

EMPLOYEE CONCERNS SPECIAL PROGRAM

VOLUME 2
ENGINEERING CATEGORY

SUBCATEGORY REPORT 24500
INCORPORATION OF REQUIREMENTS, COMMITMENTS,
AND EXPERIENCE IN DESIGN

UPDATED

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SPECIAL PROGRAM

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REASON FOR REVISION:

1. Revised to incorporate SRP and TAS comments on Rev. 0 (07/02/87), and BFN and BLN corrective action plans.
2. Revised to incorporate SRP and TAS comments on Rev. 1 (08/06/87), and BFN corrective action plans.
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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
CHTR	Certified Material Test Report
COC	Certificate of Conformance/Compliance
DCR	Design Change Request
DNC	Division of Nuclear Construction (see also NU CON)

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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

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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
TVILC	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

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1. INTRODUCTION

Subcategory Report 24500 evaluates the results of 37 ECSP element evaluations. Within these elements, 49 issues were derived from a total of 45 employee concerns that cite perceived deficiencies in the design procedures, design criteria, engineering documentation, and the effective feedback of industry and TVA nuclear experience, as well as the as-built configuration documentation of plant facilities.

The employee concerns, which provide the bases for the element evaluations, are given in Attachment A. The plant location where the concern was originally identified and the concern applicability to the other plants are also identified. Because these element evaluations treat similar elements, they have been combined into one subcategory report. The tabular material in Table 1 and Table 3 is presented in numerical order according to element number. The tabular information in Attachment B is presented in numerical order by element number and then by plant.

Revision 8 of TVA Topical Report TVA-TR75-1A, which is the Quality Assurance Program Description for the Design, Construction, and Operation of TVA Nuclear Power Plants, was the revision available when the element evaluations for this subcategory were written. Revision 9 of the Topical Report has been assessed, but does not alter the findings and conclusions of these evaluation.

The evaluations are summarized in the balance of this report as follows:

- o Section 2 -- summarizes, by element, the issues stated or implied in the employee concerns and addresses the determination of their generic applicability
- o Section 3 -- outlines the process followed for the element and subcategory evaluations and cites documents reviewed
- o Section 4 -- summarizes the findings by element and identifies the negative findings that must be resolved
- o Section 5 -- highlights the corrective actions required for resolution of the negative findings cited in Section 4 and relates them to each element and to each plant site
- o Section 6 -- identifies causes of the negative findings
- o Section 7 -- assesses the significance of the negative findings

- o Attachment A -- lists, by element, each employee concern evaluated in the subcategory. The concern number is given along with notation of any other subcategory with which the concern is shared and the plant sites to which it could be applicable. The concern is quoted as received by TVA, and is characterized as safety related (SR), safety significant (SS), or not safety related (NO).
- o Attachment B -- contains a summary of the element-level evaluations. Each issue is listed, by element number and plant, along with its corresponding findings and corrective actions. The reader may trace a concern from Attachment A to an issue in Attachment B by using the element number and applicable plant. The reader may relate a corrective action description in Attachment B to causes and significance in Table 3 by using the CATD number which appears in Attachment B in parentheses at the end of the corrective action description.

The term "Peripheral finding" in the issue column refers to a finding that occurred during the course of evaluating a concern but did not stem directly from a employee concern. These are classified as finding class "E" in Tables 1 and 2 of this report

- o Attachment C -- lists the references cited in the text

2. SUMMARY OF ISSUES/GENERIC APPLICABILITY

The employee concerns listed in Attachment A for each element and plant have been examined, and the potential problems raised by the concerns have been identified as 49 separate issues. These issues, which are related to the engineering design process, are addressed in 37 separate element evaluations.

Many of these issues were discussed in more detail during an NRC interview (Ref. 228) with one of the concerned individuals. This interview did not alter the more broadly stated concerns or the issues derived from them.

Some of the individual elements were combined with others at certain plants to facilitate evaluation, review, and preparation of corrective action plans. For example, elements 201.3, 201.4, 213.3, and 213.4 had separate element evaluations for SQN, while they were all combined and addressed under element evaluation 201.3 for WBN, and under 201.3 and 201.4 for the other two plants. Refer to Table 1 of this report for a description of which element evaluations addressed each of the elements at each of the plants.

Four of the elements (201.8, 203.1, 203.4, and 207.1), containing 22 employee concerns, were evaluated only for WBN since the concerns contained in the elements were determined to be site-specific to WBN and not generically applicable to all four nuclear plants. These concerns were raised at WBN and were related to WBN site-specific organizations, components, procedures, or situations as noted in the following paragraphs.

2.1 Generic Applicability

Element 201.8

Concerns IN-85-545-X09 and IN-85-545-005 dealt with ASME code requirements for N-5 data packages specific to WBN.

Element 203.1

Concerns IN-85-911-002, IN-85-768-002, XX-85-006-001, WI-85-091-004, IN-85-245-006, IN-85-283-004, IN-85-389-001, IN-85-533-005, and IN-86-205-005 pertained to design problems and design changes made at SQN not being corrected at WBN in a timely manner. SQN and WBN are the only two TVA plants with basically the same design.

Element 203.4

Concerns IN-85-397-003, IN-85-217-001, IN-85-354-001, IN-85-644-002, and EX-85-002-002 dealt with specific instrumentation, piping, and hanger design or installation differences between unit 1 and unit 2 at WBN.

Element 207.1

Concerns IN-85-630-003, IN-85-630-004, and IN-85-877-001 pertained to problems specifically identified in NCRs for the mortar lining of the emergency raw cooling water (ERCW) piping at WBN. Concerns IN-85-134-005 and IN-85-010-001 dealt with resolution of NCRs at WBN which implied that engineering personnel at WBN would continually override QC inspector rejections of conduit hangers and other constructions items.

General

Two of the employee concerns in this subcategory (IN-85-143-004 and ECTG-4) were so broadly stated that it was determined that they should be addressed at the subcategory level rather than at the element level. Element evaluations were not prepared for these two concerns as noted in Attachment A to this report. IN-85-143-004 is addressed as part of element 207.2, and ECTG-4 is addressed as part of element 203.1, in this subcategory report.

2.2 Summary of Issues

The issues examined have been paraphrased and summarized as described below. (A complete statement of each issue is provided in Attachment 3.)

- o 201.1, Regulatory Requirements (Regulatory Guides, NUREGs, Bulletins, etc.) (all plants) - TVA personnel generally lacked knowledge of regulatory guides, NUREGs, OIE Bulletins and Notices, and industry positions on regulations. Regulatory guides, NUREGs, and OIE Bulletins and Notices were ignored and violated to a large degree by TVA personnel.

- o 201.3, Design Criteria (all plants) - Engineering design criteria were sometimes nonexistent or incomplete, were vague, or were inadequate to form a basis for design.

Many design criteria were changed late in the project.

Design criteria were established and subsequently inactivated, and cannot now be retrieved for use as basis for modifying the original design.

- o 201.4, Standards and Guides (all plants) - Engineering design guides and standards were inadequate, were misused, were optional to designers, were not referenced or excerpted as requirements on drawings, or were not incorporated into design criteria as requirements on a mandatory basis.

The Engineering Branch changed TVA standards after the job was complete, perhaps because the completed job did not meet the original standard.

Electrical and other Engineering Branch design documents and procedures did not include IEEE and other industry standards requirements; therefore, numerous problems could result.

- o 201.5, Tracking of Commitments and Design Changes (all plants) - There was a lack of adequate tracking for EN DES (TVA) commitments.

TVA did not keep licensing documents - i.e., the Final Safety Analysis Report (FSAR) - current, including indicating the addition of a new diesel generator.

- o 201.6, Traceability of Design Requirements (all plants) - Inadequate control of design calculations adversely affected traceability of design requirements.

Design requirements, and the basis of determining design requirements, were not readily available.

- o 201.8, Code Requirements (WBN only) - Code requirements for the Watts Bar (WBN) N-5 program were far less stringent than for Bellefonte (BLN).
- o 203.1, Sequoyah Design Errors at WBNP (WBN only) - When TVA engineering and management are aware of a design defect in a system in one plant, they fail to advise other plants that have identical systems, resulting in unnecessary rework later.
- o 203.3, Experience Feedback Not Properly Utilized (all plants) - There was no formal system to track and assign commitments for problems identified by INPO; there was poor tracking of NRC experience information; there were no forced interactions with other utilities for exchange of information, and there was poor feedback to Engineering of corrections for identified problems.
- o 203.4, Change Incorporation and Retrofit Between Units Lacking (WBN only) - Design changes were made to one unit without being incorporated into the other unit in a timely manner, or at all (WBN only).

Unit 1 condensate pots may have been incorrectly installed and not checked; some were up to 90 feet from their corresponding root valve (WBN only).

The various TVA nuclear plants are all designed differently and the resulting increased cost to the rate payers is senseless (all plants).

- o 207.1, Engineering Acceptance of Rejected Work (WBN only) - TVA engineering and management overruled the inspectors by accepting subcontract work which had been rejected by Quality Control, and then failed to properly document and process disposition for the nonconforming condition reports (NCR).
- o 207.2, Safety and Licensing Evaluations (all plants) - Safety and licensing evaluations by EN DES (including Nuclear Engineering Branch) were inadequate and in a cover-up mode. Engineering and design personnel will cause a cover-up of problems with paper work.

- o 207.4, CAQ Documentation (all plants) - The existing practice for the approval of condition adverse to quality (CAQ) documentation (problem identification reports and significant condition reports) hindered TVA employees in reporting CAQs because there was no "appeal" process.
- o 213.3, Inadequate Electrical Design Criteria (all plants) - Electrical design criteria are nonexistent and inadequate to form a basis for design (SQN).

Standards and guides are not incorporated into the electrical design criteria (SQN).
- o 213.4, Electrical Procedures Do Not Properly Identify IEEE Standards (all plants) - Electrical design documents and procedures do not include IEEE standards and other industry standards requirements; therefore, numerous problems may result (SQN).

3. EVALUATION PROCESS

This subcategory report is based on the information contained in the applicable element evaluations prepared to address the specific employee concerns related to those issues summarized in Section 2.

The element and subcategory evaluation processes are discussed below. References are listed in Attachment C.

3.1 Element Evaluation Process

The steps listed below were followed to evaluate issues for each of the element evaluations.

- a. Defined issues for each element from the employee concerns. Attachment A of this report lists the employee concerns addressed in this subcategory report.
- b. Reviewed regulatory documents (Refs. 1 through 13), industry standards (Refs. 14 through 21), NRC/AEC reports (Refs. 22 through 24), TVA commitments (Refs. 25 through 32 and 107), and design criteria (Refs. 163 through 174) to develop an understanding of the requirements, commitments, traceability, methods, and experience feedback into design.

- c. Reviewed available transcript of NRC investigative interview (Ref. 228) to gain additional information regarding concerns.
- d. Reviewed TVA documents such as Nuclear Performance Plans (NPPs) (Refs. 34 through 37); Quality Assurance Programs and Instructions (Refs. 33, 38 through 48, 64, and 81); Project Manuals (Refs. 49 through 54, 175, and 176); Verification Programs (55 through 58); and Standard Practices, Reports, and Plans (Refs. 82 through 162) to establish the responsibilities and practices related to the issues.
- e. Reviewed engineering department procedures (Refs. 59 through 80) that establish design process, design inputs for commitments/requirements, use of design standards and guides, design criteria, traceability of design requirements, experience feedback, design change control, safety and licensing evaluations, and CAQ documentation requirements.
- f. Reviewed TVA/NRC correspondence (letters and memorandums, Refs. 229 through 509) to gain additional information related to the concerns (Attachment A) and issues (Attachment B).

Additional steps listed below were followed to evaluate the specific elements noted.

- g. For elements 201.1, 201.3, 213.3, and 213.4, reviewed a sample of design criteria (Refs. 163 through 174) for reference to, adoption of, or compliance with design standards and/or guides.
- h. For elements 201.3, 201.4, and 213.4, reviewed a sample of drawings (Refs. 177 and 181 through 184) against design requirements, and for use of design standards and guides.
- i. For element 201.5, reviewed documents (Refs. 71, 72, 73, 160, and 161) for issues related to the commitment tracking system.
- j. For element 201.6, reviewed procedures (Refs. 59, 60, and 61), DBVP programs (Refs. 55 through 58), TVA reports (Refs. 83 and 97) and letter (Ref. 367) to evaluate issues related to the traceability of design.
- k. For element 201.8, reviewed ASME codes (Refs. 20 and 21) and TVA memoranda (Refs. 329 and 330) for issues related to the ASME Section III Code Data Report Form N-5.

- l. For element 203.1, reviewed engineering procedure NEP-9.1 (Ref. 61), and NPPs (Refs. 34 through 37) and sample of design drawings (Ref. 178) for issues related to communication of required changes at one construction site to other construction sites of similar design.
- m. For element 203.3, reviewed various documents (Refs. 66, 67, 69, 70, 86, and 314) for issues related to the proper utilization of experience feedback.
- n. For element 203.4, reviewed instrument drawings (Ref. 179), field change requests (Ref. 212), and change control procedures (Refs. 60 and 61) for issues related to change incorporation and lack of retrofit between units.
- o. For element 207.1, reviewed NSRS and NCR reports (Refs. 118 through 129) to evaluate the issue of "use-as-is" or "repair."
- p. For element 207.2, reviewed sample of safety and licensing evaluation packages (Refs. 194 through 227) to determine compliance with procedures and appropriateness of content.
- q. For element 207.4, reviewed procedures (Refs. 59, 60, 61, and 75) and results of the INPO evaluation (Ref. 366) to address the issue related to Conditions Adverse to Quality (CAQ).

Using the results of the element evaluation process, the issues were evaluated for the element and the findings and corrective actions were documented.

3.2 Subcategory Evaluation Process

Subsequent to the element evaluation process, the steps listed below were followed for preparing this subcategory report.

- a. Tabulated all the concerns addressed by this subcategory report in Attachment A.
- b. Tabulated issues, findings, and corrective actions from the element evaluations in a plant-by-plant arrangement (see Attachment B).
- c. Prepared Tables 1, 2, and 3 in this subcategory report to permit comparison and identification of common and unique issues, findings, and corrective actions among the four plants.

- d. Classified the findings and corrective actions from the element evaluations using the ECSP definitions.
- e. On the basis of ECSP guidelines, analyzed the collective significance and causes of the findings from the element evaluations.
- f. Evaluated corrective actions to determine if additional actions are required as a result of causes found in step 'e' of this section.
- g. Provided additional judgments and/or information that may not have been apparent at the element level.

4. FINDINGS

The full text of the findings from each of the 37 element evaluations is stated in Attachment B, listed by element number and plant.

The findings (including validity of the issues) within each of the elements are summarized in the following paragraphs. Minimum discussion is devoted to those findings for which no corrective action is required, such as cases where the allegations were not substantiated by the evaluation, or cases in which the allegations were found to be true but the consequences acceptable.

4.1 Element 201.1 - Regulatory Requirements (Regulatory Guides, NUREGs, Bulletins, etc.)

4.1.1 Element 201.1 - Issue "a" for SQN, WBN, BFN, and BLN

Issue: There is a general lack of knowledge of Regulatory Guides, NUREGs, and Inspection and Enforcement (IE) Bulletins and Notices on part of TVA personnel.

Findings. The findings stated here are applicable to all four plants. The evaluation team reviewed the Systematic Assessment of Licensee Performance (SALP) Board reports that cover TVA operations for the period from 07/01/80 through 05/31/85 (Refs. 236, 237, 238, 241, and 266). In these reports the NRC states that ". . . the licensee is familiar with NRC regulations, guides, generic issues and NRC staff positions." In the SALP reports, the NRC did not identify any weaknesses that can be attributed to a general lack of knowledge of regulatory requirements or commitments.

The evaluation team also reviewed licensing commitment documents (Refs. 25 through 33), design input documents (Refs. 163, 167, 169, and 173), engineering procedures (Refs. 59, 60, and 61), design verification programs (Refs. 55 through 58), Nuclear Performance Plans (Refs. 34 through 37), and a topical report (Ref. 33) to address the issue.

Interviews and discussions (Ref. 502) were also conducted with TVA personnel.

The evaluation team found no evidence to support the allegation that there is a general lack of knowledge of Regulatory Guides, NUREGs, and Office of Inspection and Enforcement (OIE) Bulletins and Notices on the part of TVA personnel.

The issue is not valid.

4.1.2 Element 201.1 - Issue "b" for SQN, WBN, BFN, and BLN

Issue: Regulatory Guides have been ignored and have been violated to a large degree.

Findings. The findings discussed here are applicable to all four plants unless stated otherwise. A review of various reports and documents as stated in Section 4.1.1 did not reveal any weaknesses that can be attributed to intentionally ignoring or violating Regulatory Guides.

The evaluation team reviewed the NRC Safety Evaluation Reports (SERs) and supplements for WBN units 1 and 2 (Ref. 24a); BFN units 1, 2, and 3 (Ref. 24); and BLN units 1 and 2 (Ref. 23). The NRC staff found that these facilities could be or were designed to meet the requirements of the General Design Criteria (GDC) of Appendix A to 10 CFR Part 50, subject to certain additional requirements in the case of WBN.

The SER for WBN identified two items of noncompliance with regulatory requirements. One item (open item 12) related to the Fire Protection Program not meeting the technical requirements of 10 CFR 50, Appendix R. The second item (open item 14) noted that the diesel generator auxiliary system did not conform to ANSI N195 and Regulatory Guide 1.137. These items are being monitored by the NRC for resolution.

For SQN, the SALP Board's evaluation in the area of fire protection and Appendix R requirements found four items that could be attributed to omission of required features by the Engineering organization. These items were identified as one violation for several discrepancies of not meeting requirements of Appendix R, of which three could be attributed to engineering.

TVA also conducted an Appendix R reevaluation program, which found 121 safe shutdown system/cable interaction discrepancies at SQN.

The evaluation team reviewed Institute of Nuclear Power Operations (INPO) reports on the evaluation of WBN (Ref. 152), BFN (Ref. 155), and BLN (Ref. 157). Except for Watts Bar, these reports did not identify any conditions that would validate the issues addressed in this section.

With respect to BFN, the NRC identified weaknesses in several areas regarding responses to regulatory guides. As a result, TVA developed a BFN Regulatory Performance Improvement Program (RPIP) to improve performance in these areas, which included compliance with regulatory requirements. The NRC later issued a Confirmatory Order on 09/13/84 (Ref. 244) to ensure expeditious implementation of the RPIP. The final SALP report (Ref. 243) stated that the RPIP had not been effective and that regulatory problems persisted.

A sampling of five Quality Management Staff (QMS) audit reports that include NRC commitments in the audit scope was reviewed (Refs. 402, 403, 404, 405, and 451). These reports did not identify any deficiencies in the area of compliance with commitments to the NRC, except for the following suggested area for improvement in one report (Ref. 405):

"During the audit, the audit team was unable to determine who in [Mechanical Engineering Branch] MEB is responsible for proper routing of newly issued and revised regulatory guides and increased TVA commitments to them. There appears to be no clear method by which MEB ensures that design criteria under MEB revision control are reviewed against the above-mentioned types of regulatory guides to determine if the change in commitment requires a revision to the design criteria."

The Nuclear Safety Review Staff (NSRS) report on the management review of the Office of Engineering Design and Construction (OEDC) (Ref. 437) was reviewed by the evaluation team. In this report, NSRS identified several areas that needed improvement and made certain recommendations, including the following:

"Management should develop and issue commitment sheets for relevant guides and standards in accordance with referenced procedures."

"NSRS recommends that EN OES devise and implement a method of documenting the complete and up-to-date design bases for each safety-related system for the life of the nuclear plant:"

Regulatory Guides provide guidance for licensees and do not define a regulation unless they are imposed by a requirement document or TVA has formally committed to them.

In the evaluation team review, no evidence was found that regulations or requirements were intentionally ignored or violated. However, evidence was found to indicate that some regulatory requirements and commitments were not fully complied with or not completed in an appropriate period of time.

The issue is not valid.

4.1.3 Element 201.1 - Issue "c" for SQN, WBN, BFN, and BLN

Issue: NUREGs have been ignored and have been violated to a large degree.

Findings: The findings stated here are applicable to all four plants unless stated otherwise. A review of SALP reports and other documents, as stated in Section 4.1.1 above, did not reveal any weaknesses that can be attributed to intentionally ignoring or violating NUREGs requirements or licensing commitments.

The evaluation team also reviewed a sample of 14 NRC Inspection Reports (Refs. 235, 242, 244, 254, 259, 260, 261, 263, 268, and 269). These reports did not identify any violations that could be attributed to Engineering having violated or ignored a requirement.

The Independent Design Verification Program conducted by Black and Veatch at WBN identified a finding where "equipment cannot be determined to be environmentally qualified to NUREG-0588." However, NSRS Report R-84-19-WBN agrees with the TVA task force assessment of this finding that "TVA already had a program in place which could have reasonably been expected to correct the problems." The evaluation team review found that the WBN environmental qualification program is being implemented, as discussed in Subcategory Report 21000.

Some NUREGs provide guidance for licensees and do not define requirements unless the NUREGs are included in an NRC "show cause" order, letter, or other form of licensing commitment. Therefore, in this context, they cannot be violated. Most NUREGs also allow alternative approaches as long as deviations are identified and justified.

No evidence was found to indicate that applicable NUREGs that have been committed to were ignored or violated.

The issue is not valid.

4.1.4 Element 201.1 - Issue "d" for SQN, WBN, BFN, and BLN

Issue: IE Bulletins and Notices have been ignored and have been violated to a large degree.

Findings: The findings stated here are applicable to all four plants. TVA's evaluation of five OIE Bulletins and OIE Information Notices relating to electrical penetration assemblies was observed to be satisfactory based on the review of documented evaluation results (Refs. 280, 306, 307, 352, and 458).

Currently, OIE Bulletins are reviewed by the Licensing staff, and OIE Notices are reviewed and tracked by TVA in the Nuclear Experience Review (NER) Program, as discussed in element evaluation 203.3. TVA commitments to the NRC from the review of these OIE documents are tracked by the Corporate Commitment Tracking System (CCTS), as addressed in the evaluation of element 201.5.

The evaluation team reviewed other documents as listed in Sections 4.1.1 and 4.1.3 above and did not identify any weaknesses that can be attributed to intentionally ignoring OIE Bulletin and Notices.

OIE Bulletins reflect NRC staff positions which, unless complied with or a satisfactory alternative is offered, could be imposed by a formal requirement. OIE Bulletins require a formal response. OIE Notices are issued by NRC to give early notification of possible applicability, but no feedback to the NRC is requested. Because neither OIE Bulletins nor Notices are regulations, they cannot be violated.

Evidence was found to indicate that some TVA responses to OIE Bulletins were both late and partially incomplete, but no evidence was found to substantiate the allegation that this was intentional and that such documentation was ignored or violated on a large scale.

The issue is not valid.

4.1.5 Element 201.1 - Issue "e" for SON, WBN, BFN, and BLN

Issue: There is a lack of knowledge of industry positions on regulations on the part of TVA personnel.

Findings: The findings stated here are applicable to all four plants. Documentation was examined (Refs. 314, 333, and 426) to determine the extent of TVA involvement with others in the industry regarding establishing and discussing industry positions on regulations and requirements published by NRC. Approximately 490 individuals representing TVA are on 62 professional society and industry committees, subcommittees, owners groups, and working groups. Interviews and discussions with TVA personnel (Ref. 502) were also conducted on this subject. Sufficient information was provided to the evaluation team to indicate substantial TVA participation in this area.

There is evidence of TVA participation in related professional society (e.g., ASME, IEEE) activities during the design and construction phases of the four nuclear plants. Involvement in various committees and subcommittees was at both chairperson and lower levels.

TVA has participated in NISS Owners Group activities since the mid-1970s, becoming more active following issuance of NUREG-0737 in 1980. Again, participation in committee work was at both chairperson and lower levels. Participation with other utilities (e.g., Duke Power) and other industry groups (e.g., EPRI) was also noted.

The evaluation team found no evidence of a general lack of knowledge of industry positions on regulations.

The issue is not valid.

4.2 Element 201.3 - Design Criteria

4.2.1 Element 201.1 - Issue "a" for SQN, WBN, BFN, and BLN

Issue: Electrical and other engineering design criteria are not always complete, are vague, and are inadequate to form a basis for design. (Also addressed as issue "c" in element evaluation 213.3 for SQN, as shown in Attachment B)

Findings: The issue that some electrical and other engineering design criteria were generally inadequate is not valid for those design criteria documents reviewed by the evaluation team. Review of existing design criteria issued by the electrical, nuclear, mechanical, and civil branches revealed that the design criteria are, in general, complete, comprehensive, and adequate to form a basis of design for the systems covered by these criteria.

However, some discrepancies in specific electrical design criteria were noted at all four plants, as shown in Attachment B. Additionally, some criteria have been listed in the Design Criteria Manual Indices, but have not been issued.

The more significant problem with design criteria in the past was that many needed ones did not exist. This subject is addressed in Section 4.2.3 of this report.

TVA Engineering Procedure EN DES-EP 3.01 (Ref. 59), Design Criteria Documents - Preparation, Review and Approval, RO (07/12/74), was issued to govern the preparation of design criteria for all nuclear plants. The initial issue of EN DES-EP 3.01 endorses ANSI N45.2.11 (Ref. 17). However, TVA did not actually commit to comply with ANSI N45.2.11 until 06/76.

With the issuance of Office of Engineering Procedure OEP-06 (Ref. 60), "Design Input," which superseded EN-DES-EP 3.01 in 06/85, all TVA plants were required to generate design criteria documents. Finally, OEP-06 was replaced by Nuclear Engineering Procedure NEP-3.2 (Ref. 61), "Design Input," which maintained the same requirement. This procedure is currently in force and applicable to all TVA nuclear plants.

EN DES-EP 3.01, OEP-06, and NEP-3.2 identify design criteria as design input. The specifics as to preparation are quite detailed, including requirements for preparation, review, approval, revision, and ample guidance in the form of

attachments to the procedure. Therefore, from a procedural standpoint, the essentials have been and are in place to eliminate vagueness and to ensure completeness and adequacy.

The evaluation team reviewed in detail samples of design criteria from each nuclear facility (Refs. 164 through 174). Regulatory Guide 1.64 (Ref. 11) and engineering procedures (Refs. 59, 60, and 61) were used as the acceptance basis. On the basis of the review by the evaluation team, the existing BLN, WBN, and BFN design criteria reviewed were generally found to be complete, comprehensive, and adequate to form a basis of design for systems covered by these criteria. Also, the reviewed design criteria do include references to applicable discipline design standards and guides.

Discrepancies are documented under element 201.3 findings in Attachment B.

4.2.2 Element 201.1 - Issue "b" for SQN, WBN, BFN, and BLN

Issue: Many design criteria are changed late in the project.

Findings: These findings apply to all four plants unless noted otherwise. Design criteria are considered by TVA to be design input documents. Design input constitutes design requirements that govern the design of all structures, systems, and components. Design criteria are currently addressed by procedure NEP-3.2 (Ref. 61).

NEP-3.2 states that "changes to design input will be evaluated and where appropriate will be reflected in revisions to other affected design documents." Corresponding superseded procedures EN DES-EP 3.01 and OEP-06 provided essentially the same guidance.

The TVA SQN Generic Concern Task Force also investigated concern IN-85-886-001. The results of the investigation, issued as Report GCC-16-62 (Ref. 112a) relative to this issue, stated, in part:

"This investigation verified that design/acceptance criteria are still being changed but it failed to substantiate the implication that these changes are unwarranted . . ."

The issue that some design criteria were changed late in the project is valid; however, it is not a problem. Changes are made, when needed and justified, to incorporate design modifications and new regulatory requirements, correct a deficiency, or for other reasons. Appropriate engineering procedures (Refs. 59, 60, and 61) were and are in place, and were followed when making necessary changes noted in this report.

4.2.3 Element 201.1 - Issue "c" for SQN, WBN, BFN, and BLN

Issue: Some engineering design criteria are nonexistent. (Also addressed as issue "b" in element evaluation 213.3 for SQN, as shown in Attachment B)

Findings. Procedure NEP-3.2, Section 2.0, Policy, states in part:

"Design criteria documents will be prepared for all designs and will identify the effective revision of all design inputs and the portions of each design input that are applicable to each design."

In the case of BFN, the review revealed that most of the needed mechanical and electrical design criteria do not yet exist. The evaluation team established that only three mechanical and four electrical design criteria are listed in the index. In addition, out of four electrical design criteria listed, only two criteria have been issued.

The evaluation team does not have access to a list of criteria to be prepared as part of the unit 2 post-restart effort at BFN to enable it to determine if any of these criteria are on that list. These listed criteria should be on either the pre-restart list or post-restart list.

In the case of SQN, the nonexistence of some design criteria was noted in discussions with personnel in EEB (Ref. 504) as well as in discussions at the SQN jobsite (Ref. 509). The nonexistence of specific EEB design criteria is addressed in the Sequoyah evaluation of element 213.3.

Conclusions of the TVA SQN Generic Concern Task Investigation of concern IN-85-886-001, Report GCC-20-66, relative to this issue stated, in part:

"This investigation verified that there were design criteria which are needed and do not exist. In particular the design criteria for seismic hangers is scheduled to be issued for SQN by May 30, 1986. There was [sic] identified ten other design criteria in various stages of preparation of SQN."

The Gilbert/Commonwealth Report 2614 (Ref. 96) in subsection 3.1.1.3, "Previously Identified Issues," stated in part:

"The review team found that some documentation of original design bases was either not readily available or nonexistent."

It was also confirmed that corrective action to develop needed design criteria, where missing, is under way as required to support SQN restart.

The review revealed that some needed design criteria did not exist; therefore, the issue is valid. Moreover, some design criteria, suggested by the evaluation team as possible requirements, could not be identified in the Design Criteria Manual Indices as being required for WBN, BLN, SQN, and BFN design. More detail is provided in Attachment B.

4.2.4 Element 201.1 - Issue "d" for SQN, WBN, BFN, and BLN

Issue: Many design criteria were set up, then inactivated, and cannot be retrieved for use as a basis for modification of the original design.

Findings. These findings apply to all four plants unless noted otherwise. The issue that some design criteria were inactivated is valid. The review revealed that design criteria were inactivated through proper memoranda from different engineering branches.

Inactivation of design criteria was first addressed in EN DES-EP 3.01, R4 (11/19/80). Subsection 10.2 states that design criteria may be inactivated in the following situations:

- "a. After approval of the system preoperational test (EN DES-EP 6.01) or post modification test and before the design project is disbanded (for design criteria controlling initial plant design and not modifications), or
- "b. If the entire system is replaced by a different system in the plant design."

Revision 6 of EP 3.01 (05/22/84) changed this section to read:

"Design criteria may be inactivated only when the entire subject system, structure, or component has been deleted from the plant design or permanently removed from operation at the plant site."

The current procedure NEP-3.2, Section 2.0, Policy, states, in part:

"Design criteria documents may be inactivated only when the entire subject system, structure, or component has been deleted from the plant design or permanently removed from operation at the plant. Design requirements in the design criteria may be incorporated in a system description or design basis document (DBD).

"Exception to design criteria documents may be taken if they are technically justifiable and are documented in accordance with this procedure."

In a discussion at the Sequoyah jobsite (Ref. 504) it was indicated that design criteria were also inactivated when construction was completed and the system was put into operation. This practice was based on the rationale that all of the necessary information was contained in design output documents. The reason given for inactivating the design criteria was to cut down on surplus documentation, and retain only documentation needed to support the operating plant. This statement confirms the discussion on page 178 of the transcript of NRC investigative interview (Ref. 228). As noted earlier there was a time between 1980 and 1984 when such inactivation was allowed by procedure.

It is true that many design criteria were set up and then inactivated. However, Engineering has initiated restoration of these criteria through the Design Baseline and Verification Program (DBVP). It will be necessary to update these criteria, however, before they can be reissued.

4.3 Element 201.4 - Standards and Guides

4.3.1 Element 201.1 - Issues "a," "b," and "c" for SQN, BFN, and BLN; Issue "f" for WBN

Issue: Electrical and other Engineering Standards and guides are treated as guides only (e.g. they are utilized only when designers want to use them) and are not incorporated in Design Criteria as requirements on a mandatory basis. TVA Design Guides and Standards are inadequate in many areas. There are misuses of TVA design guides and standards, such as applicable parts not referenced or excerpted as requirements. (Also addressed as issue "a" in element evaluation 213.3 for SQN, as shown in Attachment B)

Findings. The findings apply to all four plants unless noted otherwise. The treatment of TVA standards as guides is not permitted by engineering procedures. However, in view of the lack of any specifics to examine, this issue cannot be substantiated. Lack of compliance with procedures as implied on page 122 of the transcript of NRC investigative interview (Ref. 228) was documented by TVA Quality Assurance as part of its surveillance program.

The issue of standards and guides was reviewed in discussions with evaluation team members of the various disciplines. Some inadequacies of TVA standards and guides were identified in Subcategory Reports 26500 and 26600.

An appropriate number of typical drawings was examined for SQN, BFN, and BLN to evaluate the issue that design guides and design standards are not referenced or excerpted as requirements on drawings. Only one drawing was found that referenced a design standard. A more common practice is to

reference design criteria and construction specifications on the drawings. In turn, the design criteria and construction specifications reference design standards and guides. Thus, design guides and standards are not normally referenced directly on drawings.

The allegation that engineering design guides are treated as guides is a true statement. Procedures allow engineers who use the guides to determine the extent to which the guides are used.

To determine whether standards and guides were to be incorporated in design criteria, EN DES-EP 4.12 on design guides and design standards was reviewed. Also, EN DES-EP 3.01 on design criteria documents was reviewed. From a procedural standpoint, design standards are to be incorporated into design criteria whenever they apply. Design guides are incorporated into design criteria as determined by the individual design engineer. An appropriate number of design criteria was reviewed by the evaluation team to determine their use of TVA standards and guides. The review revealed that the design criteria generally do incorporate references to appropriate standards and guides. Also, the review revealed that the design criteria generally do incorporate references to industry standards (e.g., AISC, ASME, IEEE, etc.).

The following conclusions can be drawn from the results of this evaluation:

- a. The issue that design guides are optional to designers is valid, in that it is a true statement.
 - o There are many design standards and design guides as well as standard drawings and typical drawings at TVA.
 - o The use of design guides is optional to designers as defined in TVA procedures.
 - o The optional use of design standards is not permitted by TVA procedure. Design standards must be used where applicable.
 - o Treatment of Engineering standards as guides is not in compliance with TVA procedures.
- b. The issue that design guides and standards are inadequate and misused on a broad scale could not be substantiated. Two cases of design standards and guides being inadequate were identified and are covered in Subcategory Reports 26500 and 26600. No examples of misuse were found.

- c. The issue that design standards and guides are not referenced or excerpted as requirements on drawings is not valid. Design standards and guides are indirectly referenced on drawings by references to design criteria or general construction specifications. The criteria and specifications contain references to the guides and standards.

4.3.2 Element 201.3 - Issue "d" for SQN, BFN, and BLN; Issue "a" for WBN

Issue: Engineering changes TVA standards after the job is complete.

Findings. These findings apply to all four plants unless noted otherwise. One example was found where two electrical standards that required compliance with the National Electrical Code (NEC) were combined and reissued as a design guide. A later challenge by NSRS to convert the guide back to a standard (Ref. 436) had the response from EEB that the guide was generally tutorial and was not suited for conversion to a design standard (Ref. 438).

In a related matter, the TVA Standards Planning and Review Council of the Electrical Engineering Branch (EEB) met on 12/13/85 and agreed that most of the drawings then currently listed as standard drawings were really typical drawings. It was recommended that, of the 33 standard drawings reviewed at the meeting, 12 be incorporated into standard procurement specifications and deleted from standard drawings, 19 be changed to typical, and 2 be deleted. One of the two, however, could possibly be downgraded to typical instead of being deleted at the option of the assigned reviewer (Ref. 412).

OEP-6 and the current procedure NEP-3.2 state:

"Any deviation from the standard design will be handled as a deviation to this procedure."

It is apparent that standards are changed as the need arises, and that there is, and has been, a mechanism in place for such changes. Changes generally are a way of upgrading the standards as experience dictates.

The issue that Engineering changes TVA standards after the job is complete is valid. After the job is complete, engineering changes to TVA standards are allowed by TVA procedure, and changes occur as they are needed and justified.

4.3.3 Element 201.1 - Issues "a" and "e" for SQN, BFN, and 6LN; Issue "h" for WBN

Issue: If TVA electrical procedures do not include IEEE standard requirements or their equivalent, numerous problems can result. (Also addressed as issues "a" and "b" in element evaluation 213.4 for SQN, as shown in Attachment 8)

Findings. A review of the current Nuclear Engineering Procedures (NEPs) indicated that they provide adequate direction for the inclusion of the requirements of industry standards in design documents and procedures for plant modifications. NEP-3.2 (Ref. 61) requires that reference to design inputs, such as codes, standards, and regulations with the applicable issue noted, be included. This NEP specifically requires the identification of "the effective revision of all design inputs and the portions of each design input that are applicable to each design." NEP-5.1 (Ref. 61) requires design output documents to be traceable to their design bases.

The evaluation team reviewed an appropriate number of electrical design criteria and electrical design standards and guides and determined that references to IEEE standards were incorporated. Also, an appropriate number of TVA General Construction Specifications was reviewed and found to contain direct reference to industry standards as well as references to TVA design standards, guides, and drawings. The TVA design documents, in turn, referred to industry standards.

NSRS Report I-85-545-WBN (Ref. 111) and the GCTF Report GCC-19-65 (Ref. 112) discuss the incorporation of industry standards into design documents. Both reports conclude that the required IEEE standards were incorporated properly in electrical design documents. On the basis of the review conducted, the evaluation team concurs with the NSRS and the GCTF reports.

The issue that Electrical and other TVA Engineering Branch procedures do not always include industry standards requirements is valid in that it is a true statement. However, there are exceptions for specific reasons. Usually, industry standards are included in other more appropriate design documents, such as design criteria and construction specifications.

Peripheral Finding "f." The evaluation team noted as an additional finding that an EEB Design Control Process program had been formed to review all electrical design guides and design standards and to recommend deletions, additions, and revisions. This program has not yet been fully implemented.

As a result of the NSRS Report I-85-545-WBN, a TVA Standards Planning and Review Council for the Electrical Engineering Branch (EEB) only, consisting of senior and experienced personnel, was established to review all electrical design standards and guides and recommend deletions, additions, and revisions (Ref. 432). This council program implementation is currently on hold and has been replaced by an EEB Design Control Process program as described in a TVA memo (Ref. 412).

Discipline standards and design guides for other engineering branches are reviewed and updated on an ongoing basis by the individual branches (Ref. 498).

4.4 Element 201.5 - Tracking of Commitments and Design Changes

4.4.1 Element 201.5 - Issue "a" for SQN, WBN, BFN, and BLN

Issue: There is a lack of adequate tracking for EN DES commitments.

Findings. Investigations at Knoxville and at the nuclear plant sites by TVA's Division of Quality Assurance and by INPO reveal that there have been some minor commitment tracking deficiencies since CCTS was implemented. These deficiencies were related primarily to either the absence of completed commitments from, or the status of commitments in, the CCTS data base. As a result, each site plans to enter into the CCTS data base commitments to NRC. The corporate standard for controlling the use of the CCTS has not yet been issued.

A review of the transcript of the NRC interview (Ref. 228) revealed that the concerned individual (CI) specifically emphasized tracking commitments made to the NRC. These commitments are made in licensing documents (final safety analysis report, safety evaluation report, and environmental report) and in separate written and docketed statements of TVA actions taken or to be taken by some future date.

Licensing commitments are contained in the FSAR for each nuclear plant and are controlled by the Nuclear Quality Assurance Manual (Ref. 38). These commitments will be confirmed by the DBVP for SQN, WBN, and BFN (Refs. 55 through 58). In this discussion, "commitments" will refer only to TVA's written and docketed commitments to the NRC that were not made in licensing documents.

In 1984, the resident NRC inspector at WBN found control room related commitments reported as closed (Ref. 22) when, in fact, they were incomplete and, therefore, still open. Subsequent reviews by TVA revealed some similar discrepancies, which were reported under 10 CFR 50.55(e) (Ref. 22a). TVA

determined that the incorrect reporting of commitment status to the NRC was caused by a lack of adequate communication between the Office of Nuclear Power and the Office of Engineering. The completion status of work identified in the WBN commitment tracking records was subsequently reviewed by a sampling program controlled by Special Engineering Procedure OE-SEP 85-01 (Ref. 73). Nonetheless, this incident, coupled with concerns about the control of data coming from several systems tracking NRC commitments, encouraged TVA to develop an integrated data base to track all TVA commitments to the NRC (Ref. 34). The new system is called the Corporate Commitment Tracking System (CCTS), and it was administered by the Director of Nuclear Safety and Licensing. In 09/85, all TVA organizations were directed (Ref. 372) to use the CCTS as the official system for tracking commitments made to the NRC.

The development of the commitment tracking systems used by the Office of Nuclear Power (ONP) is still in progress. In 09/86, the Tracking and Reporting of Open Items (TROI) System was selected for the trending of NRC citations as well as other findings. TVA is considering making the CCTS a subsystem within the TROI System.

The CCTS was specifically reviewed in a recent OA audit performed at the Knoxville and Chattanooga offices and at SQN, BFN, and WBN. The review was documented in OA Report OSS-A-86-0016 (Ref. 446) on 07/25/86. At each site that was audited, the audit team reviewed 50 to 60 examples of TVA commitments that had been transmitted to the NRC for various reasons. All commitments that originated at the sites were found listed in the CCTS data base. However, the audit report identified one deviation from requirements caused by the lack of an upper-tier OA procedure to control the CCTS program. A second deviation identified was the failure of personnel to enter into the CCTS data base those corrective actions that were completed before TVA responded to the NRC citation. The audit team also found two instances where committed corrective actions for WBN had supposedly been completed when in fact they were not.

The issue expressed by this employee concern is valid for WBN, BFN, and BLN in that the commitment tracking systems used by TVA in the past have been inadequate. This issue was not substantiated at SQN.

4.4.2 Element 201.5 - Issue "b" for WBN, BFN, and BLN; Issue "c" for SQN

Issue: TVA adds diesel generators without updating licensing documents.

Findings. FSAR amendments for construction plants are submitted to the NRC by the DNHL when there are significant changes that impact the plant parameters, design, event analysis, TVA or NSSL vendor organizations, or procedures described in the FSAR.

After TVA decided to license the fifth diesel generator at WBN, the DNSL submitted Amendment 57 of the FSAR to the NRC. Amendment 57 described the emergency power system, including the five diesel generators. However, since WBN does not yet have an operating license, annual updating of the FSAR is not required.

A fifth diesel generator has been added at SQN, but the licensing document (FSAR) does not require updating because the DG is not completely incorporated.

The evaluation team found that neither BFN nor BLN has added any additional safety-related diesel generators. The FSARs for both of these plants correctly indicate the number of diesel generators.

The issue is not valid.

4.4.3 Element 201.5 - Issue "c" for WBN and BFN; Issue "d" for SQN

Issue: TVA does not keep licensing documents (i.e., FSAR) current. (Addressed as issue "c" for WBN and BFN, and as issue "d" for SQN, as shown in Attachment B)

Findings. In late 1984, INPO inspected WBN and in 1985 issued an evaluation (Ref. 153) with a finding regarding the FSAR. The INPO report stated that:

"the administrative control of the FSAR needs improvement. Inconsistencies exist between the FSAR and other design documents. In addition, numerous cross-reference discrepancies were noted."

In response to INPO's finding, TVA took several actions to upgrade the WBN FSAR. These programmatic improvements were reflected in subsequent FSAR amendments which made the Watts Bar FSAR more current as well as more accurate. However, there may still be inaccuracies in the FSAR. The WBN Nuclear Performance Plan (WBNPP) (Ref. 36) states that there was a "failure to maintain consistently a documented design basis for the plant and to control consistently the plant's configuration with that basis." Hence, there could be minor disparities between the installed system configurations and the flow diagrams, piping and instrument diagrams, and electrical single line diagrams contained in the FSAR. TVA also recognized similar possibilities at BFN.

In response to 10 CFR 50.71(e), the Browns Ferry FSAR was rewritten and submitted to the NRC on 08/17/82. Thereafter, an annual UFSAR (Ref. 31) was submitted by BFN in July or August of each year (Ref. 501); however, TVA concluded in the BFN Nuclear Performance Plan (BFNPP) (Ref. 37) that the design control process at BFN was inadequate, and, therefore, plant

configuration and additions might not be accurately documented in the FSAR. Deficiencies in the plant flow diagrams, piping and instrument diagrams, and electrical single line diagrams could, in turn, result in errors in the UFSAR. TVA has committed in the BFNPP to accurately document the plant's as-constructed configuration by implementing the Design Baseline and Verification Program (DBVP) (Ref. 449).

In this review the evaluation team did not attempt to determine if all the modifications made at the SQN site have been accurately represented in the FSAR. Instead, it was observed that the potential for this problem has already been recognized within TVA as evidenced by the TVA memo of February 18, 1986 (Ref. 421). In preparing for the 1986 update of the FSAR, the TVA memo pointed out that all modifications made before 1984 may not be accurately reflected in the FSAR, and that a program to evaluate ECNs and their inclusion in the FSAR should be initiated.

Issue "c" was valid for WBN when the concern was submitted. However, TVA has made programmatic improvements to help ensure that the FSAR is amended when significant changes are made. The WBN DBVP now in progress contains provisions for configuration confirmation and for licensing commitment identification that may require revisions to the licensing documents.

Issue "c" is valid for BFN, and issue "d" is valid for SQN. The BFN FSAR had to be rewritten in 1982, and configuration errors may still exist in the UFSAR. BFNPP commitments 53 through 56 indicate that BFN as-built engineering drawings may not accurately reflect the plant configuration. Inaccuracies in the as-built drawings may have been reproduced in the UFSAR for both SQN and BFN.

4.5 Element 201.6 - Traceability of Design Requirements

4.5.1 Element 201.6 - Issue "a" for SQN, WBN, BFN, and BLN

Issue: There is a lack of traceability of design requirements.

Findings. ANSI/ASME NQA-1-1983 (Ref. 19) defines traceability as the ability to trace the history, application, or location of an item and like items or activities by means of recorded identification.

For purposes of discussing the issues, "traceability" will also be taken to mean maintaining records of engineering documents and revisions from basic design through installation (i.e., maintain design input and design output records).

ANSI N45.2.11 mandates relating final design output back to the source of design input and requires traceability documentation. The records requirements of ANSI N45.2.11 and of ANSI N45.2.9 also apply.

The evaluation team was able to retrieve previous drawing revisions. Availability of revised design output documents through the TVA records system provides evidence that design requirements are traceable through the TVA records system.

Regulations, industry codes and standards, etc., are traceable through application in design input documents, such as design criteria documents. These regulations, etc., are used in most of various design criteria in the various design criteria volumes. The Construction Specifications (Refs. 185 through 188) also identify regulations, etc.

Even though TVA engineering procedures generally covered this issue, lack of consistent implementation resulted in a lack of traceability of design requirements and in some design requirements not being readily available. This situation is being corrected by the development of the DBD for all four plants and from the objectives of the Design Baseline and Verification Programs (DBVPs).

The issue is valid.

4.5.2 Element 201.5 - Issue "b" for SON, WBN, BFN, and BLN

Issue: Inadequate control of design calculations impacts traceability of design requirements.

Findings. Design requirements traceability is affected by inadequate calculations. Adequacy of design calculations is addressed in Subcategory Report 24600.

Even though TVA engineering procedures generally covered this issue, lack of consistent implementation by ensuring that all input is included resulted in inadequate control of design calculations, which impacted traceability of design requirements.

4.5.3 Element 201.5 - Issue "c" for SON, WBN, BFN, and BLN

Issue: Basic design input is not available.

Findings. A TVA memorandum of 04/08/86 (Ref. 367) states:

"The design documentation requirements for a nuclear operating facility, as required by NRC and ANSI standards, consist of those engineering documents necessary to properly operate, modify, evaluate safety questions, set and evaluate limiting conditions of operation (LCO), and evaluate any abnormal event in the plant. The design basis is a

necessary part of this design documentation, and along with detailed engineering, drawings, specifications, and related documents, is required and must be controlled to ensure all licensing and power generation commitments are maintained."

The development and maintenance of the design basis and supporting documentation, such as calculations, is a generic issue which must be addressed. This is recognized by TVA in the above referenced memorandum, and in the Bender Report (Ref. 97). The implication is that some basic design input is not readily available.

