TVA EMPLOYEE CONCERNS
SPECIAL PROGRAM

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REVISION NUMBER: 1

TITLE: Engineering

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Reformat to conform with revision 4 of ECTG Program Manual, SRP comments and inclusion of final 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 (terms formed from the first letters of a series of words).

Additionally, at the end of each subcategory report the reader will find at least two attachments. The first is a Subcategory Summary Table that includes the following information: the concern number, a brief statement of the concern, and a designation of nuclear safety-related concerns. The second attachment is a listing of the concerns included in each issue evaluated in the subcategory.

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

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

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

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

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

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

ECSP GLOSSARY OF REPORT TERMS*

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

Class A: Issue cannot be verified as factual

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

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

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

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

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

concern (see "employee concern")

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

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

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

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

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

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

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

K-form (see "employee concern")

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

root cause the underlying reason for a problem.

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

Acronyms

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

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

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

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

ENGINEERING

Subcategory Report 30900

Executive Summary

I. SUMMARY OF ISSUES

The Engineering Subcategory of the Operations Category contains 11 concerns which raise 11 issues. These issues raise questions about engineering programs and processes such as the workplan process, configuration control, control of consumables, and engineering training at all TVA sites.

Four of these issues were found not to be validated. One issue was factual, but did not require corrective action. Three issues were factual and identified a problem, but corrective actions were initiated before the employee concerns evaluation of the issue was undertaken. These issues deal with a) inadequate work control on the fire protection system at WBN, b) inaccessible drawings on backshifts at WBN, and c) lack of acceptance criteria in procedures at WBN. Three issues were factual and presented problems for which corrective actions have been, or are being, taken as a result of an employee concerns evaluation. These issues deal with a) inadequate control of Teflon tape at SQN and BFN, b) lax inspection criteria at WBN leading to incomplete hardware modifications, and c) technical support engineers at WBN not getting adequate formal training. |R1

II. SUMMARY OF FINDINGS |R1

Of the 11 issues evaluated, eight were found not to be problems because corrective actions were either not needed or were already in place, but three issues revealed problems for which corrective action was required: |R1

1. WBN had two potential problems in the implementation of training for System Engineers. These problems were believed to be generic to SQN and BFN as well.

2. At WBN, a deficiency (a violation of a design, construction, or operation requirement) was found pertaining to the potential for loss of configuration control in implementing the Maintenance Request (MR) process.

3. All sites had deficiencies which allowed Teflon thread sealing tape to be used in violation of General Construction Specifications.

III. SUMMARY OF COLLECTIVE SIGNIFICANCE |R1

A collective assessment of the findings for this subcategory showed that the issues reflected upon plant-wide programmatic deficiencies and maintenance practices more fully addressed in Subcategory Report 30700, "Nuclear Power Site Programs/Procedures," and Subcategory Report 30800, "Maintenance." It was determined that a meaningful assessment of the issues presented in this subcategory could not be accomplished without also examining the findings in the other two subcategory reports. Therefore, it was decided that no subcategory-level conclusions would be made in this report and that the findings from this subcategory report on issues such as workplan process, configuration control, control of consumables, and engineering training would be analyzed more fully during the collective assessment processes on Subcategory Report 30700 and 30800. Significant conclusions resulting from these two subcategory collective assessment processes will be escalated to the Operations Category Report.

IV. SUMMARY OF ROOT CAUSES |R1

Causes for the deficiencies discussed in Section II included:

1. Some procedures governing engineering training and control of consumables are incomplete or fail to incorporate all technical requirements. (WBN, SQN) |R1

2. There have been instances of inadequate controls for temporarily altered equipment and use of consumables to ensure compliance with commitments. (WBN, SQN) |R1

V. SUMMARY OF CORRECTIVE ACTION

1. With respect to Teflon tape, SQN line management committed to revising procedures and issuing a memorandum in order to clarify the restrictions on Teflon tape application. WBN, BFN, and BLN were found to have already reviewed the use of Teflon tape and to have restricted its use. Corporate management has been requested to revise the division procedure manual relative to Teflon tape control. Corporate management is also currently negotiating a test program with Oak Ridge National Laboratory for candidate thread sealant materials to conclusively qualify unrestricted sealants.

