Numbers BFN-85-008-001
IN-85-988-001

Issue 1.2.8 - Warehouse Access

Concern Number IN-85-369-005

Issue 1.2.9 - Verification of Material Discrepancy

Concern Number XX-85-068-004

Issue 1.2.10 - Material Personnel - Search for Defective Material

Concern Number XX-85-027-X04

Issue 1.2.11 - Procedural Control for Issued Instrumentation

Concern Number WBN-223

Issue 1.2.12 - Control of NDE Material

Concern Number BNPQCP 10.35-2