Even though TVA engineering procedures generally covered this issue, lack of consistent implementation resulted in some basic design input not being available.

The issue is valid.

4.5.4 Element 201.6 - Issue "d" for SON, WBN, 6FN, and BLN

Issue: Design requirements and the basis of determination of design requirements are not readily available.

Findings. The lack of readily available design requirements and basis of determination of design requirements is substantiated by statements and acknowledgments in the CNPP.

The evolution of TVA procedures from plant inception to the present has exhibited a growing need to preserve TVA plant design basis documents. The procedures have continually been expanded to develop and enhance the basis of design requirements.

Even though TVA engineering procedures generally covered this issue, lack of consistent implementation resulted in some design requirements and the basis of determination of some design requirements not being readily available.

This issue is valid.

4.6 Element 201.8 - Code Requirements at WBN as Compared to BLN

4.6.1 Element 201.8 - Issue "a" for WBN

Issue: The Code requirements for Watts Bar N-5 program are far less stringent than for Bellefonte. (This issue is unique to Watts Bar and was not addressed at the other plants.)

Findings. When WBN's construction permit was issued, use of the 1971 Edition of ASME Section III, Winter 1972 Addenda (Ref. 20), was mandatory. The Summer 1973 Addenda was available, and was adopted for use as the Code of Record.

The Bellefonte Nuclear Plant Code of Record is the 1974 Edition of ASME Section III, including the Summer 1974 Addenda (Ref. 21).

The differences in N-5 requirements for BLN and WBN are as follows: The BLN code of record includes Subsection NF, "Component Supports," while the WBN code of record does not. Stamping of component supports was not required until the Winter 1974 Addenda (Ref. 21, Paragraph NA-8233.9). Accordingly, the N-5 Code Data Form was not revised to include listing of component supports until the Winter 1974 Addenda.

The only difference between the N-5 Forms applicable to WBN and BLN is that the BLN N-5 requires that "system working pressure and temperature" be recorded. A review of the WBN and BLN N-5 preparation procedures indicates that the N-5 programs of the two plants are essentially the same. Therefore, the issue that the code requirements for the WBN N-5 program are far less stringent than for BLN is not valid.

4.7 Element 203.1 - Sequoyah Design Errors at WBNP

4.7.1 Element 203.1 - Issue "a" for WBN

Issue: TVA management does not communicate between sites and provides poor Engineering support to the crafts. Specifically, design changes made at Sequoyah (via ECN, DCR, FCR, etc.) are not relayed to Watts Bar for the identical system, but rather, WBN is left to discover the design deficiency itself. Two examples were given: (1) the replacement of carbon steel piping with stainless steel piping at the pumping station; and (2) the connection of a pipe of one schedule (wall thickness) to be welded to a tank nozzle of a different schedule. (This element was unique to WBN, and was not evaluated for any of the other plants.)

Findings. Before 1983, communication from SQN to the WBN engineering project of design flaws discovered for SQN was not a problem because both plants were being designed by the same team. Following the split of the team into two projects, communication of design changes began to deteriorate.

In 12/82, the Division of Engineering Design (EN DES) issued EN DES-EP 1.52, RO, "Potential Generic Conditions Adverse to Quality - Identifying and Investigating." This procedure included a requirement to review all conditions adverse to quality (CAQs) for generic implications to other TVA nuclear plants that were operating or under construction. This procedure was replaced in 06/85 by the Office of Engineering Procedure OEP-17, "Corrective Action," and subsequently by the Nuclear Engineering Procedure NEP-9.1,

"Corrective Action," in 07/86, following the establishment of the Division of Nuclear Engineering (DNE). All CAQRs, SCRs, and PIRs are now reviewed for generic implications, and a potential generic condition evaluation memo is sent to any project that could be affected.

A thorough review has been conducted of the history of the first specific case mentioned in two of the employee concerns (IN-85-911-002 and IN-85-768-002) of the replacement of carbon steel pipe with stainless steel in the essential raw cooling water (ERCW) system (Ref. 388). In late 1977, during preoperational testing of the system at SQN, inadequate flow conditions were recorded for some of the essential loops. The Mechanical Engineering Branch (MEB) identified the source of the problem to have been an error in its pipe sizing calculation, and suggested replacing some of the carbon steel pipe with a larger size. Meanwhile, the Browns Ferry Nuclear Plant (BFN) was experiencing massive corrosion problems, and a study was in process for evaluating the corrosion of carbon steel pipe in raw water systems. The MEB suggested (Ref. 388) that the carbon steel pipe being replaced (enlarged) in the ERCW system at SQN be replaced with stainless steel pipe to preclude a corrosion problem similar to the one at BFN. It further suggested that much of the small pipe in the ERCW should also be changed to stainless steel for the same reason, and provided marked up flow diagrams to indicate which pipe was to be replaced (Ref. 388). The MEB also stated in its memo that this change-out should also be made at WBN.

Due to an earlier fuel load date, SQN work was given priority. However, work began at WBN in the form of an ECN dated within a month of the project being aware of the problem (ECN 1398 dated 01/24/78). The same situation is true for pipe hangers; all hangers for the carbon steel pipe in the ERCW were in place at the time that the change-out was found to be needed. No other instance of identical hanger replacement could be found.

The SWP began the change-out in the best manner thought possible to meet the scheduled SQN fuel load (at that time, 1980). SWP immediately issued ECN 1776 for SQN on 12/23/77 and an identical ECN 1398 for WBN on 01/24/78 (Ref. 178a). These ECNs were for enlarging the undersized pipe to meet the flow conditions required for the preoperational testing. The new pipe installed was stainless steel. Subsequent ECNs would be used to change-out the rest of the carbon steel pipe to stainless steel (ECNs L5235 and L5009, dated 05/27/80 and 06/26/81 for SQN, and ECNs 2176, 2756, and 3400 for WBN, dated 10/12/79, 10/19/81, and 02/17/83, respectively) (Ref. 178a). It is therefore concluded that the employee concerns are not valid for this specific example, since carbon steel pipe had already been installed at both plants and the work was done in a timely manner for both plants.

No specifics (i.e., dates, FCR numbers, etc.) were provided for the second example, employee concern IN-86-205-005. However, investigation has shown that the tank in question is probably the tritiated drain collector tank in the waste disposal system. FCRs M-600 and M-665 were issued for WBN on 03/02/77 and 05/25/77, respectively (Ref. 178a), to add a suitable transition piece between the tank nozzle and the connecting pipe. No corresponding FCRs could be found for SQN.

Therefore, the issue relating to the lack of communication to WBN of flaws in the SQN design that may be reflected in the WBN design could not be substantiated.

4.7.2 Element 203.1 - Issue "a" for WBN

Issue: Engineering approves the installation of a design at WBN that it knows is inadequate and will have to be reworked because the same design was reworked at SQN. The two examples given are the same as those cited in issue "a," Section 4.7.1 above. (This element is unique to WBN and was not evaluated for the other plants.)

Findings. These employee concerns imply that DNE engineers responsible for the WBN design were aware of the design flaws that were corrected at SQN, but did nothing to correct the same errors at WBN until it was too late to avoid the costly rework.

In the first specific example, safety-related piping and the nonsafety-related piping considered most susceptible to corrosion were changed out immediately. Some valves and pipe were left as carbon steel because the delivery time for stainless steel valves would not support the system completion schedule. Some carbon steel valves, removed with the carbon steel pipe, were reinstalled in the stainless steel pipe, and were changed out at a later time. A surveillance program was established to ensure adequate flow rates to safety-related systems until all the required changes were made. This change-out of carbon steel to stainless steel has been completed by a series of ECNs.

As was mentioned above, the time frame for both specific examples was pre-1983, when both plants were part of the same project, the SWP, and the same engineering team was responsible for both plants. For the first specific example, action began for WBN in the form of ECN 1398 on 01/24/78, (Ref. 178a) less than a month after MEB identified which pipe was to be replaced. At that time, the CS pipe was already installed and rework was unavoidable. As for the second specific example, again no information could be found about the change made at SQN to add a transition piece to the tank. No date could be found for the SQN FCR to compare with FCRs M-600 and M-665 issued for WBN in 1977.

The issue relating to engineering direction to construction to install a design at WBN that it knows is inadequate and will be changed could not be substantiated. The evaluation team found no evidence to support the allegation that Engineering authorized the installation of a deficient design for no apparent reason.

As mentioned before, no specific information could be found for SQN regarding the pipe connection to the tritiated drain collector tank.

The issue is not valid.

4.8 Element 203.3 - Experience Feedback Not Properly Utilized

4.8.1 Element 203.3 - Issue "a" for SQN, WBN, BFN, and BLN

Issue: There is no formal system to track and assign commitments for problems identified by INPO; there is poor tracking of NRC experience information; and there are no forced interactions with other utilities for exchange of information.

Findings. A review of the transcript of the NRC interview with the concerned individual (CI) (Ref. 223) reveals only a minor clarification of the issues in that the CI felt the experience information was made available to only a limited number of individuals. The CI felt that the engineers who were implementing the design were doing so with hearsay information, rather than with their own personal direct knowledge of the experience of other plants as identified by NRC or INPO.

From 1981 through 1986, the TVA Operating Experience Review (OER) program, as it used to be called, was evaluated numerous times by the NRC and INPO and audited by TVA QA (Refs. 108, 109, 139 through 157, 236 through 241, 252, 256, 314, 315, 431 through 486, and 493 through 496). Each time the program was examined, findings or deviations were identified, and improvements were recommended. Most of the findings were related to the dissemination of in-house experience information between the many TVA divisions and sites. Additionally, the program was described as fragmented, and the procedures were criticized for not sufficiently delineating responsibility and directing performance. These evaluations also identified a lack of management support for the OER program and a lack of staffing to perform the necessary reviews in an efficient and timely manner.

Operations Task Group Report 307.09 (Ref. 106a) contains a summary of the reviews and findings by INPO, NRC, and TVA QA. The report summarizes the findings that the TVA OER program is not as effective as it should be, that it

does not receive adequate management attention and concern, and that the procedures do not support the requirements or their intent.

The report identifies the following specific deficiencies:

- "o Failure to follow procedures as written.
- o Lack of upper-level control and responsiveness to written identification of problem areas and request for guidance.
- o Insufficient performance standards.
- o Written policies and actions contrary to procedures that contributed to fragmentation of responsibilities and authority and corporate distrust.
- o Lack of clearly defined procedures that outlines [sic] what documents will be formally added to the OER data base and by whom.
- o Corporate perturbations (i.e., decentralization) used as excuse for substandard performance for an excessive time frame.
- o Repetitive disregard to suggestions for improvement."

The evaluation team has examined the documents of this subcategory report (Refs. 91, 108, 109, 139 through 157, 236 through 241, 252, 256, 314, 315, 481 through 486, and 493 through 496) and concurs with the findings expressed in Operations Task Group Report 307.09.

Revision 4 of the CNPP lists the Nuclear Experience Review (NER) program, which is the new name for the new program, as commitment item 21, with completion required before restart of SQH. The corporate program is common to all sites. Each site has developed procedures for interfacing with corporate procedures and site implementation. This commitment is also shown in the Corporate Commitment Tracking System (CCTS) as commitment NCO-86-0156-109 (Ref. 109) and as a restart item for SQN.

In conjunction with this NER program, the CNPP also commits to establishing a corporate nuclear operating experience data base that will provide a management tool and TVA-wide access to all experience review items. Division of Nuclear Safety and Licensing (DNSL) has requested that the Division of Nuclear Services (DNS) provide enhancement to the old OER data base program to provide additional search and sort capabilities as well as report generation capabilities to meet the requirements of the new NER program (Ref. 425). The

commitment to establish this new data base is listed as CNPP commitment item 22 and is shown as a long-term program. The CCTS control number for this commitment is NCO-860156-063 (Ref. 108).

The issues expressed by this employee concern are valid in that the OER program as practiced by TVA in the past had limited participation and was not handled with dispatch.

4.9 Element 203.4 - Change Incorporation and Retrofit Between Units Lacking

4.9.1 Element 203.4 - Issues "a" and "b" for WBN

Issue: Design changes are being made to one unit without being incorporated into the other unit in a timely manner or at all. Hardware in the second unit must be reworked after initial incorrect installation. Examples given were: (1) pressure gauge pulsation dampers (snubbers) were required for some instruments in unit 2 without being required for corresponding instruments in unit 1; (2) piping size was changed in unit 2 without this change being made to corresponding piping in unit 1 (This issue, concern EX-85-002-002, is addressed in detail in WBN element evaluation 232.1); and (3) a maximum dimension for the distance between a condensate pot and its root valve was specified for unit 2 but not for unit 1. (This element is unique to WBN, and was not evaluated for any of the other plants.)

Findings. Minor differences between the WBN units can result from such considerations as opposite hand equipment arrangements as well as from the fact that equipment for the same function in each of the two units was supplied by different vendors (because of the later construction of unit 2). Accidental oversights should have been precluded by TVA's communication practices between the units. The same craft personnel worked on both units, and the unit 1 and unit 2 supervisors attended each other's meetings.

Pulsation dampers (snubbers) are not normally installed on pressure instruments unless construction tests, preoperational tests, or operational experience show they are necessary. TVA has no written criteria governing snubber installation; requirements and installation details are given by notes on instrument drawings. Snubber installation at WBN is currently (11/87) under a stop-work order (Ref. 331).

All WBN instrument drawings (Ref. 179) were reviewed by the evaluation team to determine which instruments required snubbers. A total of 98 instruments (52 common and 23 each at unit 1 and unit 2) were found to require snubbers.

In no case was a snubber required for an instrument in one unit without being required for its counterpart in the other unit.

Condensate pots must be no more than 3 feet from their corresponding root valves for heat transfer considerations. The 3-foot dimension was arrived at by engineering judgment, rather than by a formal calculation. The dimension applies to condensate pots in both units; however, FCRs I-2161 and A-10528 (Ref. 212) adding it to the instrument drawings are poorly written and misleading on this point.

A review of the 47W600 drawings revealed that there were two installation details for condensate pots. One is shown on drawing 47W600-86, R8, and the other on 47W600-176, R15. The 3-foot dimension was added to sheet 176 (nonsafety-related systems), but not to sheet 86 (safety-related systems).

An evaluation team member made a spot-check walkdown of condensate pot installations to check for discrepancies between units. Three pots in the main steam system (nonsafety-related) in unit 1 and their unit 2 counterparts were checked and, in both units, were found to be over 5 feet from their respective root valves. Additionally, the valve and instrument numbers did not match between the units, although care was taken to ensure that the actual counterpart was walked down. Another three pots were checked for the extraction steam system (nonsafety-related) in each unit. In unit 1 the pots were found to be over 5 feet from the respective root valve. Unit 2 had no pots installed in the lines at the time of the walkdown. Additionally, the pots checked for unit 1 were the old-style pipe tee pots, rather than the new-style pots described in TVA report STEAR 23 (Ref. 116).

A spot-check walkdown of condensate pot installation in safety-related systems was done as part of the QTC investigation of concern IN-85-217-001 (Ref. 115). The QTC investigative report noted that the safety-related condensate pots walked down by QTC all conformed to the 3-foot requirement. QTC also noted that no pots were found that were 90 feet from the root valve, as alleged in concern IN-85-217-001. QTC also determined that this allegation was based on hearsay information.

WBN design drawings are common to both units, unless specifically noted as applying to only one unit. When a design change is made to one unit by an ECN, a corresponding ECN is issued for the other unit. This practice was initiated by memo (Ref. 335) on 04/11/83. However, no written procedure was found that requires that a design change for one unit be reviewed for applicability to the other unit.

All of the design changes identified in the issues apply to both units.

- o Requirements and installation details for snubbers on instruments are given only by notes in instrument drawings (47W600 series). A review of these drawings revealed no instance where a snubber was required for an instrument in one unit only.
- o Details of the finding regarding the piping size change can be found in WBN element evaluation 232.1. The evaluation team found from WBN element evaluation 232.1 that, at the time the concern was raised, a program was already in place to resolve it.
- o The 3-foot maximum dimension for the distance between a condensate pot and its root valve was incorporated in detail B176 of WBN drawing 47W600-176, R15, a common design drawing applicable to both units. However, the FCRs that initiated this requirement are so poorly worded that a reader could infer that the FCRs applied to unit 2 only.

A review of the WBN instrument drawings revealed a detail applicable to condensate pot installation in addition to B176, i.e., details A86 and B86 of drawing 47W600-86, R8. This is also a design drawing applicable to both units. The 3-foot dimension has not been incorporated into this drawing.

Issue "a" is valid because design changes made in unit 1 were not incorporated into unit 2 in a timely manner and some hardware rework was necessary for unit 2. Issue "b" is valid because some condensate pots were not installed in accordance with drawing requirements.

4.9.2 Element 203.4 - Issue Addressed at Subcategory Level Only

Issue: Various TVA plants are all designed differently which results in increased costs. (As noted in Attachment A, element evaluations were not prepared for this employee concern, EX-85-059-003.)

Findings: The variations in design were found to be justified because they were made in response to improved technology resulting from accumulated industry experience, the increasingly more stringent licensing requirements developed with the passage of time, as well as the site-specific requirements of each plant and variations in characteristics of equipment from different manufacturers.

The issue that the various TVA nuclear plants are all designed differently is valid, but the consequences are acceptable.

4.10 Element 207.1 - Engineering Acceptance of Rejected Work

4.10.1 Element 207.1 - Issue "a" for WBN

Issue: There is a problem with conduit support (electrical hanger) documentation and inspection in unit 1. It is difficult to find the basis for acceptance of individual supports. (This issue is unique to WBN and was not evaluated at the other three plants.)

Findings. NCR 5857, R1, dated 03/01/85 (Ref. 128), states that during the finalization of documentation for electrical conduit transfers to startup on Unit 1, 528 Inspection Rejection Notices (IRNs) were submitted on conduit supports that had been inspected and accepted prior to February 1983. Prior to 1983, conduit supports were inspected as part of the conduit system using Quality Control Procedure (QCP) 3.03, "Inspection and Documentation of Electrical Conduit, Junctions Boxes, and Supports" (Ref. 46).

In February 1983, a new procedure was issued for support inspection: QCP 3.09, "Inspection of Supports for Electrical Conduit and Junction Box" (Ref. 47).

When QCP 3.09 was implemented, the method of tracking FCRs and other documents that justified individual support installations was also changed. The tracking methods used by QC inspectors are not described in QCP 3.03 or QCP 3.09.

After February 1983, newly trained QC inspectors reinspected the conduit and junction box supports in Unit 1, using the current revisions of the 47A056 conduit support drawings and the associated 47A050 general notes as the design criteria. They wrote 528 IRNs on the supports, including 109 supports which had FCRs or other documents justifying their deviation from the 47A056/050 criteria. The inspectors did not accept the 109 documented supports because 1) it was difficult to identify individual supports inspected and documented under the old procedure, 2) the new inspectors were not given instruction in the old method of FCR tracking, and 3) it was difficult to relate approved FCRs to individual supports.

In response to the NCR 5857, Engineering evaluated each conduit and junction box support cited. Each support and/or IRN was dispositioned by Engineering in 1984 and 1985.

While NCR 5857 listed conduit support acceptance as a significant condition adverse to quality (CAQ), the supports themselves were determined to be a nonreportable condition under 10 CFR 50.55(e) and 10 CFR 21.

This issue "a" was valid when the concern was expressed in that the earlier procedure which included the conduit supports as part of the conduit system for inspections did, indeed, make it difficult to identify the basis for acceptance of individual supports.

NCR 5857 documents the issue that, prior to February 1983, the inspection and basis for acceptance of individual conduit supports were not easily traceable because the supports were inspected as part of the conduit inspection program. However, in 1984 and 1985, TVA Engineering evaluated each IRN issued against a conduit support and determined that there were no hardware deficiencies. A new QC construction inspection procedure was implemented in 1983 that provided for tracking the inspection and documentation of individual supports for conduit and junction boxes.

4.10.2 Element 207.1 - Issue "b" for WBN

Issue: Many conduit and junction box supports rejected by Quality Control inspectors are accepted by management without rework via O50 notes. (This issue is unique to WBN and was not evaluated at the other three plants.)

Findings. NCR 5857 also documents this issue "b" in that 456 (87 percent) of the conduit and junction box supports rejected by QC inspectors were accepted by Engineering without modification. However, Engineering followed the procedure for handling nonconformances, EN DES EP 1.26 (Ref. 59) (which calls for technical justification for "use-as-is" dispositions), as follows:

- o Weld deficiencies (that were not repaired) were justified by the random sampling and analysis program documented by NCR 2375R (June 1983) (Ref. 129).
- o Many support configurations not indicated in 47A056 drawings were justified by approved FCRs which Engineering was able to locate and relate to individual supports in February 1985.
- o Some embedded plate and support configuration deviations were justified by Engineering by stating that "engineering judgment" was used. While no written bases for the judgments were referenced in NCR 5857, the specific requirement for written bases for judgments used in the support of a design (Policy Memorandum PM86-04-"Engineering Judgment") (Ref. 371) was not issued until April 25, 1986, after NCR 5857 was closed.

There is no mention of the 47A050 general notes in NCR 5857. As a result of the conduit support evaluation program conducted by Engineering, some of the 47A050 notes may have been revised to reflect and document Engineering's decisions regarding the installations. Revision of the 47A050 notes is an ongoing evolving process. The conduit and junction box supports that Quality Control inspectors rejected were evaluated by Engineering in connection with NCR 5857. The disposition of each support was the result of this evaluation which was conducted in accordance with applicable procedures. The NCR (5857) that deals with these rejected supports makes no mention of the 47A050 notes, nor was any other evidence obtained that would substantiate this issue.

This issue "b" is not valid because all the rejected supports have been evaluated by Engineering and have been properly dispositioned.

The conduit and junction box supports were rejected by QC inspectors because of a change in procedure rather than deficiencies with the supports.

4.10.3 Element 207.1 - Issue "c" for WBN

Issue: TVA engineering personnel consistently accept subcontractor work that has been rejected by Quality Control inspections. Nonconforming Condition Reports were incorrectly dispositioned in that Engineering accepted improperly installed and undocumented subcontract work. (This issue is unique to WBN and was not evaluated at the other three plants.)

Findings. The essential raw cooling water (ERCW) piping installed at WBN used Carbon steel piping. In the late 1970s, other TVA plants experienced corrosion and plugging problems in carbon steel piping systems using Tennessee River water. At WBN, the solution to this problem for a portion of the piping was to add a cement mortar lining. TVA Specification 5225 covered the vendor's performance of this work and Construction Specification (CSM-92) (Ref. 190) governed how TVA construction would support and inspect the vendor's work.

During the installation of the lining, TVA Construction initiated several Nonconforming Condition Reports (NCRs) regarding the vendor's compliance with the specification. The concern addressed in NCR 4270R (Ref. 125a) essentially relates to the vendor's failure to maintain proper records of the installation and repair process as required by the specification and described in the vendor's Quality Assurance Program approved by TVA.

The issues expressed by these employee concerns are that engineering inadequately responded to these NCRs because their disposition was to "use-as-is."

The technical basis for the engineering disposition, as well as the analytical and investigative efforts related to these NCRs, is covered thoroughly in Subcategory Report 23300. The issue that the contractor failed to maintain appropriate documentation is also addressed in Subcategory Report 23300. It should be noted that the TVA Quality Assurance Audit Report of Audit 83V-49 (Ref. 162) conducted on Ameron, Inc. in May 1983 states that the evidence indicates ". . . poor communication between Ameron and TVA, resulting in a well-conceived documented program being poorly implemented."

A review of the NCRs indicates that they were issued properly and in accordance with OC QAP 15.1, "Reporting and Correcting Nonconformances" (Ref. 48). Because these NCRs were considered to be "significant" and OC recommended a "use-as-is" method for correction, they were forwarded to the Nuclear Engineering Branch - Nuclear Licensing Section (NEB-NLS) and to the Design Project Organization (DPO) (i.e., Engineering) as required by OC QAP 15.1.

Each of these NCRs was properly handled by Engineering according to TVA procedure EN DES EP 1.26, "Nonconformance - Reporting and Handling by EN DES" (Ref. 59). This procedure required EN DES to provide justification for a "use-as-is" disposition, to ascertain whether a document revision is required, and to return the NCR to OC by memo with this information.

However, in 09/86 the Division of Nuclear Engineering (DNE) Engineering Assurance (EA) conducted an audit 86-27 (Ref. 380) of the WBN engineering activities related to the handling of construction nonconformance reports (NCRs) and identified deficiencies which are (1) a lack of justification and documentation for the "use-as-is" and "repair" dispositions, (2) failure to adequately document the as-built condition resulting from the accepted changes, (3) failure to provide the same level of checks and reviews for the disposition of the NCRs that were given to the original design, and (4) some violations of the ASME code resulting from the failure to properly record the as-constructed configuration.

Audit 86-27 was originally reported properly to the NRC as NCR WBNWBP8601 on 01/12/87. The audit was followed with an interim report on 02/11/87 (Ref. 305) that provided TVA's plan for corrective action for the NCR and for prevention of recurrence.

The TVA licensing procedure EN DES EP 2.02, "Handling of Conditions Potentially Reportable Under Title 10 of the Code of Federal Regulations, Parts 21, 50.36, and 50.55(e)" (Ref. 59), directs the NEB-NLS to determine within 5 working days if the conditions identified in an NCR are reportable under 10 CFR 50.55(e) and to notify the NRC-OIE of these conditions within 30 days of the initial notification.

For reporting nonconforming items under 10 CFR 50.55(e), the WBN site licensing personnel use the Watts Bar Interim Licensing Procedure Number 1, "Construction Deficiency Reporting, 10 CFR 50.55(e)." R0, 09/23/86 (Ref. 79). This procedure covers the necessary aspects of reporting 10 CFR 50.55(e) items to the NRC, but it does not yet reflect the methods and requirements of the newly revised upper tier procedures.

The procedure used by DNSL for reporting of 10 CFR 50.55(e) items is the Nuclear Licensing Staff Procedure No. 35, "Preparation of 10 CFR 50.55(e) Reports (Construction Deficiency Reports)," R1, 09/23/82 (Ref. 78). This procedure, although it addresses the necessary reporting requirements, does not yet conform to the new TVA corrective action program described in NQAM, Part I, Section 2.16 R2 and Procedure PMP 0600.03.

Thus, for dealing with significant conditions adverse to quality at WBN, the required procedural documents are in place and in use, but full coordination among the many procedures has not yet been accomplished.

In addition to the specific issues raised by these employees' concerns, this ECTG evaluation observed a TVA QA audit which identified Engineering's deficiencies in maintaining proper documentation following use-as-is and repair dispositions.

This issue is valid as a statement of fact because Engineering accepted, with a "use-as-is" disposition, the subcontractor work which had been rejected by Quality Control inspectors. However, it is not a problem because the "use-as-is" dispositions for the ERCW were technically supported by Engineering, and the proper procedures were followed in dispositioning the NCRs dealing with the ERCW piping.

4.11 Element 207.2 - Safety and Licensing Evaluations

4.11.1 Element 207.2 - Issues "a" and "b" for SON, WBN, SFN, and BLN

Issue: Safety and licensing evaluations by EN DES (including NEB) are inadequate and are in a cover-up mode.

Findings. The employee concern is not specific as to individual problem areas, except that the concerned individual does refer to the EN DES organization. The NRC investigative interview (Ref. 228) was reviewed, but no additional information was found.

The evaluation team reviewed procedures that covered the period of time from the development of the EN DES-EPs (09/73 through 06/85), the OEPs (06/85 through 06/86), to the current NEPs (07/86 to present).

The nine types of reports relating to the licensing process that were within the scope of Engineering responsibility for TVA nuclear plants were selected from the procedures and are addressed in this evaluation. The documentation packages that were reviewed for compliance with procedures and appropriateness of technical content are also listed in Attachment C (Refs. 194 through 209 and 213 through 227).

The nine types of reports examined are:

- o Internal DNE Safety Evaluation Report (SER)
- o Nonconformance Report (NCR)/Significant Condition Report (SCR)/Condition Adverse to Quality Report (CAQR)
- o Engineering Report (ER)
- o Preoperational Test Deficiency Report (PT)
- o NRC Notice of Violation Report and TVA Response
- o 10 CFR 50.55(e) Report
- o 10 CFR 21 Report
- o Unimplemented Design Item Evaluation (UDIE) Report
- o Unreviewed Safety Question Determination (USQD) Report

Because the concern lacked specifics, the evaluation team reviewed a random sample of an appropriate number of documentation packages of each type to examine previously conducted TVA activities.

On the basis of these reviews, no conditions were observed in the sets of engineering reports reviewed that would cause the evaluation team to suspect that the TVA safety and licensing evaluations were inadequate or that they appeared to cover up any fact or circumstance.

The issue is not valid.

4.11.2 Element 207.2 - Issue addressed at Subcategory Level Only

Issue: Engineering and design personnel will cause a cover-up of problems with paperwork. (As noted in Attachment A, element evaluations were not prepared for employee concern IN-85-143-004.)

Findings. On the basis of the evaluation conducted for issue 4.11.1 above, it was concluded by the evaluation team that the engineering and design personnel did not cover up problems with paperwork.

This issue is not valid.

4.12 Element 207.4 - CAQ Documentation

4.12.1 Element 207.4 - Issue "a" for SQN, WBN, BFN, and BLN

Issue: Existing practice for approval of CAQ (conditions adverse to quality) documentation (e.g., PIRs and SCRs) hinders reporting of CAQs by employees (i.e., there is no "appeal" process).

Findings. The issue identified in this element refers to a programmatic deficiency in the engineering corrective action process that hinders employees from reporting conditions adverse to quality.

The evaluation team evaluation has indicated that engineering procedures have now been changed to satisfactorily address the issue. Specifically, NEP-9.1, "Corrective Action" (RO, 07/01/86), now enables the originator of a CAQ to escalate a concern to higher management if the originator and supervisor disagree about the validity of the concern. The previous engineering procedures did not provide for such recourse.

Even if some CAQs were not documented prior to issuance of NEP-9.1, as implied by this issue, the integrity of safety systems will nevertheless be verified as required prior to plant operation through the Design Baseline and Verification Program (DBVP) and similar programs.

In addition to modification of the engineering procedures, the existence of the new TVA Employee Concerns Program allows employees to circumvent any perceived undue restrictions in the formal CAQ process.

The evaluation team concludes that although the issue was valid at the time stated, subsequent procedure and program modifications have adequately addressed and resolved it.

4.13 Element 213.3 - Inadequate Electrical Design Criteria

4.13.1 Issue: Standards and guides are not incorporated into the electrical design criteria. (Addressed as issue "a" in element evaluation 213.3 for SQN, as issue "e" in element evaluation 201.3 for WBN, and as issue "a" in element evaluation 201.4 for BFN and BLN, as shown in Attachment B)

Findings for this issue are given in Section 4.3.1 of this report.

- 4.13.2 Issue: Sufficient electrical design criteria to form a basis for design are nonexistent. (Addressed as issue "c" in element evaluation 201.3 for all plants, as well as issue "b" in element evaluation 213.3 for SQN, as shown in Attachment B)

Findings for this issue are given in Section 4.2.3 of this report.

- 4.13.3 Issue: Electrical design criteria are inadequate to form a basis for design. (Addressed as issue "a" in element evaluation 201.3 for all plants, as well as issue "c" in element evaluation 213.3 for SQN, as shown in Attachment B)

Findings for this issue are given in Section 4.2.1 of this report.

4.14 Element 213.4 - Electrical Procedures Do Not Properly Identify IEEE Standards

- 4.14.1 Issue: TVA electrical design documents and procedures do not include requirements of IEEE standards or other industry standard and if these standards are not included, numerous problems may result. (Addressed as issues "a" and "b" in element evaluation 213.4 for SQN, as issue "h" in element evaluation 201.3 for WBN, and as issue "e" in element evaluation 201.4 for 3FN and BLN as shown in Attachment B)

Findings for this issue are given in Section 4.3.3 of this report.

4.15 Summary of Subcategory Findings

The classified findings are summarized in Table 1. Class A and B findings indicate there is no problem and that corrective action is not required. Class C, D, and E findings require corrective actions. The corrective action class, defined in the Glossary Supplement, is identified in Table 1 by the numeral combined with the finding class. For example, the designation D2 in Table 1 indicates that the evaluated issue was found to be valid (finding Class D) and that a corrective action involving some type of procedure modification is required (corrective action Class 2).

Of the 122 findings/corrective actions identified by a classification in Table 1, 62 require no corrective action. Of the remaining 60, 17 had corrective actions initiated before the ECTG evaluation, 43 required new corrective actions to be identified, of which six resulted from peripheral findings uncovered during the ECTG evaluation. Findings are summarized by classification in Table 2. Where more than one corrective action is

identified in Table 1 for a single finding (e.g. Element 201.1, finding "b," BFN), Table 2 counts only a single classification. Thus, Table 2 identifies one finding for each issue evaluated.

5. CORRECTIVE ACTIONS

Table 2 identifies 55 findings that require corrective action. The corrective actions, along with their finding/corrective action classifications, are summarized in Table 3. The "CATD" column of Table 3 indicates the plant or plants to which a corrective action is applicable.

The corrective actions have been compared with the TVA commitments to NRC as stated in the Corporate Nuclear Performance Plan (CNPP), Vol. 1, Appendix 8, (Ref. 34). For each corrective action that corresponds to a TVA commitment, the commitment item number has been specified under the appropriate element number in the following paragraphs.

The corrective action descriptions in Table 3 are a condensation of the more detailed corrective action information provided in Attachment B. The corrective action plan (CAP) description in Attachment 3 includes reference to the applicable CATD. A condensation of this information by element follows:

- o 201.1, Regulatory Requirements (Regulatory Guides, NUREGs, Bulletins, etc.) - The Commitments/Requirements (C/R) Database Program, Design Basis Program, and Design Baseline and Verification Program will be completed as applicable to meet the restart requirements for each Sequoyah unit. The postrestart phases for these programs will be completed as schedules are established (SQN).

A thorough review and search will be conducted by TVA to identify and locate the source documents(s) for each C/R. All C/Rs for which adequate source documentation cannot be identified will be designated as open items and tracked by the WBN Design Baseline and Verification Program (DBVP) until fully resolved (WBN).

Identification of licensing commitments and development of Design Criteria/Design Bases, as well as the balance of General Design Criteria, will be completed before unit 2 restart. The Design Basis Document (DBD) will be completed before restart of the applicable units. The portion of the C/R database related to each unit will be completed before each respective unit restart, and will be maintained over the life of the plant (BFN).

Engineering procedures "Identification of Licensing Commitments" and "Design Criteria/Design Bases" will be revised to require the C/R database to be maintained current and to determine if the DBD requires revision when the C/R database is revised.

A DBD will be fully developed and issued before fuel loading of each unit. The C/R database generated for the DBD will be maintained for the life of the plant (BLN).

- o 201.3, Design Criteria - A DBD will be prepared before unit 1 fuel loading; the deficiencies identified in CATD 201 03 WBN 02 for specified design criteria documents will be corrected; TVA will develop and fully implement a DBVP, which will include all necessary commitments or requirements for additional specified design criteria documents. Design criteria documents for electric raceways and instrumentation sensing and air lines will be developed during preparation of the DBD (WBN).

The design criteria identified in Sequoyah Engineering Procedure 29 as requirements for restart will be reviewed, revised, or generated as applicable before restart, in accordance with the DBVP and associated design basis documents (SQN). This also applies to element 213.3 for SQN.

The applicable standards and regulatory guides will be adequately referenced in the specified design criteria documents as part of the DBVP (WBN).

Design criteria identified in Design Criteria Manual Index, but not actually issued, will be issued or deleted, as appropriate, by definite dates. Design Criteria 8FN-50-766 will be canceled, and Design Criteria BFN-50-7084 will be revised to include containment isolation requirements for cross-tie to system 32 (BFN).

Design criteria that are not required will be deleted; the design criteria discrepancies identified in the CATD will be resolved; the FSAR will be revised to agree with the revised design criteria; and all revised criteria will be issued before the unit 1 fuel is loaded (BLN).

- o 201.4, Standards and Guides - A comprehensive review will be performed of all electrical design standards and design guides, and a program will be implemented for maintaining the integrity of the

standards and guides on an ongoing basis (SQN, BFN, BLN). For WBN, this corrective action is addressed in Element 201.3. This also applies to element 213.4 for SQN.

- o 201.5. Tracking of Commitments and Design Changes - Two ONP procedures will be developed and issued covering the Corporate Commitment Tracking System (CCTS) before restart (SQN).

Open and completed commitments to the NRC will be reviewed and identified, and it will be verified that they are being tracked by CCTS (SQN, WBN, BFN).

Site Director Procedure "Site Commitment Management and Tracking" was scheduled to be issued onsite by October 1, 1987. All DNSL program area procedures have been assigned and are being tracked (BLN).

The procedures will be revised for reviewing the ECNs for the FSAR update program, and the accuracy of the UFSAR will be verified (SQN).

The as-constructed configuration control drawings (CCDs) and incorporation of changes resulting from the DBVP are being completed by the Division of Nuclear Engineering. The UFSAR will be updated accordingly during the next annual update (BFN).

- o 201.6. Traceability of Design Requirements - The DBVP, the OBD program, and the C/R database program will be developed and fully implemented (WBN and SQN).

Development of the prerestart phase of the DBVP for each unit will be completed before restart, and the postrestart phase for each unit will be completed before the next refueling outage. All OBDs were scheduled to be completed by the end of August 1987 (BFN).

The OBD for BLN is being prepared as part of the normal design process.

- o 203.3. Experience Feedback Not Properly Utilized - ONP Policy 6.1 was issued, and an ONP directive for an NER program will be issued at a later date (SQN, WBN, BFN, BLN).

The site procedure for an NER program was revised (SQN, WBN, BFN).

Division-level (DNSL and DNE) procedures for an NER program for all plants were issued. The DNE procedure is in draft form.

An NER program will be implemented as a restart item at SQN and will be implemented later at all plants.

The site procedure for an NER program will be revised (BLN).

These corrective actions respond to the findings cited in element 203.3 and are a direct result of CNPP Commitments No. 3, 21, and 22.

- o 203.4, Change Incorporation and Retrofit Between Units Lacking - The cited engineering specification will be revised to include the requirements for condensate pot installation (WBN).

The designated engineering procedure will be revised to require a review of the ECNs to determine their effects on the other WBN unit (WBN).

- o 207.1, Engineering Acceptance of Rejected Work - The specified program management procedures will remain in effect; Nuclear Safety and Licensing staff procedure 35 was scheduled to be cancelled by March 27, 1987; and site director and nuclear project manager procedures will be issued to implement the specified program management procedure. In addition, a corrective action plan to resolve the specified audit deficiency has been submitted to the manager of Engineering Assurance (WBN).

- o 213.3, Inadequate Electrical Design Criteria - Currently nonexistent design criteria documents will be fully developed and issued for safety-related portions of instrumentation and controls (I&C), lighting, communications, and thermal overload and torque (SQN).

Sequoyah Engineering Procedure 18 (which established the C/R tracking system) will be revised to make this tracking system an ongoing effort to ensure that design criteria will be kept up-to-date with regard to upper-tier document commitments and requirements (SQN).

The Engineering Assurance (EA) organization was established as an integral part of the Division of Nuclear Engineering in early 1986 (see the revised CNPP, Revision 4, March 1987, Section IV.E.2.d) and will play an active role in monitoring compliance with procedures that are developed as part of a

corrective action plan. In addition, EA will perform an independent oversight review of the corrective action plans and provide feedback to engineering management on engineering performance. This review will provide added assurance that the engineering activities associated with the program are conducted in a technically adequate manner and in accordance with the written procedures prepared specifically for this effort. In matters relating to implementation of the Nuclear Quality Assurance Program, the Manager of EA reports directly to the Director of Nuclear Quality Assurance. This new organizational structure focuses management attention on the development of adequate procedures and on training personnel in the consistent use of the procedures. Furthermore, the CNPP charges EA with the responsibility of providing training for DNE employees in the use of quality-related Nuclear Engineering Procedures.

In general, TVA senior management has identified the need for strengthening its Engineering organization in response to the requirements of nuclear plant design. The Engineering organization is responsible for the content and quality of the design documents and for ensuring that they conform to sound engineering principles, licensing commitments, and Quality Assurance program requirements. This need for strengthening is based partially on deficiencies in design process effectiveness and partially on past implementation of the TVA Quality Assurance program. Thus, strengthening of the Engineering organization, as called for by the NPPs, should be accomplished primarily through additional training of the DNE personnel to the requirements of that program and to basic management principles.

DNE NEP-5.2 and policy memo PM 87-35, "Project/Branch Responsibilities," dated January 23, 1987 [RIMS 801 870123 002], clearly delineate the responsibility, authority, and accountability of the Project Engineers and Branch Chiefs. The Project Engineer is responsible for work scope, budget, and schedule, and for ensuring that project work is executed according to plan and in conformance with the technical direction of the Branch Chiefs and the requirements of the corporate QA program. The Branch Chiefs are responsible for staffing levels and qualifications of technical personnel on the projects, and for the technical adequacy of the engineering design. This includes all design engineering work for the projects, regardless of where it is performed (Knoxville or plant sites) or by whom (DNE) or a contractor to DNE). The Branch Chiefs are the final technical authority within DNE, and have the authority to stop work that does not conform to established requirements. In the past, Branch Chiefs' authority or resources to fully administer technical reviews was limited. Under the restructured organization, the Branch Chief provides engineers and technical direction for the Project Engineer; the Branch Chief also assesses the need for technical reviews, develops a document review and approval matrix, and schedules reviews as required. These programs have been started but have not been fully implemented.

The EA organization adds another dimension to DNE's design review process by performing in-depth technical audits using qualified engineering expertise and having the authority to stop work that does not conform to established requirements. The manager of EA reports to the director of DNE on all matters other than QA. At present, EA is actively reviewing the output of ONP's major technical programs. In reviewing EA's audits at SQN of the DBVP, the evaluation team finds that the methodology and performance have been effective in identifying problems and implementing corrective actions.

There is also an increased emphasis by Engineering line management (e.g., supervisors and group leaders) on training personnel to improve the technical quality of their work. The responsibility for the technical adequacy of the engineering output products rests with the line management, and improvement over past performance is needed in this area.

The independent EA monitoring authority (audit function) is expected to effectively detect noncompliance with engineering procedures, and to help ensure compliance with procedures by providing feedback to engineering line management on engineering performance.

Summary of Corrective Actions

The above corrective actions also appear in Table 3, along with their corresponding finding/corrective action classifications. The table indicates, under the Corrective Action Tracking Document (CATD) column, the plant or plants to which a corrective action is applicable.

From the finding/corrective action classification column of Table 3, it can be seen that of the 28 corrective actions identified, 12 require procedures to be changed or generated, 15 require existing documentation to be upgraded or new documentation to be developed; and the remaining one corrective action requires the NER Program to be implemented. In addition, the CATD column of the table shows that approximately two-thirds of the corrective actions are applicable to two or more plants, and one-third to single plants. The element requiring the largest number of corrective actions is 203.3, Experience Feedback Not Properly Used, which has six.

The evaluation team has found the corrective action plans (CAPs) to be acceptable to resolve the negative findings.

6. CAUSES

Table 3 identifies the cause of each negative finding requiring corrective action and is organized in three major groups: "Management Effectiveness," "Design Process Effectiveness," and Technical Adequacy." The table has 17

column headings (e.g., "Lack of Management Attention," "Inadequate Procedures," etc.) However, in most instances, it was apparent that the problem was the result of a combination of causes, and it was felt that each of these should be identified. In nearly all cases, the experience of the evaluation team was used to establish the cause. However, when direct evidence linked a cause to a problem requiring corrective action, such evidence was taken into account. As stated in the Preface, the root causes (underlying causes) are treated in the category reports.

For the 28 corrective actions described in Table 3, 48 cause occurrences have been checked. These are shown in the table and are totaled at the end.

Using the three major groups, the totals of Table 3 show that well over one-half of the cause occurrences are attributable to prior management weaknesses in the areas of concern and well over one-third of the cause occurrences are attributable to a prior weakness in the design process effectiveness. Weak management effectiveness in these areas at the time certainly contributed to a weakness in the design effectiveness.

The two most frequent causes were procedures and design bases being incomplete or nonexistent. These two causes account for over one-half of all causes noted in this subcategory, and they reflect adversely upon the quality of management and supervision that was in place at the beginning of the Employee Concerns Special Program, approximately 2 years ago. The procedures did not encompass key areas such as documentation and control of the design bases. Justifications for the causes identified in Table 3 are covered under the appropriate element in Section 4, Findings.

7. COLLECTIVE SIGNIFICANCE

As indicated in the significance column of Table 3, all of the corrective actions for this subcategory are considered to be significant in that they all require changes to procedural, engineering, or licensing documentation. More than one-fourth of the corrective actions have the potential for causing changes in the design margins and hardware. The impact will not be known until evaluations and studies in progress are completed.

The deficiencies classified as "Inadequate Design Bases" constitute nearly one-fourth of the causes noted in this subcategory. The causes include design criteria that can be variously described as nonexistent, incomplete, unissued, and unindexed. In a number of cases, the criteria are for safety-related systems. Nonexisting design criteria make it difficult to establish the

original design basis, or to determine the basis for making and controlling future plant modifications. Timely correction of these deficiencies will help to assure a timely and successful restart of the SQN and BFN units.

The "Inadequate As-Built Reconciliation" deficiencies summarized herein relate to possible inaccurate incorporation of plant modifications in the FSAR (or UFSAR), and to the need for installed plant modifications to be accurately reflected in the FSAR or UFSAR. Poor communication between TVA and a subcontractor at WBN resulted in a well-conceived program for documentation of changes to be poorly implemented, as described further in Subcategory Report 23300. BFN engineering documents may not accurately reflect as-built conditions, and, therefore, the current UFSAR may not accurately indicate the actual configuration of all safety-related systems. Deficiencies in the SQN as-built documentation may have led to, or could lead to, inaccuracies in the UFSAR. Additionally, engineering documents that do not conform to plant as-built conditions introduce confusion and delays into the design process for future plant modifications.

Many of the deficiencies attributable to "Inadequate Procedures" relate to procedures needed to support the Nuclear Experience Review (NER) Program. The revision and issuance of these existing site and division-level procedures are essential to full implementation of the NER Program. The NER Program is intended to ensure effective dissemination among the sites of operating experience by other utilities as well as TVA's own in-house experience. This program will also ensure the in-house dissemination of INPO and NRC information as well as notification to the industry of TVA's in-house experiences.

The incomplete transfer of experience data between other nuclear-based utilities and the various TVA plants, and also among the TVA plants, contributed to the repetition of design mistakes and the prolongation of numerous technical problems. In the future, more emphasis should be placed on taking full advantage of (and contributing to) the available body of industry experience in order to avoid, or detect early-on and resolve, numerous problems that are common to the entire industry. This can be achieved by fully implementing the corrective actions associated with element 203.3. Also see specific corrective actions noted for element 203.3 in Attachment B of this report.

The overall significant fact resulting from this subcategory evaluation is that the effects on design margin and on hardware, caused by the anticipated changes in the design criteria, remain unknown. However, TVA is committed to identifying and correcting all significant deficiencies prior to restarting SQN and BFN or fuel loading WBN and BLN.

Revision 4 of the CNPP lists the NER program, which is the new name for the new program, as commitment item 21, with completion required before restart of SQN. The corporate program is common to all sites. Each site has developed procedures for interfacing with corporate procedures and for site implementation. This commitment is also shown in the Corporate Commitment Tracking System (CCTS) as commitment NCO-86-0156-109 (Ref. 109) and as a restart item for SQN.

In conjunction with this NER program, the CNPP also commits to establishing a corporate nuclear operating experience data base that will provide a management tool and TVA-wide access to all experience review items. DNSL has requested that the Division of Nuclear Services (DNS) provide enhancement to the old OER data base program to provide additional search and sort capabilities as well as report generation capabilities to meet the requirements of the new NER program (Ref. 425). The commitment to establish this new data base is listed as CNPP commitment item 22 and is shown as a long-term program. The CCTS control number for this commitment is NCO-860156-063 (Ref. 108).

Of particular significance is the fact that the need for strengthening the TVA Engineering organization in response to the requirements of nuclear plant design has been identified. The Engineering organization is responsible for the content and quality of the design documents and for ensuring that they conform to sound engineering principles, licensing commitments, and Quality Assurance program requirements. This need for strengthening is based on past deficiencies in design process effectiveness and on poor past performance in implementation of the TVA Quality Assurance program as described in Section 5 of this report.