2. With respect to implementation of the Maintenance Request (MR) process, WBN line management explained that the AI is explicit in how the maintenance request process is to be conducted and that the process provides for returning equipment to normal status as required. Therefore, the problem perceived by ECTG was thought to be with MR implementation rather than with the MR form itself.

3. With respect to system engineering training, WBN and corporate management have committed to a review of engineering training requirements and have initiated some procedural changes.

1.0 CHARACTERIZATION OF ISSUES

1.1 Introduction

The Engineering Subcategory is comprised of 11 employee concerns that raise 11 issues dealing with Engineering Training and Engineering programs which control plant processes or equipment. The subcategory originally had been developed to look at the Engineering support part of the various plants' organizations and had consisted of five higher order groups of related concerns, called elements. Later, however, two of these five elements were deleted as the elements' concerns were transferred to more appropriate subcategories. Also, as findings were generated on the remaining three elements, it became evident that the issues reflected more on plant-wide programmatic deficiencies and maintenance practices more fully addressed in Subcategory Report 307, "Nuclear Power Site Program/Procedures," and Subcategory Report 308, "Maintenance," rather than on Engineering support functions. Therefore, references to these two other subcategories are made throughout this report. In this section of the report, each of the three existing elements is presented with a brief overview of the issues.

1.2 Description of Issues

The issues have been combined into higher-order groups, called elements, to aid in identifying and evaluating related issues. In this section of the report, each element is presented with a brief overview of its issues. The employee concern numbers for each issue are listed under each issue title. R1

1.2.1 Element 309.01 - Adequacy of Procedures

Issue 309.01-1 - Management did not require Fire Protection System drained before maintenance

IN-85-595-008 R1

The CI reported that management at WBN did not request the fire protection system be drained before craft began drilling on the shutdown lines.

Issue 309.01-2 - Backshifts have no access to plant drawings

IN-85-704-002 R1

It was reported by the CI that 2nd and 3rd shifts at WBN do not have access to drawings related to instrumentation activities.

Issue 309.01-3 - Procedures lack clarity and acceptance criteria

IN-85-825-002 |R1

The CI reported that several procedures at WBN need to have portions rewritten for clarity or more defined acceptance criteria.

Issue 309.01-4 - Teflon tape is not adequately controlled

IN-85-977-001 |R1

This concern addresses the implementation of WBN programs to identify and replace the Teflon tape used on the Reactor Coolant System and those systems that return to the RCS.

Issue 309.01-5 - Technical Instructions (TI) are incorrect and incomplete

WBN-243NS |R1

The CI alleged that WBN TIs are incorrect or incomplete, citing one specific TI.

1.2.2 Element 309.04 - Procedure Violations

Issue 309.04-1 - Lax inspection criteria

IN-85-984-002 |R1

For Element 309.04 one employee concern at WBN involves a lack of adherence to existing procedures within Nuclear Power which apparently led to modifications to permanent plant ladders without revision to appropriate drawings and in another case led to the improper reassembly of a shielding enclosure.

Issue 309.04-2 - Violation of Out-of-Service tags

XX-85-122-023 |R1

At Bellefonte Nuclear Plant (BLN), lack of adherence to existing procedures was alleged by the CI who reported Office of Nuclear Power (ONP) personnel violating out-of-service tags on valves and electrical equipment, thus jeopardizing personnel safety.

1.2.3 Element 309.05 - Engineering Training

Issue 309.05-1 - Training on actual plant equipment

IN-85-495-001 |R1

The CI expressed a need at WBN for more training on the specifics of plant equipment.

Issue 309.05-2 - Personnel performing technical reviews are not properly trained

IN-86-091-001 |R1

The CI expressed a vague concern at WBN regarding training of personnel performing technical reviews.

Issue 309.05-3 - System engineers do not get adequate formal training

IN-86-209-005 |R1

The CI expressed a broad concern at WBN regarding lack of systems training which could lead to design control errors.