An independent audit of the effectiveness of the implementation of the total Quality Assurance program has been instituted by Engineering management, as a management tool, to additionally ensure that management policy is being enforced. This audit function is provided by the Engineering Assurance (EA) organization, which provides feedback to management on engineering performance.

The results of this subcategory evaluation are being combined with the other subcategory evaluations and reassessed for the Engineering category in a single report.

TABLE 1
CLASSIFICATION OF FINDINGS AND CORRECTIVE ACTIONS

Element	Issue/ Finding**	Finding/Corrective Action Classification*			
		SON	WBN	BFN	SLN
201.1 Regulatory Requirements (Regulatory Guides, NUREGs, Bulletins, etc.)	a	A	A	A	A
	b	D3	D3	D2	D3
		-	-	D3	-
	c	A	A	A	A
	d	D3	(1)	A	A
	e	A	A	A	A
201.3 Design Criteria	a	D3	C3	C3	D3
		-	-	D3	-
	b	B	B	B	B
	c	D3	D3	D3	D3
	d	B	B	B	B
	e	(2)	D3	(2)	(2)
	f	(2)	(1)	(2)	(2)
	g	(2)	B	(2)	(2)
	n	(2)	D3	(2)	(2)
201.4 Standards and Guides	a	A	(3)	B	B
	b	B(1)	(3)	B(1)	B(1)
	c	A	(3)	A	A
	d	B	(3)	B	B
	e	B	(3)	B	B
	f	E3	(3)	E3	E3
201.5 Tracking of Commitments and Design Changes	a	C2	C3	C3	C2
		C3	-	-	-
	b	(1)	A	A	A
	c	B	B	E3	-
	d	E2	-	-	-
		E3	-	-	-
201.6 Traceability of Design Requirements	a	D3	D3	D3	C3
	b	(1)	(1)	(1)	(1)
	c	D3	D3	D3	C3
	d	D3	D3	D3	C3
	e	-	-	-	E3

(1) The finding/corrective action is covered in a different element evaluation; see Attachment B.

(2) Covered in Element Evaluation 201.4.

(3) Covered in Element Evaluation 201.3.

* Explanation of classes is on the last page of table.

** Defined for each plant in Attachment B.

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TABLE 1 (Cont'd)

Element	Issue/ Finding**	Finding/Corrective Action Classification*			
		SQN	WBN	BFN	BLN
201.8 Code Requirements	a WBN only	-	A	-	-
203.1 Sequoyah Design Errors at WBNP	a WBN only	-	C2	-	-
	b WBN only	-	B	-	-
203.3 Experience Feedback Not Properly Utilized	a	D2 D7(4)	D2 -	D2 -	D2 -
	b	D2	(5)	(5)	(5)
	c	D2	(5)	(5)	(5)
	d	D2	(5)	(5)	(5)
203.4 Change Incorporation and Retrofit Between Units Lacking	a WBN only	-	D2	-	-
	b WBN only	-	D2	-	-
	c WBN only	-	B	-	-
207.1 Engineering Acceptance of Rejected Work	a WBN only	-	C2	-	-
	b WBN only	-	A	-	-
	c WBN only	-	D3 C3	-	-
207.2 Safety and Licensing Evaluations	a	A	A	A	A
	b	A	A	A	A
	c	A	A	A	A
207.4 CAQ Documentation	a	C2	C2	C2	C2
213.3 Inadequate Electrical Design Criteria	a	A	(3)	(3)	(3)
	b	D3	(3)	(3)	(3)
	c	D3	(3)	(3)	(3)
213.4 Electrical Procedures Do Not Properly Identify IEEE Standards	a	A	(2)	(2)	(2)
	b	A	(2)	(2)	(2)

- (1) The finding/corrective action is covered in a different element evaluation; see Attachment B.
- (2) Covered in Element Evaluation 201.4.
- (3) Covered in Element Evaluation 201.3.
- (4) For SQN, implementation of the NER Program is a restart item.
- (5) Issues a, b, c, and d were combined as issue a for WBN, BFN, and BLN.
- * Explanation of classes is on next page.
- ** Defined for each plant in Attachment B.

TABLE 1 (Cont'd)

*Classification of Findings and Corrective Actions

- | | |
|--|------------------|
| A. Issue not valid.
No corrective action required. | 1. Hardware |
| B. Issue valid but consequences acceptable.
No corrective action required. | 2. Procedure |
| C. Issue valid. Corrective action
initiated before ECTG evaluation. | 3. Documentation |
| D. Issue valid. Corrective action
taken as a result of ECTG evaluation. | 4. Training |
| E. Peripheral issue uncovered during ECTG
evaluation. Corrective action required. | 5. Analysis |
| | 6. Evaluation |
| | 7. Other |

TABLE 2
FINDINGS SUMMARY

Classification of Findings		Plant				Total
Class	Description	SON	WBN	BFN	BLN	
A	Issue not valid; no corrective action required.	11	9	9	9	38
B	Issue valid; consequences acceptable; no corrective action required.	6	6	6	6	24
C	Issue valid; corrective action initiated before ECSP evaluation.	2	5	3	5	15
D	Issue valid; corrective action initiated as result of ECSP evaluation.	13	11	6	4	34
E	Discovered new unidentified issue during ECSP evaluation; corrective action required.	2	3	2	2	5
TOTALS		34	31	26	26	117

TABLE J
MATRIX OF ELEMENTS, CORRECTIVE ACTIONS, AND CAUSES
SUBCATEGORY 24500

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ELEM	FINDING/ CORRECTIVE ACTION CLASS.**	CORRECTIVE ACTION	CATD	CAUSES OF NEGATIVE FINDINGS *																	Signifi- cance of Corrective Actions*			
				MANAGEMENT EFFECTIVENESS							DESIGN PROCESS EFFECTIVENESS							TECHNICAL ADEQUACY						
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17				
				Fr- gmen- tation	ade- quate- try	ade- quate- dures	Proce- dure- Not Fol- lowed	Inade- quate- Com- muni- cation	Un- timely Res of Issues	Lack of Atten- tion	Inade- quate Design Bases	Inade- quate Calcs	As-bit of cil.	Lack of Detail	Engrg Judg- ment	Crit/ Verif Not met	Insuf- ficient Docu- mentation	Stds Not Followed	Engrg Error	Vendor Error				
201.1	02	Engineering procedures "Identification of Licensing Commitments" and "Design Criteria/Design Bases" will be revised to require the C/R database to be maintained current and to determine if the Design Basis Document requires revision when the C/R database is revised. An alternate approach for the life of the plant will be proposed after all Phase 1 and 2 documentation is issued.	BFN 02			X				X						X					A	-	-	
	03	Fully develop and implement a Design Baseline and Verification Program (and Design Basis Program, where applicable) to assure identification, tracking, updating, and compliance with licensing commitments, regulatory requirements, and design criteria/design basis throughout the life of the plant.	SQM 01 WBM 01						X		X				X							A	P	P

* Defined in the Glossary Supplement.

** Defined in Table I.

TABLE J
 MATRIX OF ELEMENTS, CORRECTIVE ACTIONS, AND CAUSES
 SUBCATEGORY 24500

FINDING/ CORRECTIVE ACTION ELEM CLASS.** CORRECTIVE ACTION CATD			CAUSES OF NEGATIVE FINDINGS *															Signifi- cance of Corrective Actions* D H H					
			MANAGEMENT EFFECTIVENESS							DESIGN PROCESS EFFECTIVENESS							TECHNICAL ADEQUACY						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				16	17	
			Frag- mented Organ- iza-	Inade- quate Q-	Inade- quate Proce-	Inade- dures Fol-	Inade- quate Com-	Un- timely Res	Lack of Atten-	Inade- quate Design Bases	Inade- quate Calcs	As- bit cil.	Lack of Detail	Engrg Judgmt of Docu- mented	Design Crit/ Verif	Insuf. Stds Not Fol-	Not Commt Docu- menta-				Not Fol- lowed	Engrg Error	Vendor Error
D3		Identification of licensing commitments and development of Design Criteria/Design Bases, as well as balance of General Design Criteria, will be completed before unit 2 restart. The Design Basis Document (DBD), which is an integral part of the Design Baseline and Verification Program (DBVP), will be completed before restart of applicable units. The portion of the C/R database related to each unit will be completed before restart of each respective unit, and it will be maintained over the life of the plant (BFN).							X	X										A	P	P	
D3		Fully develop and issue a Design Basis Document (DBD) before fuel loading of each unit. The commitments/requirements (C/R) database generated for the DBD will be maintained for life of plant.							X	X											A	P	P
201.3	C3	Fully develop and implement a Design Baseline and Verification Program, including Design Basis Document, incorporating in each all current commitments and requirements; issue all design criteria documents that are not yet issued.							X	X											A	P	P

* Defined in the Glossary Supplement.

** Defined in Table I.

TABLE J
MATRIX OF ELEMENTS, CORRECTIVE ACTIONS, AND CAUSES
SUBCATEGORY 24500

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FINDING/ CORRECTIVE ACTION	ELEM	CLASS.**	CORRECTIVE ACTION	CATD	CAUSES OF NEGATIVE FINDINGS *													SIGNIFICANCE OF CORRECTIVE ACTIONS*													
					MANAGEMENT EFFECTIVENESS						DESIGN PROCESS EFFECTIVENESS						TECHNICAL ADEQUACY														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17										
					Frags- mented Organi- zation	Inade- quate Q- trng	Inade- quate Proce- dures	Not Fol- lowed	Inade- quate Com- muni- cation	Un- timely Res of Issues	Lack of Myt Atten	Inade- quate Design Bases	Inade- quate As- blt	Inade- quate Recon- cil.	Engrg Lack of Detail	Design not Docu- mented	Insuf. Verif Not Met	Stds Not tion owed	Engrg Error	Vendor Error	D	H	II								
	D3		Review, revise, develop, document, index, and issue all currently deficient or lacking design criteria, and issue a schedule for doing so; all design criteria will adequately reference applicable standards and reg. guides committed to in the FSARs.	SUN 01 WBN 05 WBN 06				X																			A	P	P		
	D3		Issue or delete, as appropriate, design criteria identified in Design Criteria Manual Index, but not actually issued, by definite dates.	BFN 01 BFN 02 BFN 03				X																				A	P	P	
	D3		Cancel Design Criteria BFN-50-766; revise Design Criteria BFN-50-7084 to include containment isolation requirements for cross-tie to System 32.	BFN 04									X															A	P	P	
	D3		Delete design criteria that are not required, resolve design criteria discrepancies, make FSAR agree with revised design criteria, and issue all revised criteria before unit 1 fuel load.	BLN 01 BLN 02 BLN 03 WBN 02 WBN 03 WBN 04				X					X															A	P	P	
201.4	E3		Perform comprehensive review of all electrical design standards and design guides, and implement a program for maintaining the integrity of the standards and guides on an ongoing basis.	NPS 01 (SUN, BFN, BLN)																									A	P	P

* Defined in the Glossary Supplement.

** Defined in Table 1.

TABLE 3
MATRIX OF ELEMENTS, CORRECTIVE ACTIONS, AND CAUSES
SUBCATEGORY 24500

REVISION NUMBER: 4
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ELEM	FINDING/ CORRECTIVE ACTION CLASS.**	CORRECTIVE ACTION	CATD	CAUSES OF NEGATIVE FINDINGS *														Signifi- cance of Corrective Actions ^a					
				MANAGEMENT EFFECTIVENESS							DESIGN PROCESS EFFECTIVENESS										TECHNICAL ADEQUACY		
				1	2	3	4	5	6	7	8	9	10	11	12	13	14				15	16	17
				Fragn- Organ- iza- tion	Inade- quate Q- ltry	Inade- quate Proce- dures	Proce- dures Not ful- lved	Inade- quate Com- muni- cation	Un- timely Res ol Issues	Lack of Mgt Atten	Inade- quate Design Bases	Inade- quate Recon- Calcs	As-blt of cfl.	Lack of Detail	Engrg Judgmt Docu- mented	Design Crit/ Not Met	Insuf. Verif Docu- ment ation				Stds Not Fol- lowed	Engrg Error	Vendor Error
201.5	C2	Issue two OHP procedures covering the Corporate Commitment Tracking System (CCTS) before restart.	SQN U1			X													A	-	-		
	C3	Verify that all open and completed commitments to NRC are being tracked by CCTS.	SQN U2 SQN U3 NPS U2 (MBN & BFN)																	A	-	-	
	C2	Issue Site Director Procedure "Site Commitment Management and Tracking" onsite by 10/01/87. All DNSL program area procedures have been assigned and are being tracked.	BLN U1			X														A	-	-	
	E2, E3	Revise procedures for reviewing the ECHs for the FSAR update program, and verify the accuracy of the UFSAR.	SQN U4			X														A	-	-	
	E3	As-constructed configuration control drawings (CLD), incorporating changes resulting from the DBVP are being completed by the Division of Nuclear Engineering; the UFSAR will be updated accordingly.	BFN U2																	A	-	-	

* Defined in the Glossary Supplement.

** Defined in Table 1.

TABLE 3
MATRIX OF ELEMENTS, CORRECTIVE ACTIONS, AND CAUSES
SUBCATEGORY 24500

REVISION NUMBER: 4
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FINDING/ CORRECTIVE ACTION ELEM	CLASS.**	CORRECTIVE ACTION	CATD	CAUSES OF NEGATIVE FINDINGS *																	Signifi- cance of Corrective Actions*									
				MANAGEMENT EFFECTIVENESS								DESIGN PROCESS EFFECTIVENESS							TECHNICAL ADEQUACY											
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17										
				Frags- mented Organi- za-	Inade- quate Q-	Inade- quate Proce- dures	Proce- dures Not Fol-	Inade- quate Com- mi-	Un- timely Res	Lack of Mgt Atten	Inade- quate Design Bases	Inade- quate As-blt Calcs	Lack of Detail	Engrg Judgmt Docu- ment	Design Crit/ not Met	Insuf. Verif tion	Stds Not Fol-	Engrg Error	Vendor Error											
201.6	D3	For SQN & BFN, develop and fully implement the Design Baseline and Verification Program (DBVP), the Design Basis Document (DBD) Program, and the Commitments/ Requirements Database Program.	SQN 01(1) WBN 01 BFN 01								X																	A	P	P
203.3	U2	Issue ONP directive requiring a Nuclear Experience Review Program (NER) program.	SQN 01 NPS 01 (WBN, BFN, BLN)			X																						A	-	-
	D2	Revise site procedure for NER program.	SQN 02			X																						A	-	-
	D2	Issue division-level procedures for NER program.	SQN 03 NPS 03 (WBN, BFN, BLN)			X																						A	-	-
	D7	Implement NER program before unit 2 restart.	SQN 04				X			X																		A	P	P
	D2	Revise site procedure and division-level procedure for NER program.	WBN 02 NPS 04 (WBN, BFN, BLN)			X																						A	-	-
	D2	Issue onsite procedure for new NER program.	BFN 01 BLN 01			X																						A	-	-
203.4	D2	Revise the specified engineering requirement specification to include requirements for condensate pot installation.	WBN 01			X																						A	-	-

(1) CATD 201 06 SQN 01 has been deleted; this corrective action is provided under CATD 201 01 SQN 01.

* Defined in the Glossary Supplement.

** Defined in Table 1.

TABLE J
MATRIX OF ELEMENTS, CORRECTIVE ACTIONS, AND CAUSES
SUBCATEGORY 24500

REVISION NUMBER: 4
PAGE 64 OF 67

FINDING/ CORRECTIVE ACTION	ELEM	CLASS.**	CORRECTIVE ACTION	CATD	CAUSES OF NEGATIVE FINDINGS *																	Signifi- cance of Corrective Actions*																		
					MANAGEMENT EFFECTIVENESS							DESIGN PROCESS EFFECTIVENESS							TECHNICAL ADEQUACY																					
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17																			
					Frag- mented Organ- iza- tion	Inade- quate Q- Planng	Inade- quate Proce- dures	Proce- dures Not Fol- lowed	Inade- quate Com- muni- cation	Un- timely Res of Issues	Lack of Mgt Ailen	Inade- quate Design Bases	Inade- quate Recon- Calcs	As-bit of Detail	Lack of Docu- ment	Engrg Judgm Not Met	Crit/ Verif Not tion	Insuf. Stds Not Engrg Error	Stds Not Engrg Error	Vendor Error	D	M	H																	
		02	Revise engineering change notice (ECN) procedure to require review of ECNs for effect on other WBN unit.	WBN 02			X		X																													A	-	-
	207.1	C2, C3, 03	The specified program management procedure (PHP) will remain in force; Nuclear Safety and Licensing Staff Procedure 35 will be cancelled by March 27, 1987; site director and nuclear project manager procedures will be issued to implement the PHP; a corrective action plan to resolve the specified audit deficiency has been submitted to the manager of Engineering Assurance.	NPS 03 (WBN) WBN 04 WBN 05			X											X																				A	-	-
	207.4	C2	Procedure and program modifications have adequately addressed and resolved the concern.	None(2)			X																															A	-	-
	213.3	03	Fully develop and issue nonexistent design criteria documents for safety related portions of instrumentation and controls (I&C), lighting, communications, and thermal overload & torque.	SQM 01 SQM 02 SQM 03				X										X																				A	P	P
TOTALS						1	0	13	5	1	5	1	11	0	4	0	0	3	2	0	0	0																	46	

(2) See Attachment B, Element 207.4, corrective action "a" for all plants.

* Defined in the Glossary Supplement.

** Def Table 1.

GLOSSARY SUPPLEMENT
FOR THE ENGINEERING CATEGORY

Causes of Negative Findings - the causes for findings that require corrective action are categorized as follows:

1. Fragmented organization - Lines of authority, responsibility, and accountability were not clearly defined.
2. Inadequate quality (Q) training - Personnel were not fully trained in the procedures established for design process control and in the maintenance of design documents, including audits.
3. Inadequate procedures - Design and modification control methods and procedures were deficient in establishing requirements and did not ensure an effective design control program in some areas.
4. Procedures not followed - Existing procedures controlling the design process were not fully adhered to.
5. Inadequate communications - Communication, coordination, and cooperation were not fully effective in supplying needed information within plants, between plants and organizations (e.g., Engineering, Construction, Licensing, and Operations), and between interorganizational disciplines and departments.
6. Untimely resolution of issues - Problems were not resolved in a timely manner, and their resolution was not aggressively pursued.
7. Lack of management attention - There was a lack of management attention in ensuring that programs required for an effective design process were established and implemented.
8. Inadequate design bases - Design bases were lacking, vague, or incomplete for design execution and verification and for design change evaluation.
9. Inadequate calculations - Design calculations were incomplete, used incorrect input or assumptions, or otherwise failed to fully demonstrate compliance with design requirements or support design output documents.
10. Inadequate as-built reconciliation - Reconciliation of design and licensing documents with plant as-built condition was lacking or incomplete.

11. Lack of design detail - Detail in design output documents was insufficient to ensure compliance with design requirements.
12. Failure to document engineering judgments - Documentation justifying engineering judgments used in the design process was lacking or incomplete.
13. Design criteria/commitments not met - Design criteria or licensing commitments were not met.
14. Insufficient verification documentation - Documentation (Q) was insufficient to audit the adequacy of design and installation.
15. Standards not followed - Code or industry standards and practices were not complied with.
16. Engineering error - There were errors or oversights in the assumptions, methodology, or judgments used in the design process.
17. Vendor error - Vendor design or supplied items were deficient for the intended purpose.

Classification of Corrective Actions - corrective actions are classified as belonging to one or more of the following groups:

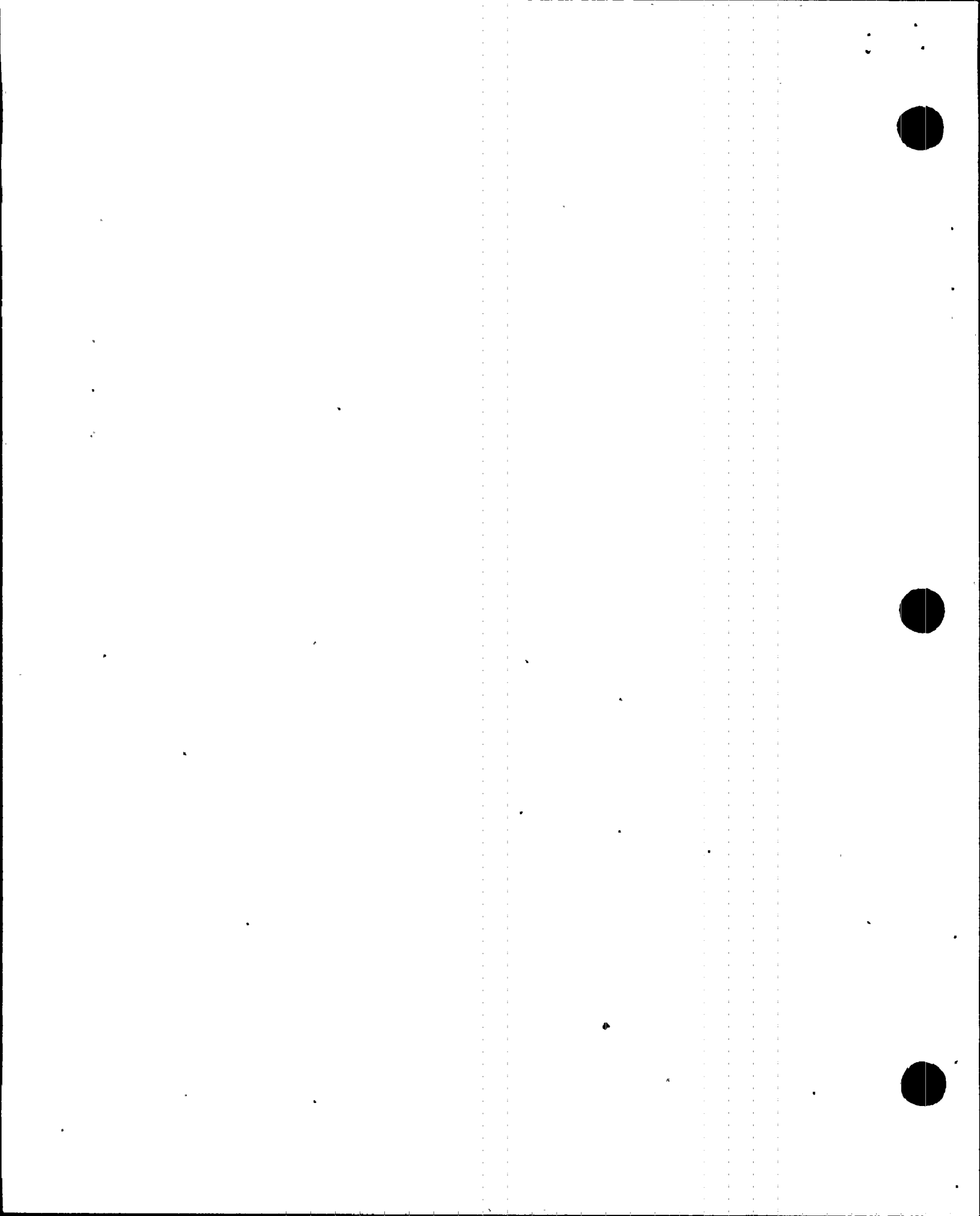
1. Hardware - physical plant changes
2. Procedure - changed or generated a procedure
3. Documentation - affected QA records
4. Training - required personnel education
5. Analysis - required design calculations, etc., to resolve
6. Evaluation - initial corrective action plan indicated a need to evaluate the issue before a definitive plan could be established. Therefore, all hardware, procedure, etc., changes are not yet known
7. Other - items not listed above

Peripheral Finding (Issue) - A negative finding that does not result directly from an employee concern but that was uncovered during the process of evaluating an employee concern. By definition, peripheral findings (issues) require corrective action.

Significance of Corrective Actions - The evaluation team's judgment as to the significance of the corrective actions listed in Table 3 is indicated in the last three columns of the table. Significance is rated in accordance with the type or types of changes that may be expected to result from the corrective action. Changes are categorized as:

- o Documentation change (D) - This is a change to any design input or output document (e.g., drawing, specification, calculation, or procedure) that does not result in a significant reduction in design margin.
- o Change in design margin (M) - This is a change in design interpretation (minimum requirement vs actual capability) that results in a significant (outside normal limits of expected accuracy) change in the design margin. All designs include margins to allow for error and unforeseeable events. Changes in design margins are a normal and acceptable part of the design and construction process as long as the final design margins satisfy regulatory requirements and applicable codes and standards.
- o Change of hardware (H) - This is a physical change to an existing plant structure or component that results from a change in the design basis, or that is required to correct an initially inadequate design or design error.

If the change resulting from the corrective action is judged to be significant, either an "A" for actual or "P" for potential is entered into the appropriate column of Table 3. Actual is distinguished from potential because corrective actions are not complete and, consequently, the scope of required changes may not be known. Corrective actions are judged to be significant if the resultant changes affect the overall quality, performance, or margin of a safety-related structure, system, or component.



ATTACHMENT A

EMPLOYEE CONCERNS
FOR SUBCATEGORY 24500

Attachment A -- lists, by element, each employee concern evaluated in the subcategory. The concern's number is given, along with notation of any other subcategory with which the concern is shared and the plant sites to which it could be applicable. The concern is quoted as received by TVA, and characterized by TVA as safety related (SR), safety significant (SS), or not safety related (NO).

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4

PAGE A-2 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SN	WBN	BFN	BLN	
201.1	WI-85-100-001 (shared with 70600)	WBN	X	X	X	X	"Electrical and I&C regulations (Reg. Guides, NUREGs, Bulletins and notices) have been ignored and violated to a very large degree at all plants. This has been caused by a lack of knowledge, a poor attitude toward safety and regulations, and a lack of knowledge of industry positions on regulations on the part of TVA personnel. CI has no further information. Anonymous concern via letter." (SR)
	XX-85-122-001 (shared with 70600)	SN	X	X	X	X	"Sequoyah - Electrical and I&C regulations (Reg. Guides NUREGs, Bulletins and notices) have been ignored and violated to a very large degree at all plants. This has been caused by a lack of knowledge, a poor attitude toward safety and regulations, and a lack of knowledge of industry positions on regulations on the part of TVA personnel. CI has no further information. Anonymous concern via letter." (SS)
	XX-85-122-002 (shared with 70600)	BLN	X	X	X	X	"Bellefonte - Electrical and I&C regulations (Reg. Guides NUREGs, Bulletins and notices) have been ignored and violated to a very large degree at all plants. This has been caused by a lack of knowledge, a poor attitude toward safety and regulations, and a lack of knowledge of industry positions on regulations on the part of TVA personnel. CI has no further information. Anonymous concern via letter." (SR)
	XX-85-122-003 (shared with 70600)	BFN	X	X	X	X	"Browns Ferry - Electrical and I&C regulations (Reg. Guides NUREGs, Bulletins and notices) have been ignored and violated to a very large degree at all plants. This has been caused by a lack of knowledge, a poor attitude toward safety and regulations, and a lack of knowledge of industry positions on regulations on the part of TVA personnel. CI has no further information. Anonymous concern via letter." (SR)
201.3	WI-85-100-044	WBN	X	X	X	X	"TVA has set up design criteria for WBNP and, after the fact, has inactivated a large percentage of the criteria. CI has no further information. Anonymous concern via letter." (SR)
	WI-85-100-019	WBN	X	X	X	X	"Electrical Standards and Guides are treated as guides, and are not incorporated in design criteria requirements. Electrical design criteria, where it exists, is not complete, is vague, and in general is inadequate. CI has no further information. Anonymous concern via letter." (SR)

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECI6 Program manual and applied by TVA before evaluations.

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4
PAGE A-3 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SQN	WBN	BFR	BLN	
201.3 (Cont'd)	IN-85-886-001 (shared with 20400 and 22000)	WBN	X	X	X	X	"TVA designs were not developed well enough to be constructible: 1) design changes are still being instituted in areas where there should have been minimal changes especially in area of conflicts between TVA and vendor dwgs. 2) engineering design criteria is often non-existent, particularly for seismic hanger design. Many design criteria or acceptance criteria are still being changed. This is generic concern. Any further information would divulge confidentiality. Construction Dept. concern. CI has no further information." (SR)
201.4	WI-85-100-038 (shared with 20400)	WBN	X See 201.3	X	X	X	"Design/installation drawings do not always represent or include design requirements. Design guides/standards are utilized only when designers want to use them. Design guides/standards are inadequate in many areas, and there are misuses, such as applicable parts are not referenced or excerpted as requirements. CI has no further information. Anonymous concern via letter." (SR)
	IN-86-259-X11	WBN	X See 201.3	X	X	X	"If TVA electrical procedures do not include IEEE standards requirements or their equivalent, numerous problems can result. Construction Dept. concern. CI has no further information. No follow-up required." (SR)
	BNP-QCP-10.35-8-26-2	BLN	X See 201.3	X	X	X	"Engineering can do a job within their standards, then they change those standards after the job is complete." (SR)
201.5	WI-85-100-041 (shared with 20400)	WBN	X	X	X	X	"Lack of adequate tracking for EN DLS commitments and design changes. CI has no further information. Anonymous concern via letter." (SR)
	XX-85-122-006 (shared with 24600)	SQN	X	X	X	X	"Diesel generator margins are inadequate. TVA has added DGs to Browns Ferry, Sequoyah and Watts Bar. Each time a question is raised, TVA must conduct another study. TVA adds diesel generators without upgrading licensing documents. CI has no further information. Anonymous concern via letter." (SS)

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECIG Program manual and applied by TVA before evaluations.

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4
PAGE A-4 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SQH	WBN	BFN	BLN	
201.5 (Cont'd)	XX-85-122-007 (shared with 24600)	BFN	X	X	X	X	"Diesel generator margins are inadequate. TVA has added DGs to Browns Ferry, Sequoyah and Watts Bar. Each time a question is raised, TVA must conduct another study. TVA adds diesel generators without upgrading licensing documents. CI has no further information. Anonymous concern via letter." (SR)
	WI-85-100-002 (shared with 24600)	WBN	X	X	X	X	"Diesel generator margins are inadequate. TVA has added DGs to Browns Ferry, Sequoyah and Watts Bar. Each time a question is raised, TVA must conduct another study. TVA adds diesel generators without upgrading licensing documents. CI has no further information. Anonymous concern via letter." (SR)
	I-85-142-SQH (shared with 24600)	SQH	X	X	X	X	"Diesel generator margins are inadequate. TVA has added DGs to Browns Ferry, Sequoyah and Watts Bar. Each time a question is raised, TVA must conduct another study. TVA adds diesel generators without upgrading licensing documents. CI has no further information. Anonymous concern via letter." (SR)
201.6	WI-85-100-037	WBN	X	X	X	X	"Lack of traceability of design requirements. The standard answer is "it's TVA practice". CI has no further information. Anonymous concern via letter." (SR)
	I-85-128-NPS (shared with 20400, 24600, 20600, 80300, and 80500)	BFN	X	X	X	X	"An individual from BFN wrote NSRS expressing his concern that the control and quality of OE's design effort is inadequate. The CI sent several roughly written pages detailing and summarizing his evaluation and conclusion of three major areas: (1) Design Calculations, (2) NCR's, and (3) Management Policies." (SS)

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECIG Program manual and applied by TVA before evaluations.

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4
PAGE A-5 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SEQ	WBN	WBH	BLN	
201.6 (Cont'd)	W1-85-100-043 (shared with 24600)	WBN	X	X	X	X	"There are problems in design calculations, in that some are never prepared, some are inadequate in scope and quality, and some are not stored as quality records. There is inadequate interface and control of design calculations, which impacts traceability of design requirements. CI has no further information. Anonymous concern via letter." (SR)
201.8	IN-85-545-X09	WBN		X			"The Watts Bar Code requirements are far less stringent than Bellefonte. Construction Dept. concern. CI has no further information."
	IN-85-545-005	WBN		X			"The Watts Bar code requirements are far less stringent than Bellefonte."
203.1	IN-85-911-002	WBN		X			"TVA management does not communicate between sites. Mistakes were made at the a Sequoyah plant and then fixed. When the same systems were installed at WBHP, the fix was not included. Example provided was the replacement of 6-8" black iron pipe at Pumping Station at Sequoyah, then subsequent installation of black iron pipe at WBHP, the same location. No further information available." (NO)
	IN-85-768-002	WBH		X			"Management makes same mistakes at WBHP that were made at Sequoyah (e.g., Carbon steel lines were run where stainless steel was known to be needed.) No further details available." (RO)
	XX-85-006-001	WBN		X			"Where the design errors at Sequoyah corrected? They were carried forward to Watts Bar. On this concern, CI was contacted for additional information. CI stated it was hearsay and CI has no information to back it up. Construction Dept. concern. CI has no further information." (SR)

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the LCIG Program manual and applied by TVA before evaluations.

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4
PAGE A-6 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SQH	WBN	BFN	BLN	
203.1 (Cont'd)	WI-85-091-004	WBN		X			"The identified design problems causing a lot of rework at Sequoyah was not corrected in the Watts Bar design and as a result the same amount of rework has to be done at Watts Bar. This created a lot of unnecessary material scrap and a waste of money. CI has no further information. Construction Dept. concern." (NO)
	IN-85-245-006	WBN		X			"TVA fails to incorporate changes into designs, even when the change was proven necessary in a separate, but similar hardware configuration. This results in hardware being installed to obsolete designs. And the hardware then must be cut out and reworked to the way it should have been in the first place. CI had no further information. (Construction department concern.)" (SR)
	IN-85-283-004	WBN		X			"Design errors which were made at Sequoyah were also carried over to Watts Bar. CI could provide no additional information. Construction concern. Units 1 and 2." (SR)
	IN-85-389-001	WBN		X			"Pipe, hangers, conduit, cable, etc...that was installed at Sequoyah and had to be changed/reworked to satisfy new design input is installed at WBNP the same way, knowing that it will have to be changed/reworked at a later date." (NO)
	IN-85-533-005	WBN		X			"Watts Bar was supposed to be a duplicate of Sequoyah, but changes made at Sequoyah have never been reflected into the drawings at Watts Bar. The CI wants to know why TVA continues to make the mistakes that Sequoyah made but found solutions for? Construction Dept. concern. CI has no further information." (NO)

* SR/NO/SS indicates safety-related, not safety related, or safety significant per determination criteria in the ECTG Program manual and applied by TVA before evaluations.

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4
PAGE A-7 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SON	WBN	BFN	BLR	
203.1 (Cont'd)	IN-86-205-005 (shared with 71000)	WUN		X			"Engineering support for the craft is poor. For example design changes at Sequoyah are not properly incorporated at WBNP. One such case was the titration tank, common to both units on EL. 676' Auxiliary Building. It had a SCH 40 nozzle with a "J" bevel that had to connect to a schedule 10 "V" bevel pipe (all S.S.). Instead of incorporating the design change that was made at Sequoyah via FCR, WBNP Engineering waited until the craft was ready to work the hardware; and only then write on FCR. It took several weeks to arrive at the same solution that Sequoyah employed (which was to machine a transition piece out of such SCH 40 pipe including to proper weld pups and wall thickness reduction). Construction Department concern R1975. CI has no further information." (NO)
	ECTG-4	WUN		X			"The TVA Director of Engineering, in the early 1970s, directed that Sequoyah designs be copied for Watts Bar, to the maximum extent possible, since the plants were of the same type. However, these plans were soon found to be unacceptable, since there were so many design foulups at Sequoyah, and it was decided that widespread copying of errors would result. Were these plans carried out? (Ref: NRC letter from B. J. Youngblood to S. A. White dated Feb. 18, 1986. RIMS # A02 860224 020)" (SS)
203.2							(Now in 204.4)
203.3	WI-85-100-034 (shared with 20400, and 30/00)		X	X	X	X	"Engineering (ENDES) inadequately addresses and considers operation, maintenance, testing and construction requirements and general industry practices in the design process. There are not forced interactions with other utilities, no formal system to track and assign commitment for problems identified to INPO, and poor tracking of NRC experience information." (SR)
203.4	IN-85-397-003	WUN		X			"Requirements for Unit 2 are different from Unit 1, but there was no effort to retrofit Unit 1. Unit 2 pressure indicators must be installed within line pressure regulators (snubbers) which make the instruments sense less erratically than if they were connected directly to the pressurized system. These devices were not required on Unit 1. CI has no further information." (SR)

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECTG Program manual and applied by TVA before evaluations.

27310-R9 (11/20/87)

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4

PAGE A-8 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SRN	NRN	DFR	ULR	
203.4 (Cont'd)	IN-85-217-001	WBN		X			"Design drawings for Unit #1 omitted installation dimension for [condensate] pots which should have been a maximum of 3 feet from root valve to [condensate] pot. Numerous [condensate] pots in Unit #1 were installed with up to 90 feet between [condensate] pots and root valve[s]. Drawings for Unit #2 have this dimension specified. Concerned that [condensate] pots installed in Unit #1 [are] out of tolerance and should be corrected." (SR)
	IN-85-354-001	WBN		X			"Instrumentation design of Unit[s] 1 & 2 changes have been made on Unit 2 instrumentation sensing lines, and not on Unit 1. C/I was not told a maximum distance for the installation of condensate pots for Unit #1. C/I does have a maximum distance on Unit #2. The possibility exists [that] Unit #1 has not been checked. This concern is located in the turbine room north-south valve room." (Note: This is the same as IN-85-217-001 above.) (SR)
	IN-85-644-002	WBN		X			"Drawing/design changes made on Unit 2 instrumentation systems, which require actual system rework, are not imposed upon corresponding [identical] items and systems previously installed in Unit 1. Of specific concern was the dimension allowable from the 'condensate pot' to the 'root valve.' [This] dimension [was] specified for Unit 2, [but was] not specified for Unit 1. No specifics, or any further details could be provided by [the] C/I." (Note: this is the same as in IN-85-354-001 and IN-85-217-001 above.) (SR)
	EX-85-002-002 (shared with 26000)	WBN		X			"Accumulators on Unit 2 had a 6" pipe going into accumulator. Error found in flow [calculation] and piping changed out to 10". Unit 1 still has 6" pipe. Reactor building pipe chase area, elevation 716'-745'. (not all accumulators). CI had no further information." (SR)

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECTG Program manual and applied by TVA before evaluations.

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4
PAGE A-9 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SQN	WBN	BFN	ULN	
203.4 (Con'td)	EX-85-059-003** (shared with 70600)	WBN		X			"C/I would like to know why the various TVA plants (nuclear) are all designed differently? C/I expressed that the increased cost factor to the rate payers is senseless. Const. Dept. concern. C/I has no further information." (NO)
207.1	IN-85-134-005	WBN		X			"TVA engineering personnel consistently provide "buy-offs" of rejected work. The instance reported concerned a 3/4" slag hole in a weld. CI has passed away, no further details available." (SR)
	IN-85-630-003 (shared with 24600)	WBN		X			"Emergency raw cooling water (LRCW) intake lines were improperly installed by the subcontractor. Several nonconformance reports were written, all of which came back dispositioned as 'no significant problem'. CI disagrees with these dispositions. Constr. Dept. concern. CI has no further information. No followup required." (SR)
	IN-85-630-004 (shared with 24600)	WBN		X			"Contractor (known) for the lining installation on the emergency raw cooling water (ERCW) intake line was required by contract, to maintain appropriate documentation relative to work performed. A nonconformance report was written, and dispositioned "use as is" after the contractor twice failed to produce the required documentation. Const. Dept concern. CI has no further information. No followup required." (SR)

NOTE: ** Concern EX-85-059-003 to be included in the WBN element 203.4 at subcategory level. It was not addressed at the element level.

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECTG Program manual and applied by TVA before evaluations.

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4
PAGE A-10 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SQN	WBN	BFN	BLN	
207.1 (Cont'd)	IN-85-877-001 (shared with 23300)	WBN		X			"The ECRW [sic] line was accepted by Knoxville engineering even though Watts Bar QA found and documented the following non-conformances: (1981/1982) 1. Did not meet min thickness (liner). 2. Liner did not bond to pipe. 3. Grout was not maintained at 100% humidity (ends of pipe were improperly covered during curing). 4. Liner has cracks. 5. Screens going into RB 1&2 are currently being clogged with chipped grout. No additional information available." (SR)
	IN-85-010-001	WBN		X			"Problem with electrical hanger documentation and inspection in Unit #1. Example: QC hanger inspectors rejecting a hanger then being overridden by management via USO notes. CI would not supply any additional information because CI feels that NCR #5857 and NCR letters [in TVA docket numbers] 50-390, 391, 438 and 439 adequately address this condition." (SR)
207.2	W1-85-100-027	WBN	X	X	X	X	"TVA Safety and Licensing Evaluations by EN DES (including NEB) are inadequate and appear too much in a cover up mode. CI has no further information. Anonymous concern via letter." (SR)
	IN-85-143-004** (shared with 71700)	WBN		X			"CI is concerned that the quality of engineering and design personnel would cause a cover-up of problems with paperwork. Construction department concern. No further information is available in file. No follow up required." (SR)

NOTE: ** Concern IN-85-143-004 to be included in WBN element 207.2 at the subcategory level. It was not addressed at the element evaluation level.

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECTG Program manual and applied by TVA before evaluations.

ATTACHMENT A

EMPLOYEE CONCERNS FOR SUBCATEGORY 24500

REVISION NUMBER: 4
PAGE A-11 OF 11

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY				CONCERN DESCRIPTION*
			SQN	WBN	BFN	BLN	
207.3				D E L E T E D			(Now in 213.2)
207.4	I-85-761-NPS	WBN	X	X	X	X	"DNE practice for approval of CAQ Documentation (i.e., PIR & SCR) hinders the reporting of conditions adverse to quality by employees." (SS)
213.3	HI-85-100-019	WBN	X	X See 201.3	X See 201.3	X See 201.3	"Electrical Standards and Guides are treated as guides, and are not incorporated in design criteria requirements. Electrical design criteria, where it exists, is not complete, is vague, and in general is inadequate." (SR)
213.4	IN-86-259-X11	WBN	X	X See 201.3	X See 201.3	X See 201.3	"If TVA electrical procedures do not include IEEE standard requirements or their equivalent, numerous problems can result. Construction Dept. concern. CI has no additional information". (SR)

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECTG Program manual and applied by TVA before evaluations.



ATTACHMENT B

SUMMARY OF ISSUES, FINDINGS, AND
CORRECTIVE ACTIONS FOR
SUBCATEGORY 24500

Attachment B -- contains a summary of the element-level evaluations. Each issue is listed, by element number and plant, opposite its corresponding findings and corrective actions. The reader may trace a concern from Attachment A to an issue in Attachment B by using the element number and applicable plant. The reader may relate a corrective action description in Attachment B to causes and significance in Table 3 by using the CATD number which appears in Attachment B in parentheses at the end of the corrective action description.

The term "Peripheral finding" in the issue column refers to a finding that occurred during the course of evaluating a concern but did not stem directly from a employee concern. These are classified as "E" in Tables 1 and 2 of this report

ATTACHMENT B
SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
FOR SUBCATEGORY 24500

REVISION NUMBER: 4
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Issues	Findings	Corrective Actions
***** Element 201.1 - Regulatory Requirements *****		
SQN	SQN	SQN
a. There is a general lack of knowledge of Regulatory Guides, NUREG, and Inspection and Enforcement (IE) Bulletins and Notices on the part of TVA personnel.	a. The evaluation team found no evidence to support the allegation that there is a general lack of knowledge of Regulatory Guides, NUREGs, and OIE Bulletins and Notices on the part of TVA personnel. Based on the documentation reviewed and interviews conducted during the course of the employee concerns review, appropriate TVA personnel are cognizant of the requirements.	a. None required.
b. Regulatory Guides have been ignored and have been violated to a large degree.	b. Regulatory Guides provide guidance for licensees and do not define a regulation unless they are imposed by a requirement document or they are formally committed to by TVA. Evidence was indicated that some regulatory guides applicable to SQN were not addressed or incorporated in a timely manner. An example of this is discussed in detail in Sequoyah License Evaluation 213.3. In the evaluation team review no evidence was found of regulations or requirements being intentionally ignored or violated. Sometimes, however, action on such matters was not completed in an appropriate period of time.	b. The C/R Database program (SQEP 18 R2), Design Basis Program and Design Baseline and Verification Program shall be completed as applicable to meet the requirements for each unit at Sequoyah. The OS-125 But phases for these programs will be completed as schedules are established. CADO 201 21 SQN 212 - 87
c. NUREGs have been ignored and have been violated to a large degree.	c. NUREGs provide guidance for licensees and do not define requirements unless the NUREGs are included in an NRC show cause order, letter, or other form of licensing commitment. Therefore in this context they cannot be violated. Most NUREGs also allow alternative approaches as long as deviations are identified and are justified. No evidence was found to indicate that NUREGs applicable to SQN that have been committed to were ignored or violated.	c. None required.
d. OIE Bulletins and Notices have been ignored and have been violated to a large degree.	d. OIE Bulletins reflect NRC staff positions which, unless complied with or a satisfactory alternative is offered, could be imposed by a formal requirement. Since they are not regulations, they cannot be violated. However, evidence was found to indicate that some TVA responses to bulletins were both late and partially incomplete or inadequate.	d. See b. above

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SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
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REVISION NUMBER: 4
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Issues	Findings	Corrective Actions
Element 201.1 - SQN (Continued)		
e. There is a lack of knowledge of industry positions on regulations on the part of TVA personnel.	<p>OIE Notices are issued by NRC to give early notification of possible significant events. Usually Notices suggest review for possible applicability, but no feedback to the NRC is requested. Since they are not regulations, they cannot be violated. No evidence was found that any Notices were intentionally ignored.</p> <p>e. The evaluation team found no evidence of a general lack of knowledge of industry positions on regulations. Documentation reviewed indicated active TVA participation in NSSS Owner's group efforts as well as in technical societies (IEEE, ASME, etc.) at both committee and subcommittee levels.</p>	e. None required.
WBN	WBN	WBN
a. There is a general lack of knowledge of Regulatory Guides, NUREG, and Office of Inspection and Enforcement (OIE) Bulletins and Notices on the part of TVA personnel.	<p>a. The evaluation team found no evidence to support the allegation that there is a general lack of knowledge of Regulatory Guides, NUREG, and Office of Inspection and Enforcement (OIE) Bulletins and Notices on the part of TVA personnel. Appropriate TVA personnel are cognizant of the regulatory requirements on the basis of the evaluation team review of the licensing commitment documents, design input documents, engineering procedures, and interviews with TVA personnel. The licensing commitment documents reviewed were the WBN FSAR and the Topical Report TVA-TR/5-1A.</p> <p>Design input documents reviewed included a sample of 14 design criteria documents. TVA engineering procedures which describe the methods and practices for handling licensing requirements and design input were examined. These included five Division of Engineering Design, Engineering Procedures (EN DLS-LPs); two Office of Engineering Procedures (OEPs); and two Nuclear Engineering Procedures (NEPs). Appropriate engineering personnel are indoctrinated on the requirements of the engineering procedures through a training program. This program has been implemented and is audited by the Quality Management Staff. During the employee concerns review, 10 TVA personnel from various engineering branches were interviewed.</p>	a. None required.

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SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
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REVISION NUMBER: 4
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Issues	Findings	Corrective Actions
Element 201.1 - WBN (Continued)	<p>In addition, reports on the evaluation of Watts Bar were examined. These reports included the NRC Safety Evaluation Report (SER), the NRC Systematic Assessment of Licensee Performance (SALP) Board reports (from January 1983 to July 1985), the Institute of Nuclear Power Operations (INPO) Report, and the Black and Veatch Independent Design Review. While these reports have documented conditions of incomplete, inadequate, and non-punctual compliance with licensing commitments, which are discussed in the other findings of this report, no evidence of a general lack of knowledge on Regulatory Guides, NUREGs, and OIL Bulletins and Notices was noted.</p>	Corrective Actions
d. Regulatory Guides have been ignored and have been violated to a large degree.	b. Regulatory Guides provide guidance for licensees and do not define a regulation unless they are imposed by a requirement document or TVA has formally committed to them.	d. The following corrective action plan (CAP) will be taken to confirm that licensing requirements and commitments have been appropriately implemented:
	<p>In the evaluation team review, no evidence was found that regulations or requirements were intentionally ignored or violated. However, evidence was found to indicate that some regulatory requirements and commitments were not fully complied with or not completed in an appropriate period of time as discussed below.</p>	o THE WBN FSAR, Safety Evaluation Report, Technical Specifications, and supporting reference documents will be reviewed to identify and document WBN regulatory commitments and requirements.
	<p>An example of not adequately referencing regulatory guides in a design criteria document is discussed in the Watts Bar Element Evaluation 201.3, "Design Criteria." Other examples of noncompliance are two items identified in the WBN SER for resolution. One item related to the Fire Protection Program not meeting the technical requirements of 10CFR50, Appendix R. The second item noted that the diesel generator auxiliary system did not conform to ANSI-N-195 and Regulatory Guide 1.137. These items are monitored by the NRC for resolution.</p>	o For each regulatory commitment/ requirement (C/R) a review will be performed to identify and document the highest level TVA source document in which the C/R is contained. For example, design criteria and system description documents will be reviewed first; if the C/R is not found, lower level documents (such as flow diagrams, control drawings, purchase specifications, etc.) will be reviewed until a TVA document containing the C/R is found or the C/R is documented as not found.
	<p>An example of not completing commitments in an appropriate period of time is documented by the Systemic Assessment of Licensee Performance (SALP) Board Report for WBN covering the period from January 1, 1985 through May 31, 1985. The NRC stated that:</p>	

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SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
FOR SUBCATEGORY 24500

REVISION NUMBER: 4
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Issues

Findings

Corrective Actions

Element 201.1 - WBN (Continued)

- o Any C/R for which a TVA source document cannot be identified will be documented as an open item and transmitted to the responsible line organization for a detailed review. These open items will be tracked by the WBN Design Baseline and Verification Program (DBVP) to ensure resolution.
- o The responsible line organization will review each assigned open item to verify that the C/R has been or is being adequately met, and to identify the appropriate TVA source document within which the C/R should be documented. The TVA corrective action program will be utilized, as appropriate, to ensure that C/Rs are adequately implemented, appropriate TVA source documents are updated, or exceptions to C/Rs are appropriately documented, justified, and approved.

The first three actions are to be accomplished as a part of the DBVP and will be governed by that program's procedures. The procedures covering these activities will be issued before work begins on the licensing verification portion of the DBVP. These three actions are to be completed prior to Unit 1 fuel load.

The line organization review, outlined in the fourth item above, will also be completed prior to Unit 1 fuel load. However, each Condition Adverse to Quality (CAQ) report initiated as a part of the fourth item will be individually evaluated to determine the required implementation schedule for the associated corrective actions. All CAQs will be tracked using the Tracking and Reporting of Open Items (TROI) system. Corporate Commitment Tracking System (CCIS) entries will be made for CAQs that are determined to be reportable to the NRC.
(CAID 201 01 WBN 01)

ATTACHMENT B
SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
FOR SUBCATEGORY 24500

REVISION NUMBER: 4
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Issues	Findings	Corrective Actions
Element 201.1 - WBN (Continued)		
c. NUREGs have been ignored and have been violated to a large degree.	<p>"the licensee did not make a concerted effort to ensure completion of SER commitments . . . despite commitment tracking deficiencies being identified as a significant construction deficiency several months earlier."</p> <p>Implementation of a program which confirms that licensing requirements and commitments have been appropriately implemented, should adequately resolve these programmatic issues. The Quality Management Staff (QMS) audit program has included implementation of commitments to MRC as an item for future audit and surveillance activities.</p> <p>c. Some NUREGs provide guidance for licensees and do not define requirements unless the NUREGs are included in an NRC "show cause" order, letter, or other form of licensing commitment. Therefore, in this context, they cannot be violated. Most NUREGs also allow alternative approaches as long as deviations are identified and are justified. No evidence was found to indicate that NUREGs applicable to WBN that have been committed to were ignored or violated.</p>	c. None required.
d. OIE Bulletins and Notices have been ignored and have been violated to a large degree.	<p>The Independent Design Verification Program conducted by Black and Veatch on WBN identified a finding where "equipment cannot be determined to be environmentally qualified to NUREG-0588." However, Nuclear Safety Review Staff (NSRS) Report No. R-84-19-WBN agrees with the TVA task force assessment of this finding that "TVA already had a program in place which could have reasonably been expected to correct the problems." The evaluation team review found that the Watts Bar environmental qualification program is in the process of implementation as discussed in the Watts Bar Element Evaluation 210.2.</p> <p>d. OIE Bulletins reflect NRC staff positions which, unless complied with or a satisfactory alternative is offered, could be imposed by a formal requirement. OIE Bulletins require a formal response. OIE Notices are issued by NRC to give early notification of possible significant events. Usually Notices suggest review of possible applicability, but no feedback to the NRC is requested. Since neither OIE Bulletins nor Notices are regulations, they cannot be violated.</p>	d. See Corrective Actions for Element 203.3 for WBN.

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SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
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Issues	Findings	Corrective Actions
Element 201.1 - WBN (Continued)		
	<p>Evidence was found to indicate that some TVA responses to Bulletins or Notices were both late and only partially complete or inadequately evaluated. As a result, TVA committed to the NRC on June 21, 1984, to review all NRC Information Notices and Circulars issued between 1979 and 1983. Of 324 documents reviewed, eight items required further investigation. These actions were tracked in the Tracking and Reporting of Open Items (TROI) to ensure final resolution.</p>	
	<p>Currently, OIE Bulletins and Notices are reviewed by TVA as part of the Nuclear Experience Review (NER) Program. Full implementation of this program requires corrective actions as discussed in Watts Bar Element Evaluation 203.3. TVA commitments to the NRC from the review of these OIE documents are now tracked by the Corporate Commitment Tracking System (CCTS) as addressed in Watts Bar Element Evaluation 201.5. Completion of corrective actions documented by these element evaluations should ensure timely review and evaluation of the OIE documents.</p>	
<p>e. There is a lack of knowledge of industry positions on regulations on the part of TVA personnel.</p>	<p>e. The evaluation team found no evidence of a general lack of knowledge of industry positions on regulations. Documentation reviewed indicated active TVA participation in NSSS Owner's group efforts as well as in technical societies (IEEE, ANSI, ASME, AIE, etc.) at both committee and subcommittee levels.</p>	<p>e. None required.</p>
<p>BFN</p>	<p>BFN</p>	<p>BFN</p>
<p>a. There is a general lack of knowledge of Regulatory Guides, NUREG, and Office of Inspection and Enforcement (OIE) Bulletins and Notices on the part of TVA personnel.</p>	<p>a. The evaluation team found no evidence to support the allegation that there is a general lack of knowledge of Regulatory Guides, NUREG, and OIE Bulletins and Notices on the part of TVA personnel. Appropriate TVA personnel are cognizant of the regulatory requirements on the basis of the evaluation team review of the licensing commitment documents, design criteria documents, engineering procedures, and interviews with TVA personnel. In addition, SER, SALP, and INPU reports on the evaluation of Browns Ferry were examined.</p>	<p>a. None required.</p>

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SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
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Issues	Findings	Corrective Actions
Element 201.1 - BFN (Continued)		
b. Regulatory Guides have been ignored and have been violated to a large degree.	b. Regulatory Guides provide guidance for licensees and do not define a regulation unless they are imposed by a requirement document or TVA has formally committed to them. In the evaluation team review, no evidence was found that regulations or requirements were intentionally ignored or violated. However, evidence was found that some regulatory requirements and licensing commitments were not fully complied with or not completed in an appropriate period of time. TVA has developed a CNPP and BFNPP that define the plans for correcting these problems. These plans include the implementation of the Design Baseline and Verification Program (DBVP), which confirms that licensing commitments and requirements have been appropriately implemented. The DBVP contains procedures for identifying the licensing commitments and requirements (C/Rs) and for developing the C/R database. The program, however, lacks procedural requirements for update and maintenance of the C/R database for the life of the plant.	b. "(a) The identification of Licensing Commitments and development of Design Criteria/Design Bases is in progress for the Unit 2 systems identified by the safe shutdown analysis as being required for restart. This work will be completed before restart of Unit 2. The issuance of the balance of the system and General Design Criteria required for Unit 2 Restart is currently forecasted to be complete by the end of July 1987. The Design Criteria Documents required to support non-restart portions of Unit 2, and to support both the restart and non-restart portions of Units 1 and 3, will be developed at a later date and implemented as required. "(b) The design basis document (DBD) is part of the issue outputs of the Design Baseline and Verification Program (DBVP) for each BFN unit. This document is currently being produced in accordance with NEP 3.2 and will be complete before restart of the applicable unit. "(c) The program elements of BFEP PI 86-17 have been implemented and the C/R data base does exist. The portion of the C/R data base which represents each BFN unit will be completed prior to the restart of each unit. Current plans are the C/R data base will be maintained current over the life of the plant in accordance with NEP 3.2."
(CATD 201 01 BFN 01)		

ATTACHMENT B
SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
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Issues

Findings

Corrective Actions

Element 201.1 - BFN (Continued)

Issues	Findings	Corrective Actions
		BFEP PI 86-17, "Identification of Licensing Commitments," will be revised to require the BFN C/R Database to be made current and maintained current. BFEP PI 86-18, "Design Criteria/Design Basis," will be revised to require a review of the Design Basis Document to determine if any revision is needed whenever the BFN C/R Database is revised. (After all Phase 1 (unit 2 restart) and Phase 2 (post unit 2 restart) Documentation is approved and issued, BFEP will propose for review and approval of Engineering Assurance an alternate approach for the life of the plant). (CATD 201 01 BFN 01)
c. NUREGs have been ignored and have been violated to a large degree.	c. Some NUREGs provide guidance for licensees and do not define requirements unless the NUREGs are included in an NRC "show cause" order, letter, or other form of licensing commitment. Therefore, in this context, they cannot be violated. Most NUREGs also allow alternative approaches as long as deviations are identified and are justified. No evidence was found to indicate that NUREGs applicable to BFN that have been committed to were ignored or violated.	c. None required.
d. OIE Bulletins and Notices have been ignored and have been violated to a large degree.	d. OIE Bulletins reflect NRC staff positions which, unless complied with or a satisfactory alternative is offered, could be imposed by a formal requirement. OIE Bulletins require a formal response. OIE Notices are issued by NRC to give early notification of possible significant events. Usually OIE Notices suggest review of possible applicability, but no feedback to the NRC is requested. Because neither OIE Bulletins nor Notices are regulations, they cannot be violated. Evidence was found to indicate that some TVA responses to Bulletins were late and only partially complete or inadequately evaluated.	d. Because the OIE Bulletins and Notices are currently being tracked by the Nuclear Experience Review (NER) program and by the Corporate Commitment Tracking System (CCTS), no further corrective action is required.

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Issues	Findings	Corrective Actions
Element 201.1 - BFN (Continued)		
e. There is a lack of knowledge of industry positions on regulations on the part of TVA personnel.	e. The evaluation team found no evidence of a general lack of knowledge of industry positions on regulations. Documentation reviewed indicated active TVA participation in NSSS Owner's Group efforts as well as in technical societies (IEEE, ANSI, ASME, AIF, etc.) at chairperson, committee, and subcommittee levels.	e. None required.
BLN	DLN	BLN
a. There is a general lack of knowledge of Regulatory Guides, NUREGs, and Inspection and Enforcement (IE) Bulletins and Notices on part of TVA personnel.	a. The evaluation team found no evidence to support the allegation that there is a general lack of knowledge of Regulatory Guides, NUREGs, and OIE Bulletins and Notices on the part of TVA personnel. Appropriate TVA personnel are cognizant of the regulatory requirements on the basis of the evaluation team review of the licensing commitment documents, design criteria documents, engineering procedures, as well as the SER, S&LP, and IHPD reports and interviews with TVA personnel.	a. None required.
b. Regulatory Guides have been ignored and have been violated to a large degree.	b. Regulatory Guides provide guidance for licensees and do not define a regulation unless they are imposed by a requirement document or TVA has formally committed to them. In the evaluation team review, no evidence was found that regulations or requirements were intentionally ignored or violated.	b. A Design Basis Document (DBD) for each unit is to be prepared before fuel loading of each unit. In accordance with NEP-3.2, the DBD will be comprised of those Design Criteria (DC) and System Description (SD) documents that were determined by the Discipline Lead Engineers to be required to define the design basis for BLN. This effort will include the preparation of some completely new documents, the consolidation of some existing documents, and the revision of some existing documents. The DBD will also include those documents which are listed as references in the DC/SD documents. The C/R data base generated for the DBD will be maintained for life of plant per NEP-3.2. (CATD 201 01 BLN 01)

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SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
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Issues

Findings

Corrective Actions

Element 201.1 - BLN (Continued)

TVA has developed a CIPP that defines the plans for correcting problems in the management of the TVA nuclear program.

A Bellefonte Design Basis Document has not been developed or implemented for the identifying, updating and maintenance of a commitments and requirements (C/Rs) database for the life of the plant.

c. NUREGs have been ignored and have been violated to a large degree.

c. Some NUREGs provide guidance for licensees and do not define requirements unless the NUREGs are included in an NRC "show cause" order, letter, or other form of licensing commitment. Therefore, in this context, they cannot be violated. Most NUREGs also allow alternative approaches as long as deviations are identified and are justified. No evidence was found to indicate that NUREGs applicable to BLN that have been committed to were ignored or violated.

c. None required.

d. IE Bulletins and Notices have been ignored and have been violated to a large degree.

d. OIE Bulletins reflect NRC staff positions which, unless complied with or a satisfactory alternative is offered, could be imposed by a formal requirement. OIE Bulletins require a formal response. OIE Notices are issued by NRC to give early notification of possible significant events. Usually OIE Notices suggest review of possible applicability, but no feedback to the NRC is requested. Because neither OIE Bulletins nor Notices are regulations, they cannot be violated.

d. None required.

e. There is a lack of knowledge of industry positions on regulations on the part of TVA personnel.

It was noted by the evaluation team that OIE Bulletins and Notices are being properly addressed and are being tracked in the Nuclear Experience Review (NER) program and in the Corporate Commitment Tracking System (CCTS).

e. The evaluation team found no evidence of a general lack of knowledge of industry positions on regulations. Documentation reviewed indicated active TVA participation in NSSS Owners Group efforts, as well as in industry organizations (e.g., IEEE, ANSI, ASME, AIF) at the chairperson, committee, and subcommittee levels.

e. None required.

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Issues

Findings

Corrective Actions

Element 201.3 - Design Criteria

SQN

a. Electrical and other engineering design criteria are not always complete, are vague, and are inadequate to form a basis for design.

SQN

a. The issue that some electrical and other engineering design criteria were inadequate is valid. However, procedural essentials exist for eliminating vagueness for achieving completeness, and for assuring adequacy of design criteria.

Completeness and adequacy are being established through design verification and interface review. This situation should be mitigated for SQN through the DBVP when walkdown/test data are compared to the licensing and the design basis criteria.

b. Many design criteria are changed late in the project.

b. Design criteria are sometimes changed late in the project. Changes are made when necessary to correct deficiencies. Appropriate procedures are in place for making necessary changes.

b. None required.

THIS ITEM COMPLETED
DATE: 7/1/88
SQN
In accordance with the Design Baseline (DBVP) and associated Design Basis Documents, the Design Criteria that are identified in SQEP-29 as requirements for the art will be reviewed, revised, or generated as applicable prior to restart (CAID 201 03 SQN 01) 88

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Issues	Findings	Corrective Actions
Element 201.3 - SQN (Continued)		
c. Some engineering design criteria are nonexistent.	c. The issue that some needed criteria did not exist was found to be true. Appropriate procedures, such as NEP-3.2, SQEP-18, and SQEP-29, are in place for generating such criteria.	c. See a. above.
d. Many design criteria were set up, then inactivated, and cannot be retrieved for use as a basis for modification of the original design.	d. It is true that some design criteria were set up and then inactivated. However, it was found that the inactivated criteria could easily be retrieved although they required update after retrieval. Some design criteria documents were inactivated when construction was completed and the system was put into operation, using the rationale that all necessary information was contained in design output documents. This was allowed by EP-3.01 at the time. The current procedure NEP 3.2 allows design criteria documents to be inactivated only when the entire subject system, structure, or component has been deleted from the plant or permanently removed from operation at the plant. Design requirements in the design criteria may be incorporated in a system description or design basis document.	d. None required.
WBN	WBN	WBN
a. Electrical design criteria are not always complete, are vague, and are inadequate to form a basis for design.	a. TVA engineering procedures are now, and were at the time the employee concerns were raised, in place which provide direction to assure that design criteria prepared by engineering are complete and are adequate. The electrical design criteria reviewed in detail by the evaluation team for this issue, were generally found to be adequate to form a design basis. However, some discrepancies, identified below, were noted: o WB-DC-30-1 RO (01/15/72), "Emergency Auxiliary Ac Power System" This criteria document was originally issued in 1972 and still refers to "PSAR" in Section 2.0. Additionally,	a. A DBD is to be prepared before fuel loading of Unit 1. The DBD will comprise those design criteria (DC) and system description (SD) documents that were determined by the discipline lead engineers to be required to define the design basis for WBN. This effort will include the preparation of some completely new documents, the consolidation of some existing documents, and the revision of some existing documents. This improved body of DC/SU documents will incorporate the current commitments and design requirements (C/R data base) for WBN. The DBD will also include those documents that are listed as references in the DC/SU documents. (CATD 201 03 WBN 01)

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Element 201.3 - WBN (Continued)

all applicable specific standards and Regulatory Guides are not adequately referenced in Section 7.0.

In Section 7.2, a reference to specific information is listed as "vendor," instead of the information being provided.

The description of the protection system in Section 3.4.4 is very general and may not clearly establish a basis of design.

- o WB-DC-30-3 R1 (10/25/85), "120 V Ac Vital Instrument Power System"

In this design criteria document, no voltage variation limit is stated for normal input 480 V, 3-phase power source to the inverter.

- o WB-DC-30-4 R4 (10/03/85), "Separation of Electrical Equipment and Wiring"

Findings regarding this design criteria document are discussed in detail in Watts Bar Element Evaluation 242.0, "Electrical Separation." Refer to CATDs of Element Evaluation 242.0 for problems identified relative to this specific design criteria document.

- o WB-DC-30-5 R2 (06/05/85), "Power, Control and Signal Cables for Use in Category 1 Structures"

Section 8.3.1 still references Design Standards DS-E9.2.1 and DS-E9.2.2 which have been superseded by Design Guide DG-E2.3.5.

Design Standards DS-E12.1.1 and DS-E12.1.2 are referenced in Sections 8.3.2 and 8.3.3, respectively, although they have been voided by Design Standard DS-E12.6.3 (09/02/86).

Furthermore, this design criteria document did not include reference to IEEE Standard 323-1976.

TVA has recognized that the Watts Bar design basis lacks adequate documentation. The WBN Design Baseline and Verification Program (DBVP) includes development of the DBD per Watts Bar Engineering Project (WBEP) Engineering Procedure (EP) WBEP-EP 08.02. The program will assure that all commitments will be identified and included in the DBD as appropriate. Specific findings identified in the CATD will be corrected for design criteria documents WB-DC-30-1, WB-DC-30-3, WB-DC-30-4, and WB-DC-30-5. This effort will be completed by TVA to support fuel load for Unit 1. (CATD 201 03 WBN 02)

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Element 201.3 - WBN (Continued)

The review also indicated that some commitments have not yet been incorporated into the appropriate electrical design criteria.

It is also important to note that TVA had already acknowledged the need for improvement in the area of design basis documentation.

The WBN Design Baseline and Verification Program (DBVP), includes development of the Design Basis Document (DBD) per Watts Bar Engineering Project (WBEP) Engineering Procedure (EP) WBEP-EP DB.02. The program also assures that all commitments will be identified and will be included in the DBD as appropriate. All commitments and requirements applicable to each design criteria document and each system description document shall be reviewed and incorporated into new design criteria/system descriptions or the existing design criteria/system descriptions shall be revised. This effort must be completed by TVA to support fuel load for Watts Bar Unit 1. Complete implementation of the DBD program should resolve this issue and those relating to incomplete or inadequate design criteria.

b. Many design criteria are changed late in the project.

b. Design criteria are sometimes changed late in the project, so the issue was found to generally be true. Changes are made when necessary to correct deficiencies regardless of the state of the project. Appropriate procedures are in place for making any necessary changes.

b. None required.

c. Some engineering design criteria are nonexistent.

c. The issue that some engineering design criteria are nonexistent was found to be true. Appropriate procedures, such as Nuclear Engineering Procedure (NEP) NEP-3.2 and WBEP-EP DB.02, are in place for generating such criteria.

c. TVA has recognized that the Watts Bar design basis lacks adequate documentation and has embarked on a DBVP. This program includes the development of the DBD, and assures that all commitments will be identified and included in the DBD as appropriate.

Although a review of the WBN electrical design criteria index by the evaluation team indicated that most of the needed electrical design criteria documents currently exist, design criteria documents for the following could not be identified:

- o Electrical raceway system
- o Protective relaying settings
- o Instrumentation and control system

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Element 201.3 - WBN (Continued)

The index of design criteria and the index of system descriptions were both included in the review. The following design criteria documents were identified by TVA in the design criteria index, but no evidence was found that they were ever issued:

- o WB-DC-30-11, "The Emergency Fire Protection Communication System"
- o WB-DC-30-14, "Class 1E Power Systems Response to Accident (Harsh) Environment"

This effort will include any necessary commitments or requirements for WB-DC-30-11, "The Emergency Fire Protection Communication System" and WB-DC-30-14, "Class 1E Power Systems Response to Accident (Harsh) Environment." This effort will be completed by TVA to support fuel load for Unit 1.
(CATD 201 03 WBN 03)

"TVA has recognized the need for criteria documents for electric raceways and for Instrumentation Sensing Lines and air lines. These will be included in development of the DBD. There is no TVA general design criteria for instrumentation and controls. This information is included in standards, guides, specifications, and system descriptions which ensure a design basis. However, TVA is developing specific design criteria or guides for instrumentation and controls (i.e., logic, control diagrams, sense line slope).

"Protective relaying and setting is presently procedurally controlled by ID-QAP-3.3. Relay settings are made by Power Systems Operations (PSO) and those required to ensure safety within the Auxiliary Power System are approved by DNE. Design and functional requirements of the protective relay systems are controlled by Design Standard DS E-5.3.2-'Selection of Current Transformers for Protective Relaying in AC Auxiliary Power System,' Design Guide DG-E7.1.2 - 'Protective Relay System Design for AC Auxiliary Power System' and

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Element 201.3 - HBN (Continued)

Issues	Findings	Corrective Actions
d. Many design criteria were set up, then inactivated, and cannot be retrieved for use as a basis for modification of the original design.	d. It was found to be true that some design criteria were established and then were inactivated (voided). However, it was also found that the inactivated criteria could easily be retrieved, although they required updating after retrieval before they could be reissued. Inactivation was allowed by Division of Engineering Design (EN DES) Engineering Procedure (EP) EP 3.01 when the design criteria no longer controlled the design or modification of a system.	Design Guide DG-E7.1.3 - 'Functional Requirements of Protective Relays for 1 & C Power Systems'. Relay settings are performed in accordance to PSO QAP's 2.2, (Calculations), 2.3 (Control of setting sheets), and 2.4 (Input documents used in performance of calcs) and reviewed by UNE in accordance to EEB22.24 - 'Protective Relays - Review of Setting Instruction'. However, if commitments are identified that reflect this subject they will be included in the DDD. The DDD must be completed by TVA to support fuel load for Watts Bar Unit 1." (CATD 201 03 HBN 04)
	The current procedure NLP-3.2 allows design criteria documents to be inactivated only when the entire subject system, structure, or component has been deleted from the plant design, or permanently removed if the item has been constructed, and the criteria have been consolidated or replaced with equivalent documents. Design requirements from the design criteria may be incorporated in a system description or DDD.	d. See first paragraph of a. above.
	TVA has advised that inactivated criteria are being reactivated as necessary.	

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Issues	Findings	Corrective Actions
Element 201.3 - WBN (Continued)		
<p>e. TVA electrical and other engineering standards and guides are not incorporated in design criteria.</p>	<p>e. Review of a sample (14 out of approximately 21) of electrical design criteria by the evaluation team indicates that applicable standards, regulatory guides, and regulations are included in these design criteria and are committed to when appropriate. In only two of the criteria reviewed, WB-DC-30-1 and WB-DC-30-5, were the applicable standards and regulatory guides not adequately referenced.</p>	<p>e. TVA has recognized that the Watts Bar design basis lacks adequate documentation. The WBN Design Baseline and Verification Program (DBVP) includes development of the DBD per Watts Bar Engineering Project (WBEP) Engineering Procedure (EP) WBEP-EP DB.02. The program will assure that all commitments will be identified and included in the DBD as appropriate. Applicable standards and regulatory guides will be referenced in design criteria WB-DC-30-1 and WB-DC-30-5. This effort will be completed by TVA to support fuel load for Unit 1. (CATU 201 03 WBN 05)</p>
<p>f. TVA design guides and standards are inadequate, are misused, are optional to designers, and are not referenced or excerpted as requirements on drawings.</p>	<p>f. Design Guides and Standards:</p> <ul style="list-style-type: none"> o The use of design guides is optional to designers as defined in TVA engineering procedures. o The optional use of design standards is not permitted by TVA procedures. Design standards must be used where applicable. o Design guides and standards are referenced or excerpted on drawings when applicable; generally indirectly through other engineering documents such as design criteria and construction specifications. 	<p>f. See Corrective Actions in Sequoyah Element Evaluation 237.2, 238.1, and 240.0.</p>

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Element 201.3 - WBN (Continued)		
	<ul style="list-style-type: none">o The issue that design guides and standards are inadequate or misused was substantiated through discussions with evaluation team members of the civil, electrical, mechanical, and plant design disciplines.o Substantiation of inadequate/misused TVA design standards and guides, which apply to all TVA nuclear plants, is evident in Sequoyah Element Evaluation 237.2, 238.1, and 240.0; in HCR WBN MEB 8513 and NLR WBN MEB 8203 R1. Corrective actions are provided in the noted documents.	
g. Engineering changes TVA standards after the job is complete, perhaps because the completed job did not meet the original standards.	g. Engineering changes to TVA standards after a job is complete are allowed by TVA procedure. A general requirement of NEP-3.2 is that "any deviation from the standard design will be handled as a deviation to this procedure." The evaluation team found no obvious evidence to indicate that TVA standards were changed without an appropriate justification.	g. None required.
h. TVA electrical and other Engineering Branch procedures do not include industry standards requirements; therefore, numerous problems can result.	h. Industry Standards in Electrical and other Engineering Branch Procedures: <ul style="list-style-type: none">o Engineering Branch procedures do not generally include industry standards requirements because they are included in other documents. Some exceptions were found in the Civil Engineering Branch (CEB) engineering procedures (EP) (e.g., CEB-EP-21.12 and CEB-EP-21.4J).	h. TVA has recognized that the Watts Bar design basis lacks adequate documentation. The WBN Design Baseline and Verification Program (DBVP) includes development of the DBB per Watts Bar Engineering Project (WBEP) Engineering Procedure (EP) WBEP-EP DB.02. The program will assure that all commitments will be identified and included in the DBB as appropriate. Specific items identified in the CATD will be incorporated in WB-DC-30-1 and WB-DC-30-5. This effort will be completed by TVA to support fuel load for Unit 1. (CATD 201 03 WBN 06)

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Element 201.3 - WBN (Continued)

- o Industry standards are generally included in documents such as design standards, design guides, and construction specifications. Construction specifications provide construction, erection, and installation instructions/ procedures to field forces.

Nuclear Safety Review Staff (NSRS) Investigation Report I-85-545-WBN on Concern IN-86-259-X11, concluded that IEEE standards requirements or their equivalent were incorporated in design documents and procedures as appropriate.

Results of the document review by the evaluation team generally support the conclusions of the NSRS report. The WBN FSAR Chapters 7 and 8 were reviewed by the evaluation team to determine which IEEE Standards were committed to by TVA. Five of the most often used standards were selected for further review. All electrical design criteria were reviewed to see if these five standards were properly addressed. Only two cases were noted where the standards were not adequately addressed. The deficient documents are:

- o Design Criteria WB-DC-30-1, "Emergency Auxiliary A-C Power System," which did not include reference to IEEE standards 323-1976 and 387-1977
- o Design Criteria WB-DC-30-5, "Power, Control, and Signal Cables for use in Category I Structures," which did not include reference to IEEE standard 323-1976

The more extensive review currently being planned for the WBN DBVP, which includes development of the WBN DBU, should resolve any significant problems of this nature.

The NSRS report also recommended that an interorganizational working team review all applicable procedures to ensure that the requirements of industry standards are understood and implemented. Subsequently, a meeting of interorganizational representatives in November 1985 resolved comments on proposed revisions of two construction specifications.

Furthermore, the evaluation team found evidence of efforts to preclude recurrence of similar problems in that the current RFPs provide adequate directions for including requirements of industry standards in design documents and procedures.

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Issues	Findings	Corrective Actions
Element 201.3 - BFN	BFN	BFN
a. Electrical and other engineering design criteria are not always complete, are vague, and are inadequate to form a basis for design.	a. Review of existing BFN design criteria issued by the electrical, nuclear, mechanical, and civil branches revealed that the design criteria are, in general, complete, comprehensive, and adequate to form a basis of design for the systems covered by these criteria. As discussed in Section 9.2 of Element Evaluation 201.3(C), an inadequacy in the area of primary containment isolation requirements was found in one design criterion, BFN-50-766. Some criteria have been listed in the BFN Design Criteria Manual Index, but have not been issued. However, unissued and new design criteria required to be prepared for the BFN unit 2 restart program should be completed through the RUVU and DBVP when walkdown/test data are compared to the licensing and design basis documents. Additionally, the review of the BFN Design Criteria Manual Index revealed that the index does not include all design criteria necessary for unit 2 restart or the other design criteria required for long-term corrective action plans.	a. <u>Issues "a" and "c"</u> Design criteria identified in the BFN Design Criteria Manual Index, but apparently not issued, all fall into one of the following categories: <ul style="list-style-type: none">o Superseded by, or addressed in, another identified design criterion or design standard (some in this category have been deleted or voided)o Not issued but to be considered for input in revision 1 and subsequent revisions to General Design Criteriao Not part of baseline; either on hold and not currently scheduled, or a planned issue date existso Deleted; facility will not be constructed The Design Criteria Manual Index will be updated in subsequent revisions; design criteria numbers will be added or deleted as needed. In addition, the design criteria required for a short-term program (unit 2 restart) and a long-term program, and not listed in the BFN Design Criteria Manual Index, are identified in a listing of BFEP PI 86-18 and are scheduled to be issued by a definite date. (CATD 201 U3 BFN 01) <u>Issues "a" and "c"</u> "The post-restart (phase 2) program, as currently described in the DB&VP Plan, Rev. 1, will complete engineering documentation and evaluations, describing the final functional configuration as CCOs. The change control and management review procedures used during the pre-restart phase (1) will also be in effect during the post-restart phase (2)

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Element 201.3 - BFN (Continued)

- "The post-restart phase (2) will:
- Issue design change packages which were not required for pre-restart and complete the related modifications.
 - Complete the design criteria/design basis.
 - Complete other corrective actions resulting from the restart final report.
 - Implement the permanent design change control system.
 - Complete system evaluation not required for restart.

"The current goal is to complete the post-restart activities by the end of the first refueling outage following restart of each respective unit at BFN."
(CATD 201 03 BFN 03)

Issue "a"

"- Cancel BFN 50-766

"- Revise BFN-50-7084 to include containment isolation requirements for the cross-tie to system 32 and identify the Appendix R portion of cross-tie requirements that must be implemented for U2CS.

"Note: Restart CCD will reflect only one CAD (system 84) line to DCA (system 32) with no split ring header in the drywell to the accumulators. Those portions of the 50-766 document to implement additional requirements beyond Appendix R will be addressed in the plant modification package for the ECN for that outage.

(The element evaluation includes item-by-item comments on the identified concerns.)
(CATD 201 03 BFN 04)

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Element 201.3 - BFN (Continued)		
b. Many design criteria are changed late in the project.	d. Design criteria are sometimes changed (revised) late in the project. Changes are made, when needed and justified, to incorporate design modifications and regulatory requirements. Appropriate engineering procedures were followed when making necessary changes.	d. None required.
c. Some engineering design criteria are nonexistent.	c. The review revealed that some needed design criteria did not exist. Moreover, some design criteria, listed in Section 9.4 of Element Evaluation 201.3(C), could not be identified in the list of safety system design criteria to be completed before restart. Also, some design criteria listed in the BFN Design Criteria Manual Index have not been included in the list for the unit 2 baseline restart program. These design criteria are listed in Section 9.4 of Element Evaluation 201.3(C). However, the review determined that appropriate procedures, such as NEP-3.2 and BFEP-PI-06-18, and other programs are in place for generating all the required design criteria.	c. Also see 201 03 BFN 01 in "a." above <u>Issue "c"</u> The design criteria a) not identifiable either in the list of unit 2 restart safety system design criteria or in the BFN existing design criteria manual index, or b) listed in the BFN Design Criteria Manual Index but not included in the list for the unit 2 baseline restart program, all fall into one of the following categories: <ul style="list-style-type: none">o The criteria, where applicable, have been addressed in other identified design criteria, QIR documents, or other identified CATDs. The criteria not applicable to BFN are identified by the CAP and the reason stated.o No subject-specific general criteria exist, but the subjects are covered in appropriate General Design Criteria documents and System Design Criteria documents; some details are covered by design guides and design standards or specific calculations under identified procedure methods, and design guides and standards.o Criteria are scheduled to be issued by a definite date.o Criteria are covered in design criteria documents for other plants and usable at BFN under specified documents.
(CATD 201 03 BFN 02)		

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Element 201.3 - BFN (Continued)		
d. Many design criteria were set up, then inactivated, and cannot be retrieved for use as a basis for modification of the original design.	d. The review revealed that BFN design criteria were inactivated in two instances. In one instance, the design criteria were inactivated after the design was completed and the facility constructed. In another, the criteria were inactivated because the associated system was eliminated from the plant. At the time, this inactivation of design criteria was permitted by engineering procedure EP 3.01. Although it was found that the inactivated criteria could easily be retrieved, it is unlikely that these criteria will be required for use in future design or modification. Furthermore, generation of new design criteria for the low-level radioactive waste volume reduction and solidification system is part of current long-range plans for BFN.	d. None required.
Element 201.3 - BLN		
a. Electrical and other engineering design criteria are not always complete, are vague, and are inadequate to form a basis for design.	a. Review of existing BLN design criteria issued by the electrical, nuclear, mechanical, and civil branches revealed that the design criteria are, in general, complete, comprehensive, and adequate to form a basis of design for the systems covered by these criteria. As discussed in Section 9.2 of Element Evaluation 201.3, some discrepancies are noted in the BLN existing design criteria. Additionally, some criteria have been listed in the BLN Design Criteria Manual Index, but have not been issued. However, unissued and new design criteria required to be prepared for BLN should be completed through the DBVP when walkdown/test data are compared to the licensing and design basis documents (DBD). The DBD has not yet been developed or implemented for BLN.	a. An evaluation for the need of each of these criteria will be performed. Either documentation for deletion of the criteria from the Index or a proposed schedule for issue of the document will be provided. The evaluation will be completed in time to issue the needed criteria prior to fuel load of unit 1. (CATD 201 03 BLN 01) A program first to resolve design criteria discrepancies noted in this CATD will be developed and implemented prior to U1 fuel load. A program will be implemented to bring the FSAR into agreement with the revised design criteria prior to fuel load of unit 1. (CATD 201 03 BLN 02)
b. Many design criteria are changed late in the project.	b. Design criteria are sometimes changed (revised) late in the project. Changes are made, when needed and justified, to incorporate design modifications and regulatory requirements, or for other reasons. Appropriate engineering procedures are in place, and were followed when making necessary changes noted in BLN Element Evaluation 201.3.	b. None required.

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Element 201.3 - BLN (Continued)		
c. Some engineering design criteria are nonexistent.	c. The review revealed that some needed design criteria did not exist. Moreover, some design criteria suggested by the evaluation team, as listed in Section 9.4 of Element Evaluation 201.3, could not be identified in the design criteria manual index as being required for BLN design. However, the review determined that appropriate existing engineering procedure, such as NEP-3.2 and Design Basis Document (DBD) will be used for generating all the required design criteria.	c. Due to manpower and priority limits, resolution of which criteria are required could not be resolved at this time. As such, each of the proposed criteria subjects listed in the CATD will be reviewed in detail. Based on this review, either schedules for issue of the criteria or documentation for not requiring the criteria will be provided. This review and documentation will be reviewed and approved by Project Engineer. The study will be completed in time to allow issue of criteria prior to fuel load of unit 1. (CATD 201 03 BLN 03)
d. Many design criteria were set up, then inactivated, and cannot be retrieved for use as a basis for modification of the original design.	d. The review revealed that BLN design criteria were inactivated through proper memoranda from different engineering branches. In one instance, the design criterion was inactivated because the particular system did not require separate written design criteria. This criterion is retrievable if needed for future design and modification work.	d. None required.
***** Element 201.4 - Standards and Guides *****		
SQN	SQN	SQN
a. Electrical and other Engineering Standards and guides are treated as guides only (e.g., they are utilized only when designers want to use them) and are not incorporated in Design Criteria as requirements on a mandatory basis.	a. Use of Design Guides and Standards: <ul style="list-style-type: none"><li data-bbox="712 1136 1207 1202">o There are many design guides and design standards, including standard drawings, at TVA.<li data-bbox="712 1227 1353 1276">o The use of design guides is optional to designers as defined in TVA procedures.<li data-bbox="712 1301 1384 1376">o The optional use of design standards is not permitted by TVA procedure. Design standards must be used where applicable.<li data-bbox="712 1392 1384 1442">o Treatment of Engineering standards as guides is not in compliance with TVA procedures.	a. None required.

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Issues	Findings	Corrective Actions
Element 201.4 - SQN (Continued)		
b. TVA Design Guides and Standards are inadequate in many areas.	d. A few cases of inadequate TVA design standards and guides, which apply to all TVA nuclear plants, were noted in Sequoyah Element Evaluation 237.2, 238.1, and 240.0. Corrective actions are provided in the noted documents. No examples of misuse were found.	b. See Corrective Actions in Sequoyah Element Evaluation 237.2, 238.1, and 240.0.
c. There are misuses of TVA design guides and standards, such as applicable parts are not referenced or excerpted as requirements.	c. Design guides and standards are indirectly referenced on drawings by means of references to design criteria or general construction specifications. The criteria and specifications contain references to the appropriate guides and standards.	c. None required.
d. Engineering changes TVA standards after the job is complete.	d. Engineering changes to TVA standards after the job is complete are allowed by TVA procedure, and changes occur as they are needed and justified. Providing needed changes to design standards is considered a common practice.	d. None required.
e. If TVA electrical procedures do not include IEEE standard requirements or their equivalent, numerous problems can result.	e. Electrical and other TVA Engineering Branch procedures do not usually include industry standards (e.g., IEEE, ANSI) requirements. However, there are exceptions for specific reasons. Usually, industry standards are included in other more appropriate design documents such as design criteria and construction specifications. Further discussion related to IEEE standards in particular can be found in Sequoyah Element Evaluation 213.4.	e. None required.
f. Not defined.	f. As an additional finding, the evaluation team cited the formation of an E&B Design Control Process program to review all electrical design guides and design standards and recommend deletions, additions, and revisions. This program has not yet been fully implemented.	f. A comprehensive review of TVA electrical design standards and design guides will be completed by 10/17/88, at which time a program for maintaining the integrity of the standards and guides will be in place. Maintenance of the standards and guides will be an ongoing process." (CATD 201 04.NPS 01)

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Issues	Findings	Corrective Actions
Element 201.4 - WBN	WBN	
Not Applicable	Not Applicable	WBN
BFN	BFN	Not Applicable
<p>a. Electrical and other Engineering Standards and guides are treated as guides only (e.g., they are utilized only when designers want to use them) and are not incorporated in Design Criteria as requirements on a mandatory basis.</p>	<p>a. Use of design guides and standards:</p> <ul style="list-style-type: none"> o There are many design guides and design standards, including standard drawings, at TVA. o The use of design guides is optional to designers as defined in TVA procedures. o The optional use of design standards is not permitted by TVA procedure. Design standards must be used where applicable. o Treatment of Engineering standards as guides is not in compliance with TVA procedures. 	<p>BFN</p> <p>a. None required.</p>
<p>b. TVA Design Guides and Standards are inadequate in many areas.</p>	<p>b. Two cases of design guides and standards being inadequate were identified and are covered in more detail in Browns Ferry Element Evaluation 237.2 and 240.0. No examples of misuse were found.</p>	<p>b. None required.</p>
<p>c. There are misuses of TVA design guides and standards, such as applicable parts are not referenced or excerpted as requirements.</p>	<p>c. Design guides and standards are indirectly referenced on drawings by means of references to design criteria or general construction specifications. The criteria and specifications contain references to the guides and standards.</p>	<p>c. None required.</p>
<p>d. Engineering changes TVA standards after the job is complete.</p>	<p>d. After the job is complete, engineering changes to TVA standards are allowed by TVA procedure, and changes occur as they are needed and justified. Needed changes to design standards are considered a common practice.</p>	<p>d. None required.</p>

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Element 201.4 - BFN (Continued)		
e. If TVA electrical procedures do not include IEEE standard requirements or their equivalent, numerous problems can result.	e. Electrical and other TVA engineering branch procedures do not usually include industry standards requirements. However, there are exceptions for specific reasons. Usually, industry standards are included in other more appropriate design documents such as design criteria and construction specifications.	e. None required.
f. Not defined.	f. As an additional finding, the evaluation team cited the formation of an EEO Design Control Process program to review all electrical design guides and design standards and recommend deletions, additions, and revisions. This program has not yet been fully implemented.	f. A comprehensive review of TVA electrical design standards and design guides will be completed by 10/17/88, at which time a program for maintaining the integrity of the standards and guides will be in place. Maintenance of the standards and guides will be an ongoing process. (CATD 201 04 RPS 01)
BLN	BLN	BLN
a. Electrical and other Engineering Standards and guides are treated as guides only (e.g., they are utilized only when designers want to use them) and are not incorporated in Design Criteria as requirements on a mandatory basis.	a. Use of design standards and guides: <ul style="list-style-type: none"> o There are many design standards and design guides as well as standard drawings and typical drawings at TVA. o The use of design guides is optional to designers as defined in TVA procedures. o The optional use of design standards is not permitted by TVA procedure. Design standards must be used where applicable. o Treatment of Engineering standards as guides is not in compliance with TVA procedures. 	a. None required.

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Issues	Findings	Corrective Actions
Element 201.4 - PLN (Continued)		
b. TVA Design Guides and Standards are inadequate in many areas.	b. Two cases of design standards and guides being inadequate were identified and are covered in more detail in Bellefonte Element Evaluation 237.2 and 240.0. No examples of misuse were found.	b. None required.
c. There are misuses of TVA design guides and standards, such as applicable parts are not referenced or excerpted as requirements.	c. Design standards and guides are indirectly referenced on drawings by references to design criteria or general construction specifications. The criteria and specifications contain references to the guides and standards.	c. None required.
d. Engineering changes TVA standards after the job is complete.	d. After the job is complete, engineering changes to TVA standards are allowed by TVA procedure, and changes occur as they are needed and justified. Needed changes to design standards are considered a common practice.	d. None required.
e. If TVA electrical procedures do not include IEEE standard requirements or their equivalent, numerous problems can result.	e. Electrical and other TVA Engineering Branch procedures do not usually include industry standards requirements. However, there are exceptions for specific reasons. Usually, industry standards are included in other more appropriate design documents, such as design criteria and construction specifications.	e. None required.
f. Not defined.	f. As an additional finding in Section 9.3 of Element Evaluation 201.4, the evaluation team cited the formation of an E&D Design Control Process program to review all electrical design guides and design standards and to recommend deletions, additions, and revisions. This program has not yet been fully implemented.	f. A comprehensive review of TVA electrical design standards and design guides will be completed by 10/17/88, at which time a program for maintaining the integrity of the standards and guides will be in place. Maintenance of the standards and guides will be an ongoing process. (CAFD 201 04 RPS 01)

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Issues

Findings

Corrective Actions

Element 201.5 - Tracking of Commitments and Design Changes

SQN

a. There is a lack of adequate tracking for EN DES (TVA) commitments.

SQN

a. A computerized commitment tracking system (CCS) was implemented at the Sequoyah Site in 1982. Since that time commitments have been tracked on this system in accordance with the directions in Procedures SQN-13 and CS-SIL-5. In 1988, the site-developed CATS was replaced by the corporate mainframe system (CMRS) for tracking NRC commitments. Procedure SQA-13b was revised to reflect this change. Although the latest revision of CS-SIL-5 in November 1988 does not specifically name the CCS, this instruction ceased to be appropriate when the site compliance section was reorganized in June 1989. Consequently, this instruction is no longer applicable.

The corporate standard for controlling the use of the CCS has not yet been issued. Meanwhile, personnel at the Sequoyah site are utilizing SQN-13, the h. c. policy-directive, and their own knowledge and expertise to maintain the tracking status of NRC commitments.

TVA has committed to the NRC to completely implement the CCS, including the necessary procedures, prior to restart of the Sequoyah Plant. However, the complete set of five procedures has been committed to be completed in the long term, and all five are not required before restart.

SQN

THIS ITEM COMPLETED

DATE: 7-10-87

The CAP states that procedures to govern the CCS will be prepared before restart. This action is being tracked on the CCS by the NRC and NCU 1600-0102. The CAP is acceptable to the evaluation team.
(CATD 201.05 SQN 01)

THIS ITEM COMPLETED

DATE: 7-10-87

The CAP states that Regulatory Licensing will review past violation responses, bulletin responses, licensee event reports, EOP/7, etc. back to January 1981. TVA has committed to complete this action before restart and is tracking it on the CCS. NCU 0504-012. This CAP is acceptable to the evaluation team.
(CATD 201.05 SQN 02)

THIS ITEM COMPLETED

DATE: 7-10-87

The CAP states that open and completed NRC commitments back to January 1, 1980 will be identified and input to the CCS. This action is being tracked on the CCS. This CAP is acceptable to the evaluation team. This CAP is acceptable to the evaluation team.
(CATD 201.05 SQN 03)

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Issues	Findings	Corrective Actions
Element 201.5 - SQN (Continued)		
b. There is a lack of adequate tracking for EN UES (TVA) design changes.	b. Issue "b" is addressed in Sequoyah Element Evaluation, 204.6, Issue "a."	b. See Corrective Actions for SQN Element Evaluation 204.6, Issue a.
c. TVA adds diesel generators without updating licensing documents.	c. A fifth diesel generator has been added at SQN, but updating of the licensing document (FSAR) is not yet required because the incorporation of the DG is not yet complete.	c. None Required.
d. TVA does not keep licensing documents (i.e., FSAR) current.	d. The wider question of updating licensing documents in general is currently being addressed (see Bradley memo of 02/18/86; and the DBVP includes procedures to coordinate design basis commitments with the FSAR. The response to the NRC address ECR closure and FSAR updating corrective actions for this issue.	d. The revised CAP describes a program of reviewing ECRs and verifying the accuracy of the FSAR. The NRC has also noticed the lack of closure of ECRs and the discrepancies with the FSAR. The NRC has requested TVA to provide by January 31, 1986, a program of correcting this issue. This CAP is a preliminary description of the program TVA intend to submit to the NRC. The NRC has indicated in this CAP that this is not a residual item. However, because of the specific involvement of the NRC in this issue, this CAP is acceptable to the evaluation team. (CATD 201 US SQN 04)
WBN	WUN	WUN
a. There is a lack of adequate tracking for EN UES commitments.	a. Tracking of TVA commitments to the NRC for the Watts Bar project has not been adequate. NRC inspection of the Safety Evaluation Report (SER; NUREG-0827) Appendix D commitments for the control room, which were reported by TVA to be closed, found several to be incomplete.	a. Enter into the CCIS data base commitments to NRC violations where actions taken are completed prior to TVA's response to NRC. These completed NRC violation actions (as stated in the TVA letters to NRC) will be input back to January 1, 1986 (November 1, 1985 for Watts Bar) for each plant on the following schedule: o Sequoyah Nuclear Plant: prior to startup (currently July, 1987)

THIS CAP IS PARTIALLY COMPLETED
 AT SQN
 DATE 11/16/87

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Issues	Findings	Corrective Actions
Element 201.5 - WBN (Continued)	<p>There has been a misinterpretation of the definition of "closure" or "completion" for commitments transferred to the Office of Nuclear Power (ONC PK). The Office of Engineering (OE) "closed" a commitment based on completion of the OE responsibilities, not on the actual implementation of the commitment. Administrative and procedural guidance for accurate documentation of the status of commitments has been inadequate. Misunderstanding or inadequate definition of the scope of a commitment, especially where the commitment applied to both Units 1 and 2, has resulted in commitments not being tracked properly. Incomplete commitments were reported to the NRC as closed because of inadequate communication and interfaces between ONC PK and OE.</p> <p>An Institute of Nuclear Power Operations (INPO) evaluation of TVA corporate activities identified numerous independent commitment tracking systems that contributed to difficulty in actions necessary to achieve reasonable, timely, and lasting results.</p>	<ul style="list-style-type: none">o Browns Ferry Nuclear Plant (BFN): prior to startupo Watts Bar Nuclear Plant (WBN): prior to startupo Bellefonte Nuclear Plant (BLN): complete <p>Further, the definition of a commitment to be provided in appropriate upper-tier standard(s) will clarify this matter: (CATD 201.05 NPS 02)</p>
	<p>TVA has completed a Special Engineering Program (SEP 82-17) to examine the status of NRC commitments and verify their completion, or if incomplete, that they are adequately tracked. For those commitments that are part of the SER appendix B, the TVA Control Room Design Review team verified their completion or tracking status.</p>	
	<p>TVA has committed in the Corporate Nuclear Performance Plan (CNPP) to establish a corporate Commitment Tracking System (CCIS). The corporate policy has been issued, and the CCIS computer system is in use. The Corporate Procedure (0005.01) to govern TVA commitment tracking activities was issued on 01/13/87. At the Watts Bar site, the Standard Practice 8011.6 is being revised to reflect the new activities as directed in the Corporate Procedure 0005.01. This revision is scheduled for 02/24/87.</p>	

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Issues

Findings

Corrective Actions

Element 201.5 - WBN (Continued)

b. TVA adds diesel generators without updating licensing documents.

b. A fifth diesel generator has been added at Watts Bar, and the FSAR was updated by amendment 57 which was submitted to the NRC on January 31, 1986. TVA initially notified the NRC of its intent to install a fifth diesel generator in July 1984. Subsequent communications with the NRC described TVA's plan to not connect nor license the fifth diesel generator until the first refueling outage for Unit 1 and before fuel load for Unit 2 to avoid interference with the rest of the licensing process. When the date for the operating license slipped, TVA determined that the fifth diesel generator licensing would not cause a delay in the issuance of the operating license, and the FSAR was updated accordingly, as noted above.

b. None required.

c. TVA does not keep licensing documents (e.g., UFSAR) current.

c. The 1985 INPO review of Watts Bar found that the administrative control of the FSAR needs improvement. Inconsistencies exist between the FSAR and other licensing documents. NRC and TVA inspections have identified differences between FSAR drawings and actual constructed configurations. Although the current status of the FSAR may be questionable, there is no specific NRC requirement for maintaining the FSAR current for a Construction Permit plant. The only requirement is that the FSAR be accurate at the time the operating license is issued.

c. None required.