Issue 309.05-4 - Inexperienced Shift Technical Advisor (STA) Course instructors

IN-86-209-012 |R1

The CI reported individuals at WBN with no STA experience instructing STA classes.

To locate the issue in which a particular concern is evaluated, please consult the following attachments:

Attachment A, Subcategory Summary Table

Attachment B, List of Concerns by Element/Issue

2.0 EVALUATION PROCESS

2.1 General Methodology

The evaluation of this subcategory was conducted according to the Evaluation Plan for the Employee Concerns Task Group and the Evaluation Plan for the Operations Group. The concern case files were reviewed. Source documents were researched and interviews conducted in order to identify the requirements and criteria which |R1

applied to the issues raised by the concerns. The issues were evaluated against the identified requirements and criteria to determine findings. A collective significance analysis was conducted; causes were indicated for negative findings; and corrective action for the negative findings was initiated or determined to have already been initiated. |R1

2.2 Specific Methodology |R1

During the element evaluations, the evaluators reviewed applicable sections from the following baseline requirements documents: Final Safety Analysis Report (FSAR) at WBN; applicable regulatory requirements including NUREGs; and ANSI Standards. To ensure consistency and implementation of the requirements found in these documents, the evaluators reviewed applicable Standard Practices, Administrative Instructions (AI), Surveillance Instructions (SI), Technical Instructions, Quality Control Instructions (QCI) and procedures, data packages, Maintenance Requests (MRs), and records. In addition, the evaluators reviewed files which had been expurgated by NRC, as well as WBN plant staff reports, Nuclear Safety Review Staff (NSRS) reports of concerns previously investigated, and interoffice memoranda at WBN, SQN, BLN, and BFN.

The evaluators conducted informal interviews with cognizant personnel when required either to verify document-based findings or to provide nondocument-based evaluation input. Interviews were conducted with personnel in ONP; Steamfitters at SQN, Power Stores Management at BFN; the Instrument Maintenance (IM) Engineer at WBN; Electrical and Mechanical Superintendents, General Foremen, and Shift Engineers in both DNC and ONP organizations at BLN; the BLN Employee Concerns Program Site Representative (ECP-SR); and STA course students at SQN.

From their element evaluation findings, the evaluators identified specific deficiencies and analyzed them for perceived root causes at the element level. A final determination was made on whether or not each specific deficiency was safety-related. The evaluators initiated CATDs for the specific deficiencies that had been identified during the element evaluations. The evaluators documented their findings, specific deficiencies, and perceived root causes in element reports written in accordance with the Operations Category Evaluation Plan.

3.0 FINDINGS

NOTE: Generic applicability statements are included for concerns which are classified as being potentially safety-related or safety-significant as denoted on Attachment A.

3.1 Element 309.01 - Adequacy of Procedure

Issue 309.01-1 - Management did not require Fire Protection System drained before maintenance (WBN)

Concern IN-85-595-008 pertained to management not requesting the Fire Protection System to be drained prior to drilling on the system. The evaluator found that during the 1983-1984 timeframe, an isolated incident occurred which fit the description of the concern. Craft personnel informed the evaluator that a new system had been installed in the fire protection system which used instrument air to detect leakage in the sprinkler system. An Auxiliary Unit Operator (AUO), unaware of the new system, did not ensure that the air pressure was bled off before authorizing work to commence. Therefore, approximately four gallons of muddy water (from a low spot in the lines) spilled on the floor while craft personnel were working on the fire protection.

Conclusion

The issue was factual, identified a problem, but corrective action for the problem was initiated before the evaluation of the concern was undertaken. The AUOs were subsequently trained on the system and the evaluator could find no recurrence of the incident. No further corrective action was determined to be necessary.

Issue 309.01-2 - Backshifts have no access to plant drawings (WBN)

One of the five WBN concerns for the adequacy of procedures (IN-85-704-002) pertained to the inaccessibility of plant drawings to backshift personnel. During the evaluation it was learned that Watts Bar Nuclear Plant Site (WBNPS) document control section opened a 24-hour-a-day, 7-days-a-week document control center. Instrumentation drawings for plant operations and maintenance are available for use by individuals working all three shifts. No further corrective action was determined to be necessary.