Furthermore, the Watts Bar Engineering and Configuration Assurance Program (ECAP) now in progress contains provisions for identifying licensing commitments that may require revisions to licensing documents.

BFN

BFN

BFN

a. There is a lack of adequate tracking for EN OES commitments.

a. Written and docketed statements of TVA actions to be taken at BFN by some future date have been tracked by TVA since at least 1977. These NRC commitments were tracked on computers at TVA headquarters and at each site, using various programs. In 03/85, BFN personnel stopped entering these commitments on the site computer and utilized only the corporate commitment tracking system (CCTS).

a. Browns Ferry has requested and received from NRC a copy of their open items list (OIL). This list is being utilized to correlate items showing "complete" on TVA's CCTS listing and "open" on NRC's OIL list. A commitment is provided in the Browns Ferry Nuclear Performance Plan to review and resolve open NRC items necessary for startup.

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Issues	Findings	Corrective Actions
Element 201.5 - BFN (Continued)		
	<p>Corporate and site procedures have been issued for all TVA organizations using the CCIS. However, investigations by TVA's Division of Quality Assurance and by INPO reveal that there have been tracking deficiencies at BFN in the past. These deficiencies were primarily related to either the absence of completed commitments from, or the status of completed commitments in, the various tracking systems. However, TVA has begun entering completed commitments (arising from NRC violations) into the CCIS in accordance with recent TVA policy.</p> <p>At present, draft responses to the NRC are prepared or reviewed by Site Licensing. Having this review responsibility and site input into the CCIS in the same organization provides additional assurance that NRC commitments will be adequately tracked in the future.</p>	<p>See also WBN Corrective Action a. (CAFD 201 05 NPS 02)</p>
b. TVA adds diesel generators without updating licensing documents.	b. Unlike Sqn and WBN, BFN has not added any additional safety-related diesel generators. Therefore, the BFN UFSAR correctly indicates a total of eight safety-related diesel generators in all of the amendments.	b. None required.
c. TVA does not keep licensing documents (e.g., UFSAR) current.	<p>c. The BFN UFSAR has been updated annually since 1982, as required by 10 CFR 50.71(e). Corporate, division, and site organization procedures exist to control the annual updating process. Recent reviews of the UFSAR by the NRC have not identified any deficiencies related to the currency of the document. However, TVA has concluded that BFN engineering documents may not accurately reflect the as-constructed conditions. There is the possibility, therefore, that the current UFSAR may not accurately describe the configuration of all safety-related systems.</p> <p>The BFN DBVP is being implemented to document the as-constructed configuration. Engineering drawing changes resulting from the DBVP will be reviewed annually for incorporation in the UFSAR.</p>	c. The Browns Ferry Design Baseline Verification Program (DBVP) is being implemented by BFN Division of Nuclear Engineering (DNE) to document the as-constructed configuration of BFN. Configuration control drawings (CCD) incorporating changes resulting from the DBVP are being completed by DNE. CCDs will be incorporated into the BFN UFSAR during the next scheduled annual UFSAR update after the transmittal of CCDs to BFN Licensing by DNE. (CAFD 201 05 BFN 02)

Attachment D
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Issues	Findings	Corrective Actions
Element 201.5 - BLN	BLN	BLN
a. There is a lack of adequate tracking for EN DES commitments.	<p>a. In the past, there was a lack of adequate tracking for EN DES commitments to the NRC.</p> <ul style="list-style-type: none"> o Written and docketed statements of IVA actions to be taken at BLN by some future date have been tracked by IVA since at least 1977. These NRC commitments were tracked on computers at IVA headquarters and at each site, using various programs, including IRUI and CANS. In late 1985, BLN personnel started forwarding these NRC commitments to DNSE for entry into the Corporate Commitment Tracking System (CCTS). o OHP procedures have been issued for all IVA organizations using the CCTS. However, investigations of the various organizations by TVA's Division of Quality Assurance and by HRO reveal that there have been some commitment tracking deficiencies since CCTS was implemented. These deficiencies were primarily related to either the absence of completed commitments from, or the status of completed commitments in, the various tracking systems. While BLN has entered some completed commitments back to OI/OI/db into the CCTS, other, have yet to be identified and entered. o BLN Standard Practice BLA4.1, R16, deviates from the requirements of PMP 0605.01. Responsibilities assigned to the Site Licensing Manager by PMP 0605.01 are assigned to the Plant Operations Review Staff Supervisor in BLA4.1. Also, the Commitment Verification and Completion Form included in BLA4.1 does not call for the information that is indicated on attachment 4 to PMP 0605.01. 	<p>a. BLN Site Director Procedure (SDP) - 6.2.1, "Site Commitment Management and Tracking" is undergoing Site Licensing development to implement PMP 0605.01 and will be reviewed and issued onsite by 10/1/87. All DNSE Program Area Procedures (PMAs) which are to be implemented by Site Licensing have been assigned and are being tracked through BLG3, "Program Procedures Manuals and Implementation Assignments." (CALD 201 US BLN 01)</p>
b. TVA adds diesel generators without updating licensing documents.	<p>b. Unlike Sequoyah and Watts Bar, Bellefonte has not added any additional safety-related diesel generators. Therefore, the BLN FSAR correctly indicates, in all amendments, a total of four safety-related diesel generators.</p>	<p>b. None required.</p>

Attachment 6
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Issues	Findings	Corrective Actions
<p>***** Element 201.6 - Traceability of Design Requirements *****</p>		
SQ#	SQ#	SQ#
<p>a. There is a lack of traceability of design requirements.</p>	<p>a. There is a lack of traceability of ^{some} design requirements.</p>	<div style="border: 2px solid black; padding: 5px;"> <p align="center">THIS ITEM PARTIALLY COMPLETED</p> <p align="center">AT <u>SQN</u></p> <p align="center">DATE <u>11-24-87</u></p> <p><small>The CR Data... Basis... will be completed as applicable to meet the restart requirements for each... phases... as schedules are established. (CATD 201 01 SQ# 01)</small></p> </div>
<p>b. Inadequate control of design calculations impacts traceability of design requirements.</p>	<p>b. Inadequate control of design calculations impacts traceability of design requirements. Sequoyah Element Evaluation 205.2 addresses measures to mitigate this condition.</p>	<p>b. Each engineering discipline is establishing criteria for classifying calculations as essential, desirable, or obsolete which are identified in their Essential Calculation Program.</p> <p>Calculations are being reviewed for unverified assumptions, reasonable method/approach, etc., and are monitored in calculations logs in accordance with engineering procedures.</p> <p>Each engineering discipline has been requested to address in their Essential Calculation Program the need to document an independent review of the list of essential/desirable calculations and obtain approval by TVA management; and to provide a detailed schedule for the post-restart, long-term completion of the Essential Calculation Program. (CATD 205 02 SQ# 01)</p>

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Issues	Findings	Corrective Actions
Element 201.6 - SQH (Continued)		
c. Basic design input is not available.	c. Some basic design input is not always readily retrievable.	c. See a. above.
d. Design requirements and the basis of determination of design requirements are not readily available.	d. Some design requirements and the basis of determination of design requirements are not readily available.	d. See a. above.
WBN	WBN	WBN
a. There is a lack of traceability of design requirements.	a. There is a lack of traceability of some design requirements. The complete implementation of the Watts Bar Nuclear Plant (WBNP) Engineering and Configuration Assurance Program (ECAP), which incorporates the development of a WBN Design Basis Document (DBD), should mitigate this situation.	a. Findings "a," "c," and "d" will be resolved by the implementation of the Design Basis Area of the Watts Bar Design Baseline and Verification Program (DBVP), formerly called the Engineering and Configuration Assurance Program (ECAP). A product of the Design Basis Area is the Design Basis Document (DBD). Design requirements and commitments which have resided in various source documents have been collected into a relational computer data base and will be included in design criteria (DC) and system description (SD) documents. The appropriate set of controlled design criteria, system description documents, and a limited set of design basis reference documents will make up the DBD. Commitments and design requirements which have been consolidated in the DBD will be traceable to their source documents. The DBD will serve as an up-to-date compilation of basic design input. It will be readily available in the WBEP document control station for reference, and will be maintained current for the life of the plant.

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Issues	Findings	Corrective Actions
Element 201.6 - WBN (Continued)		
<p>b. Inadequate control of design calculations impacts traceability of design requirements.</p> <p>c. Basic design input is not available.</p> <p>d. Design requirements and the basis of determination of design requirements are not readily available.</p>	<p>b. Design requirements traceability is indeed impacted by inadequate design calculations. Watts Bar Element Evaluation 205.1 addresses Electrical, Civil, Mechanical, and Nuclear calculation inadequacy and also addresses measures to mitigate the condition.</p> <p>c. Some basic design input is not available. Complete implementation of the WBN LCAP and development of the DBD for WBN which is to be controlled and maintained throughout the life of the plant will ensure availability of current design input.</p> <p>d. Some design requirements and the basis of determination of design requirements are not readily available. Development of a DBD for WBN will define and establish the design requirements necessary to meet Criterion III of 10CFR50 Appendix B.</p>	<p>Calculations have been and are required to support the design basis. Watts Bar Element Evaluation 205.1 addresses the reviewing and mitigating of any inadequacy in the body of calculations supporting existing DC and SD documents. All new DC and SD documents and revised documents prepared in the DBD development will be supported to the extent required by retrievable Division of Nuclear Engineering (DNE) calculations in accordance with Nuclear Engineering Procedure (NEP) 3.1. Any new or revised calculations will be completed in accordance with the calculations upgrade program. The corrective action plan (CAP) for Watts Bar Element Evaluation 205.1 contains details on the calculations program.</p> <p>The scheduled completion date for this corrective action is 12/31/87 (except for calculations associated with WBN Element Evaluation 205.1 corrective action) (CATD 201.6b WBN 01)</p> <p>b. See WBN Element Evaluation 205.1, Corrective Action for Finding b.</p> <p>c. See a. above</p> <p>d. See a. above</p>

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Issues	Findings	Corrective Actions
Element 201.b -BFN	BFN	BFN
a. There is a lack of traceability of design requirements.	a. There is a lack of traceability of some design requirements.	<p>a. (a) The Design Baseline and Verification Program has been put into place at Browns Ferry. The program's scope is to ensure that the actual plant configuration is reflected on plant documents and conforms to the design basis requirements. The program is divided into two phases. The pre-restart phase (1) of the program includes systems and portions of systems required for safe shutdown. This phase is currently scheduled for completion before restart.</p> <p>The post-restart phase (2) will complete engineering documentation and evaluations, and describe the final functional configuration as a CCD. The change control and management review procedures used during phase (1) will be in effect during the post-restart phase. This phase will be completed before the next refuel outage.</p> <p>(b) The design basis document is part of the issue outputs of the Design Baseline and Verification Program. These documents are currently being produced and must be complete before restart.</p> <p>(c) The program elements of BFLP P100-1/ have been implemented and the C/R data base does exist. Currently, the data base is the responsibility of MEB section of the Baseline group located at Knoxville (Richard Wilson, ext. J080-K). There is a copy located in Site Licensing at the Browns Ferry site.</p> <p>The schedule for completion of this Corrective Action is:</p> <p>o before restart for completion of Phase 1 of the Baseline Program.</p>

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Issues	Findings	Corrective Actions
Element 201.0 - BFN (Continued)		
d. Inadequate control of design calculations impacts traceability of design requirements.	b. Inadequate control of design calculations impacts traceability of design requirements. Browns Ferry Element Evaluation 205.1 addresses measures to mitigate this condition.	o The Design Basis documents are scheduled to be complete by the end of July, 1987. (CATD 201 06 BFN 01)
c. Basic design input is not available.	c. Some basic design input is not always readily retrievable.	b. See BFN Element Evaluation 205.1, Corrective Actions.
d. Design requirements and the basis of determination of design requirements are not readily available.	d. Some design requirements and the basis of determination of design requirements are not readily available.	c. See a. above.
BLN	BLN	BLN
a. There is a lack of traceability of design requirements.	a. There is a lack of traceability of some design requirements.	d. The Design Basis Document (DBD) is required for each TVA nuclear plant by TVA policy stated in NEP-3.2. BLN is still under construction and design is not yet complete. TVA has advised that the DBD for BLN will be prepared as a part of the normal process. Therefore, a CATD is not provided with this element evaluation. When the DBD is complete for Bellefonte, no further corrective action will be needed to satisfy the findings in this report. (CATD - Deleted)

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Issues	Findings	Corrective Actions
Element 201.b - BLN (Continued)		
b. Inadequate control of design calculations impacts traceability of design requirements.	b. Inadequate control of design calculations impacts traceability of design requirements. Bellphone Element Evaluation 205.1 addresses measures to mitigate this condition.	b. See BLN Element Evaluation 205.1 Corrective Actions.
c. Basic design input is not available.	c. Some basic design input is not always readily retrievable.	c. See a. above.
d. Design requirements and the basis of determination of design requirements are not readily available.	d. Some design requirements and the basis of determination of design requirements are not readily available.	d. See a. above.
e. Not defined.	e. As an additional finding, the evaluation team noted that the DBD, as required by hLP-3.2, has not yet been prepared for BLN. IVn has advised that the DBD will be prepared as part of the normal process.	e. See a. above.

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Issues	Findings	Corrective Actions
***** Element 201.8 - Code Requirements: Comparison with Bellefonte *****		
SQN	SQN	SQN
Not Applicable	Not Applicable	Not Applicable
WBN	WBN	WBN
a. The Code requirements for Watts Bar N-5 program are far less stringent than for Bellefonte.	<p>a. The employee concern as expressed was clarified by cdl Investigation Report IR-85-545-X09 to be limited to the N-5 program.</p> <p>The Watts Bar nuclear Plant's (WBN) Code of Record is the 1971 Edition of ASME Section III, including the Summer 1973 Addenda. The Bellefonte nuclear Plant's (BLN) Code of Record is the 1974 Edition of ASME Section III, including Summer 1974 Addenda.</p> <p>The Summer 1974 Addenda imposed Subsection NF, "Component Supports." The N-5 Code Data Form was not affected by the addition of Subsection NF until the Winter 1974 Addenda, which added the requirement for Code stamping of component supports (Paragraph HA-8233.9). The Winter 1974 Addenda also revised the N-5 Form to provide for listing of the component supports. Subsection NF applicability to BLN does not affect the BLN N-5 program.</p> <p>The only difference between the N-5 Forms applicable to WBN and BLN is that the BLN N-5 requires recording of "system working pressure and temperature." A review of the WBN and BLN N-5 preparation procedures indicates the N-5 programs of the two plants to be essentially the same. This establishes that the concerned individual's perception that the code requirements for the WBN N-5 program are far less stringent than for BLN is incorrect.</p>	a. None required.
BFN	BFN	BFN
Not Applicable	Not Applicable	Not Applicable
BLN	BLN	BLN
Not Applicable	Not Applicable	Not Applicable

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Issues	Findings	Corrective Actions
<p>***** Element 203.1 - Sequoyah Design Error at WBN *****</p>		
SQN	SQN	SQN
Not Applicable	Not Applicable	Not Applicable
WBN	WBN	WBN
<p>a. TVA management does not communicate between sites and provides poor Engineering support to the crafts. Specifically, design changes made at Sequoyah (via ECH, DCR, FCR, etc.) are not relayed to Watts Bar for the identical system, but rather, WBN is left to discover the design deficiency itself.</p> <p>Two examples were given:</p> <ul style="list-style-type: none"> o The replacement of carbon steel piping with stainless steel piping at the pumping station o The connection of a pipe of one schedule (wall thickness) to be welded to a tank nozzle of a different schedule 	<p>a. In the past, communication to WBN of design changes at SQN was a problem. At the time the concerned individuals expressed their concern of the impact of SQN design changes on the WBN designs, their concern was appropriate. However, TVA was already aware of the problem.</p> <p>In September 1985, revision 2 of Office of Engineering Procedure OEP-17, Corrective Action, was issued to include a review of all Significant Condition Reports (SCRs) and Problem Identification Reports (PIRs) for generic implications. This procedure was replaced by nuclear Engineering Procedure NEP-9.1 in July 1986 following the establishment of the Division of Nuclear Engineering (DNE). All SCRs/PIRs are now reviewed for generic implication, with a Potential Generic Condition Evaluation Memo sent to any project considered as potentially impacted. Properly implemented, NEP-9.1 should be sufficient to resolve this issue.</p> <p>Examination of the records concerning the specific example of carbon steel/stainless steel pipe change-out, employee concerns IN-85-911-002 and IN-85-766-002, has shown that both plants were designed by the same project group at the time (pre-1983, when both plants were the same project, SWP) and were thus aware of the required design change at the same time. Due to an earlier fuel load date, SQN work took precedence. However, work began at WBN in the form of an ECH dated within a month of being aware of the problem (LEN 1398 dated 01/24/83).</p>	<p>a. No further corrective action is required.</p>

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Issues	Findings	Corrective Actions
Element 203.1 - WBN (Continued)		
<p>b. Engineering approves the installation of a design at WBN that it knows is inadequate and will have to be reworked because the same design was reworked at SQH. The two examples given are the same as those cited in Issue "a" above.</p>	<p>No specifics were provided for the second example, employee concern IN-86-205-005, (i.e., dates, FCR numbers, etc.). However, investigation has shown that the tank in question is probably the tritiated drain collector tank in the waste disposal system. No further information could be found.</p> <p>b. The evaluation team found no evidence to support the allegation that Engineering authorized the installation of a deficient design for no apparent reason. Engineering decisions to postpone implementation of a design change are based upon many factors which may not be known to all employees.</p> <p>In the first specific example, safety-related piping and the nonsafety-related piping considered most susceptible to corrosion were changed out immediately. Some valves and pipe were left as carbon steel because the delivery time for stainless steel valves would not support the system completion schedule. Some carbon steel valves, removed with the carbon steel pipe, were reinstalled in the stainless steel pipe, and were changed out at a later time. A surveillance program was established to ensure adequate flow rates to safety-related systems until all the required changes were made. This change-out of carbon steel to stainless steel has been completed by a series of ECHs.</p> <p>* As mentioned before, no specific information could be found for SQH regarding the second example of pipe connection to the tritiated drain collector tank.</p>	<p>b. None required.</p>
BFH	BFH	BFH
Not Applicable	Not Applicable	Not Applicable
BLN	BLN	BLN
Not Applicable	Not Applicable	Not Applicable

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Element 203.J - Experience Feedback Not Properly Utilized

SQH

- a. There is no formal system to track and assign commitments for problems identified by InPU. (1)

SQH

- a. The evaluation team review of the operating experience review program at IVA shows that in 1981 IVA implemented an OTR program as required by NRCG-0737. This program has, however, been inadequate as exemplified by the continual occurrence of deviations and findings not examined by NRC, InPU, and IVA QA. The program has been fragmented with no central coordination for the multitude of individual and separate programs.

IVA has recognized these inadequacies and has so stated in the Nuclear Performance Plan. IVA remedy this situation by implementing a directed system for operating experience and internal and industry-wide dissemination of IVA experience. IVA has the core procedure (PMP 0001.01) for the new NER program prepared but has yet to issue necessary upper-tier governing documents, and the lowest level implementing procedures. This commitment is presented in the NPP and is included in the CCIS data base as NCO 00010109.

SQH

THIS ITEM COMPLETED
DATE: 6-22-87

The NER program at Nuclear Power (UNP) Procedures Staff has been developing an OTR Policy and Directive that will require a Nuclear Experience Review Program (NER). The procedure staff has indicated that the policy has been approved and is in the process of being issued. The directive will be issued in approximately one year. (CAID 203 03 SQH 01)

THIS ITEM COMPLETED
DATE: 6-22-87

Standard Practice SQH-20 will be revised to reflect the requirement of the Standard Practice, Policy, and the Division of Nuclear Safety and Licensing procedure to implement the NER program at Sequoyah. SQH-20 will be revised to implement PMP 0001.01, Nuclear Experience Review, and the DIVISION of Nuclear Safety and Licensing procedure prior to Sequoyah Unit 2 restart (node 4). (CAID 203 03 SQH 02)

THIS ITEM COMPLETED
DATE: 6-22-87

A temporary procedure PMP 0001.01, Nuclear Experience Review, has been written to implement the NER requirements within one year of the initial stage. The DIVISION of Nuclear Safety and Licensing has written a procedure that describes the requirements and actions that will implement the NER Program as described in PMP 0001.01. This procedure is still in its initial draft form. Both of these procedures are to be in place prior to Sequoyah Unit 2 restart (node 4). (CAID 203 03 SQH 03)

THIS ITEM COMPLETED
DATE: 6-17-87

The NER Program will be implemented under temporary procedures by the Sequoyah Unit 2 (node 4) as outlined. This NER program, under temporary procedures, will be in place prior to Sequoyah Unit 2 restart (node 4). (CAID 203 03 SQH 04)

(1) The four issues for SQH relate to the lack of an adequate NER program. These issues were later combined into one issue for the other sites.

21960-15 (11/20/87)

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Issues	Findings	Corrective Actions
Element 203.3 - SQN (Continued)		
b. There is poor tracking of NRC experience information. ⁽¹⁾	b. Included in a. above.	b. Included in a. above.
c. There are no forced interactions with other utilities for information exchange. ⁽¹⁾	c. Included in a. above.	c. Included in a. above.
d. Feedback to engineering of corrections for problems identified is not adequate. ⁽¹⁾	d. Included in a. above.	d. Included in a. above.
WBN	WBN	WBN
a. There is no formal system to track and assign commitments for problems identified by INPO; there is poor tracking of NRC experience information; and there are no forced interactions with other utilities for exchange of information.	<p>a. All of the issues identified in this concern relate to the acquisition, distribution, and tracking of power industry experience. The typical sources of this information are identified in the concern and are:</p> <ul style="list-style-type: none"> (1) the Nuclear Regulatory Commission (NRC); (2) Institute of Nuclear Power Operations (INPO); and (3) other nuclear utilities. All of the issues can be grouped under the single heading of Operating Experience Review (OER) and may be addressed together. 	<p>a. Although the Directive is not in place, the Nuclear Operating Review (NOR) program will still be implemented. The Office of Nuclear Power (ONP) Procedure Manual is in place as well as the Division of Nuclear Safety and Licensing (DNSL) Procedure Manual-06.1-2. Presently, ONP is developing instructions that describe the format and content of a "Directive." It is DNSL's intent to have the NRC Directive in place in approximately one year. (CATU 203 03 NPS 01)</p>
	<p>The evaluation team review of the OER program at TVA shows that in 1981 TVA implemented a program as required by NUREG-0737. This program has, however, been inadequate as evidenced by the continual occurrence of deviations and findings when examined by NRC, INPO, and TVA QA (e.g., the program has been fragmented, with no central coordination for the seven individual site and office separate programs).</p>	<p>Watts Bar Standard Practice WB 6.3.13 RB was issued on 02/13/87 to reflect the requirements of the new NRC program defined in PNP 0601.01. This procedure will be reformatted to agree with the new TVA hierarchy of procedures after the Nuclear Procedures Staff develops the programs and procedures for this transition. However, the Nuclear Procedures Staff has not yet developed a schedule for this task at Watts Bar. (CATU 203 03 WBN 02)</p>

THIS ITEM COMPLETED
DATE 6/1/88

(1) The four issues for SQN relate to the lack of an adequate NRC program. These issues were later combined into one issue for the other sites.

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Element 203.3 - WBH (Continued)

IVA has recognized these inadequacies and in the Corporate Nuclear Performance Plan attempting to remedy this situation by implementing a centrally directed system for operating experience and for internal and industry-wide dissemination of operating experience. In the policy for the nuclear system (IVA memo, 07/10/86, LOC 800/09 859) a five-level hierarchy of procedures is described. For the Nuclear Experience Review (NER) program the Directive has not yet been issued, nor have the instructions been issued for the Watts Bar site, the Division of Nuclear Safety and Licensing, or the Division of Nuclear Engineering. WBH has issued the corporate policy (ONP 6.1) and the procedure PMP 0601.01 for the new Nuclear Experience Review (NER) program (formerly NER) for the corporate activities. WBH has the Standard Practice WB6.3.13. The Division of Nuclear Safety and Licensing (DNL) has issued Division Procedure DNL-DVP-6.1.2 but the Division of Nuclear Engineering (DNE) does not address this activity in any procedure.

The commitment to implement an NER program is presented in the CNPP and is included in the Corporate Commitment Tracking System (CCIS) data base as NCB 800100109.

THIS ITEM COMPLETED

DATE: 7/27/87

DATE: 7/27/87

DATE: 7/27/87

DATE: 7/27/87

DATE: 7/27/87

DATE: 7/27/87

DATE: 7/27/87

6.1-2 has been issued and will replace the old Group Instruction Letter 0601 effective March 30, 1987. This new structure reflects the requirements of the new NER program described in PMP 0601.01 which will also become effective on the same date.
(CATD 203 03 NPS 03)

DNL will develop and issue a division level procedure (NLP) to establish formal guidance to all DNE organizations for implementing the NER program as defined in PMP 0601.01. The NLP will describe a methodology for distribution, review, and response to all items/information assigned to DNE. These items to be included will be identified. The NLP will also define the items originating within DNE which should be disseminated to the industry and the mechanisms which DNE should utilize to accomplish this task. This corrective action is scheduled to be completed by 06/15/87.
(CATD 203 03 NPS 04)

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Issues	Findings	Corrective Actions
Element 203.3 - BFN	BFN	BFN
<p>a. There is no formal system to track and assign commitments for problems identified by INPU; there is poor tracking of NRC experience information; and there are no forced interactions with other utilities for exchange of information.</p>	<p>a. The evaluation team review of the operating experience review program at TVA shows that in 1981 TVA implemented an OER program as required by NUREG-0737. This program had many shortcomings due mostly to lack of full management support and to inadequate staffing at the corporate level, as observed by NRC, INPU and TVA QA, as well as the Employee Concerns Task Group for Report 307.09.</p>	<p>a. See WBN Corrective Action a, first, third, and fourth paragraphs, above. (CATD 203 03 NPS 01) (CATD 203 03 NPS 03) (CATD 203 03 NPS 04)</p>
	<p>TVA has recognized these inadequacies and has so stated in the Corporate Nuclear Performance Plan. TVA has plans under way to remedy this situation by implementing a centrally directed system for operating experience review and for internal and industry-wide dissemination of TVA experience. TVA has the corporate procedure (PMP 0601.01) of the new NER program in place with the necessary first-level governing documents and second-level implementing procedures scheduled for issue in June 1987 and April 1987, respectively.</p>	<p>THIS ITEM COMPLETED DATE: 3-28-88</p> <p>BFN will implement the requirements of PMP 0601.01 (Operating Experience Review) in accordance with the schedule of 05/06/87 (CATD 203 03 BFN 01)</p>
BLN	BLN	BLN
<p>a. There is no formal system to track and assign commitments for problems identified by INPU; there is poor tracking of NRC experience information; and there are no forced interactions with other utilities for exchange of information.</p>	<p>a. The evaluation team review of the operating experience review program at TVA shows that in 1981 TVA implemented an OER program as required by NUREG-0737. This program had many shortcomings due mostly to lack of adequate management support and to inadequate staffing at the corporate level, as observed by NRC, INPU and TVA QA, as well as the Employee Concerns Task Group for Report 307.09.</p>	<p>a. See WBN Corrective Action a, first, third, and fourth paragraphs, above. (CATD 203 03 NPS 01) (CATD 203 03 NPS 03) (CATD 203 03 NPS 04)</p>
	<p>TVA has recognized these inadequacies and has so stated in the Corporate Nuclear Performance Plan. TVA has plans under way to remedy this situation by implementing a centrally directed system for operating experience (to include other utilities) review and for internal and industry-wide dissemination of TVA experience. TVA has the corporate procedures PMP 0601.01 and OHSI-DVP for the new NER program in place. The Division of Nuclear Engineering (Dnt) has scheduled the issue of their interfacing and implementing procedure for 06/15/87.</p>	<p>THIS ITEM COMPLETED DATE: 6-22-88</p> <p>TVA has advised that the necessary site implementing procedure for BLN, Site Director's Order (SDO) 6.1.2 "Operating Experience Review" is being prepared, and is to be issued before the end of 1987. When completed and fully implemented, the issue of BLN-ER procedures should be scheduled (CATD 203 03 BLN 01)</p>

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Issues	Findings	Corrective Actions
<p>***** Element 203.4 - Change Incorporation and Retrofit Between Units Lacking *****</p> <p>SQN Not Applicable WBN</p> <p>a. Design changes are being made to one unit without being incorporated into the other unit in a timely manner or at all. Hardware in the second unit must be reworked after initial incorrect installation.</p> <p>o Pressure gauge pulsation dampers (snubbers) were required for some instruments in Unit 2 without being required for corresponding instruments in Unit 1.</p> <p>o Piping size was changed in Unit 2 without this change being made to corresponding piping in Unit 1. (This issue, concern EX-85-U02-U02, is addressed in detail in Watts Bar Element Evaluation 232.1.)</p> <p>o A maximum dimension for the distance between a condensate pot and its root valve was specified for Unit 2 but not for Unit 1.</p>	<p>SQN Not Applicable WBN</p> <p>a. WBN design drawings are common to both units, unless specifically noted as applying to only one unit. When a design change is made to one unit by an Engineering Change Notice (ECN), a corresponding ECN is issued for the other unit. This practice was initiated by memo. However, no written procedure was found that requires that a design change for one unit be reviewed for applicability to the other unit.</p> <p>All of the design changes identified in the issues apply to both units.</p> <p>o Requirements and installation details for pulsation dampeners (snubbers) on instruments are given by notes on instrument drawings (4/W000-series). A review of these drawings revealed no instance where a snubber was required for an instrument in one unit only.</p> <p>o details of the finding regarding the piping size change can be found in Watts Bar Element Evaluation 232.1. The evaluation team noted that, at the time the concern was raised, a program was in place to resolve it.</p> <p>o The 3-foot maximum dimension for the distance between a condensate pot and its root valve was incorporated on detail B1/b of WBN drawing 4/W000-170, R152.1. This is a common design drawing applicable to both units. However, the Field Change Requests (FCRS) that initiated this requirement are so poorly worded that a reader could infer that the FCRS apply to unit 2 only.</p>	<p>SQN Not applicable WBN</p> <p>a. Engineering Requirement Specification ER-WBN-ELL-001 has not been updated to address requirements for condensate pot installation. This action will be completed before Unit 1 fuel load. (CATD 203 04 WBN 01)</p> <p>Engineering Requirement Specification ER-WBN-ELL-001 will be updated to include requirements for condensate pot installation. This action will be completed before Unit 1 fuel load. (CATD 203 04 WBN 01)</p> <p>SVA has no written procedure to require an ECN written against one unit to be checked for possible applicability to the other unit.</p> <p>WBNP project procedure WBNP-EP 43.02 (Engineering Change Notices) is being revised. This revision (R1) will include the requirement to review each change for its applicability to the other unit. If the change affects both Unit 1 and Unit 2, then the implementing ECN number for the "other" unit will be entered on each ECN to cross reference the modification. If the change affects only one unit, the ECN will be so noted. This action was completed on 04/27/88. (CATD 203 04 WBN 02)</p>

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Issues	Findings	Corrective Actions
***** Element 207.1 - Engineering Acceptance of Rejected work *****		
SQN	SQN	SQN
Not Applicable	Not Applicable	Not Applicable
WQN	WQN	WQN
<p>a. There is a problem with conduit support (electrical hanger) documentation and inspection in Unit 1. It is difficult to find the basis for acceptance of individual supports.</p> <p>b. Many conduit and junction box supports rejected by Quality Control inspectors are accepted by management without rework via O&D notes.</p>	<p>a. NCR 5657 documents the issue that, prior to February 1983, the inspection and basis for acceptance of individual conduit supports were not easily traceable because the supports were inspected as part of the conduit inspection program. However, in 1984 and 1985, TVA Engineering evaluated each IRN issued against a conduit support and determined that there were no hardware deficiencies. A new QC construction inspection procedure was implemented in 1983 that provided for tracking the inspection and documentation of individual supports for conduit and junction boxes.</p> <p>b. Issue "b" is not valid. The conduit and junction box supports were rejected by QC inspectors due to a change in procedure rather than deficiencies with the supports. All the rejected supports have been evaluated by engineering and have been properly dispositioned.</p>	<p>a. None required.</p> <p>b. None required.</p>

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Element 207.1 - WNR (Continued)

c. TVA engineering personnel consistently accept work which has been rejected by Quality Control inspections. Nonconforming Condition Reports were incorrectly dispositioned in that Engineering accepted improperly installed and undocumented subcontract work.

c. During the installation of the lining, initiated several Nonconforming Conditions regarding the vendor's compliance with the specification. Six NCRs were issued by Construction of which four were considered to identify significant conditions, and two were considered to be non-significant. These NCRs cite numerous deficiencies in the contractor's performance of the work. These deficiencies include excessive slump, excessive temperature, improper humidity control during curing, surface cracks, insufficient mortar thickness, pipe ends left uncapped, insufficient compressive strength, and the vendor's failure to maintain proper records as required by the specification and described in the vendor's Quality Assurance Program approved by TVA.

The issues expressed by these employee concerns are that engineering inadequately addressed these NCRs because their disposition was to "use as is."

Each of these NCRs was properly handled by Engineering according to TVA procedure LR DLS EP 1.20 which required LR DLS to provide justification for a "use-as-is" disposition, to identify if a document revision is required, and to return the NCR to QC by memo providing this information. For all of the NCRs above, this procedure was followed by LR DLS.

The TVA hierarchy of procedures requires five levels of procedures to control an activity. There are three at the corporate level, the Policy, Directive, and Standard, and two at the site and division levels, Procedure and Instruction. At the present time, the only corporate level procedure issued for governing the activities associated with the disposition and reporting of nonconformances is the internal corporate standard PMP 0600.03, "Evaluation and Reporting of Construction and Design Deficiencies. 10 CFR 50.55(e)." This standard was issued on 02/13/87 and applies TVA-wide and governs the performance of these activities at each of the sites and divisions.

THIS ITEM COMPLETED
DATE: 6-15-88
This item was completed by the site director and nuclear project manager procedures will be issued to implement PMP 0600.03. Interim site licensing procedure 1 will be superseded by these two procedures. This will be complete by April 20, 1987. (CATD 207 01 WNR 03)

The site director and nuclear project manager procedures will be issued to implement PMP 0600.03. Interim site licensing procedure 1 will be superseded by these two procedures. This will be complete by April 20, 1987. (CATD 207 01 WNR 04)

Matts Bar Engineering Project (MBEP) has submitted to the Manager of Engineering Assurance a corrective action plan to resolve Audit Deficiency No. 86-27-01. (Reference H. B. Bounds memo to J. F. Reinhold dated January 14, 1987 [B26 B70114-014]). The Manager of Engineering Assurance approved the corrective action plan per A. P. Capozzi's memorandum to H. B. Bounds dated February 11, 1987 (B05 870211 011).

Any changes to the approved corrective action plan will require Engineering Assurance review and approval. The corrective action plan will be implemented and completed prior to Unit 1 fuel load. Engineering Assurance will perform an independent verification of the completed corrective action and if satisfactory, will close the deficiency. (CATD 207 01 WNR 05)

Attachment B
SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
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Issues	Findings	Corrective Actions
Element 207.1 - NBN (Continued)		
	Several of the site and BIL division level procedures exist but do not yet reflect the specific details of the corporate procedure PMP 0000.03.	
	Finally, other deficiencies by the Watts Bar Engineering Project (WBEF) in the documentation, control, and disposition of construction-oriented NCRs have been noted by TVA's Division of Nuclear Quality Assurance (DNQA). These deficiencies have been reported in DNQA report 86-27 and NCR WBN WBP8001 on 01/12/87, and the WBEF plan for corrective action has been approved by DNQA.	
BFN	BFN	BFN
Not Applicable	Not Applicable	Not Applicable
BLN	BLN	BLN
Not Applicable	Not Applicable	Not Applicable
***** Element 207.2 - Safety and Licensing Evaluations *****		
SQN	SQN	SQN
a. Safety and licensing evaluations by EN DES (including NEB) are inadequate.	a. There was no evidence obtained or observed that indicated inadequate performance by EN DES (including NEB) in the area of safety and/or licensing evaluations.	a. None required.
b. Safety and licensing evaluations by EN DES (including NEB) are in a cover-up mode.	b. There was no evidence obtained or observed that indicated any effort by EN DES (including NEB) to cover up or hide any information related to areas examined.	b. None required.

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Issues	Findings	Corrective Actions
Element 207.2 - WBN	WBN	WBN
a. Safety and licensing evaluations by EN DES (including NEB) are inadequate	a. There was no evidence obtained or observed that indicated inadequate performance by EN DES (including NEB) in the area of safety and/or licensing evaluations.	a. None required.
b. Safety and licensing evaluations by EN DES (including NEB) are in a cover-up mode.	b. There was no evidence obtained or observed that indicated any effort by EN DES (including NEB) to cover up or hide any information related to areas examined.	b. None required.
c. Engineering and design personnel will cause a cover-up of problems with paperwork. (NOTE: This issue was derived from Concern IN-85-143-004 which was not addressed at the element level, but which was treated at the subcategory level.)	c. On the basis of the investigation conducted in connection with issue "b" above, it was concluded that the engineering and design personnel did not cause a cover-up of problems with paperwork. This issue is not valid.	c. None required.
BFN	BFN	BFN
a. Safety and licensing evaluations by EN DES (including NEB) are inadequate.	a. There was no evidence obtained or observed that indicated inadequate performance by EN DES (including NEB) in the area of safety and/or licensing evaluations.	a. None required.
b. Safety and licensing evaluations by EN DES (including NEB) are in a cover-up mode.	b. There was no evidence obtained or observed that indicated any effort by EN DES (including NEB) to cover up or hide any information related to areas examined.	b. None required.
DLN	DLN	DLN
a. Safety and licensing evaluations by EN DES (including NEB) are inadequate.	a. There was no evidence obtained or observed that indicated inadequate performance by EN DES (including NEB) in the area of safety and/or licensing evaluations.	a. None required.
b. Safety and licensing evaluations by EN DES (including NEB) are in a cover-up mode.	b. There was no evidence obtained or observed that indicated any effort by EN DES (including NEB) to cover up or hide any information related to areas examined.	b. None required.

ATTACHMENT a
SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
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Issues

Findings

Corrective Actions

Element 207.4 - CAQ Documentation

SQN

- a. Existing practice for approval of CAQ (conditions adverse to quality) documentation (e.g., PIRs and SCR's) hinders reporting of CAQs by employees (i.e., there is no "appeal" process).

SQK

- a. Sequoyah Safety Analysis Reports (PSAR and FSAR) adequately respond to the applicable regulatory criteria and impose appropriate requirements on the project for CAQ reporting and processing.
- b. Quality Assurance Program Description for the Design, Construction, and Operations of TVA Nuclear Power Plants adequately address the applicable criteria for CAQ reporting and processing.
- c. The Sequoyah NPP acknowledges that CAQs have been a problem and also addresses corrective action.
- d. TVA management has accepted as valid three INPO findings regarding CAQs. These findings were critical of the following elements of TVA's CAQ programs: documentation of CAQ, CAQ evaluation, establishment of basic cause of CAQ, and implementation of timely and effective corrective action for all CAQs.
- e. Prior to the issuance of NLP-9.1 in July, 1980, the engineering procedures implementing the corrective action process at SQN did not offer a means for the initiator of a potential CAQ to escalate a concern to higher management if a supervisor disagreed about the validity of the concern. NLP-9.1 now provides such measures.
- f. The new Employee Concerns Special Program now provides additional measures, if needed, to escalate a concern to higher management.

SQH

- a. See WBN Corrective Action a. below.

Attachment B
SUMMARY OF ISSUES, FINDINGS, AND CORRECTIVE ACTIONS
FOR SUBCATEGORY 24500

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Issues	Findings	Corrective Actions
<p>Element 207.4 - WBN</p> <p>a. Existing practice for approval of CAQ (conditions adverse to quality) documentation (e.g., PIRs and SCRs) hinders reporting of CAQs by employees (i.e., there is no "appeal" process).</p>	<p>WBN</p> <p>a. Watts Bar Safety Analysis Reports (PSAR and FSAR), and the TVA topical Report TVA-TR/5-1a, "Quality Assurance Program Description for the Design, Construction, and Operation of TVA Nuclear Power Plants," adequately respond to the applicable regulatory requirements and impose appropriate requirements on the project for CAQ reporting and processing.</p> <p>TVA management has acknowledged in the CHPP that documentation of CAQs has been a problem. They have accepted as valid an INPO finding regarding CAQs that was critical of the element of TVA's CAQ programs concerning initial documentation of CAQs.</p> <p>Prior to the issue of Nuclear Engineering Procedure NEP-9.1 in 07/86 by the Division of Nuclear Engineering (DNE), the engineering procedures implementing the corrective action process at WBN did not offer a means for the initiator of a potential CAQ to refer that potential CAQ to higher management if a supervisor disagreed about its validity. NEP-9.1 now provides such measures. The issue of this concern relates to the period before issue of NEP-9.1. TVA received Employee Concern 1-85-71-APS in 06/86.</p> <p>The Employee Concerns Special Program now provides additional measures, if needed, to refer a concern to higher management.</p>	<p>WBN</p> <p>a. NEP-9.1, issued 07/01/86, provides a means for the initiator of a potential CAQ to escalate a disagreement about the validity to higher management. No further corrective action is required.</p>
<p>BFN</p> <p>a. Existing practice for approval of CAQ (conditions adverse to quality) documentation (e.g., PIRs and SCRs) hinders reporting of CAQs by employees (i.e., there is no "appeal" process).</p>	<p>BFN</p> <p>a. The following are the findings of the evaluation team relative to Issue "a":</p> <p>o Browns Ferry Safety Analysis Report (FSAR) adequately responds to the applicable regulatory criteria and imposes appropriate requirements on the project for CAQ reporting and processing.</p> <p>o Quality Assurance Program Description for the Design, Construction, and Operations of TVA Nuclear Power Plants adequately addresses the applicable criteria for CAQ reporting and processing.</p>	<p>BFN</p> <p>a. NEP-9.1 RO was issued 07/01/86. No further corrective action is required for CAQ documentation.</p>

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Element 207.4 - BFN (Continued)

- o The Browns Ferry NPP acknowledges that CAQs have been a problem and also addresses corrective action.
- o TVA management has accepted as valid IRPO findings regarding CAQ evaluation (documentation). The TVA responses to the IRPO findings address corrective action.
- o Before issuance of NRP-9.1 in 07/86, the engineering procedures implementing the corrective action process at BFN did not offer a means for the initiator of a potential CAQ to escalate a concern to higher management if a supervisor disagreed about the validity of the concern. NRB-9.1 and NRB-EP 25.1.2 now provide such measures.
- o The new Employee Concerns Special Program now provides additional measures, if needed, to escalate a concern to higher management.

BLN

- a. Existing practice for approval of CAQ (conditions adverse to quality) documentation (e.g., PIRs and SCRs) hinders reporting of CAQs by employees (i.e., there is no "appeal" process).

BLN

- a. Bellefonte Safety Analysis Reports (PSAR and FSAR), and the TVA Topical Report TVA-TR/5-1A, "Quality Assurance Program Description for the Design, Construction, and Operation of TVA Nuclear Power Plants," adequately respond to the applicable regulatory requirements and impose appropriate requirements on the project for CAQ reporting and processing.

TVA management has accepted as valid an IRPO finding regarding CAQs that was critical of the element of TVA's CAQ programs concerning initial documentation of CAQs.

Prior to the issue of Nuclear Engineering Procedure NRP-9.1 in 07/86 by the Division of Nuclear Engineering (DNE), the engineering procedures implementing the corrective action process at BLN did not offer a means for the initiator of a potential CAQ to refer it to higher management if a supervisor disagreed about its validity. NRB-EP 25.1.2 and NRP-9.1 now provide such measures.

The issue of this concern relates to the period before issue of NRP-9.1. TVA received Employee Concern 1-85-761-RPS in 06/86.

BLN

- a. NRP-9.1, RO, was issued on 07/01/86. No further corrective action is required for CAQ initiation and documentation.

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Element 207.4 - BLN (Continued)		
	The Employee Concerns Program now provides additional measures, if needed, to refer a concern to higher management.	
***** Element 213.3 - Inadequate Electrical Design Criteria *****		
SQ#	SQ#	SQ#
a. Standards and guides are not incorporated into the electrical design criteria.	a. Review of a sample of the electrical design criteria indicates that standards, guides, and regulations are part of these criteria and are committed to when appropriate.	a. None required.
b. Sufficient electrical design criteria to form a basis for design are nonexistent.	b. Although this review indicates that most of the electrical design criteria documents currently exist, design criteria documents for the following could not be identified: communications, overall plant security, instrumentation and controls, and lighting. Additionally, it was determined that some design criteria were identified by IVA but never issued.	<p>b. The corrective action plan responds to three general categories of problems as follows: nonexistence of criteria for some systems/subjects, criteria having been identified but never issued, and the status of the C/R tracking program. Each plan addresses the specific points described on the CATUs for each of the general categories.</p> <p>With regard to the nonexistence of design criteria, CATU 213.3-SQ#-03 identifies these subjects/system as not having formal design criteria documents: instrumentation and controls (I&C), lighting, communications, and overall plant security. The disposition of each of these as stated in the corrective action shall be discussed separately.</p> <p>o IVA acknowledges the need for general I&C design criteria and has committed to their issue before 09/30/87, which is after restart of Unit 2. Although portions of I&C are safety-related, IVA justifies the delay in issuance of these criteria until after restart by the following:</p> <ul style="list-style-type: none"> - Requirements for the I&C portions of individual systems exist in the system's design criteria

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Element 213.3 - SQN (Continued)

- Set point adequacy has been evaluated through Eq and/or calculation programs required for restart
- Requirements for instrument sense lines, although fragmented, do exist. Design criteria specifically for instruments sense line will be issued 03/87 (prerestart)
- All ECNs and CAQs have been reviewed for impact on the safety portion of I&C as part of the restart effort
- No major I&C changes are now being, nor will be, made prior to issuance of design criteria
- o The lighting criteria are to be issued 12/31/87. The basis for the postponement of the issuance until after restart is the various tests (i.e., pre-up, start-up) and evaluations which have been performed over the years, and the fact that most emergency lighting system components are covered in other design criteria and on design drawings. Additionally, no major changes have been made, or are planned which would invalidate the previous tests and evaluations.

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Element 213.3 - SQN (Continued)		<ul style="list-style-type: none"><li data-bbox="1370 349 1834 633">o IVA has committed to issue Communications Design Criteria by 12/15/87. Since SQN communication systems are not safety-related, this criteria document is not required for restart by SQEP 29. However, the portions of the communication systems which are important to safety (emergency operations, fire brigade, security) are covered in other safety-related design criteria and other design output documents.<li data-bbox="1370 657 1834 1185">o IVA has indicated that sufficient design criteria for plant security exist in the form of two design criteria: SQN-DC-V-23.0, "Security - Power Block;" SQN-DC-V-23.1, "Electrical Security and Communication Equipment - Power Block Project." Because of the sensitivity of safeguard information, the evaluation team was not able to personally review these documents; however, through discussions with TVA (01/11/87) it was established that these criteria contain sufficient detail for, and are applicable to, overall plant security. In addition, the SQN Physical Security Plan defines all aspects of the overall plant security including those in the above referenced design criteria. For these reasons, no additional security design criteria are required. <p data-bbox="1370 1201 1602 1226">(Cat# 213 03 SQN 01)</p>

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Element 213.3 - SQM (Continued)

The second general problem is that criteria have been identified but never issued. The CATD lists these specific criteria:

- o SQM-DC-V-9.7, "Emergency Operations Facility"
- o SQM-DC-V-9.11, "Safety Related Display Instrumentation"
- o SQM-DC-V-9.12, "The Emergency Fire Protection Communications Systems"
- o SQM-DC-V-11.1, "Thermal Overload and Burnout"

The disposition of each of these criteria is as follows:

- o Design Criterion SQM-DC-V-9.7 is no longer required as TVA implemented a central emergency control center (CECC), located in Chattanooga, to satisfy the post-1979 NUREG 0696 requirements. DWE indicated that the design requirements for the CECC are the responsibility of the Office of Nuclear Power and not project specific. The specific requirements and interface with SQM site are identified in the SQM Radiological Emergency Plan. This plan was reviewed in part by the evaluation team which substantiated DWE statements. This design criteria number is to be deleted from the design criteria manual's index.

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Element 213.3 - SQN (Continued)

- o The design criteria for the "safety-related display instrumentation" SQN-DC-V-9.11, have been incorporated into the post-accident monitoring (PAM) design criteria, SQN-DC-V-19.0, via a design input memorandum and will be included in the next formal revision of that criterion. Therefore, a separate design criterion is not required and design criterion number SQN-DC-V-9.11 shall be deleted.
- o The communication systems are currently outlined in the SQN FSAR. Included in the FSAR is a communication systems evaluation which indicates availability of adequate communication equipment during several postulated events (including fires). TVA has indicated that the design criteria for the emergency fire protection communication system will be part of the radio system design criteria which will be issued in conjunction with the communication design criteria. A separate criterion is not needed; therefore, the number SQN-DC-V-10.6 will be deleted from the index. All other communication systems are designated as nonsafety-related and, therefore, design criteria are not required to be completed prior to restart.
- o Finally criterion SQN-DC-V-11.9, "Thermal Overload and Torque" is currently being developed and will be issued prior to restart.

(CATD 213 03 SQN 02)

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Element 213.3 - SQN (Continued)		
c. Electrical design criteria are inadequate to form a basis for design.	c. Review of C/R data sheets indicates that some commitments have not yet been incorporated into the electrical design criteria required for restart and that no plans for closeout of unincorporated C/R data sheets currently exist, as IVA has "essentially completed" the DDDP. Provisions for the issuance or revision of electrical design criteria necessary to fully document the design bases (nonrestart portion) have not been made. Procedures for the closeout of nonrestart C/R data sheets have not been formulated.	Lastly, the general issue of C/R closeout has been resolved by the commitment by IVA to incorporate, or justify not incorporating, the remaining C/R data sheets. Additionally, SQEP 1B, which established the C/R tracking system, will be revised to make this an ongoing effort to ensure that design criteria will be kept up to date with regard to upper-tier document commitments and requirements. (CATD 213 03 SQN 03) c. See Corrective Action b., above.
WBN See 201.3 BFN See 201.3 BLN See 201.3	WBN See 201.3 BFN See 201.3 BLN See 201.3	WBN See 201.3. BFN See 201.3. BLN See 201.3.

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 Element 213.4 - Electrical Procedures do not Properly Identify IEEE Standards

SQN

Sqn

Sqn

a. TVA electrical design documents and procedures do not include requirements of IEEE standards or other industry standards.

a. The HSRS report concluded that IEEE standard requirements or their equivalent were incorporated in design documents and procedures. The GCIF report concluded that all electrical design documents and procedures include standards to which TVA is committed. Results of the document review by the evaluation team support the conclusions of the HSRS and GCIF reports. Furthermore, current NLPs provide adequate directions for including requirements of industry standards in design documents and procedures.

a. None required.

The HSRS report also recommended that an interorganizational review of all applicable documents be conducted to ensure that the requirements of industry standards are understood and implemented. Subsequently, a meeting of interorganizational representatives in November 1985 resolved comments on proposed revisions of two construction specifications and their concurrence led to issue of the revisions. Future requirements for similar interorganizational reviews are discussed in Sequoyah Element Evaluation 201.4.

b. If these standards are not included, numerous problems may result.

b. The issue, that numerous problems may result if requirements of IEEE and other industry standards are not included in electrical documents, is not valid for Sequoyah since no such deficiencies were found.

b. None required.

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Element 213.4 - WBN	WBN	WBN
See 201.3	See 201.3	See 201.3.
BFN	BFN	BFN
See 201.4	See 201.4	See 201.4.
BLN	BLN	BLN
See 201.4	See 201.4	See 201.4.



ATTACHMENT C

REFERENCES

1. Title 10 of the Code of Federal Regulations, Part 50 (10 CFR 50), Chapter 1, Appendix B, "Quality Assurance Criteria For Nuclear Power Plants and Fuel Reprocessign Plants" (as amended 01/75)
2. 10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants," Design Criteria 5, "Records Requirements"
3. 10 CFR 50.35, "Issuance of Construction Permits"
4. Title 10 of the Code of Federal Regulations, Part 50.55, "Conditions of Construction Permits," Reporting Criteria for Significant Deficiencies 10CFR50.55(e), (04/19/76)
5. Title 10 of the Code of Federal Regulations, Part 50.59, "Changes, Tests, and Experiments"
6. 10 CFR 50.71, "Maintenance of Records, Making of Reports"
7. Title 10 of the Code of Federal Regulations, Part 21, "Reporting of Defects and Noncompliance"
8. Regulatory Guide 1.16, "Reporting of Operating Information - Appendix A, Technical Specifications," R4, (08/75)
9. Regulatory Guide 1.28, "Quality Assurance Program Requirements (Design and Construction)," R0, (06/07/72)
10. Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operations)," R2, (02/78)
11. Regulatory Guide 1.64, "Quality Assurance Requirements for the Design of Nuclear Power Plants," R2, (06/76)
12. Regulatory Guide 1.88, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuciear Power Plants," R2, (10/76)
13. NRC NUREG-0737, "Clarification of TMI Action Plan Requirements, Item I.C.5," (11/80)
14. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants"

15. ANSI N45.2.9-1974, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants"
16. ANSI N45.2.10-1973, "Quality Assurance Terms and Definitions"
17. ANSI N45.2.11-1974, "Quality Assurance Requirements for the Design of Nuclear Power Plants"
18. ANSI N18.7-1976, "Administrative Control and Quality Assurances for the Operational Phase of Nuclear Power Plants"
19. ANSI/ASME NQA-1-1983 Edition, "Quality Assurance Program Requirements for Nuclear Facilities"
20. ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components, Subsection NA, "General Requirements," 1971 Edition through Summer 1973 Addenda
21. ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components, Subsection NA, "General Requirements," 1974 Edition through Summer 1974 Addenda
22. NRC Inspection Report 50-390/85-38, [B45 850910 826], (08/29/85)
- 22a. Nonconformance Report Watts Bar Nuclear Plant, WBNNEB8419, Rev. 1, July 2, 1985 [B45 850703 851]
23. USAEC Report, "Safety Evaluation of the Bellefonte Nuclear Plant, Units 1 and 2" (05/24/74), and Supplement 1 (08/30/74)
24. USAEC Report, "Safety Evaluation of the TVA Browns Ferry Nuclear Plant, Units 1, 2 and 3" (06/26/72) and Supplements 1-9.
- 24a. USNRC Report, "Safety Evaluation Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2," (06/82) and Supplements 1-4, (TTB 9-41).
25. Sequoyah Preliminary Safety Analysis Report, (PSAR).
26. Sequoyah Final Safety Analysis Report (UFSAR) Updated, through Amendment 3 (04/86)
27. Watts Bar Final Safety Analysis Report (FSAR) updated through Amendment 55. (04/15/85)
28. Watts Bar Preliminary Safety Analysis Report (PSAR) Amendment 22, (08/10/73)
29. Bellefonte Preliminary Safety Analysis Report (PSAR) through Amendment 13 (10/10/75)
30. Bellefonte Final Safety Analysis Report (FSAR) through Amendment 27 (06/20/86)

31. Browns Ferry Final Safety Analysis Report (FSAR) Amendment 31, and Updated Final Safety Analysis Report (UFSAR), through Amendment 4 (08/86)
32. BFN Final Safety Analysis Report (FSAR), RO (09/25/70); Section 8, "Electrical Power"
33. TVA-TR75-1A, "Quality Assurance Program Description for the Design, Construction, and Operation of TVA Nuclear Power Plants," R8, (04/09/85); R9, (No Issue Date)
34. TVA Corporate Nuclear Performance Plan, (CNPP), Volume 1, R4, (04/87); R2, (08/13/86; R1, (07/22/86); R0, (03/86)
35. Sequoyah Nuclear Performance Plan, Volume 2, R1, Final Concurrence Transmitted July 14, 1986, (L44 860714.800)
36. Watts Bar Nuclear Performance Plan (WBNPP), Volume 4, (03/13/87-Draft), (TTB 373, 05/06/87)
37. Browns Ferry Nuclear Performance Plan, Volume 3, RO (09/02/86)
38. TVA, Nuclear Quality Assurance Manual, (NQAM), (11/14/85), and Interim NQAM: (10/21/86) (issued 07/02/86)
39. Sequoyah Nuclear Plant Quality Assurance Manual (SQN QAM)
Quality Assurance Procedures (QAPs) employed in the review of this element are from Revision 11 of the SQN QAM (and prior) and include:
SQN-QAP-III-1.1, R2, "Preparation and Review of Design Criteria for Sequoyah Nuclear Plant," (04/07/71)
SQN-QAP-III-1.3, (No. Rev.) "Preparation, Review and Records of Design Computations," (no date). (Note: Rev. 1 of this procedure is superseded by DED-EP-3.03)
40. TVA Office of Engineering Design and Construction (OEDC) Quality Assurance Manual, (09/12/75)
41. TVA Office of Nuclear Power Quality Assurance Manual (ONP QAM), R1, (10/21/86)
42. OGP0025-00, Bellefonte Nuclear Plant Quality Assurance List (Q-List) RO, "Q-List General Notes," (10/30/84) and Q-List (9 volumes).
43. Browns Ferry Nuclear Plant Construction Quality Assurance Manual (07/24/70, revised 11/03/720)

44. TVA Division of Construction, Watts Bar Nuclear Plant (WBN), Quality Control Instruction (QCI)
- WBNP-QCI-1.45, R0 "N-5 Preparation," (12/30/81)
 - WBNP-QCI-1.45, R1 "N-5 Preparation," (05/19/82)
 - WBNP-QCI-1.45, R2 "N-5 Preparation," (06/22/82)
 - WBNP-QCI-1.45, R3 "N-5 Preparation," (12/22/82)
 - WBNP-QCI-1.45, R4 "N-5 Preparation," (04/16/84)
 - WBNP-QCI-1.45, R5 "N-5 Preparation," (08/22/85)
45. TVA Division of Construction, Bellefonte Nuclear Plant (BLN), Quality Control Procedure (QCP)
- BNP-QCP-10.17, R0 "Preparation of N-5 Code Data Report," R0, (04/11/83)
46. Watts Bar QCP 3.03, Rev. 20, "Inspection of Electrical Conduit and Junction Boxes"
47. Watts Bar QCP 3.09, Rev. 0, "Inspection of Supports for Electrical Conduit and Junction Boxes"
48. TVA Office of Construction Quality Assurance Procedure OC-QAP 15.1 R12, "Reporting and Correcting Nonconformances," [C03 850830 005], (11/01/85)
49. Sequoyah Engineering Project (SQEP) Project Manual
- SQEP-13, R0 "Procedure for Transitional Design Change Control," (07/25/86)
 - SQEP-18, R1 "Procedure for Identifying Commitments and Requirements as Source Information for Sequoyah Design Criteria Development," (07/09/86)
 - SQEP-18, R2 "Procedure for Identifying Commitments and Requirements as Source Information for Sequoyah Design Criteria Development, "(Draft)"
 - SQEP-29, R1 "Procedure for Preparing the Design Basis Document for Sequoyah Nuclear Plant," (07/18/86)

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50. Watts Bar Engineering Project - Project Manual, R1, (01/09/86):
- WBEP-EP LV.01, R0, "Compilation of Licensing Commitment Units," (11/26/86)
 - WBEP-EP DB.01, R0, "Preparation of Commitment/Requirement Data Base," (11/18/86)
 - WBEP-EP DB.02, R0, "Preparation of Design Basis Document," (12/18/86)
51. Watts Bar Engineering Project, Engineering Procedures (WBEPs)
- WBEP-EP 43.02, "Engineering Change Notices," R1, (04/27/87)
 - WBEP-EP 43.03, "Field Change Requests," R0, (09/27/85)
 - WBEP-EP 43.05, "N-5 Data Report Forms," R0, (09/27/85)
 - WBEP-43.09, "Identifying the Calculation Required to Support Electrical Design," R1, (02/28/86)
52. TVA Division of Nuclear Engineering (DNE), Browns Ferry Engineering Project (BEP), Project Manual, R4, (09/29/86)
- Browns Ferry Project Instruction BFEP-PI-86-17, "Identification of Licensing Commitments," R0, (09/24/86)
 - Browns Ferry Project Instruction BFEP-PI-86-18, "Design Criteria/Design Basis," R1, (04/03/87)
 - Browns Ferry Project Instruction BFEP-PI-86-46, "Design Baseline and Verification Program Walkdown Interface Procedure," R0, (11/26/86)
53. Browns Ferry Environmental Qualification Project Manual (BFN-EQP-01) (09/86)
54. Bellefonte Engineering Project - Project Manual, R4 (12/31/86) including Project Procedures BLEP-01 through BLEP-08, BLEP-10, and BLEP-14
55. Sequoyah Nuclear Plant, "Design Baseline Verification Program," R0, [B25 860506 020], (05/06/86)
56. Watts Bar Nuclear Plant, Design Baseline and Verification Program, R0 (07/21/86)
57. Design Baseline and Verification Program, Watts Bar Nuclear Plant, R1, (01/05/87) (formerly Engineering and Configuration Assurance Program - ECAP)

58. Design Baseline and Verification Program, Browns Ferry Nuclear Plant, RO, (07/07/86)
59. TVA Division of Engineering Design (EN DES) Engineering Procedures Manual. This evaluation refers to the following:

Volume 1, Section 1.0, Category: General
Volume 2, Section 3.0, Category: Engineering
Volume 3, Section 4.0, Category: Design
Volume 4, Section 5.0, Category: Procurement

- EP 1.14, RO and "Engineering Records - Retention and
EP 1.14, R10. Storage," (05/13/83)
- EP 1.26, R9 "Nonconformance," (03/15/85)
- EP 1.28, R7 "Control of Documents Affecting Quality," (07/23/84)
- EP 1.48, R2 "Preoperation of Failure Evaluations/Engineering Reports
of Deficient Condition for Nuclear Plants," (03/15/85)
- EP 1.51, R1 Conditions Adverse to Quality Trend Analysis Program,"
(04/24/84)
- EP 1.52, R0 "Potential Generic Conditions Adverse to Quality
Identifying and Investigating," (12/28/82)
- EP 2.01, R6 Safety Analysis Reports (Admendments and Revisions) -
Preparation, Review and Approval," (04/24/84)
- EP 2.02, R9 "Handling of Conditions Potentially Reportable Under
Title 10 of the Code of Federal Regulations, Parts 21,
50.36 and 50.55(e)," (03/15/85)
- EP 2.03, R6 "Unreviewed Safety Question Determination - Handling and
Preparation," (04/24/84)
- EP 2.06, R4 "Distribution and Review of Licensing and Regulatory
Information," (04/06/81)
- EP 2.07, R6 "Licensing Commitments - Control and Tracking,"
(02/28/85)
- EP 2.08, R6 "NRC Regulatory Guides - Review, Comment, and
Documentation of TVA Conformance," (09/14/84)

EP 2.10, R7 "NRC - OIE Bulletins, Circulars and Information Notices - Distribution and Preparation of Responses," (03/02/84)

EP 2.11, R4 "NRC - OIE Inspection Reports, Orders, Immediate Actions Letters, and Confirmation of Acting Letters - Handling and Preparation of Responses," (09/23/83)

EP 2.13, R3 "Initial Fuel Loading Safety Evaluation - Handling," (11/29/84)

EP 3.01, R6 "Design Criteria Documents - Preparation, Review, and Approval," (05/22/84)

EP 3.03, R8 "Design Calculations," (04/24/84)

EP 3.04, R13 "EN DES Construction Specifications - Preparation, Review, and Approval," (02/14/84)

EP 3.06, R6 "Design Reports Load Capacity Data Sheets, and Owner's Review, ASME III Division I - Preparation, Review, and Certification," (11/18/82)

EP 3.09, R3 "Design Criteria Diagrams for Fluid Systems - Preparation, Review, and Approval" (12/14/81)

EP 3.37, R3 "Codes, Standards, and Other Non-TVA Documents - Filing and Referencing," (08/11/83)

EP 3.38, R0 "System Description Documents - Preparation, Review, and Approval," (02/16/83)

EP 3.45, R0 "ASME Code N-5 Data Reports - Handling," (11/18/82)

EP 4.01, R10 "Signatures/Initials for Preparation, Review, and Approval of EN DES Drawings," (04/25/85)

EP 4.02, R16 "Engineering Change Notices (ECNs) Before Licensing - Handling," (07/23/84)

EP 4.03, R0 "Field Change Requests Initiated by Construction," (11/21/84)

EP 4.11, R1 "Combined-Design Drawings and Project Standard Drawings - Preparation and Use," (07/11/78)

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- EP 4.12, R5 "EN DES Design Guides and Design Standards - Preparation, Review, Approval, Distribution, and Revision," (04/15/82)
- EP 4.14, R3 "EN DES Typical Drawings and Standard Drawings - Preparation, Review, Approval, Distribution, and Revision," (08/10/81)
- EP 4.16, R5 "Configuration Control by Use of Drawings and Drawing Lists," (11/10/82)
- EP 4.18, R4 "Design Change Requests (DCRs) - Processing, Reviewing, and Approving," (05/22/84)
- EP 4.21, R3 "Revising and Voiding EN DES Engineering Drawings," (10/18/83)
- EP 4.39, R3 "Routine Distributing of Prints and Microfilm Aperture Cards for Drawings Under TVA Control," (10/18/83)
- EP 5.01, R17 "Purchase Requisitions - Evaluation of Bids and Recommendation/Rejection of Contract Award - Revisions to Contracts," (05/23/85)
- EP 5.20, R7 "Processing Procurement Requests," (11/05/84)
- EP 5.30, R6 Standard Format for the Preparation of Procurement Specifications," (07/29/83)
- EP 5.32, R3 "Preparation of Procurement Specifications for Civil Items," (05/13/83)
- EP 5.33, R8 "Procurement Quality Assurance," (10/26/84)
- EP 6.01, R5 "Preoperational Testing Documents - Processing," (01/12/83)
60. TVA Office of Engineering (OE) Procedures Manual, (04/26/85)
- OEP-06, RO "Design Input," (04/26/85)
- OEP-07, RO "Calculations," (04/26/85)
- OEP-08, RO "Design Output," (04/26/85)
- OEP-09, RO "Procurement," (04/26/85)
- OEP-10, RO "Review," (04/26/85)

OEP-11, RO "Change Control" (04/26/85)
OEP-13, RO "Testing" (04/26/85)
OEP-14, R1 "Licensing" (12/02/85)
OEP-16, RO "Design Records Control," (04/26/85)
OEP-17, RO "Corrective Action" (04/26/85)
OEP-17, R1 "Corrective Action" (07/01/85)
OEP-17, R2 "Corrective Action" (08/30/85)

61. TVA Division of Nuclear Engineering (DNE) Procedures Manual:

NEP-1.3, RO "Record Control," (07/01/86)
NEP-2.1; RO "Licensing Support," (07/01/86)
NEP-3.1, RO "Calculations," (07/01/86)
NEP-3.2, RO "Design Input," 07/11/86)
NEP-4.1, RO "Procurement," (07/01/86)
NEP-5.1, RO "Design Output," (07/01/86)
NEP-5.2, RO "Review," (07/01/86)
NEP-6.1, RO "Change Control," (07/01/86)
NEP-9.1, RO "Corrective Action," (07/01/86)
NEP-9.1, R1 "Corrective Action," (02/20/87)
NEP-9.1, R2 "Corrective Action," [805 870630 501], (06/30/87)
NEP-10.1, RO "Engineering Services Output," (07/01/86)
NEP-10.2, RO "Control of Measuring and Test Equipment," (07/01/86)
NEP-10.3, RO "Testing," (07/01/86)
NEP-10.4, RO "Testing Scoping Documents and Instructions," (07/01/86)

62. Site Procedures:

Maintenance Instructions MI-8.10 R5, 8.12 R6, 8.17 R5, and 10.52 R0
Surveillance Instructions SI-72 R11, 73 R3, 75 R12, 94.1 R1, 95 R3, 96
R2, 97 R11, 251.1 R3, and 251.2 R3
Special Maintenance Instructions, SMI-0-317-39 R2, 0-317-40 R1, and
0-364-1 R2
Special Operation Instructions SOI-30.6 R14, 30.7 R11, 30.8 R3, 32.1 R12,
and 32.2 R14
Technical Instructions TI-41-28 R2, 41-29 R0, and 76 R5
Modification and Additions Instructions M&AI-4 R10, 7 R9, and 13 R6
Inspection Instructions II-10 R16, and 28 R6

63. Sequoyah Engineering Procedures SQEP-06 R0, 08 R3, 11 R4, 12 R2, 13 R0,
14 R0, 15 R0, 16 R0
64. Sequoyah Nuclear Plant Compliance Staff Instruction Letter CS-SIL-5,
"Commitment and Corrective Action Tracking," Rev. 2, (11/27/85)
65. SQN AI-19, Part IV, R10, "Plant Modifications After Licensing," (Site
Procedure), (06/07/85)
66. TVA Division of Nuclear Power, Procedure No. 0601.01 (formerly DPM No.
N72A39), "Review, Reporting, and Feedback of Operating Experience Items,"
(06/04/85)
67. DPM N72A39, "Review, Reporting, and Feedback of Operating Experience
Items," (07/28/81) with later revision (04/05/83)
68. Office of Nuclear Power Policy 6.1, "Nuclear Safety," draft (12/06/86)
69. PMP 0601.01, "Nuclear Experience Review," R0, [L65 861106 433], (01/13/87)
70. Division Procedure DNSL-DVP-6.1-2, "Nuclear Experience Review"
71. TVA Division of Nuclear Safety and Licensing (NSL) Division Procedure:
DNSL-DVP-6.2-2, "Corporate Commitment Tracking System User Manual," R0,
(12/19/86)
72. TVA Office of Nuclear Power (ONP) Program Management Procedure:
PMP 0605.01, "Commitment Management and Tracking," R0, (01/13/87)
73. TVA Office of Engineering Procedure OE-SEP 85-01, "Review of WBN
Commitment Tracking Program," R0, [B45 851018 263], (02/20/85)

74. WBN Site Procedures:

Maintenance Instructions MI-57.29, R1; MI-57.99.3, R11; MI-57.99.6, R11; MI-57-99.7, R11; MI-57.99.8, R11; MI-235.2, R3

Modifications and Additions Instructions MAI-3, R7; MAI-4, R5; MAI-5, R8; MAI-14, R6

Qualify Control Instructions QCI-3.05, R11; QCI-3.06.4, R5; QCI-3.20, R8

Quality Control Procedures QCP-3.04, R13; QCP-3.05, R28; QCP-3.06-4

Surveillance Instructions SI-8.10, R10; SI-8.25, R4; SI-8.26, R6; SI-K612A/K607A, R4

System Operating Instructions SOI-57.3, R4; SOI-57.6, R4; SOI-57.7, R6; SOI-57.8, R6

Technical Instructions TI-56.57, R0; TI-56.58, R0; TI-56.278, R2; TI-56.293, R0

75. TVA Nuclear Engineering Branch Procedures Manual, Procedure NEB-EP-25.1.2, "Processing Conditions Adverse to Quality, R3, [B05 860701 503], (06/16/86)
76. TVA Office of Nuclear Power, Program Manual Procedure PMP 0600.03 R0, 02/13/87, "Evaluation and Reporting of Construction and Design Deficiencies 10 CFR 50.55(e)," [L65 870203 192]
77. TVA Office of Nuclear Power (ONP) Program Management Procedure: PMP 0600.01, "Regulatory Reporting Requirements," R0, (12/30/86)
78. TVA Nuclear Licensing Staff Procedure 35, "Preparation of 10 CFR 50.55(e) Reports (Construction Deficiency Reports)," R1, (09/23/82)
79. TVA Watts Bar Nuclear Plant, Interim Licensing Procedure 1, "Construction Deficiency Reporting, 10 CFR 50.55(e)," R0, (09/23/86) with cover memo from R. A. Pedde and G. Toto to Those Listed, "Watts Bar Nuclear Plant (WBN) - Issuance of WBN Interim Licensing Procedure Number 1, 'Construction Deficiency Reporting - 10 CFR 50.55(e)'," [T03 860924 862], (09/23/86)
80. TVA Division of Nuclear Engineering, Watts Bar Engineering Project, Project Procedure WBEP-EP 43.23, R0, "Conditions Adverse to Quality - Reporting and Correcting," [B26 870121 001], (01/21/87)

81. TVA Watts Bar Nuclear Plant, Administrative Instruction AI-2.8.5, "Conditions Adverse to Quality - Corrective Actions," RO, (03/06/87)
82. Tennessee Valley Authority Sequoyah Nuclear Plant, Standard Practice, SQA0134, "Critical Structure, Systems, and Components (CSSC) List," R8, (01/27/86)
83. Action Items Originated by the Engineering Assurance Independent Oversight Review Team for the Sequoyah Nuclear Plant Design Baseline and Verification Program - Summary Report, Prepared by: John Von Weisenstein, (10/22/86), (RFI 714, 11/11/86)
84. Sequoyah Nuclear Plant Standard Practice SQA A183, "Change Control Board (CCB)," R1, (08/06/86)
85. SQN Standard Practice, SQA 26, "Review, Reporting, and Feedback of Operating Experience Items," R7, (11/20/85)
86. WBN Standard Practice, WB6.3.13, "Nuclear Operating Experience Review Program," R5, (07/25/86)
87. WBN Standard Practice: WB11.6, "Commitment Management," R5, [TTB-59], (07/31/86)
88. BFN Site Director Standard Practice SDSP-15.6, "Commitment/Action Item Tracking," RO, (10/86)
89. BFN Site Director Standard Practice BF-1.13, "Final Safety Analysis Report and Technical Specifications," RO (03/25/86)
90. BFN Site Director Standard Practice SDSP-15.7, "Periodic Final Safety Analysis Report (FSAR) Updating," RO (09/09/86)
91. BFN Standard Practice, BF 21.17, "Review, Reporting, and Feedback of Operating Experience Items," 01/10/85)
92. TVA Browns Ferry Site Director Standard Practices, BF-SDSP-3.7, R2, "Corrective Action," (01/15/87)
93. TVA BFN Site Director Standard Practice (SDSP) 8.1, "Plant Modifications/Design Change Approval," R2, (01/07/87)
94. BLN Standard Practice: BLA4.1, "Open Item Status Tracking System," R16, (03/09/87)
95. Standard Practice BLA 4.3 for Bellefonte, "Review of Operating Experience Items," R5, (08/01/85)

96. Gilbert/Commonwealth, Inc. Report No. 2614, "Sequoyah Nuclear Plant Modification for Tennessee Valley Authority," (03/03/86) (RFI 538)
97. TVA Report: "Assessment of Engineering Design Control for the Browns Ferry Nuclear Plant," by Myer Bender, F. E. Laurent, E. H. Cole, and R. D. Sabin, (09/85) (TTB 142)
98. CCTS Commitment Update Report, Commitment No. NCO 860156098
99. CCTS Commitment Update Report, Commitment No. NCO 860156102
100. CCTS Commitment Update Report, Commitment No. NCO 850491012
101. Employee Concerns Task Group, Other Sites, Element: Piping Design Analysis, Report Number SWEC-SQN-06, (09/15/86)
102. Employee Concerns Task Group, Other Sites, Element: HRC Notification Inadequate, Report Number SWEC-SQN-23, (10/07/86)
103. Employee Concerns Task Group, Other Sites, Element: Non-Conformance Reporting, Report Number SWEC-SQN-31, (09/09/86)
104. Employee Concerns Task Group, Other Sites, Element: TVA Comparison to Industry Medians, Report Number SWEC-SQN-12 R1, (01/05/87)
105. Employee Concerns Task Group, Other Sites, Element: High Failure Rate for Auxiliary Feedwater (AFW) System, Report Number SWEC-SQN-43 R0, (11/15/86)
106. Employee Concerns Task Group, Other Sites, Element: SQN Operational Readiness Review, Report Number SWEC-SQN-48 R1, (01/05/87)
- 106a. Employee Concerns Task Group Operations ECG, Subcategory: nuclear Power/Site Program/procedure Element: Experience Review Program; Report 307.09.
107. Licensing Commitment No. NCO 850467007 to "Implement Corporate Commitment Tracking System which will include updating the CCTS data base and implementing CCTS policy in procedures," to be completed prior to restart
108. Corporate Commitment Tracking System Commitment Update Report, Operating Experience Review, Control Number: NCO-86-0156-063
109. Corporate Commitment Tracking System Commitment Update Report, Operating Experience Review Program, Control Number: NCO-86-0156-109
110. TVA WBN ECTG Operations CEG, Subcategory: Nuclear Power/Site Program/Procedure, Element Review Program Report No. 307.09, (06/05/86)
111. NSRS Investigation Report No. I-85-545-WBN for Employee Concern IN-86-259-XIL, "Industry Requirements in TVA Electrical Procedures," (11/14/85)

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112. Generic Concern Task Force Report GCC-19-65 on Employee Concern IN-86-259-X11, R2, 06/04/86
- 112a. Generic Concern Task Force Report GCC-16-62 on Employee Concern IN-85-886-001, R1, 06/01/86.
113. TVA NSRS Investigation Report I-85-651-SQN, "Electrical Regulations Ignored and Violated," (03/10/86)
114. Watts Bar Nuclear Plant Units 1 and 2 - Task Force Report, "Evaluation of Black and Veatch Findings," (03/19/84)
115. Quality Technology Company ERT investigation report for concern IN-85-217-001, (07/14/85)
116. TVA test report STEAR 23, "Condensate Pot Design and Test," [SWP 811116 056], (11/03/81)
117. Significant Condition Report (SCR) WBN EEB8538, (08/28/85)
118. Tennessee Valley Authority Nuclear Safety Review Staff Investigation Report I-85-166-WBN, (10/03/85)
119. Tennessee Valley Authority Nuclear Safety Review Staff Investigation Report I-85-158-WBN, (07/05/85)
120. Tennessee Valley Authority Nuclear Safety Review Staff Investigation Report I-85-723-WBN, (11/19/85)
121. Tennessee Valley Authority Nuclear Safety Review Staff Investigation Report I-85-361-WBN, (12/12/85)
122. TVA Division of Construction Nonconforming Condition Report, Watts Bar Nuclear Plant Units 1 and 2, NCR 4117R, [WBN 820513 101], (05/13/82)
123. TVA Division of Construction Nonconforming Condition Report, Watts Bar Nuclear Plant Units 1 and 2, NCR 4133R, [WBN 820527 125], (05/26/82)
124. TVA Division of Construction Nonconforming Condition Report, Watts Bar Nuclear Plant Units 1 and 2, NCR 4133R, R1, [EBN 820621/123], (06/18/82)
125. TVA Division of Construction, Nonconforming Condition Report, Watts Bar Nuclear Plant Units 1 and 2, NCR 4163R, [WBN 820622/100], (06/21/82)
- 125a. TVA Division of Construction, Nonconforming Condition Report, Watts Bar Nuclear Plant Units 1 and 2, NCR 4270R, [WBN 820810 103], (08/09/82)
126. TVA Division of Construction, Nonconforming Condition Report, Watts Bar Nuclear Plant Units 1 and 2, NCR 4357R, [WBN 821012/101], (10/08/82)
127. TVA Division of Construction, Nonconforming Condition Report, Watts Bar Nuclear Plant Units 1 and 2, NCR 4419R, [WBN 821109/180], (11/05/82)

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129. Nonconforming Condition Report 2375R WBNP (06/83)
130. TVA NSRS Report R-84-20-BFN, "Assessment of the Browns Ferry Regulatory Performance Improvement Plan," [GNS 840730 051], (07/30/84)
131. TVA NSRS Investigation Report I-85-773-BFN, "Thermal Overload Bypass and Indication Problems," (03/18/86)
132. TVA NSRS Report R-81-08-BFN, "Nuclear Safety review Staff Major Management Review of the Office of Power and the Office of Health and Safety Management Controls," [GNS 810515 001], (05/15/81)
133. Corporate Commitment Tracking System Commitment Update Report, Bellefonte Plant, (06/09/87)
134. NSRS Report R-84-09-BLN, [GNS 840627 054], (06/27/84)
135. Bellefonte Nuclear Plant Electrical Evaluation Task Force Plan, [TAS 841129 001], (11/27/84)
136. Office of Engineering (OE) Bellefonte Electrical Evaluation (01/22/85)
137. Office of Engineering Action Plan for Bellefonte Nuclear Plant Electrical Correction and Improvements (05/01/85)
138. Nonconformance Report BLN BLP8119, [BLP 810713 098], (07/13/81)
139. INPO Report of Sequoyah Nuclear Plant TVA, February 1984 Evaluation (TT8 156)
140. INPO Report of Sequoyah Nuclear Plant, 11/81 Evaluation
141. Foremost Safety and Reliability Issues, Identified through INPO Plant Evaluation and the Significant Events Evaluation and Information Network Program (SEE IN), (12/81)
142. INPO Report, "Evaluation of Sequoyah Nuclear Plant," Second Draft, (07/02/85)
143. INPO Report, "Recurring Recommendations and Good Practices from NTOL Assistance Visits," (05/84)
144. INPO Report, "Browns Ferry Nuclear Plant," (10/84)
145. Recurring Findings and Recommendations and Good Practices, INPO, (01/82)

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147. INPO Report, "Evaluation of Watts Bar Nuclear Plant," Second Draft, (09/03/85)
148. Institute of Nuclear Power Operations, "Plant Program for Industry Operating Experience Review," (Preliminary Good Practice TS-403), INPO, Atlanta, Georgia, (11/83)
149. Institute of Nuclear Power Operations, "Plant Program for In-House Operating Experience Review," (Preliminary Good Practice TS-406), INPO, Atlanta, Georgia, (11/83)
150. Institute of Nuclear Power Operations, "Monthly Synopsis of Operating Experience," (Preliminary Good Practice TS-404), INPO, Atlanta, Georgia, (06/84)
151. INPO 1987 Corporate Evaluation Debrief Meeting at TVA, [L33 870424 800], (04/24/87)
152. INPO Report, "Evaluation of Watts Bar Nuclear Plant," Final Draft, (06/85) (TTB 1-11a)
153. INPO Report, "Evaluation of Watts Bar Nuclear Plant," first draft, [TTB-1-11A], (06/85; Finding DC.5-1)
154. INPO Good Practices document, DE-101 "Configuration Management," Preliminary, (03/86)
155. Institute of Nuclear Power Operations Report, "Evaluation of Browns Ferry Nuclear Plant," Second Draft, 02/12/87
156. Institute of Nuclear Power Operations Report, "Browns Ferry Nuclear Plant," January 1986 Evaluation, (01/86)
157. INPO Report, "Evaluation of Bellefonte Nuclear Plant, Construction Project," (TTB 1-11b) (03/84)
158. General Construction Specifications Manual Index, (12/18/85)
159. INPO Construction Project Evaluation Report -Bellefonte (01/85)
160. TROI User's Guide, R15, (06/30/86)
161. Tracking and Reporting of Open Items (TROI) log, all type I, J, L, M, U, V, 1, 2, 3, 4, 5, and 6 items for Bellefonte, (05/29/87)

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162. Tennessee Valley Authority, Office of Quality Assurance, Design Quality Assurance Branch, Quality Assurance Audit Report, Audit No. 83V-49, May 3-6, 1983, Ameron Incorporated Pipe Lining Division, Wilmington, California, Watts Bar Nuclear Plant Contract No. 82K 53-830267, "Cement Mortar Lining of Piping for Essential Raw Cooling Water (ERCW) System," [OQA 830729 508], (07/29/83)
163. Sequoyah Nuclear Plant Design Criteria Manual (6 Volumes), (06/26/86)
164. SQN Design Criteria:
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| SQN-DC-V-1.1.1.1, R1 | "Detailed Design Criteria for Evaluation of Unreinforced Masonry Walls Constructed from Solid Concrete Blocks," (05/21/81) |
| SQN-DC-V-1.1.9, R2 | "Design Criteria for Pressure Confining Personnel Doors," (10/01/86) |
| SQN-DC-V-1:3.2, R8 | "Miscellaneous Steel Components for Class I Structures," (09/14/84) |
| SQN-DC-V-2.3, R0 | "Containment Vessels," (07/01/69) |
| SQN-DC-V-2.16, R0 | "Single Failure Criteria for Fluid and Electrical Safety-Related Systems," (07/14/86) |
| SQN-DC-V-3.2, R1 | "The Classification of Heating, Ventilating and Air Conditioning Systems," (09/25/85) |
| SQN-DC-V-4.1.1, R0 | "Main Steam System," (07/11/86) |
| SQN-DC-V-7.4, R2 | "Essential Raw Cooling Water System (67)," (07/11/86) |
| SQN-DC-V-11.2, R3 | "125-V Vital Battery System," (07/11/86) |
| SQN-DC-V-11.2.1, R2 | "125-V Fifth Vital Battery System," (07/11/86) |
| SQN-DC-V-11.4 & 11.5, R1 | "Emergency Auxiliary Ac Power System," (07/25/86) |
| SQN-DC-V-11.4.1, R2 | "Normal and Emergency Ac Auxiliary Power System," (07/22/86) |
| SQN-DC-V-11.6, R3 | "120-V Ac Vital Instrument Power System," (07/11/86) |
| SQN-DC-V-11.8, R0 | "Diesel Generator and Auxiliary Systems," (07/10/86) |

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- SQN-DC-V-12.2, R6 "Separation of Electric Equipment and Wiring,"
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- SQN-DC-V-13.3, R3 "Detailed Analysis of Category I Piping
Systems," (08/13/84)
- SQN-DC-V-13.9.1, R0 "Diesel Generator Building Ventilation System
- System 30-DGB," (07/11/86)
- SQN-DC-V-26.2, R0 "Environmental Qualification to 10CFR50.49,"
(07/21/86)
165. Sequoyah Nuclear Plant Design Criteria, Volume 1 through Volume 7,
Index - R3, (01/30/86)
166. WBN Design Criteria:
- The following WBN design criteria have been reviewed in detail.
- WB-DC-00-2, R1 "Codes and Standards for Nuclear Power Plants,"
(01/08/73)
- WB-DC-30-1, R0 "Emergency Auxiliary AC Power System," (01/15/72)
- WB-DC-30-2, R1 "125-Volt Vital Battery Systems," (10/25/85)
- WB-DC-30-2.2, R0 "Non-Class 1E Direct Current Power Distribution
Systems - Compliance with 10 CFR 50 Appendix R,"
(11/18/85)
- WB-DC-30-3, R1 "120-Volt AC Vital Instrument Power System," (10/25/85)
- WB-DC-30-3.1, R0 "Spare Vital UPS System," (06/14/85)
- WB-DC-30-3.2, R0 "Non-Class 1E 120V Alternative Current Power
Distribution Systems - Compliance with 10CFR50
Appendix R," (11/18/85)
- WB-DC-30-4, R4 "Separation of Electrical Equipment and Wiring,"
(10/03/85)
- WB-DC-30-5, R2 "Power, Control, and Signal Cables for Use In Category
I Structures," (06/05/85)
- WB-DC-30-6, R0 "Cable Support System for Capability of Testing Cables
for the Design Basis Flood," (04/29/74)
- WB-DC-30-8, R0 "Technical Support Center Data System," (02/21/84)

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- WB-DC-30-9, R1 "Electric Power System for Volume Reduction And Solidification System Facility," (06/10/82)
- WB-DC-30-10, R0 "Volume Reduction and Solidification System General Instrumentation and Control Requirements," (01/08/82)
- WB-DC-30-12, R0 "Safety Parameter Display System," (07/20/83)
- WB-DC-30-13, R0 "10 CFR 50, Appendix R, Type II Items," (08/13/85)
- WB-DC-30-15, R0 "Motor Operated Valve Thermal Overload and Torque Switch Bypass," (12/30/86)
- WB-DC-40-24.1, R1 "Bypassed and Inoperable Status Indication," (09/29/82)
- WB-DC-40-25, R1 "Mechanical Unit Control Panels," (02/02/83)
- WB-DC-40-26, R2 "Mechanical Auxiliary Instrumentation Room Panel," (09/09/83)
- WB-DC-40-27, R1 "Mechanical Local Panels For Class I Equipment," (09/09/83)
- WB-DC-40-28.1, R1 "Additional Diesel Generator System Class IE," (02/07/86)
167. Watts Bar Nuclear Plant Design Criteria Manual (5 volumes), (TTB 419-2), (01/28/86)
168. Browns Ferry Nuclear Plant Design Criteria Manual (2 volumes), R2 (12/09/86)
169. Browns Ferry Nuclear Plant Design Criteria Manual (2 volumes), R1, (12/01/86)
170. Browns Ferry Nuclear Plant Design Criteria Manual (2 volumes), (02/02/87)
171. The following design criteria have been reviewed in detail:
- o BFN-50-0706 The Torus Integrity Long-Term Program
 - o BFN-50-0707 Analysis of As-Built Piping System
 - o BFN-50-724 Class 1 Seismic Pipe Support Design
 - o BFN-50-789 Normal, Standby, and Emergency Lighting Systems for the Main Control Room

- o BFN-50-794 Physical Independence of Electrical System
- o BFN-2R-D701 Inelastic U-Bolt Pipe Rupture Restraints
- o BFN-50-D709 Reevaluation Criteria for Masonry Walls
- o BFN-50-754 Miscellaneous Steel Components for Class I and II Structures
- o BFN-50-747 Fire Protection of Safe Shutdown Capabilities
- o BFN-50-766 Drywell Control Air System: Containment Atmosphere Dilution System/Drywell Control Air Crosstie
- o BFN-50-779 Replacement of Selected Piping to Limit Susceptibility to IGSCC
- o BFN-50-798 Component Selection Criteria for Baseline Evaluation

172. BFN Design Criteria:

- BFN-50-D707, R3, "Analysis of As-Built Piping Systems," (04/17/85)
- BFN-50-D708, R0, "The Volume Reduction and Solidification Structure," (03/09/81)
- BFN-50-D709, R0 "Reevaluation Criteria for Masonry Walls," (03/26/82)
- BFN-50-D710, R1 "Field Inspection of Instrument Lines," (08/05/81)
- BFN-50-715, R0 "Environmental Design," (11/03/83)
- BFN-50-716, R1 "Spent Fuel Rod Consolidation System," (06/27/84)
- BFN-50-717, R0 "Spent Fuel Storage Cask Facility," (09/08/83)
- BFN-50-718, R0 "High Range Radiation Monitor Building," (04/13/83)
- BFN-50-719, R0 "Pipe Whip Restraints and Jet Deflectors Associated with the IGSCC Piping Replacement Program," (09/05/84)
- BFN-50-720, R1 "Evaluating the Effects of a Pipe Failure Outside Containment," (09/05/84)
- BFN-50-D721, R2 "Rectangular Duct Seismic Design," (11/21/84)

BFN-50-747, RO	"Fire Protection of Safe Shutdown Capability," (01/27/86)
BFN-50-774, R1	"Technical Support Center," (06/21/84)
BFN-50-775, RO	"Technical Support Center - Habitability and Environmental Control System," (06/04/82)
BFN-50-789, RO	"Normal, Standby, and Emergency Lighting Systems for the Main Control Rooms," (01/09/84)
BFN-50-790, RO	"Structural Acceptance of Access Platform Drywell," (04/11/85)
BFN-50-792, R1	"Off Gas Treatment Building," (11/05/85)
BFN-50-793, RO	"Weld Reinspection Sample Program," (11/08/85)
BFN-50-794, RO	"Physical Independence of Electrical Systems," (11/26/85)
BFN-50-795, RO	"Evaluating Expansion Shell Anchors," (05/12/86)
BFN-50-796, RO	"Design of Class II Fire Protection Piping," (05/22/86)
BFN-50-798, RO	"Component Selection Criteria for Baseline Evaluation," (08/26/86)
BFN-50-7200C, DD	"250 VDC Power Distribution System," Draft D, (01/16/87)
BFN-50-7200D, DD	"480 VAC Auxiliary Power System," Draft D, (01/16/87)
BFN-50-7200E, DD	"4 kV AC Auxiliary Power System," Draft D, (01/16/87)
BFN-50-7200F, DD	"Standby AC Power Supply and Distribution System," Draft D, (01/16/87)
BFN-50-7082, DC	"Standby Diesel Generator System," Draft C, (01/16/87)
BFN-50-736, DB	"Licensing Requirements and Application of Industrial Codes and Standards," with matrix of applicable codes, standards and other commitments/requirements for each safe shutdown system, Draft B, (02/17/87)

173. BLN Design Criteria:

N4-50-D716, R4	"Seismically Qualifying Round and Rectangular Duct Systems," (05/06/75)
N4-50-D717, R4	"Design of Safety-related Piping Supports and Supplemental Steel," (10/22/85)
N4-50-D718, R1	"Seismically Qualifying Conduit Supports," (09/12/84)
N4-50-D719, R1	"Seismic Support of Lighting Fixtures in Category I Structures," (07/09/84)
N4-50-D720, R6	"Evaluating the Effects of a Pipe Failure Inside and Outside Containment," (11/15/85)
N4-KC-D740, R1	"Component Cooling Water System," (01/11/84)
N4-KD-D750, R1	"Control Rod Drive Cooling Water System," (11/16/84)
N4-KE-D740, R3	"Essential Raw Cooling Water System," (08/08/85)
N4-KH-D750, R3	"Heat Rejection System," (07/15/85)
N4-KW-D740, R3	"Raw Cooling Water System (kW)," (07/15/85)
N4-CF-D740, R2	"Feedwater System," (07/12/84)
N4-CM-D740, R1	"Condensate System," (04/24/84)
N4-CR-D740, R4	"Steam Generator Startup, Recirculation, Blowdown, and Drain System," (01/14/86)
N4-CS-D740, R2	"Condensate Storage and Transfer System," (04/30/84)
N4-CV-D740, R0	"Condenser Vacuum Removal," (05/16/77)
N4-FD-D740, R0	"Fuel Oil Storage and Transfer System," (06/23/75)
N4-FF-D750, R1	"Fuel Oil System," (08/22/84)
N4-FG-D740, R0	"The Gasoline Storage and Transfer System," (01/27/75)

N4-GC-D740, R2	"CO ₂ Storage, Fire Protection, and Purge," (11/12/85)
N4-GS-D740, R2	"The Hydrogen System," (12/03/84)
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N4-IR-D740, R3	"Detailed Design Criteria for Radiation Monitoring Systems - Bellefonte Nuclear Plant," (03/10/86)
N4-MA-D740, R1	"Access Control Features Required to Limit Radiation Exposure to In-Plant Personnel," (01/06/77)
N4-MA-D740A, R3	"Safety-Related Requirements for Doors," (03/28/86)
N4-NB-D740, R2	"Chemical Addition and Boron Recovery System," (09/25/84)
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N4-NI-D740, R1	"Containment Isolation and Leak Testing System," (01/18/85)
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N4-NL-D740, R3	"Core Flood System," (01/03/86)
N4-PR-D775A, R5	"Bellefonte Nuclear Plant General Design Criteria for Standby AC Auxiliary Power System," (06/30/86)
N4-50-D786, R3	"Physical Independence of Electrical Systems," (09/30/85)
N4-EJ-D775, R1	"120V Class 1E AC Vital Power Distribution System," (01/11/84)
N4-EK-D775, R1	120V Class 1E AC Auxiliary Power Distribution System, (01/11/84)

N4-EU-D775, R2 125V Class 1E DC Power Distribution System, (12/18/85)
N4-IC-D775, R1 Process Monitoring System, (11/30/84)
N4-IL-D775, R1 Solid State Control System, (03/11/83)
N4-RP-D775, R3 Normal AC Auxiliary Power System, (10/06/83)
N4-RPD-775A, R5 Standby AC Auxiliary Power System, (06/30/86)
N4-50-D786, R3 Physical Independence of Electric System, (09/30/85)
N4-50-D787, R2 Power, Control, and Signal Cables for use in Category I Structures, (03/09/84)
N4-50-D789, R1 Normal, Standby, and Emergency Lighting System, (02/22/84)
N4-50-D791, R0 Auxiliary Control System; (06/10/86)
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N4-VK-D740, R3 Control Building Environmental Control System, (10/30/84)
N4-A3-D701, R1 Auxiliary Building Structural Steel, (03/09/84)
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N4-2R-D701, R0 Equipment Support and Cable Tray Supports for Containment Structures Reactor Building, (06/23/76)
N4-9R-D701, R1 Miscellaneous Steel Components for Containment Structures Reactor Building, (03/09/81)

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- N4-50-D702, R5 Design of Civil Structures, (08/12/86)
- N4-50-D703, R2 Reinforced Concrete Block Walls, (04/12/82)
- N4-50-D711, R3 Detailed Analysis and Seismic Qualification of Category I and I(L) Piping System, (10/17/85)
- N4-50-D730, R1 Piping System Anchors Installed in Category I Structures, (04/19/85)
- N4-50-D746, R2 Main Control Room Habitability System, (10/30/84)
- N4-RJ-D740, R3 Essential Compressed Air System, (01/14/86)
- N4-50-D710 Seismic Qualification of Category I Fluid System Components and Electrical or Mechanical Equipment
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176. TVA Division of Engineering Design Standard Drawing Manual:
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| | Volume 3 | (01/03/86) |
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47W920-1, R40 "Powerhouse Control Building Mechanical Heating, Ventilating and Air Conditioning," (initial issue 08/22/71), (TTB 159)

47W920-2, R36 "Powerhouse Auxiliary Building Mechanical Heating, Ventilating and Air Conditioning," (12/01/82), (TTB 159)

47W920-5, R42 "Powerhouse Auxiliary Building Mechanical Heating, Ventilating and Air Conditioning," (10/09/81, (TTB 159).