Conclusion

This issue was factual, identified a problem, but corrective action for the problem was initiated before the evaluation of the concern.

Issue 309.01-3 - Procedures lack clarity and acceptance criteria (WBN)

Another concern, IN-85-825-002, alleged inadequacy in TVA procedures to provide clear instructions and well-defined acceptance criteria. Two examples were provided: Technical Instructions (TI)-27 and Modifications and Addition Instruction (M&AI)-14. NSRS report I-85-339-WBN had previously investigated this concern. This report concurs with the findings of the NSRS report. NSRS found deficiencies in TI-27 to have been already addressed under the WBN Quality Assurance Program. As a result of the QA corrective actions, the TI was adequately revised to include measures to direct the performance of troubleshooting activities. The other example provided by the CI was not validated by the NSRS investigation. |R1

Contrary to the allegation, Revision 5 of M&AI-14 dated May 15, 1985 did not use the term "Qualified Personnel." The instruction did provide explicit references on who could sign-off on data sheets, namely QC Inspectors and Craft Foremen.

Conclusion

This issue was factual, identified problems, but corrective actions for the problems were initiated before the evaluation. No further corrective action was determined to be necessary. |R1

Generic Applicability

This concern was evaluated at the site of the concern (WBN). It was determined that the issue was related to specific WBN procedures. Adequate corrective action had been implemented prior to the ECTG evaluation. No other site evaluations are necessary. |R1

Issue 309.01-4 - Teflon tape is not adequately controlled

WBN

Concern IN-85-977-001 pertained to a perception that TVA defaulted on a commitment to identify and replace misapplications of Teflon tape on the Reactor Coolant Systems (RCS). NSRS Report I-85-383-WBN reviewed the usage of Teflon tape with respect to Construction Specifications. This concern was validated by the NSRS Report and this report concurs with the NSRS Report findings. The misapplication of Teflon tape on lines that re-enter the RCS on WBN units 1 and 2 was previously identified by Nonconformance Report (NCR) W-231-P. |R1 |R1

As part of the NCR corrective action measures, the WBN Office of Engineering (OE) released a memorandum requiring immediate removal of Teflon tape from specific areas of the plant and also justified use as-is in the remainder of the plant until all tape could be replaced on a no-delay-to-operations basis. It also stated that Teflon tape located outside the applicable RCS boundary did not pose a safety concern. The memorandum further stated that Teflon tape would no longer be used at Watts Bar. NSRS verified removal of Teflon tape from the Power storeroom and Construction warehouse stock. This decision virtually eliminates any use of Teflon tape and possible future problems in this area. Subsequent to this memorandum, Nuclear Power removed all Teflon tape applied on the referenced applicable stainless-steel lines in unit 1. The unit 2 portion of the NCR remains open until similar action can be accomplished on the applicable unit 2 lines. No further corrective action was determined to be necessary.

SQN

A SQN evaluation was also performed for the concern pertaining to a perception that TVA defaulted on a commitment to identify and replace misapplications of Teflon tape. This concern was validated under NSRS Inspection Report I-85-383-WBN and was generically applied to SQN. This report concurs with the NSRS Report findings. The inspection found that standard practice SQA-160 had contained the restrictions on Teflon tape usage that were consistent with the General Construction Specification, but that planners, foremen, and engineers were not familiar enough with the standard practice to preclude recurrence of the problem. |R1

This unfamiliarity was discovered in interviews with planners, foremen, and an engineer who had the responsibility to be knowledgeable with the requirements of the standard practice. No working level instruction addressed the use of tape. To address the fact that no program exists to identify and replace the existing misapplications of Teflon tape, Operating Experience Report (OER) SQN 850088001 was initiated. This OER is also performing the task generic to all TVA nuclear sites which is to locate a suitable substitute for Teflon tape. |R1

Subsequent to the initial evaluation and the Corrective Action Plan (CAP) received for CATD 30901-SQN-01, some questions were raised by the NRC. Additional information was obtained in response to questions concerning the proposed corrective action as stated in Section 6.0. |R1

It was determined that Teflon tape is not a problem if used within the environmental limits, regardless of the system on which it is used. Revision 5 of SQA-160 removed the restriction prohibiting use of Teflon tape on any lines that will reenter the reactor system. The removal of this requirement creates an inconsistency with the upper-tier requirements in G29, DPM N73E1 and N73M2.

The requirements in revision 5 of SQA-160 will override DPM N73E1 until the DPM is revised to reflect the same requirements. This is allowed by plant procedure SQA-188, and a cover sheet is attached to the revision 5 of SQA-160 documenting headquarters' endorsement of the standard practice in lieu of the upper-tier document indicated on the cover sheet. The cover sheet indicates that DPM N73E1 is overridden but does not indicate G-29 or DPM N73M2 as being overridden. Therefore an inconsistency still exists between SQA-160 and upper-tier documents G-29 and DPM N73M2. |R1

The requirements of G-29 are applicable to SQA-160 since G-29 is a Division of Nuclear Construction (DNC) Document and Modifications, which is a branch of DNC, uses SQA-160.

The disposition of OER SQN 850088001 indicates an environmental drawing prerequisite will be imposed on Teflon tape usage. A discussion with OER tracking personnel revealed that this prerequisite has not been implemented and remains an open item on the OER.

A Condition Adverse to Quality Report, (CAQR) SQP 870155, was initiated on March 9, 1987 which identifies the lack of a "consistent policy or program to identify, control, and eliminate improper usage of Teflon tape."

It was concluded that the specific concern that no program has been established to identify and replace Teflon tape on the RCS is not valid. However, the issue of preventing the use of Teflon tape in all unacceptable locations was determined to be valid. The present approach by SQN in allowing limited, controlled use of Teflon tape is not consistent with the WBN and BFN approach as indicated in OER SQN 850088001. CAQR SQP 870155 identifies this inconsistency for resolution. CATD 30901-SQN-01 was issued to SQN line management to address the lack of employee familiarity with Teflon tape usage and to address the adequacy of Standard Practice SQA-160. CATD 30901-SQN-02 was issued to track closure of CAQR SQP-870155. |R1

BFN

The concern for the control of Teflon tape was also evaluated at BFN. The evaluation concluded that this concern was not valid for BFN since there is no specific management directive to remove Teflon tape from BFN installations. In the absence of any directive, however, BFN line management assigned a chemical engineering supervisor to further evaluate the scope of the problem. As a result, existing Teflon tape was transferred out of Nuclear Power and a list of existing known Teflon tape applications was compiled. The investigation provided justification for not removing Teflon tape on a blanket basis. Final corrective action depends on the results of the investigation for Teflon substitutes provided under the OER initiated at SQN.

BFN has begun a program to identify and replace questionable applications and has completed steps to prevent new use of Teflon tape, but at present no identifiable tracking device exists to ensure completion and closeout of the laboratory/substitute effort as it applies to BFN. CATD 30901-BFN-01 requests the plant to initiate a tracking mechanism to ensure that all Teflon tape will be removed before reaching its radiation dose limit. |R1

BLN

The concern for the control of Teflon tape was also evaluated at BLN. The investigation revealed no problems which could be substantiated. Documents revealed that Teflon tape use at BLN was discontinued in 1983. All Teflon tape has been removed from both Construction and Nuclear Power power stores warehouses. One instance of vendor use of Teflon tape on process piping capable of carrying fluids into the Reactor Coolant System had been identified and adequately resolved via the Nonconformance Report (NCR) procedure. Other components which potentially contain vendor-used Teflon tape will be addressed in a similar manner. No adverse effects on safety were identified.

Conclusions

CATD 30901-NPS-01 sent to corporate management noted that inconsistencies exist between WBN, BFN, and SQN on the restrictions of Teflon tape. It also noted that identification of an acceptable substitute for Teflon tape has not been aggressively pursued. |R1

This issue at WBN was factual and identified a problem, but corrective action for the problem was initiated before the evaluation of this issue at WBN was undertaken. |R1

This issue at SQN and BFN was factual and presents a problem for which corrective action is being undertaken as a result of the evaluation. |R1

This issue at BLN was not verified as factually accurate.