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47W343-1, R1 "Powerhouse Unit 1-2 Mechanical Sampling and Water Quality System," (01/10/74)

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47W809-2, R6 "Auxiliary Building Unit 1 and 2 Flow Diagram CVCS Chemical Control," (10/31/86)

47W813-1, R27 "Powerhouse Units 1 and 2 Flow Diagram Reactor Coolant System," (06/18/86)

47W815-1, R12 "Powerhouse Turbine Building Units 1 and 2, Flow Diagram Auxiliary Building System," (10/31/86)

47W839-1 R9 "Diesel Generator Building Flow Diagram Diesel Starting Air System," (11/07/84)

48N904, R12 "Reactor Building Units 1 and 2 - Misc. Steel - S.G., R.C., Pump and Press. Rel. Tank - Access Platform Sh. 2"

48N905, R24 "Reactor Building Units 1 and 2 - Misc. Steel - S.G., R. C. Pump and Press. Rel. Tnk. - Access Platform - Sh. 1," (date not legible)

48N906, R12	"Reactor Building Units 1 and 2 - Misc. Steel - S. G., R. C. Pump and Press. Rel. Tnk. - Access Platform - Sh. 2," (03/16/85)
48N908, R10	"Reactor Building Units 1 and 2 - Misc. Steel - Steam Generator - Access Platform," (04/21/81)
48N908-1, R7	"Reactor Building Units 1 and 2 - Misc. Steel - Steam Generator - Access Platform," (11/29/85)
48N908-2, R6	"Reactor Building Units 1 and 2 - Misc. Steel - Steam Generator - Access Platform," (02/18/84)
48N908-3, R3	"Reactor Building Units 1 and 2 - Misc. Steel - Steam Generator - Access Platform," (03/21/85)
48N908-4, R1	"Reactor Building Units 1 and 2 - Misc. Steel - Steam Generator - Access Platform," (03/21/85)
48N908-6, R0	"Reactor Building Units 1 and 2 - Misc. Steel - Steam Generator - Access Platform," (11/29/85)
47W476 Series, R0	"Piping Bill of Material, Sequoyah Nuclear Plant Units 1 and 2, Reactor Building - Annulus Floor DR and EMB Piping," Sheets 1 and 2, (01/17/73)
47W476-1, R9	"Powerhouse Reactor Building - Units 1 and 2, Mechanical Annulus Floor Drains and Embedded Piping," (07/02/81)
SQN-47W479-1, R12	"Mechanical Drains & Embedded Piping"
SQN-47W560-7, R13	"Mechanical Waste Disposal System"
SQN-47W830-1, R17	"Mechanical Flow Diagram - Waste Disposal System"
SQN-47W845-1, R23	"Mechanical Flow Diagram - Essential Raw Cooling Water System"
SQN-47W845-2, R25	"Mechanical Flow Diagram - Essential Raw Cooling Water System"
SQN-47W845-3, R25	"Mechanical Flow Diagram - Essential Raw Cooling Water System"

SQN-47W845-4, R25 "Mechanical Flow Diagram - Essential Raw Cooling Water System"

SQN-47W845-5, R13 "Mechanical Flow Diagram - Essential Raw Cooling Water System"

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- 179. WBNP Instrumentation Drawings; 47W600-series [attachment to 825 870203 005].
- 180. TVA WBN Drawings - Seismic Class I Structures, 47A050, Mechanical Hanger Drawings General Notes, Revisions as of 03/87
- 181. TVA WBN Drawings:
 - 17W303-1, R10 "Condenser Water Supply Cooling Tower System - Units 1 & 2 Mechanical Cooling Towers & Liquid Waste Discharge Piping & Valves," (01/03/85), (TTB 353)
 - 45N700-1, R5 "Powerhouse Units 1 & 2 Key Diagram 120V AC & 125V DC Vital Plant Control Power System," (01/06/86), (TTB 353)
 - 45N703-1, R19 "Powerhouse Units 1 - 2 Wiring Diagrams 125V Vital Battery Board I Single Line - Sheet 1," (04/25/86), (TTB 353)
 - 45W724-1, R15 "Auxiliary Building Unit 1 Wiring Diagrams 6900V Shutdown Board 1A-A Single Line," (11/29/86), (TTB 353)
 - 45W727, R9 "Diesel Generator Building Units 1 & 2 Wiring Diagrams, 6900V Diesel Generators Single Line," (07/17/86), (TTB 353)

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- 47W435-1, R23 "Powerhouse Auxiliary Building Units 1 - 2 Mechanical Safety Injection System Piping," (04/21/86), (TTB 353)
- 47W435-5, R17 "Powerhouse Reactor Building Unit 1 Mechanical Safety Injection System Piping," (09/02/86), (TTB 353)
- 47W435-17, R24 "Powerhouse Reactor Bldg Unit 1 Mechanical SIS - Upper Head Injection System Piping (Inactive)," (08/25/86), (TTB 353)
- 47W610-3-3, R24 "Powerhouse Units 1 & 2 Electrical Control Diagram Auxiliary Feedwater System," (04/22/86), (TTB 353)
- 47W610-31-9, R7 "Auxiliary Building Units 1 & 2 Electrical Post Accident Sampling Control Diagram," (09/04/84), (TTB 353)
- 47W610-63-1, R20 "Powerhouse Units 1 & 2 Electrical Control Diagram Safety Injection System," (11/05/86), (TTB 353)
- 47W610-67-1, R7 "Powerhouse Units 1 & 2 Electrical Control Diagram ERCW System," (12/31/85), (TTB 353)
- 47W610-68-1, R12 "Powerhouse Units 1 & 2 Electrical Control Diagram Reactor Coolant System," (06/02/86), (TTB 353)
- 47W610-90-1, R9 "Powerhouse Units 1 & 2 Electrical Control Diagram Radiation Monitoring System," (12/31/85), (TTB 353)
- 47W611-31-1, R14 "Control Building Units 1 & 2 Electrical Logic Diagram Air Conditioning System," (08/18/86), (TTB 353)
- 47W611-31-9, R6 "Auxiliary Building Units 1 & 2 Electrical Post Accident Sampling System Logic Diagram," (12/31/85), (TTB 353)
- 47W611-88-1, R12 "Units 1 & 2 Electrical Logic Diagram Containment Isolation," (11/18/86), (TTB 353)
- 47W611-99-3, R7 "Powerhouse Units 1 & 2 Electrical Logic Diagram Reactor Protection System," (08/22/86), (TTB 353)
- 47W801-1, R23 "Powerhouse Units 1 & 2 Flow Diagram Main & Reheat Steam," (06/19/86), (TTB 353)

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- 47W803-1, R36 "Powerhouse Units 1 & 2 Flow Diagram Feedwater,"
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- 47W803-2, R29 "Powerhouse Units 1 & 2 Flow Diagram Auxiliary Feedwater,"
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- 47W804-1, R26 "Powerhouse Units 1 & 2 Flow Diagram Condensate,"
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- 47W805-1, R24 "Powerhouse Units 1 & 2 Flow Diagram High Pressure Heater
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- 47W809-1, R30 "Powerhouse Units 1 & 2 Flow Diagram Chemical & Volume
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- 47W810-1, R23 "Powerhouse Units 1 & 2 Flow Diagram Residual Heat Removal
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- 47W811-1, R31 "Powerhouse Units 1 & 2 Flow Diagram Safety Injection
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- 47W811-2, R22 "Powerhouse Units 1 & 2 Flow Diagram Mechanical SIS Upper
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- 47W813-1, R33 "Powerhouse Units 1 & 2 Flow Diagram Reactor Coolant
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- 47W830-1, R22 "Powerhouse Auxiliary Bldg & Reactor Bldg Unit 1 & 2
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- 47W831-1, R18 "General Units 1 & 2 Flow Diagram Condenser Circulating
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- 47W839-1, R15 "Units 1 & 2 Diesel Generator Building Flow Diagram Diesel
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- 47W843-2, R12 "Diesel General Building Flow Diagram CO2 Storage & Fire
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- 47W845-1, R28 "Units 1 & 2 Mechanical Flow Diagram - Essential Raw
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- 47W855-1, R18 "Powerhouse Aux & Reactor Building Units 1 & 2 Mechanical
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- 47W859-1, R30 "Powerhouse Auxiliary Building Units 1 & 2 Mechanical Flow Diagram Component Cooling System," (01/12/87), (TTB 353)
- 47W865-9, R24 "Powerhouse Auxiliary Building Flow Diagram General Ventilation Chilled Water," (07/16/86), (TTB 353)
- 47W866-1, R34 "Powerhouse Reactor Building Flow Diagram Heating and Ventilating Air Flow," (03/07/86), (TTB 353)
- 47W866-15, R5 "Powerhouse Post Accident Sampling System Flow Diagram Heating, Ventilating and Air Conditioning Air Flow," (11/27/85), (TTB 353)
- 47W915-6, R19 "Powerhouse Reactor Buildings Units 1 & 2 Mechanical Heating, Ventilating and Air Conditioning," (06/09/86), (TTB 353)
- 48N410, R14 "Reactor Building Units 1 & 2 Structural Steel Equipment Support Reactor Supports," (09/23/83), (TTB 353)

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- WBN-N3-228-4003, RO Auxiliary, Control, and Reactor Building Lighting System (08/14/84)
- WBN-N3-235-4003, RO 120 V AC Class 1E Vital Instrument Power Distribution System, (08/15/85)
- WBN-N3-236-4003, RO 125 V AC Class 1E Vital Power Distribution System, (08/15/85)
- WBN-N3-251-4003, RO Shutdown Control Center Communication System (Sound Powered)

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- 67M4-47W600-135, R25 "Mechanical Instruments and Controls," (01/23/73)
- 67M47W600-167, R5 "Mechanical Instruments and Controls," (09/16/75)

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- 67M47W1600-197, R3 "Mechanical Instruments and Controls," (06/12/81)
- 67M47W1600-198, R2 "Mechanical Instruments and Controls," (06/12/81)
- 67M47W600-314, R4 "Mechanical Instruments and Controls," (05/13/85)
- 67M4-47W251-9, R1 "Mechanical Emergency Equipment Cooling Water Floor Diagram," (06/05/67)
- 67M4-47W251-6, R1 "Flow Diagram Ventilation," (06/16/66)
- 67M47W216-51, R1 "Fire Protection - 10 CFR 50 Appendix R, Fire Area Compartmentation and Zone Drawings," (05/19/86)
- 67M47W610-23-1, R14 "Mechanical Control Diagram RHR Service Water System," (06/13/69)
- 67M47W610-3-1, R33 "Mechanical Control Diagram Reactor Feedwater System," (06/07/68)
- 67M4-47W610-85-1A, R2 "Mechanical Control Diagram Hydraulic System," (06/09/77)
- 67M4-47W600-1, R9 "Mechanical Instruments and Controls," (12/11/67)
- 67M4-47W600-21, R8 "Mechanical Instruments and Controls," (07/09/69)
- 67M4-47W600-117, R10 "Mechanical Instruments and Controls," (05/26/72)
- 67M4-47W200-3, R19 "Equipment Plans EL 621.25 and EL 617.1, (03/13/67)
- 67E15-N810-1, R33 "Conduit and Grounding Plan," (03/03/86)
- 67E15-W500-SD-1, R1 "Auxiliary Power System Key Diagram Cable Identification," (01/09/87)

67E15-W500-1, R9	"Key Diagram of Standby Aux. Power System," (03/31/81)
67E15-W500-2, R20	"Key Diagram of Normal Aux Power System," (06/26/84)
67E15-W500-3, R3	"Key Diagram of Normal and Standby Aux Power System," (06/26/84)
67C4-41N942, R1	"Concrete Beams - Elevation 664.0 Reinforcement - Sheet 1," (05/14/70)
67C4-41N929, R2	"Concrete Drywell and Pool Walls Above EL 636.0 Reinforcement - Sheet 1," (05/05/70)
184. TYA BLN Drawings:	
2GW0900-FF-1, R5	"Functional Control Logic Diagram Fuel Oil System," (09/18/85)
2GW0900-KE-1, R10	"Functional Control Logic Diagram Essential Raw Cooling Water System," (12/03/85)
2GW0900-RF-01, R9	"Functional Control Logic Diagram High Pressure Fire Protection System," (05/30/84)
2GW0900-VG-1, R7	"Functional Control Logic Diagram Diesel Generator Buildings Heat and Vent System," (04/02/86)
3ZW0625-VI-01, R0	"Hot Machine Shop Design Criteria Diagram Air Conditioning System," (02/19/85)
3YW0620-BD-01, R3	"Yard Design Criteria Diagram Yard Drainage," (01/29/84)
3BW0831-YR-31, R0	"Flow Diagram Chemical Cleaning Spent Fuel Cooling System," (03/24/78)
3BW0831-YR-02, R0	"Flow Diagram Chemical Cleaning Primary Power Conversion System," (05/22/79)
3BW0819-NV-03, R0	"Operating Diagram Makeup and Purification System," (12/27/82)
3AW0878-NB-04, R0	"Chemical Addition and Boron Recovery System Operating Diagram," (12/27/82)

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- 3BW0860-G8-01, R0 "Mechanical Flow Diagram Breathing Air System,"
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- 3GW0883-FF-01, R0 "Flow Diagram Fuel Oil System," (02/14/73)
- 5RW1925-NS-09, R1 "Instrument and Controls Local Panels 1IX-IL
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- 5RW2925-WL-52, R1 "Instrument and Controls Local Panels
2IX-ILPR-052 and 054 Installation El. 622'-0"
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- 5RW0911-IO-01, R4 "Instruments and Controls Plans El 700.0,"
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- 5RW0911-10-16, R3 "Instrument and Controls Mtg Det R Bldg Annulus
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- 3DW0234-00-1R3, R3 "Diesel Generator Building - Equipment Plans
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- 3BW0200-00-19, R1 "Hot Machine Shop & Decontamination Facility,"
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- 3BW0200-00-13, R6 "Equipment - Reactor Building El. 622.0,"
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- 3BW0200-00-9, R6 "Equipment Longitudinal Section A9-A9,"
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- 3BW0200-00-7, R7 "Equipment Plan El. 579.0 and El. 590.0,"
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- 3BW0200-00-4, R9 "Equipment Plan El. 649.0," (09/17/85)
- 3BW0200-00-1, R7 "Equipment Plans - Roof," (09/17/85)
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191. TVA Purchase Requisition No. 830267, Watts Bar Nuclear Plant Units 1 and 2 Cement Mortar Lining and Piping for Essential Raw Cooling Water (ERCW) System, (10/28/81)
192. TVA EN DES Calculations, "Black and Veatch Task Force Category 35, Safety Evaluation of Higher Instantaneous Current Circuit Breaker Settings," [NEB 840207 222], (02/07/84)
193. TVA EN DES Calculations, "Inst. Trip Settings for MOV CB," [BLP 841204 400], (12/04/84)
194. TVA Safety Evaluation Reports (SERs) reviewed for SQN are as follows:
 - B45 851104 224 "Determine proper solenoid engagement under specific accidents/data developed"
 - B45 851219 220 "Containment sump level instrument accuracy/accuracies and levels provided"
 - B45 860715 218 "Superheated steam in valve vaults - line break long term cooling can be provided"
 - NEB 800811 275 "Safety evaluation IE Bulletin 79-14 piping/safety impact - plant would not meet design basis"
 - NEB 810917 250 "Pressurizer pressure during RHR event/data provided"
 - NEB 820311 251 "Evaluate impact on plant safety due to boiler rupture - Aux. Bldg./evaluation prepared. - no safety impact on safe shutdown"
 - NEB 820326 319 "SG level reference error correctional system as designed is acceptable"

- NEB 820412 252 "List equipment powered by Emergency Generator to mitigate 2 inch diameter location/. tabulated date provided"
- NEB 820505 224 "Heat treat tracing safety related function/investigation performed and info tabulated"
- NEB 820804 226 "Provide equipment categorization - NUREG 0588 for IE components/info tabulated and provided"
195. Significant Condition Reports (SCRs) reviewed for SQN are as follows:
- SQNMEB8201 R7 "Motor Operators W/Class F Insulation - Should be Class B, Replace with qualified operators"
- SQNMEB8206 "Failure of valve actuator yokes & keys/install replacement yoke & key modification kits"
- SQNMEB8302 "Automatic closing valves/add closing valves and modify logic"
- SQNMEB8403 R1 "Screen wash system - Class C or G/corrective action to be handled by NUC PR"
- SQNMEB8410 "NAMCO Limit Switches not qualified/Replace w/qualified switches IOCFR50.49"
- SQNMEB8411 "Stress Corrosion of SS pipe w/foam insulation; OK as-is, not evaluated temp"
- SQNCEB8301 "Diesel Generating Building exhaust lines - Seismic adequacy/reanalyze for adequate support scheme"
- SQNCEB8303 R1 "Analysis of piping problems w/o correct technique/do it over but w/correct technique"
- SQNCEB8404 R1 "Base plate flexibility and expansion anchors/design is more than adequate based on study"
- SQNCEB8410 "Seismically Qualified Conduit Supports/TVA to search to determine if installed conduit is adequate"
196. Failure Evaluation/Engineering Reports reviewed for SQN are as follows:
- 825 850408 001 "Inadequate wire temperature rating/all wiring will perform design function"
- 845 850625 258 "Baseplate flexibility & construction tolerances not considered for Anchor bolt loads/sampling program no impact on safe operations"

- SQP 841004 001 "Valve operation slowed due to seal swelling/stroke valves 3-4 times/2 weeks until seals are replaced"
- SQP 841019 002 "Electrical Cable tray risers not supported as specified/ quality existing risers, fix others, add supports as necessary"
- SQP 850109 010 "Radiation monitors mislocated or ID tags interchanged/correct wiring and nameplates verified"
- S01 860211 970 "Main Steam Line Break temperature increase invalidate equipment qualification/changed valves flow solenoid - to control"
- S01 860218 815 "No Engineering Evaluation to justify seismic supported IL systems/no failure or safety impact"
- NEB 840515 253 "Spent Fuel Pool Cooling pump motors ≠ NUREG 0588/use as-is, plan to replace in 15 years"
- NEB 840622 262 "Personnel Qualification/Tng/ certification - no safety impact"
- NEB 840705 282 "No alarm for low temperature/no safety impact"
197. Unimplemented Design Item Evaluation Reports (UDIEs) reviewed for SQN are as follows:
- SWP 810401 090 "Tagging condensate demineralizer/not required"
- SWP 810406 052 "Repair solenoid Main Steam Header/repair before heatup following fuel load"
- SWP 810407 063 "Relocate connection - pipe/no safety impact," (ECN 2984)
- SWP 810601 035 "Added sewerage plant capacity/no safety impact"
- SWP 810514 051 "Heat exchanger vibration/operation restriction"
- SWP 810616 015 "Apply red marking - concrete/N.R. no safety impact"
- SWP 810618 009 "Correct vent valve installation/add support"
- SWP 810622 082 "Correct pipe gap clearance/no safety impact," (ECN 3030)

SWP 810622 089 "Evaluate pipe weight changes due to actual insulation addition (vs) piping analyses input/no safety impact," (ECN L5271R1)

SWP 840504 019 "Complete documentation/accomplish prior to heat up"

198. Unreviewed Safety Question Determination Reports (USQDs) reviewed for SQN are as follows:

SWP 810810 500 "Modification of ac IE ac power supply/detailed instruction provided"

SWP 820513 536 "Suggested changes to drawings/schematics to operate as designed"

SWP 830325 800 "Generator neutral transformer resister and bus/transfer unit from Unit 2 to Unit 1"

SWP 830408 818 "Logic change - to assure cooling water flow/added to logic of valves (xyz, etc.)"

PWP 830922 506 "Polar crane welded (vs) bolted keybar/better design authorized"

PWP 831004 506 "Modify concrete and steel near main steam check valves/not safety related - help maintenance effort"

PWP 831104 529 "Add watchtowers to complement power concept of security improvement/study and cost benefit analyses provided"

PWP 831209 503 "Radiation monitors and air flow switches remove and remount w/shock absorber mtl/listed - environmentally qualify sensing tubing"

PWP 840307 538 "Waste disposal system high alarm/add an alarm - not safety related"

825 860815 504 "Modify ERCW system/add valve locking devices"

199. Preoperational Test Deficiency Reports reviewed for SQN are as follows:

PT-221 "Pipe vibration - Support added," (ECN 3371)

PT-222 "Low level pump alarm - setpoint change," (ECN 2450)

PT-237 "High temperature of containment - lower compartment/rebalance lower compartment cooling system"

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- PT-253 "Air Conditioner Air Supply Flow Rate/Adjust damper"
- PT-297 "Downscale Trip Annunciators testing/not necessary"
- PT-606 "Pressure switches/setpoint changes"
- PT-623 "Lack of current flow temperatures control/check for continuity and proper insulation"
- 2PT-596 "Wiring to drawing but no power/revise drawing" (ECN 2483)
- 2PT-642 "Damper springs/replace damper assembly," (ECN 3006)
- 2PT-652 "Ice weight limits/increase per Westinghouse letter"
200. NRC Violation Reports reviewed for SQN are as follows:
- 50-327/86-27 NRC Violation Report - Sequoyah Unit 1
- 50-328/86-27 NRC Violation Report - Sequoyah Unit 2
201. 10 CFR 50.55(e) and 10 CFR Part 21 Reports reviewed for SQN are as follows:
- NEB 800124 254 "Diesel Generator Load Sequence Timer Error"
- NEB 800513 250 "Ruskin Fire Dampers"
- NEB 810416 288 "Environmental Qualification of 480V and Control Cables in EGTS Filter Rooms"
202. TVA Safety Evaluation Reports (SERs) reviewed as WBN are as follows:
- NEB 810903 256 (09/01/81) "Mitigate Loss of Coolant Accidents and High Energy Line Breaks Report per NUREG-0588" - added the auxiliary boiler system.
- NEB 811125 267 (11/05/81) "Maximum Containment Water Level Rise" - determined the conservative water level raise rate, surge rate levels . . . for post-LOCA maximum design base event.
- NEB 820120 259 (01/12/82) "IEB 79-27 Study: Effects on the Auxiliary Feedwater System of Loss of 120 V AC Vital Power Board" - stated that loss of power to one of AC boards would not prevent the AFWS from performing its design function.

- NEB 820401 251 (03/15/82) "Reduction of Vital Battery Loads for Loss of All AC Power" - provided for switching off of selected loads in the unlikely event of the loss of all AC power.
- NEB 820319 251 (03/05/82) "Single Failure Analysis for PAM variables" - a single failure cannot cause the operators to defeat or fail to perform a required safety function.
- 845 860326 221 (03/25/86) "Single Failure Analysis for RG 1.97 Category I PAM Variable" - analyzed that a single failure cannot cause the operators to defeat or fail to perform a required safety function.
- NEB 821119 218 (11/17/82) "RHR Sump Valve Room Safety Evaluation" - evaluated that the configuration of the valve room is acceptable and does not compromise nuclear safety.
- 845 850304 224 (03/05/85) "PAM Instrument Accuracy Acceptability" - evaluated instrument accuracies and made some exceptions.
- 845 860320 221 (03/19/86) "Category & Operating Times of Control Air Systems per NUREG-0588" - evaluated class 1E components for this system.
- 845 860320 219 (03/20/86) "Reactor Coolant Pump Trip Setpoint" - established - new trip setpoint to prevent excessive depletion of RCS water inventory.

203. Significant Condition Reports (SCRs) reviewed for WBN are as follows:

- SCR WBNNEB 8523 "Reevaluation of Flow Switch for New Environment Condition" - replaced with qualified switch per ECN 5862 [B43 850716 948], (07/09/85)
- SCR WBNCEB 8516 "Inadequate Attachment of Pipe Support to Containment Vessel" - pipe supports will be reanalyzed [B41 850717 006], (07/12/85)
- SCR WBNCEB 8531 "Pipe Support Design Calculation Issuance" - review files and complete missing calculations by the first refueling outage [B41 851106 012], (10/28/85)
- SCR WBNNEB 8513 "Containment Negative Pressure Requirement During DBE/Annulus Flooding" - installed loop seal in the annulus sump drain and filed SCR completion verification sheet [B45 850722 851], (07/17/85)

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- SCR 6719-S, RO "Deficiencies in Sampling and Controlling
SCR 6720-S, RO Concrete" [B26 860403 126], (04/01/86) and
SCR 6721-S, RO [B26 860611 002], (06/06/86)
- SCR WBNMEB 8663 "Pressure Switch Setpoints for Screen Wash Pumps" -
revised setpoint [B44 860529 004], (05/28/86)
- SCR WBNMEB 8663 "Pressure Switch Setpoints for Screen Wash Pumps" -
required no change in the switch setpoint [B44 860929
014], (09/29/86)
- SCR WBNECB 8604 "Verification and Documentation of Cable Routing and
Design Output" - established design verification process
NCR WBNECB 8501 and SCR WBNEQP 8625 [B42 860707 018],
(06/27/86)
- SCR WBNECB 8669 "Deficient Concrete Pullout Capacity for Embedded
Plates" - prepared additional guidelines [B41 860709
014], (06/26/86)
- SCR WBNMEB 8692 "Flow Diagrams & Piping Dwgs Do Not Show Clearly &
Distinctly the Piping Class Breaks" [B44 860911 011],
(09/16/86)
- SCR WBNECB 8687 "Computer Program Design Guide for BASEPLATE II" [B26
861020 006], (10/20/86)
204. Engineering Reports (ERs) reviewed for WBN are as follows:
- SCR WBNEEB 8523 "Re-evaluation of Flow Switch for New Environment
Condition" - replaced with qualified switch per ECN 5862
[B45 850805 264], (08/05/85)
- SCR WBNECB 8531 "Pipe Support Design Calculation Issuance" - review
files and complete missing calculations by the first
refueling outage [B45 851121 269], (11/21/85)
- SCR WBNEEB 8607 "80 Ampere Fuse Added in Series with 15 Ampere Fuse" -
reviewed #14 and #16 AWG wiring [B45 860205 270],
(02/04/86)
- SCR WBNMEB 8663 "Pressure Switch Setpoints for Screen Wash Pumps" -
revised setpoint [B45 860612 260], (06/12/86)
- SCR WBNMEB 8663 "Pressure Switch Setpoint for Screen Wash Pumps" -
required no change in the switch setpoint [B26 861010
028], (10/8/86)

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- SCR WBNECB 8604 "Verification & Documentation of Cable Routing & Design Output" - established design verification process [B26 360723 002], (07/22/86)
- SCR WBNNEB 8637 "Train System Evaluation Personnel" - prevented
SCR WBNNEB 8638 human errors and generic review of calculations [B26 860811 006] (08/08/86)
- SCR WBNCB 8669 "Deficient Concrete Pullout Capacity for Embedded Plates" - prepared additional guidelines [B26 860915 008] (09/05/86)
- SCR WBNMEM 8693 "Piping Class Breaks on Flow Diagrams" - physical piping drawings would not be affected - not reportable [B26 861028 024] (10/24/86)
- SCR WBNCB 8687 "Computer Program Design Guide for BASEPLATE II" - formulated design criteria, instructed designers, and reviewed some BASEPLATE II as required [B26 861029 028] (10/29/86)

205. Unimplemented Design Item Evaluation Reports (UDIEs) reviewed for WBN are as follows:

- 826 850416 097 "Repull cable to meet App. R Separation
(04/12/85) Requirements" - scheduled to perform prior to initial criticality (FCR A1163), commitment to NRC
- 826 850403 003 "Main Turbine Wiring Changes" - scheduled to
(04/02/85) complete prior to Mode 3, not safety related
- 826 850410 014 "Replacement of Inoperable Transmitter" - scheduled
(04/09/85) to complete prior to closure of capital account
- 826 850426 031 "Changes to Resolve 10 CFR 50 App. R Interactions
(04/26/85) in CVCS, CCS & ERCS Systems" - scheduled to complete prior to Unit 1 fuel loading for inside of containment; initial critical for outside of containment building (ECN 5318), commitment to NRC
- 826 850424 016 "Temporary Covers for Floor Drains" - remove
(04/23/85) temporary covers prior to Mode 4
- 826 850425 007 "Removal of Mirror Insulation from Feedwater
(04/25/85) Piping" - scheduled to complete prior to Mode 3, commitment to NRC

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- 826 850507 087 "Fire Barrier Materials & Conduit Without Seismic
(05/07/85) 1L Test Report" - use as is, no safety impact (NCR 5948)
- 826 850703 009 "Corrective Action for Potentially Unacceptable
(07/01/85) Terminal Lugs" - no action is required (NCR 6076)
- 826 850712 134 "Add Load Shedding to 6.9 kV" - scheduled to
(07/11/85) complete prior to Unit 2 fuel loading, not required for
safe shutdown of the plant (ECNs 4836 and 4837)
- 826 850827 006 "Replace Missing Instrument Fuse Caps" - scheduled
(08/27/85) to complete prior to closure of capital accounts, not
safety related
- 826 851025 206 "Reroute 4 inch Condensate Line on Aux. Boiler" -
(08/13/85) not safety related (FCR NP917)
206. Unreviewed Safety Question Determination (USQDs) Reports reviewed for WBN
are as follows:
- 826 850403 033 "Assumed Thrust Forces at Relief Valves" -
(03/30/85) reanalyzed analysis problems and redesign all affected
supports to qualify loading conditions (ECN 5246)
- 826 850403 042 "Installation of Block Valves to Facilitate Testing
(03/27/85) of Primary Containment Isolation Valves" - stated that
the block valves will be installed immediately (ECN 3036)
- 826 850403 079 "Revision of Various Lifting Devices per
(03/27/85) Requirements of NUREG 0612" - analysis showed the margin
of safety is not reduced (ECN 4411)
- 826 850403 083 "Addition of Emergency Battery Pack Lighting" - met
(03/27/85) the requirements of App. R, 10 CFR 50 (ECN 5384)
- 826 850406 006 "Changes of Existing Cable on Solenoid Valve
(04/06/85) Housings with Higher Temperature Rating" - changed for
the control air system per FSAR (ECN 5413)
- 826 850415 066 "Removal of Mirror Insulation from Feedwater
(04/15/85) Piping" - remove prior to Mode 3 (ECN 3895)
- 826 850416 087 "Corrective Action for the Unacceptable Cable
(04/11/85) Interactions" - install a Fire barrier and perform
additional Appendix R review and analysis (NCR 5761, ECN
5046)

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- 826 850416 105 "Installation of Pump Timers on Nuclear Power
(04/16/85) Sewage Ejector Pumps" - has no affect on nuclear safety
(TACF 0-85-20-40)
- 826 850426 035 "Modification of the Former Power Stores" -
(04/25/85) modified floor and wall penetrations to suit store hot
equipment and tools (ECN 2978)
- 826 850529 001 "Addition of Bypass for ERCW Discharge Valve" -
(05/23/85) added bypass and completed all mechanical and electrical
work (ECN 5198)

207. Preoperational Test Deficiency Reports (PTs) reviewed by WBN are as follows:

- PT-21 "Leakage CO₂ Around Door," TVA-35B, (06/25/79)
- PT-080 "Repair/Replacement of Defective Primary Makeup Pump
1B," TVA-46, (11/03/81)
- PT-268 "Repair/Fix Containment Isolation Valves," TVA-2,
(12/15/83)
- PT-412 "Replace Equipment of Radwaste Filter Elements," TVA-53,
(04/19/84)
- PT-385 "Logic & Wiring changes for Nitrogen Supply System,"
TVA-34, (04/27/84)
- PT-246 "Pipe Spool Interfering with Cable Tray Support Steel,"
TVA-51, (11/02/83)
- PT-443 "8-inch Extension of Monorail for Hatch Plate," TVA-53,
(05/01/84)
- PT-547 "Modification of Motor Control & Alarm System of Post
Accident Sampling System," TVA-68, (06/18/84)
- PT-267 "Proper Operation of Sump Pump Control," TVA-44A,
(01/18/84)
- PT-490 "Provide a Centrifugal Pump for Emptying the Waste
Collector Tank," TVA-65, (09/26/84)
- PT-124 "Installation of a Needle Valve in the Main Feedwater
System," TVA-38, (09/15/83)

208. NRC Notice of Deviation/Violation Report and TVA Response reviewed for WBN are as follows:

Letters from L. M. Mills, TVA, to James P. O'Reilly, NRC

"NRC Inspection Report RII" - revised responses, [A27 801124 019], (11/24/80)

"NRC Letter RII" - additional information, [A27 810108 002], (01/08/81)

"NRC Inspection Report RII" - additional/revised responses, [A27 810219 032], (02/19/81)

"NRC Letter RII" - additional information, [A27 810407 040], (04/07/81)

Letter from R. C. Lewis, NRC, to H. G. Parris, TVA, "Report Nos. 50-390/80-21 and 50-391/80-15," [NEB 810327 528], (03/19/81) and [A02 810518 012], (05/14/81)

Letter from R. C. Lewis, NRC, to H. G. Parris, TVA, "NRC Violation Report Nos. 50-390/84-25 and 50-391/84-20," [A02 840430 008], (04/24/84)

Letter from L. M. Mills, TVA, to James P. O'Reilly, NRC, "NRC-OIE Region II Inspection Report 50-390/84-25, 50-391/84-20 - Response to Violation," [A27 840524 011], (05/24/84)

Letter from R. D. Walker, NRC, to H. G. Parris, TVA, "NRC Violation Report Nos. 50-390/85-44 and 50-391/85-35," [A02 850710 001], (07/05/85)

Letter from J. A. Domer, TVA, to Dr. J. Nelson Grace, NRC, "Response to Violation 50-390/85-44-01, 50-391/85-35-01 - Failure to Audit All Applicable Construction Elements," [L44 850731 800], (07/31/85),

209. Determination of Reportability, 10 CFR 50.55(e) and 10 CFR 21 Reports reviewed for WBN are as follows:

NEB 811209 266 "Changed Rubber Seals to Metal Seals" - reportable,
(12/9/81) (NCR 3080R)

845 851126 829 "Pipe Support Design Calculation Issuance" -
(11/26/85) partially reportable, (SCR WBNCEB 8531)

845 860218 827 "80 Ampere Fuse Added in Series with 15 Ampere
(02/18/86) fuse" - not reportable, (SCR WBNEEB 8607)

845 860403 828
(04/03/86)

- B45 860618 826 "Pressure Switch Setpoint for Screen Wash Pumps" -
(06/17/86) reportable, (SCR WBNMEB 8663)
- B44 860919 004 "Pressure Switch Setpoint for Screen Wash Pumps" -
(09/23/86) no change setpoints, (SCR WBNMEB 8663 Revised Final)
- B45 860820 828 "Train System Evaluation Personnel" - not
(08/20/86) reportable, (SCR WBNNEB 8637)
- B26 861106 009 "Computer Program Design Guide for BASEPLATE II" -
(11/06/86) not reportable, (SCR WBNCEB 8687)

210. Nonconformance Reports (NCRs) reviewed for WBN are as follows:

- WBNEEB 8522 "Stainless Steel Flexible Conduit" - replace with
qualified flexible conduit [B43 850624 901], (06/18/85)
- WBNCEB 8515 "Uncontrolled Revisions of Fabrication Drawings" -
revise and perform evaluation of added welds [B41 850620
002], (06/14/85)
- 6719, RO "Deficiencies in Sampling and Controlling
6720, RO Concrete," [B26 860314 018
6721, RO 326 860314 031, and B26 860314 019],
(all dated 03/13/86)
- WBNEEB 8202, R1 "NAMCO Limit Switch with Faulty Top Cover Gasket
Reference IE Bulletin 79-28" - manufacturer has
controlled the problem and removed faulty gasket [EEB
820617 917], (06/17/82)
- WBNEEB 8102 "Blown Fuse Alarms for Control Panels" - changed ground
connection, completion verification sheet [EEB 821227
918], (12/20/82)

211. Problem Identification Reports (PIRs) reviewed for WBN are as follows:

- PIR WBNEEB 8650 "Investigation of Capillary Fill Fluids" - problem does
not exist at Watts Bar plant [B43 860620 913], (06/04/86)
- PIR WBNEEB 8651 "Fire Alarm System in the Battery Room V" - changed to
automatic fire suppression system [B43 860722 905],
(07/08/86)
- PIR WBNCEB 8667 "Erroneous Locations of Seismic Supports," [B41 860624
007], (06/04/86)

PIR WBNMEB 8618 "Improperly Installed Fire Barrier Materials Identified by Employee Concern IN-85-008-002" - use "as-installed" per test report 86-66 (06/20/86) by 3M Company [B44 860226 006], (02/21/86)

212. Field Change Requests (FCRs)

FCR I-2161, [C24 850404 317], (04/01/85)
FCR I-2222, [C24 850502 306], (04/30/85)
FCR A-10528, (TTB-244-9), (07/03/85)

213. BFN Safety Evaluation Reports (SERs) reviewed are as follows:

822 860115 005 "Fuel Pool Gate Removal with Lead Shielding on Reactor Attached Piping" - analyzes removing the spent fuel pool gate.

822 850413 001 "Use of Miscellaneous Cables for Safety Related Circuits (Fire Recovery Plan Deviation) for the Standby Gas Treatment System (SGTS)" - evaluates impact of safety related circuits utilizing cable not intended for safety related use.

845 850401 219 "Reactor Vessel Head Spray Nozzle Blind Flange Overtorquing" - evaluates excessive torque applied to the reactor vessel head spray nozzle blind flange.

NEB 840413 222 "An Evaluation of the Ability of the Emergency Equipment Cooling Water (EECW) and Residual Heat Removal Service Water (RHRSW) Systems to Meet Their Design Bases" - evaluates a sample of components taken from each of the two systems to confirm design bases.

NEB 841008 218 "Support of Instrument Lines at Primary Containment Penetrations" - addresses inadequate support of instrument lines in penetrations.

NEB 840830 218 "Corrective Action Report (CAR: NCO-83-001-8F) Discrepancies Between G-28 and N-OQAM" - evaluates conflicting documents as to quality assurance requirements for individual components.

3FP 850112 001 "Pressure Instrumentation Installed on CRD Pump Suction Filters" - evaluates discrepancy between as-constructed configuration and plant drawings.

- BFP 850116 012 "Reverse Installation of Globe Valves 63-528 and 63-529" - evaluates impact of valves installed in the reverse direction.
- 822 850405 017 "Installation of Valves HCV-71-32 and HCV 73-24 Without Internal Springs" - addresses the impact of missing spring contrary to vendor's valve drawing.
- 822 850424 010 "Failure of Resistors in TSN's Associated with HPCI Valves 1-FSV-73-6A & B and PCV-73-18B" - evaluate the impact of failed resistors in the transient suppression networks (TSN).

214. BFN Significant Condition Reports (SCRs) reviewed are as follows:

- SCR BFNEEB 8530 No environmental qualification documentation for flexible conduit.
- SCR BFNEEB 8601 RO Cable lengths inadequate for OE calculations.
- SCR BFNECB 8601 RO Overfilled cable trays.
- SCR BFNECB 8602 RO No project specific engineering procedure for cable schedule development exists.
- SCR BFNECB 8603 RO No project specific engineering procedure for conduit schedule development exists.
- SCR BFNECB 8604 RO Data files have no protection from deliberate/inadvertent deletion.
- SCR BFNEEB 8510 Wrong size flow orifice in containment atmosphere dilution system.
- SCR BFNEEB 8522 R2 Circuit breaker is improperly coordinated with fuses and feeder cable.
- SCR BFNEEB 8529 R1 Failure to identify minimum set of design calculations required to document power system design basis.
- SCR BFNECB 8626 RO Drawings were issued without depicting a "Q" or "N" as required by procedure OEP-8, Attachment 1.

215. BFN Engineering Reports (ERs) reviewed are as follows:

- SCR BFNEEB 8522 RO Fuses are changed out without properly evaluating the consequences on the breaker and cable.

- SCR 8FNECB 8601 R1 Cable tray overflow.
- SCR 8FNEEB 8601 R1 Scaled and computer routed cable lengths are inadequate for OE calculation required to support "as-built" electrical design.
- SCR 8FNCEB 8637 RO Eliminate gap between the SRV lines and the drywell jet deflection sleeve.
- SCR 8FNECB 8604 RO Computer data files and source program needs protection.
- SCR 8FNCEB 8520 RO Qualification of baseplates and concrete anchors in the typical support detail (BFN-50-712) cannot be verified and no weld details are specified.
- SCR 8FNEEB 8530 R1 No documentation for qualification of flexible conduit used in drywell.
- SCR 8FNNEB 8701 RO Determine if reactor building floor drain sump pumps A and B are required to be seismic class I.
- SCR 8FNNEB 8702 RO Check valve requirement at interface of raw cooling water and emergency essential cooling water.
- SCR 8FNCEB 8640 RO Drywell platform not installed in accordance with the applicable design drawings.
216. 8FN Unreviewed Safety Question Determination (USQDs) reviewed are as follows:
- 822 851101 009 "Add Bypass Contacts to MOV Control Circuits to Bypass Thermal Overloads on Critical Valves in the Event of an Accident." - adds a bypass electrical circuit around the thermal overload relay contacts to mitigate an accident (ECN L-2071).
- L36 810504 831 "Postaccident Sampling Facility" - provide improved postaccident sampling facilities for reactor liquids and containment atmosphere (ECN P-0314).
- TDP 811009 500 "CRD Hydraulic System" - modifies the control rod drive hydraulic system and to the clean radioactive waste drain system (ECN P-0392).
- 822 860625 500 "Control Rod Drive" - modifies the CRD insert and withdrawal pipe supports to meet seismic requirements for the system (ECN P-0859).

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- DCR P1853 07/31/79 "Feedwater Piping to the Reactor Vessel" - addresses major considerations as a result of NRC Bulletins 79-02 and 79-14 (ECN 2096).
- DCR 1720 01/25/79 "Relocate Flow Transmitters" - discusses the potential relocation of flow transmitters because of water (ECN P0250).
- DCR 1777 05/01/79 "Main Steam Isolation Valves" - discusses removal of packing bleed-off valves (ECN P-0242).
- DCR 1700 05/15/81 "Add RHR Service Recorder" - discusses adding the recorder to log flow rate (ECN P0248).
- DCR 2575 06/30/81 "Reactor Water Cleanup System Valve Replacement" - discusses replacement of stainless steel gate valve (ECN P0492).
- DCR 2033 05/29/81 "Main Steam Isolation Valve Repair" - discusses refacing valve seat (ECN P0481).
217. BFN Preoperational Test Deficiency Reports (PTs) reviewed are as follows:
- 06/20/73 Memo from R. H. Dunham to R. T. Hathcote, "BFN Unit 1 - Final Review and Approval of Preoperational Test Supplementary Disposition of Exceptions No. 1. GE-31-2A, -2B, -2C, -2D, Standby Diesel Generators A, B, C, D"
- 08/20/73 "Results of Preoperational Test No. GE-5, RHR System" BFN unit 1
- 12/04/73 Memo from H. C. Russell to R. T. Hathcote, "Final Review and Approval of Preoperational Test Results - GE-32, DC Power System, Supplemental Disposition of Exceptions No. 3 - Unit 2 and Change Sheet No. 7, units 1, 2, and 3."
- 07/02/75 Memo from H. C. Russell to R. T. Hathcote, "BFN Unit 3 - Final Review and Approval of Preoperational Test Results - GE-32-2, 125-Volt D.C. Power System"
- 05/24/76 "Results of Preoperational Retest No. RG-32-1, 250-V DC Power System," BFN units 1 and 2
- 06/29/76 "Results of Preoperational Retest No. RG-31-3, AC Emergency Power System Operation, ECCS Testing on Normal Auxiliary Power and Diesel Generator Power," BFN unit 1

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- 01/14/76 Memo from R. C. Russell to R. T. Hathcote, "BFN Unit 3 - Final Review and Approval of Preoperational Test Results - GE-1, Feedwater Control System"
- 06/10/76 Memo from B. S. Montgomery to M. M. Price, "BFN Unit 3 - Final Review and Approval of Preoperational Test Results - GE-2, Reactor Water Cleanup System - BFN-63"
- 09/03/76 Memo from B. S. Montgomery to M. M. Price, "BFN Unit 3 - Final Review and Approval of Preoperational Test Results - TVA-4 Emergency Equipment Cooling Water System - Supplemental Disposition of Exception No. 4-BFN-63"
- 03/18/76 Memo from B. S. Montgomery to M. M. Price, "BFN Unit 3 - Final Review and Approval of Preoperational Test Results - TVA-16 Evacuation Alarm System; Disposition of Exceptions - BFN-63"
218. NRC Notice of Violation Report and TVA Response reviewed for BFN are as follows:
- Inspection Report from N. C. Moseley, AEC, to J. E. Watson, TVA, "Inspection Conducted on September 11-14, 1973," (10/05/73)
- Letter from J. E. Gilleland, TVA, to N. C. Moseley, AEC, "Response to N. C. Moseley October 5, 1973 Letter," (10/29/73)
- Inspection Report from N. C. Moseley, AEC, to J. E. Watson, TVA, "Inspection Conducted on March 26-29, 1974," (04/12/74)
- Letter from J. E. Gilleland, TVA, to N. C. Moseley, AEC, "Response to N. C. Moseley April 12, 1974 Letter," (05/14/74)
- Inspection Report from N. C. Moseley, NRC, to J. E. Watson, TVA, "Inspection Conducted on October 1-3 and 15-17, 1975," (11/11/75)
- Letter from J. E. Gilleland, TVA, to N. C. Moseley, NRC, "Response to N. C. Moseley November 11, 1975 Letter," (12/03/75)
- Inspection Report from F. J. Long, NRC, to G. Williams, Jr., TVA, "Inspection Conducted on March 2-5 and 8, 1976," (03/31/76)
- Letter from J. E. Gilleland, TVA, to N. C. Moseley, NRC, "Response to F. J. Long March 31, 1976 Letter," (04/21/76)
- Inspection Report from R. C. Lewis, NRC, to H. G. Parris, TVA, "Inspection Conducted on September 4-7, 1979," [A27 791016 015], (09/25/79)

Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to R. C. Lewis' September 25, 1979 letter," [DES 791019 034], (10/16/79)

Inspection Report from R. C. Lewis, NRC, to H. G. Parris, TVA, "Inspection Conducted on August 6 through September 14, 1979," [A27 791205 004], (11/08/79)

Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to R. C. Lewis' November 8, 1979 letter," [NEB 791207 566], (12/05/79)

Inspection Report from R. C. Lewis, NRC, to H. G. Parris, TVA, "Inspection Conducted on October 22-26, 1979," [NEB 791211 268], (12/04/79)

Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to R. C. Lewis' December 4, 1979 letter," [A27 791221 020], (12/21/79)

Letter from V. Stello, Jr., NRC, to H. G. Parris, TVA, "Notice of Violation, Notice of Proposed Imposition of Civil Penalties," (01/04/80)

Letter from H. G. Parris, TVA, to V. Stello, Jr., NRC, "Response to V. Stello, Jr., January 4, 1980 letter," [GNS 800909 101] (01/20/80)

Inspection Report from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Inspection Conducted on October 26 - November 25, 1983," (12/08/83)

Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to D. M. Verrelli December 8, 1983 Letter," (01/09/84)

Inspection Report from R. D. Walker, NRC, to H. G. Parris, TVA, "Inspection Conducted on June 21 - July 26, 1985," (08/07/85)

Letter from R. H. Shell, TVA, to J. H. Grace, NRC, "Response to R. D. Walker August 7, 1985 Letter," (09/27/85)

219. Determination of Reportability, 10 CFR 50.55(e) and 10 CFR 21 Reports reviewed for BFN

Letter from J. E. Gilleland, TVA, to D. F. Knuth, NRC, "Reportable Deficiency - Use of Improper Schedule Pipe In Standby Liquid Control System," (02/11/76)

Letter from J. E. Gilleland, TVA, to D. F. Knuth, NRC, "Reportable Deficiency - Potential for RHR Pump Operation Beyond Runout Condition," (03/04/76)

Letter from H. S. Fox, TVA, to J. P. O'Reilly, NRC, "Reportable Occurrence Report BFRO-50-260/7712," [QAS 770922 003], (09/20/77)

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Letter from J. E. Gilleland, TVA, to N. C. Moseley, NRC, "Reportable Deficiency - Clogged Cooling Water Lines to RHR and Core Spray Motor Bearing Coolers - IE Control No. HO 1309F2," [QAS 770706 004], (07/01/77)

Letter from J. S. Fox, TVA, to J. P. O'Reilly, NRC, "Reportable Occurrence Report BFRO-50-260/7822," [DES 790102 033], (12/29/78)

Letter from H. S. Fox, TVA, to J. P. O'Reilly, NRC, "Reportable Occurrence Report BFRO-50-259/797," [DES 790503 035], (05/02/79)

Letter from J. R. Calhoun, TVA, to J. P. O'Reilly, NRC, "Reportable Occurrence Report BFRO-50-259/8001," [DES 800422 030] (04/18/80)

Letter from J. R. Calhoun, TVA, to J. P. O'Reilly, NRC, "Reportable Occurrence Report BFRO-50-259/8048," [DES 800707 017], (07/01/80)

Letter from H. J. Green, TVA, to J. P. O'Reilly, NRC, "Reportable Occurrence Report BFRO-50-259/8105," [NEB 810218 559], (02/09/81)

Letter from G. T. Jones, TVA, to NRC, "Reportable Occurrence Report BFRO-50-296/83006 R4," [NEB 841120 600], (11/16/84)

220. BFN Nonconformance Reports (NCRs) reviewed are as follows:

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|-------------|---|
| BFNBWP 8304 | "Nondivisional Conduit M80" - M80 will be reissued as a 3ES divisional II conduit [BWP 830307 002] |
| BFNEEB 8409 | "Division I and Division II Cable Connections" - to be handled by NUC PR per procedure manual N80A25 [EEB 840725 953] |
| BFNCEB 8103 | "Piping Analysis Does Not Agree With As-Built" - correct per NRC OIE Bulletin 79-14 and 79-02 [CEB 830609 015] |
| BFNCEB 8303 | "Pressure Suppression Chamber Ring Header Analyzed with an Incorrect Response Spectra" - reanalyze the affected piping using compatible response spectra [CEB 830518 002] |
| BFNMEB 8405 | "Drawing was Issued with Incorrect Part Numbers" - revise drawing to correct parts list [MEB 841018 006] |
| BFNECB 8501 | "Cable Routing Computer Programs Do Not Have Documentation" - verify and document codes [B42 850415 001] |

221. BFN Problem Identification Reports (PIRs) reviewed are as follows:

BFNECB 8605	"Incorrect Control Diagram" - correct control diagram [B42 860923 003]
GENNEB 8601	"MITAS II Computer Code Not Documented" - document computer code MITAS II per ECS-EP 2801 [B45 860310 852]
BFNCEB 8626	"Drawings Not Signed Off as Required", - correct drawings [B41 860818 012]
BFNEEB 8641	"Excessive Voltage Drop Between the Source and the Load" - is being analyzed under the minimum set of calculations program [B22 870331 014]
BFNNEB 8710	"Weldolets Installed Without PT or MT Requirements" - determine consequences and upgrade to a SCR if found to be adverse to safety [B22 870226 020]
BFNNEB 8714	"Appropriate Scope for Issuing Revision of Level Switch Tabulation" - NEB performed Phase II USQDs with no problems encountered [B22 870306 026]

222. BLN Safety Evaluation Reports (SERs) reviewed are as follows:

821 860718 200	"Qualification of Insect Screens"
821 870417 200	"Requirements on RBES Level Sensors"
NEB 831205 218	"Plant Dynamic Response Analysis Strip Charts"
NEB 831107 218	"Removable Masonry Wall Missile Evaluation"
845 850823 218	"Active Components List - Mechanical Equipment Qualification Program"
NEB 840813 222	"Single Failure Analysis for Bellefonte PAM Variables"
NEB 841115 221	"Safety Parameter Display System Critical Safety Function Alarms"
NEB 841210 200	"Steam Line Break in the Valve Vaults at Bellefonte"
NEB 841224 218	"Safety Evaluations of High Instantaneous Current Circuit Breaker Settings"

- NEB 831005 219 "Reactor Building Emergency Sump pH Control Post LOCA"
223. BLN NCRs, SCR, CAQRs reviewed are as follows:
- U13 870413 003 CAQR No. BLP 870020, Main Control Room Air Conditioning Chiller Control Valve Failure
- 842 860707 002 SCR No. BLN ECB 8602, Data Files for Cable Routing System have no Protection from Deletion
- 843 851212 903 SCR No. BLN EEB 8543, No. Published Document for Implementation of the 10 CFR 50.49 Environmental Qualification Program
- 843 850802 906 SCR No. BLN EEB 8511, Separation of Non Class 1E Equipment from Class 1E Power Sources
- 844 851031 016 SCR No. BLN MEB 8509, Physical Separation and Seismic Qualification of Category I (L)B Piping
- CEB 840427 006 NCR No. BLN BLP 8404, Failure to Include Thermal Expansion Gaps in Pipe Support Design
- BLN 840103 112 NCR No. 2668, Failure to Test Portions of the High Pressure Fire Protection System
- NEB 840514 268 NCR No. 2517, Deficient Square Root Extractor Module for the Reactor Protection System
- NEB 831125 274 NCR No. 2515, Carbon Steel Dowel Pin Found in Makeup/High Pressure Injection Pump Casing
- EEB 830329 920 NCR No. 2277, Cable Trays Filled Above Side Rails at Certain Node Points
224. BLN Engineering Reports (ERs) reviewed are as follows:
- 821 870113 011 ER for SCR GEN EEB 8606, Use of Unverified Personal Computer Software
- 845 860128 256 ER for SCR BLN EEB 8543, No Methodology Document Exists for Environmental Qualification of Electrical Equipment
- 821 860821 004 ER for SCR BLN CEB 8518, No Control of Spacing of Attachments to Embedded Anchorage Plts

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| 821 860724 005 | ER for SCR BLN ECB 8603, Conduit Schedule Input Sheets Not Verified Against Conduit Drawings |
| 821 860717 005 | ER for SCR BLN ECB 8602, Cable Routing Computer Data Files Not Protected |
| 845 860108 262 | ER for SCR BLN EEB 8548, Cable Lengths Determined from Computer Routing Programs are not Adequate for Calculations |
| 845 851115 263 | ER for SCR BLN MEB 8509, Routing of Seismic Category I (L) B Piping In Vicinity of Safety-Related Electrical Equipment |
| 845 851114 261 | ER for SCR BLN MEB 8508, ERCW Pump Discharge Air Release Valves Undersized |
225. BLN Preoperational Test Deficiency Reports (PTs) reviewed are as follows:
- 06/17/85 Nuclear Plant Test Deficiency Report No. PT-65, Rev 2
 - 11/21/84 Nuclear Plant Test Deficiency Report No. PT-57, Rev S1
 - 07/24/85 Nuclear Plant Test Deficiency Report No. PT-82, Rev S1
 - 05/22/85 Nuclear Plant Test Deficiency Report No. PT-83, Rev 0
 - 07/16/82 Nuclear Plant Test Deficiency Report No. PT-13, Rev 0
 - 12/08/82 Nuclear Plant Test Deficiency Report No. PT-16, Rev 0
 - 11/23/82 Nuclear Plant Test Deficiency Report No. PT-22, Rev 0
 - 06/13/82 Nuclear Plant Test Deficiency Report No. PT-27, Rev 0
 - 11/14/83 Nuclear Plant Test Deficiency Report No. PT-32, Rev 1
 - 10/30/84 Nuclear Plant Test Deficiency Report No. PT-45, Rev 1
226. NRC Notice of Violation Reports and TVA Response reviewed for BLN are as follows:
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|-----------------|--|
| 50-438/83-02-4, | Inadequate Construction Operating Instructions |
| 50-438/81-26-1, | Employee Terminated for Reporting to NRC |
| 50-439/81-26-1 | |

50-438/81-33-08, 50-439/81-33-08	Cold Sprung Pipe
50-438/82-28-08, 50-438/82-28-01, 509-439/82-28-01	Improperly Prepared Tubing Section and Isolator Cabinet Spacing Violation
50-438/83-15, 50-439/83-15	Switchgear Frame Welded Assembly
50-438/83-28, 50-439/83-28	Failure to Maintain Heat to ERCW Pump Motors
50-438/84-04, 50-439/84-04	Failure to Document a Condition Adverse to Quality Within the Procedurally Required Time Frame
50-438/84-26, 50-439/84-26	Instrument Craft Foreman Not Appropriately Trained for Assignment
50-438/86-04-01, 50-439/86-04	No Separation Criteria for Instrument Lines
50-438/84-15,	Failure to Follow Procedure for Inspection of Floor Penetrations

227. Determination of Reportability, 10 CFR 50.55(e) and 10 CFR 21 Reports reviewed for BLN are as follows:

321 870121 002 Determination of Reportability for SCR GEN EEB 8606
844 851031 014 Determination of Reportability for SCR BLN MEB 8508
NEB 831110 219 NRC-OIE Reportability Information for NRC 2515
NEB 821220 220 NRC-OIE Reportability Information for NCR 2094
NEB 830616 270 10 CFR 50.55(e) Report 2 for NCR 2089
FOI 851122 702 NRC-OIE Reportability Information for SCR BLN MEB 8509
U10 860116 802 NRC-OIE Reportability Information for SCR BLN EEB 8548
NEB 831222 220 NRC-OIE Reportability Information for NCR 2661
B21 860728 004 NRC-OIE Reportability Information for SCR BLN ECB 8602

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228. Letter from B. J. Youngblood, NRC, to S. A. White, TVA with the attached transcript of the investigative interview conducted by the NRC on 02/21/86 at the First Tennessee Bank Building in Knoxville, TN, [845 860714 832], (06/25/86)
229. Letter from B. J. Youngblood, NRC, to S. A. White, TVA, "Concerns Regarding TVA Nuclear Programs," [A02 860224 020], (02/18/86)
230. Letter B. J. Youngblood, NRC, to S. A. White, TVA, "TVA Employee Concern Program," (L44 860224.774), (02/13/86)
231. Letter from D. R. Hicks to NRC, Committee on Energy and Commerce, Committee on Interior and Insular Affairs, "Concerns Regarding the TVA Nuclear Program," [L44 860226 001], (11/27/85)
232. Letter from J. M. Taylor, NRC, to S. A. White, TVA, "Report Nos. 50-327/86-38 and 50-328/86-38," (09/15/86)
233. Letter from NRC to C. C. Mason, TVA, "Report Nos. 50-327/86-45 and 50-328/86-45," (10/31/86)
234. Letter from NRC to S. A. White, TVA, "Report Nos. 50-327/86-27 and 50-328/86-27," [A02 860502 002], (04/22/86)
235. Letter from J. M. Taylor, NRC, to S. A. White, TVA, "Notice of Violations and NRC Inspection Report Nos. 50-259, 50-260, 50-296/86-23; 50-327, 50-328/86-56; 50-390, 50-391/86-22; 50-438, 50-439/86-08," (01/28/87, (TTB-259)
236. Letter from Richard C. Lewis, (NRC), to H. G. Parris, (TVA), "Report Nos. 50-259, 260, 296/84-09; 50-327, 328/84-08; 50-390/84-24; 50-391/84-19; and 50-438, 439/84-07," [NEB 840614 612], (06/12/84).
237. Letter from R. C. Lewis, (NRC), to H. G. Parris; (TVA), "Report Nos. 50-259, 296/83-04; 50-327, 328/83-04; 50-390/83-07; 50-391/83-06; and 50-438, 439/83-06," [A02 830415 001], (04/13/83)
238. Letter from R. C. Lewis (NRC), to H. G. Parris, (TVA), "Report Nos. . . . Systematic Assessment of Licensee Performance (SALP) Board Report for Your Bellefonte, Browns Ferry, Hartsville, Phipps Bend, Sequoyah, Watts Bar and Yellow Creek Plants," [A02 820823 010], (08/20/82)
239. Letter from R. C. Lewis, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/83-28 adn 50-439/83-28," [NEB 840118 609], (01/13/84)
240. Letter from R. C. Lewis, NRC, to H. G. Parris, TVA, "Report Nos. 50-438-15 and 50-439/83-15," [NEB 830726 218], (07/19/83)

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241. Letter from William J. Dircks, (NRC), to Charles Dean, (TVA), [B45 850919 826], (09/17/85)
242. NRC letter from J. P. O'Reilly to H. G. Parris, Report Nos. 50-327/83-31 and 50-328/83-31, (02/14/84)
243. Letter from J. P. O'Reilly, NRC, to H. G. Parris, TVA, "SALP" [A02 840907 003], (09/04/84)
244. NRC letter from J. P. O'Reilly, NRC, to H. G. Parris, TVA, "Severity Level III Violation EA 84-82, Violation Resulting from Design Review Deficiencies," [L44 840918 426], (09/13/84)
245. Letter from J. P. O'Reilly, NRC, to H. G. Parris, TVA, "Investigation Report Nos. 50-438/81-26 and 50-439/81-26 (Supplemental), 10/21/82)
246. Letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Inspection Report No.s 50-438/81-33 and 50-439/81-33," (07/20/82)
247. Letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/84-26 and 50-439/84-26," (03/01/85)
248. Letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/84-04 and 50-439/84-04," [NEB 840918 605], (09/10/84)
249. Letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/84-04 and 50-439/84-04," [NEB 840327 608], (03/22/84)
250. Letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/83-15 and 50-439/83-15," [NEB 831221 610], (12/15/83)
251. Letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/81-33 and 50-439/81-33," [NEB 840228 608], (02/23/84)
252. Letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Report Nos. 50-390/85-36 and 50-391/85-36" [A02 850621 006], (06/19/85).
253. NRC letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/84-24 and 50-439/84-24" [L44 841224 273], (12/13/84)
254. NRC letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/83-07 and 50-439/83-07," [NEB 830422 219], (04/14/83)
255. NRC letter from D. M. Verrelli to H. G. Parris, Report Nos. 50-327/85-23 and 50-328/85-23, (08/02/85)
256. Letter from D. M. Verrelli, NRC, to H. G. Parris, TVA, "Report Nos. 50-390/84-82 and 50-391/84-56," (A02 841217 015), (12/12/84)

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257. NRC letter from G. G. Zech, NRC, to S. A. White, TVA, Notice of Violation (Inspection Report Nos. 50-327/86-31 and 50-328/86-31), (L44 860820311), (08/12/86)
258. Letter from G. G. Zech, NRC, to S. A. White, TVA, "Sequoyah ECN Closeout and FSAR Updates," (L44 861224 113), (12/18/86)
259. NRC letter from G. G. Zech, NRC, to S. A. White, TVA, Notice of Violation (NRC Inspection Report Nos. 50-327/86-42 and 50-328/86-42), (L44 861003356), (09/26/86)
260. NRC letter from J. A. Olshinski to S. A. White, Report Nos. 50-327/85-46 and 50-328/85-46, (03/05/86)
261. NRC letter from J. A. Olshinski to S. A. White; Report Nos. 50-327/86-06 and 50-328/86-06, (03/05/86)
262. Letter from J. A. Olshinski, NRC, to S. A. White, TVA, Report Nos. 50-327/85-46 and 50-328/85-46, (01/29/86)
263. NRC letter from J. A. Olshinski, NRC, to H. G. Parris, TVA, "Report Nos. 50-259/84-40, 50-260/84-40, and 50-296/84-40," [L44 841123 138], (11/19/84)
264. Letter from J.A. Olshinski, NRC, to S. A. White, TVA, "Report Nos. 50-259/86-05, 50-260/86-05 and 50-296/86-05," (03/05/86)
265. Letter from J. A. Olshinski, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/84-04 and 50-439/84-04," (10/31/84)
266. Letter from J. N. Grace, NRC, to H. G. Parris, TVA, "SALP Board Report," [L44 850401 001], (03/26/85)
267. NRC letter from E. G. Adensam, NRC, to H. G. Parris, TVA, "Review of Responses to Power Systems Concerns," [L44 850121 720], (01/14/85)
268. Letter from R. D. Walker, NRC, to H. G. Parris, TVA, "Report Nos. 50-390/85-40 and 50-391/85-31," [845 850729 830], (07/19/85)
269. Letter from R. D. Walker, NRC, to H. G. Parris, TVA, "Report Nos. 50-259/85-26, 50-260/85-26" and 50-296/85-26," [L44 850516 410], (05/14/85)
270. Letter from F. S. Cantrell, NRC, to H. G. Parris, TVA, "Report Nos. 50-438/81-29 and 50-439/81-29," (02/22/82)

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271. Letter from L. M. Mills, TVA, to H. R. Denton, NRC, "Response to D.G. Eisenhower's Letter dated October 31, 1980, Post TMI Requirements, Browns Ferry Nuclear Plant, Docket Nos. 50-259, 50-260, 50-296," (A27 801223019), (12/23/80)
272. Letter from L. M. Mill, TVA, to R. Adensam, NRC, "Response to Generic Letter, 83-28," Docket 50-327, 50-328 (A27 831107 026) (11/07/83)
273. Letter from Mills, TVA, to O'Reilly, NRC, (A27 840314 041), "Annual Report 1-1-83 to 12-31-83 - SQM Unit 1 and 2," (03/14/84)
274. Letter from L. M. Mills, TVA, to E. Adensam, NRC, (AQ7 830414 007), "Transmittal of Updated FSAR," (04/14/83)
275. Letters from L. M. Mills, TVA, to James P. O'Reilly, NRC, [A27 830916 011, and A27 831019 001], (09/16/83 and 10/19/83), "Steel Containment Penetration Assembly - Units 1 and 2 (NCR WBNCEB 8014)," WBRD-50-390/81-08, 50-391/81-07, Thirteenth Interim Report and Final Report, respectively
276. Letter from L. M. Mills (TVA) to James P. O'Reilly (NRC), "Watts Bar Nuclear Plant Units 1 and 2 - Deficiencies in Cement Mortar Lining by Ameron - WBRD-50-390/82-55, WBRD-50-391/82-52 - First Interim Report," [A27 820621 023], (06/21/82)
277. Letter from L. M. Mills (TVA) to James P. O'Reilly (NRC), "Watts Bar Nuclear Plant Units 1 and 2 - Deficiencies in Cement Mortar Lining by Ameron - WBRD-50-390/82-55, WBRD-50-391/82-52 - Second Interim Report," [A27 820809 021], (08/06/82)
278. Letter from L. M. Mills (TVA) to James P. O'Reilly (NRC), "Watts Bar Nuclear Plant Units 1 and 2 - Deficiencies in Cement Mortar Lining by Ameron - WBRD-50-390/82-55, WBRD-50-391/82-52 - Third Interim Report," [A27 821028 016], (10/28/82)
279. Letter from L. M. Mills (TVA) to James P. O'Reilly (NRC), "Watts Bar Nuclear Plant Units 1 and 2 - Deficiencies in Cement Mortar Lining by Ameron - WBRD-50-390/82-55, WBRD-50-391/82-52 - Final Report," [A27 830520 005], (05/20/83)
280. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, [A27 830124 001], (01/24/83)
281. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, Response to Inspections Report Nos. 50-259/83-53, -260/83-53, -296/83-53, -327/83-27, -328/83-27, -390/83-49, -391/83-38, -438/83-30, -439/83-30, [A27 840425 025], (04/25/84)

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282. Letter from L.M. Mills, TVA, to J. P. O'Reilly, NRC, Response to NRC Inspection Report Nos. 50-327/80-24, -328/80-15, -390/80-20, -391/80-14, -438/80-13, -518/80-11, -519/80-11, -520/80-11, -553/80-11, -554/80-10, -556/80-10, and -567/80-10, (A27 800902 004), (09/02/80)
283. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to Violations 50-438, 50-439/81-26-01," (02/10/82)
284. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Revised Response to Violation 50-438, 50-439/81-29-01," (02/10/82)
285. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to Violation 50-438, 50-439/81-33-08," (02/26/82)
286. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to Violation 50-438, 50-439/81-33-08," (03/11/82)
287. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to Violation 50-438, 50-439/81-33-08," (06/17/82)
288. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to Violations 50-438/82-28-08 and 50-438, 50-439/82-28-01," (11/19/82)
289. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Second Revised Response to Violation 50-438, 50-439/81-33-08," [NEB 840126 615], (01/25/84)
290. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Second Revised Response to Violation 50-438/84-02," [NEB 840921 617], (09/19/84)
291. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to Violation 50-438/84-04-02," [NEB 840514 614], (05/10/84)
292. Letter from L. M. Mills, TVA, to J. P. O'Reilly; NRC, "Response to Violations 50-438/83-28-02 and 50-438/83-28-01, 50-439/83-28-01," [NEB 840103 603], (11/19/82)
293. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Response to Violations 50-438/83-15-01, 50-439/85-15-01, 50-438/83-15-04, 50-438/83-15-05," [NEB 831011 219], (08/24/83)
294. Letter from L. M. Mills, TVA, to J. P. O'Reilly, NRC, "Revised Response to Violations 50-438/83-15-04, 50-438/85-15-05," [NEB 831125 602], (11/23/83)
295. Letter from Domer, TVA, to Adensam, NRC, (L44 850201 806), "Amendment to operating license for SQN," (02/01/85)

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296. Letter from Domer, TVA, to Adensam, NRC, (851211 001), "Proposed Change to Technical Specifications to Allow Use of a Fifth Standby Generator," (L44 850201 806), (02/01/85)
297. Letter from Shell, TVA, to Adensam, NRC, (L44850418 806), "Additional Information for Technical Specification Revision to Allow Use of a Fifth D/G," (04/18/85)
298. Letter from D. S. Kammer, TVA, to E. Adensam, NRC, (A27 840416 013), "Transmittal of Amendment 1 to the Updated FSAR," (04/16/84)
299. Letter from D. S. Kramer, TVA, to J. P. O'Reilly, NRC, "Revised Response to Violation 50-438/84-04-02," (06/20/84)
300. Letter from J. W. Hufham, TVA, to E. Adensam, NRC, (L44 850411 809), "Transmittal of Amendment 2 to the Updated FSAR," (04/11/85)
301. Letter from J. W. Hufham, TVA, to Dr. J. Nelson Grace, NRC, [L44 851024 804], (10/24/85), "Steel Containment Penetration Assembly - Unit 2 (NCR WBNCEB 8014)," WBRD-50-391/81-07, Supplement Final Report (schedule slip to 09/12/86)
302. Letter from J. W. Hufham, TVA, to Dr. J. Nelson Grace, NRC, [L44 850909 808], (09/09/85), "Containment Negative Pressure Requirement During DBE/Annulus Flooding," Final Completion Report (SCR WBNNEB 8513)
303. Letter from J. W. Hufham, TVA, to Dr. J. Nelson Grace, NRC, [L44 860113 804], (01/13/86), "Lack of Supporting Documentation for 10% of Pipe Support Designs," WBRD-50-390/86-02, Final Report (NCR WBNCEB 8531)
304. Letter from M. B. Whitaker, TVA, to B. Youngblood, NRC, (L44 860411 812), "Transmittal of Amendment 3 to the Updated FSAR," (04/11/86)
305. Letter, R. Gridley (TVA) to Dr. J. Nelson Grace (NRC), "Watts Bar Nuclear Plant Units 1 and 2 - 'Use-as-is' and 'Repair' Dispositioning for Construction Nonconformance Reports - WBRD-50-390/87 05 and WBRD-50-391/87-05 - Interim Report," [L44 870211 804], (02/11/87)
306. Letter from J. E. Gilleland, TVA to J. P. O'Reilly, NRC, [QAS 771207 002], (12/02/77)
307. Letter from J. e. Gilleland, TVA to J. P. O'Reilly, NRC, [QAS 780124 004], (01/20/78)
308. Letter from R. L. Gridley, TVA, to Dr. J. Nelson Grace, NRC, [L44 861204 806], (12/04/86), "Documenation of Verbal Extensions to Commitments Made in 10 CFR 50.55(e) Reports, Changed Priorities Within TVA (NCR WBNCEB 8014)" - Will be completed by Unit 2 fuel load

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309. Letter from R. L. Gridley, TVA, to Dr. J. Nelson Grace, NRC, [L44 860430 811], (04/30/86), "Deficiencies in Sampling and Controlling of Concrete," Interim Report - reportable (NCRs 6719, 6720, and 6721)
310. Letter from R. L. Gridley, TVA, to Dr. J. Nelson Grace, NRC, [L44 860819 805], (08/19/86), "Deficiencies in Sampling & Controlling of Concrete," Final Report - reviewed concrete strength test results and production records. This item is no longer considered reportable, (NCRs 6719, 6720, and 6721)
311. Letter from R. L. Gridley, TVA, to Dr. J. Nelson Grace, NRC, "Deficiencies Involving Circuits Inside Penetrations," WBRD-50-390/86-46, (NCR W-353-P)
- L44 860502 805; (05/02/86), Interim Report (next report by 08/01/86)
- L44 861031 804, (10/31/86), Second Interim Report (final report by 02/13/87)
312. Letter from J. A. McDonald, TVA, to Dr. J. Nelson Grace, NRC, [T35 861007 846], (10/07/86), "Incorrct Pressure Switch Setpoints for ERCW Screen Wash Pumps," WBRD-50-390/86-58, 50-391/86-55, Final Report, (SCR WBNMEB 8663)
313. Letter from E. P. Wilkinson, INPO, to H. G. Parris, TVA, concerning recommendations and good practices identified during INPO's assistance visit to WBN during week of 01/18/82, [A02 820217 012], (02/10/82)
314. TVA Division of Nuclear Power, Reactor Engineering Branch (REB), Section Instruction Letter, from J. Hutton to NSSS Engineering and Analysis Group, "Disposition of Experience Review Material - REB NSSS82A2," (11/03/83)
315. TVA ONP Nuclear Licensing Branch, Group Instruction Letter, from D. E. McCloud to Licensing Support Group, "Disposition of Experience Review Material - LSG 85A1, Revision, 3," [L44 861031 817], (08/04/86)
316. Letter from Impell to TVA (Attention: Mr. Henry Jones), "Design Control Program External Audit Finding Evaluation," (Impell/TVA-86-162), (06/19/86) (TTB 150)
317. Letter from Impell to TVA (Attention: Mr. Henry Jones), "Design Control Program External Audit Finding Evaluation," (Impell/TVA-86-180), (06/30/86) (TTB 150)
318. Letter from Impell to TVA (Attention: Mr. Henry Jones), "Design Control Program External Audit Finding Evaluation," (Impell/TVA-86-197), (07/10/86) (TTB 150) [860723 002]

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319. Letter from Impell to TVA (Attention: Mr. Henry Jones), "Design Control Program External Audit Finding Evaluation," (Impell/TVA-86-233), (07/23/86) (TTB 150)
320. Letter from J. L. Boulay, Impell, to W. S. Raughley, TVA, "BFNP CRDR Assistance Project (Phase 1), Review of CRDR Program Plan and CRDR Activities," [B43 860825 003], (08/21/86)
321. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, "Employee Concern Evaluation Program - Sequoyah Restart Program - Corrective Action Plan (CAP)," (TCAB-026), (12/12/86)
322. Letter from G. R. McNutt (TVA) to Gordon L. Parkinson, "Employee Concern Evaluation Program - Watts Bar Nuclear Plant - Corrective Action Plan (CAP)," TCAB-225, 03/04/87
323. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, "Employee Concern Evaluation Program - Sequoyah Restart Program - Corrective Action Plan (CAP)," (TCAB-095), (06/05/87)
324. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, "Employee Concern Evaluation Program - Watts Bar Nuclear Plant - Corrective Action Plan," TCAB 294, (03/16/87)
325. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, "Employee Concern Evaluation Program - Watts Bar Nuclear Plant - Corrective Action Plan," TCAB 295, (03/16/87)
326. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, "Employee Concern Evaluation Program - Watts Bar Nuclear Plant - Corrective Action Plan," TCAB 296, (03/16/87)
327. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, "Employee Concern Evaluation Program - Corrective Action Plan," TCAB-037, (12/19/86)
328. Corrective Action Plan transmitted via TCAB-044 (12/30/86) and TCAB-057 (01/15/87)
329. TVA informal memo from J. W. Self to R. W. Olson, "Watts Bar Nuclear Plant - Formation of Task Force to Review ASME Code Documentation Generated Prior to November 1, 1982," (02/02/83)
330. TVA informal memo from J. W. Self to N-5 Unit Personnel, "Watts Bar Nuclear Plant - Method of Review Performed on ASME Code Documentation," (12/23/83)
331. TVA memo, White to Parker, Pedde, and Toto, [A02 870109 028], "Stop Work Orders and Related Activities," (01/11/87)

332. TVA memo from S. A. White to Those Listed, "Policy Establishing the Nuclear Procedures System," [L02 860709 839], (07/10/86)
333. TVA memo from S. A. White, to Those Listed (H. L. Abercrombie et al.) "Identification of TVA Representatives on Industry Committees or Subcommittees," [L44 861009 800], (10/16/86)
334. TVA memo from CTF to S. A. White, "Office of Nuclear Power (ONP) - Configuration Control Task Force (CTF) Final Report," [R25 860626 833], (06/30/86)
335. TVA memo from Standifer to Those Listed, "SWP 830412 014], "Watts Bar Nuclear Plant - Scoping of Engineering Change Notices (ECNs)," (04/11/83)
336. TVA two-part memo from (to) J. C. Standifer to (from) C. A. Chandley, "Watts Bar Nuclear Plant - Nonconformance Report (NCR) No. 4117R," [SWP 820526 115], (05/25/82)
337. TVA two-part memo from (to) J. C. Standifer to (from) C. A. Chandley, "Watts Bar Nuclear Plant - Nonconformance Report (NCR) No. 4133R R1," [SWP 820630 043], [MEB 820707 001], (06/30/82), (07/07/82)
338. TVA two-part memo from (to) J. C. Standifer to (from) C. A. Chandley, "Watts Bar Nuclear Plant - Nonconformance Report (NCR) No. 4357R RO," [SWP 821101 069], [MEB 821213 022], (10/25/82), (12/08/82)
339. TVA two-part memo from (to) J. C. Standifer to (from) C. A. Chandley, "Watts Bar Nuclear Plant - Nonconformance Report (NCR) No. 4419R RO," [SWP 821122 020], [MEB 821221 005], (11/19/82), (12/21/82)
340. TVA memo from J. C. Standifer to Guenter Wadewitz, "Watts Bar Nuclear Plant - Division of Engineering Design's Disposition of Nonconformance Report 4117R - Noncompliance with TVA Technical Specification N3M-921 RO for Installation of Cement-Mortar Lining in Essential Raw Cooling Water Pipes," [CEB 820604 017], (06/04/82)
341. TVA memo from J. C. Standifer to G. Wadewitz, "Watts Bar Nuclear Plant - Division of Engineering Design's Disposition of Nonconformance Report 4133R R1 - Noncompliance with TVA Technical Specification N3M-921 RO for Installation of Cement-Mortar Lining in Essential Raw Cooling Water Pipes," [CEB 820701 003], (07/01/82)
342. TVA memo from J. C. Standifer to G. P. Wadewitz, "Watts Bar Nuclear Plant - Division of Engineering Design's Disposition of Nonconformance Report 4163R R1 - Noncompliance with TVA Technical Specification N3M-921 RO for Installation of Cement-Mortar Lining in Essential Raw Cooling Water Pipes," [CEB 820726 036], (07/29/82)

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343. TVA memo from J. C. Standifer to G. P. Wadewitz, "Watts Bar Nuclear Plant - Division of Engineering Design's Disposition of Nonconformance Report 4270R - Noncompliance with TVA Technical Specification N3M-921 RO for Installation of Cement-Mortar Lining in Essential Raw Cooling Water Pipes," [CEB 821008 003], (10/07/82)
344. TVA memo from J. C. Standifer to G. Wadewitz, "Watts Bar Nuclear Plant Units 1 and 2 - NCR 4270R R1 - Cement Mortar Lining Repairs," [MEB 821119 042], ((11/19/82)
345. TVA memo from J. C. Standifer to G. Wadewitz, "Watts Bar Nuclear Plant - Division of Engineering Design's Disposition of Nonconformance Report 4357R RO - Noncompliance with TVA Technical Specification N3M-921 RO for Installation of Cement Mortar Lining in Essential Raw Cooling Water Pipes;" [CEB 821206 015], (12/06/82)
346. TVA memo from J. C. Standifer to G. Wadewitz, "Watts Bar Nuclear Plant - Division of Engineering Design's Disposition of Nonconformance Report 4419R RO - Noncompliance with TVA Technical Specification N3M-921 RO for Cement Mortar Lining in Essential Raw Cooling Water Pipes," [MEB 821217 012], (12/17/82)
347. TVA memo from J. C. Standifer to G. Wadewitz, "Watts Bar Nuclear Plant - Division of Engineering Design's Disposition of Nonconformance Report 4270R R1 and R2, Noncompliance with TVA Technical Specification for Installation of Cement Mortar Lining in Essential Raw Cooling Water (ERCW) Pipes - N3M-921RO," [MEB 830308 031], (03/07/83)
348. TVA memo from J. C. Standifer to R. A. Costner, "Watts Bar Nuclear Plant - April 1984 Surveillance Report Summary," [WBP 840718 076], (07/18/84)
349. TVA memo from C. A. Chandley to J. C. Standifer, "Watts Bar Nuclear Plant - Nonconformance Report (NCR) No. WBNNEB8017 (with attached NCR WBNNEB8017, 12.30.86)," [B44 860114 021], (01/14/86)
350. TVA memo from C. A. Chandley to J. A. Raulston, "Watts Bar Nuclear Plant - Deficiencies in Cement Mortar Lining - Input for Final Report for NCR-4117R, 4133R R1, and 4163R," [MEB 821012 038], (10/12/82)
351. TVA memo from C. A. Chandler to John A. Raulston, "Watts Bar Nuclear Plant - Deficiencies in Cement Mortar Lining - Input for Final Report for NCR-4117R, 4133R, 4133R R1, 4163R, 4270R, 4270R R1, and 4270R R2," [MEB 830427 039], (04/27/83)
352. TVA memo from F. W. Chandler to J. A. Raulston, "NRC IE Information Notice No. 82-40 - Deficiencies in Primary Containment Electrical Penetration Assemblies," [EEB 821117 930], (11/18/82)

353. TVA memo from F. W. Chandler to H. L. Jones, "BFN Units 1, 2, and 3 - Evaluation of Black and Veatch Finding for Category 19," [EEB 840106 909], (01/05/84)
354. TVA memo from F. W. Chandler to R. M. Hodges, "Bellefonte Nuclear Plant Units 1 and 2 - Conflicting Design Criteria," [EEB 800923 905], (09/23/80)
355. TVA memo from C. A. Chandley to L. J. Cooney, "Bellefonte Nuclear Plant - System Design Criteria," [MEB 830729 011], (07/28/83)
356. TVA memo from F. W. Chandler to E. G. Beasley, "Bellefonte Nuclear Plant - Office of Engineering (OE) Quality Management Staff (QMS) Audit 85-27 - Electrical Design Project (BLEP)," PB43 851004 914], (10/03/85)
357. TVA memo from F. W. Chandler to R. M. Hodges, "Bellefonte Nuclear Plant Units 1 and 2 - Evaluation of Black and Veatch (B&V) Finding 137, Task Force Item 35," [EEB 830623 914], (06/17/83)
358. TVA memo from F. W. Chandler to H. L. Jones, "Bellefonte Nuclear Plant Units 1 and 2 - Independent Review - Evaluation of Black and Veatch Findings," [BLP 841107 013], (11/07/84)
359. TVA memo from J. A. Raulston to L. M. Mills, "Watts Bar Nuclear Plant - Deficiencies in Cement Mortar Lining by Ameron, 10 CFR 50.55(e) Report No. 2 (Interim) - NCR 4117R, 4133R and 4136R," [NEB 820802 259], (08/02/82)
360. TVA memo from John R. Raulston to L. M. Mills, "Watts Bar Nuclear Plant - Deficiencies in Cement Mortar Lining by Ameron, 10 CFR 50.55(e) Report No. 3 (Interim) - NCR 4117R, 4133R, 4163R, and 4270R," [CEB 821020 270], (10/20/82)
361. TVA memo from J. A. Raulston to J. W. Hufham, "Handling of NRC Bulletins, Circulars, and Information Notices for Plants with an Operating License (OL)," (NEB 850220 251), (02/20/85)
362. TVA memo from J. A. Raulston to Those Listed (R. O. Barnett, et al), "Bellefonte, Browns Ferry, Sequoyah, and Watts Bar Nuclear Plants - Review of NRC-OIE Circulars and Information Notices Issued between 1979 and 1983 (Inclusive)," (NEB 850228 290), (02/28/85)
363. Two-part TVA memo between Raulston and Beasley, "Commitment Endorsement No. WBN-E 487," (NEB 850207 301) (02/07/85) and (805 850418 003) (04/18/85)
364. TVA memo from John A Raulston to G. R. Hall, "Browns Ferry Nuclear Plant - Inactivation of Design Criteria on the Long-Term Onsite Storage Facility for Low-Level Radioactive Waste - BFN-50-0745," [NEB 840612 255], (06/12/84)

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378. TVA memo from J.P. Stapleton to Those Listed, "Browns Ferry Nuclear Plant - Design Basis Effort to Support Restart," [B22 860515 010], (05/15/86)
379. TVA memo from J. R. Lyons to J. A. McDonald, "Watts Bar Nuclear Plant - Review of SQN NRC Inspection Report - 50-327/86-27 and 50-328/86-27 for Applicability to WBN," [B26 861027 012], (10/27/86)
380. TVA memo, J. F. Weinhold to J. R. Lyons, Engineering Assurance Audit 86-27, [B05 861014 003], (10/14/86)
381. TVA memo from J. R. Lyons to J. W. Coan, "Watts Bar Nuclear Plant - Pre-INPO Design Evaluation," [B49 851106 001], (11/06/85)
382. TVA memo from Domer to Cottle, WBN - Employee Concern Investigation Report Transmittal (03/10/86)
383. TVA memo from Ennis to Standifer, WBN - Employee Concern Investigation Report Transmittal (12/09/85)
384. TVA memo from G. W. Curtis to Watts Bar Design Baseline and Licensing Verification Program (DB&LVP) Management Staff, Watts Bar Nuclear Plant [B26 861023 024], (10/23/86)
385. TVA memo, A. P. Capozzi to H. B. Bounds, "Watts Bar Engineering Project - Engineering Assurance Audit (EA) 86-27 - Nonconforming Conditions, Disposition, Documentation, and Control, Corrective Action Evaluation," [B05 870211 011], (02/11/87)
386. TVA memo from H. B. Bounds to A. P. Capozzi, "Watts Bar Nuclear Plant - Revised Response for Engineering Assurance Audit Deficiency 86-27-01 - Nonconforming Conditions, Disposition, Documentation and Control," [B26 870413], (04/13/87)
387. TVA memo from H. B. Bounds to J. F. Weinhold, "Corrective Action Plan to Resolve Audit Deficiency No. 86-27-01," [B26 870114 014], (01/14/87)
388. TVA memo from MEB Chief to SWP Manager, "ERCW System Corrosion/Construction Study," [MEB 780104 021], (01/04/78)
389. TVA memo from MEB Chief to SWP Manager, "ERCW System Corrosion/Construction Study," [MEB 780118 019], (01/18/78)
390. TVA memo from Head Nuclear Engineer to NEB Files, "WBNP-NRC OIE Inspector Concerns In Regard To Corrosion In Raw Water System" [NEB 801230 251], (12/30/80)
391. TVA memo from MEB Chief to NEB Chief, "WBNP - Corrosion in Carbon Steel Raw Water Piping," [MEB 180113 028], (01/21/81)

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365. TVA memo J. A. Raulston to E. G. Beasley, "Bellefonte Engineering Project (BLEP) Nuclear Design Project - Quality Management Staff (QMS) Audit 85-23," [B45 850528 254], (05/28/85)
366. TVA memo from L. L. Jackson to Those Listed, "Institute of Nuclear Power Operations (INPO) Corporate Evaluation Responses," [A02 860813 012], (08/14/86). Specific findings reviewed include, 1.2A-2, 1.2A-3, 2.4A-1 and 2.8A-1
367. TVA memo from W. C. Drotleff, Jr., to Those Listed, (R. G. Domer, et al), "Design Basis Program for TVA Nuclear Plants," (B44 860402 007), (04/08/86)
368. TVA memo from W. C. Drotleff to S. A. White, "Design Change Process Improvements Program," [B01-860801 001], (08/01/86)
369. TVA memo from W. C. Drotleff to Those Listed, "Specification Improvement Program," [B05 860808 001], (08/08/86)
370. TVA memo from W. C. Drotleff, to Those Listed (H. L. Abercrombie, et al.), "Transition to Division of Nuclear Engineering Procedures," (B05 860410 008), (04/14/86)
371. TVA memo from W. C. Drotleff, "Policy Memorandum PM86-04 (DNE) - Engineering Judgment," [B20 860424 001], (04/25/86)
372. TVA memo from H. G. Parris to Those Listed, "Policy Regarding Control Over Making Commitments to the NRC," [L44 850919 805], (09/26/85)
373. TVA memo from J. R. Parrish to Those Listed "Browns Ferry Nuclear Plant - Quality Assurance Program," (06/20/72) located in BFN OEDC-QPM-No. 3-73, R1.
374. TVA memo from H. G. Parris to H. N. Culver, "Response to NSRS Assessment of the Results of Black and Veatch Independent Design Review of the Watts Bar Nuclear Plant Auxiliary Feedwater System - NSRS Report R-84-19-WBN," [EDC 840801 601], (07/31/84)
375. TVA memo from J. A. Kirkebo to J. E. Houston, "Revision to Specification Improvement Plan," (B80 861008 001), (10/08/86)
376. AEC memo from Davis to Watson (TVAO, "03/72 Audit Findings on Preoperational Test Program," (05/04/72)
377. TVA memo from J. P. Stapleton to Those Listed, (T. L. Brothers et al.), "Browns Ferry Nuclear Plant - Baseline Program Plan Revision 0, July 7, 1986," [B22 860714 017], (07/14/86)

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EXECUTIVE SUMMARY

Subcategory Report 24500 summarizes the results of 37 element evaluations. The element evaluations document the assessment of 49 issues that were derived from a total of 45 employee concerns related to TVA's four nuclear power plant sites. The concerns cite perceived deficiencies in the design procedures, design criteria, and engineering documentation, as well as in the feedback of industry and TVA nuclear experience and as-built documentation of the plant facilities configuration to Engineering.

The evaluation team found that over one-half of the issues either were not valid or were valid but required no corrective action. In addition, over one-fourth of the remaining issues were related to problems that TVA had already identified and was in the process of resolving. Those issues that were substantiated involved procedures that were not totally effective in the support of the Nuclear Experience Review (NER) Program, some incomplete or nonexistent design criteria, and some incomplete feedback documentation to engineering of the as-built configuration of plant facilities.

The collective significance of the findings is that for a period of time some design criteria documents for safety-related systems did not fully establish the requirements or were nonexistent; feedback to other TVA nuclear plants of important in-house nuclear operating experience and the nuclear industry experience of other utilities was not handled with dispatch; and the lack of as-built plant configuration information feedback may have limited the accuracy of the as-built configuration of the engineering design documents in the final safety analysis reports (FSARs). The overall significance of the results of this subcategory evaluation is that the effects on design margin and on hardware (which may be caused by anticipated changes in design criteria) remain unknown, pending completion of design analyses now in progress or to be scheduled.

The causes for the negative findings were diverse. The most frequently occurring cause, but not necessarily the most significant one, was the use of procedures that did not fully establish the requirements. Acceptable completion of the currently established corrective actions, combined with application of the independent oversight review by ONE's Engineering Assurance group, should provide a basis for a reasonable expectation that the problems will be corrected and prevented from recurring.

Of the 117 findings, 62 were found to require no corrective action. Twenty-eight corrective actions were required to remedy the remaining 55 findings, of which the corrective actions for 15 findings had been initiated by TVA before the Employee Concerns Task Group (ECTG) started its evaluations. Corrective actions required for the remaining 40 findings included those required to resolve six additional peripheral findings identified during the ECTG evaluations. The corrective actions have been correlated with TVA's commitments to NRC as stated in Appendix 8 of the Corporate Nuclear Performance Plan (CNPP).

2804D-R21 (11/20/87)

Revision 4 of the CNPP lists the NER program, which is the new name for the new program, as commitment item 21, with completion required before restart of SQN. The corporate program is common to all sites. Each site has developed procedures for interfacing with corporate procedures and site implementation. This commitment is also shown in the Corporate Commitment Tracking System (CCTS) as commitment NCO-86-0156-109 (Ref. 109) and as a restart item for SQN.

In conjunction with this NER program, the CNPP also commits to establishing a corporate nuclear operating experience data base that will provide a management tool and TVA-wide access to all experience review items. Division of Nuclear Safety and Licensing (DNSL) has requested that the Division of Nuclear Services (DNS) improve the old Operating Experience Review (OER) data base program to provide additional search and sort capabilities as well as report generation capabilities to meet the requirements of the new NER program (Ref. 425). The commitment to establish this new data base is listed as CNPP commitment item 22 and is shown as a long-term program. The CCTS control number for this commitment is NCO-860156-063 (Ref. 108).

An evaluation of the combined element findings at the subcategory level did not identify any broader issues. The causes identified and other evaluation results are being reexamined from a wider perspective in the Engineering category evaluation.