Issue 309.01-5 - Technical Instructions are incorrect and incomplete (WBN)

Another concern (WBN-243NS) alleged that TIs are incorrect or incomplete, citing one specific TI where the output values in two separate instrumentation loops were expressed in units of millivolts when the actual output values were in units of kilo-pounds/hour (KBH). The evaluator discredited the concern for one of the loops by determining its output value to be in units of degrees F; rather than either of the cited units. The concern for the other loop was also not validated because the evaluator determined the instruction correctly expressed computer input values in millivolt units and output values as KBH.

Conclusion |R1

This issue was not verified as factually accurate.

3.2 Element 309.04 - Procedure Violation |R1

Issue 309.04-1 - Lax inspection criteria (WBN)

The site specific concern (IN-85-984-002) that WBN Nuclear Power (NUC PR) personnel violated procedure by modifying permanent plant ladders without revising appropriate drawings and in another case, improperly reassembling a shielding enclosure was validated. |R1

The first instance of procedure violation was substantiated based on evidence that two of the three cited ladders had been modified without supporting documentation. An interview with the cognizant engineer revealed that the ladder modifications were eventually documented by a Temporary Alteration Control Form (TACF) sometime after the concern was initiated and at least two years after the modification.

The second instance of procedure violation was substantiated based on physical evidence that the cited shielding enclosure around a radiation monitor was improperly reassembled as alleged. In fact, the evaluator determined that the shields had remained improperly reassembled (disassembled) for over two years. The initiating Maintenance Request (MR) had been kept open to document the state of disassembly of the shields; however, the open MR was not being tracked by any central tracking device nor was the Instrument Maintenance Engineer aware that the MR was open.

By procedures, governing Administrative Instructions required sufficient action to preclude the occurrence of this deficiency. The Administrative Instruction which governs MRs even requires second party verification that equipment which has been temporarily altered in a manner such as this is returned to its normal condition. It further requires the completion of a TACF if the temporary alteration is not returned to normal. Other associated AIs make similar provisions to track alterations. However, where these associated AIs, SIs, and MIs all include a step to verify the system is returned to normal, MRs do not include a specific sign-off block to reference a TACF written upon closure of the MR or to verify that the item has been returned to normal. Although MRs do not include the specific sign-off block, it was determined that the WBN MR program requires TACFs to be referenced on the MR. CATD 30904-WBN-01 was issued to address this discrepancy. |R1 |R1 |

The issues of workplans and configuration control are addressed more thoroughly in Subcategory Report 307.

Conclusion

This issue was verified as factual and presents a problem for which corrective action is being taken as a result of the evaluation.

Generic Applicability

|R1

The WBN evaluation of this concern determined the issue to be instances of procedural noncompliance and inadequate procedures limited to WBN. No other site evaluations are necessary.

Issue 309.04-2 - Violation of Out-of-Service tags (BLN)

A concern (XX-85-122-023) expressing a lack of proper recognition for equipment out-of-service tags by personnel at BLN could not be substantiated based on numerous employee interviews and a thorough review of training documents. The evaluator determined that all operations and construction personnel authorized to hold a protective clearance for equipment work are required to complete a training class on clearance procedures once every two years. |R1

The evaluator found that additional emphasis is routinely put on protective cards at the group safety meetings in DNC and ONP organizations. In short, the evaluator found sufficient training and instructions to ensure that all plant personnel are knowledgeable of the requirements on protective cards used at BLN. Furthermore, interviews revealed no evidence of a widespread indifferent attitude toward protective tags or personnel safety problems related to such practices. The evaluator found that no concerns of this nature had been identified to the BLN Employee Concerns Program, indicating continued employee respect for protective cards.

Conclusion

This issue was not verified as factually accurate.

Generic Applicability

This concern was evaluated at the site of the concern (BLN) and found to be not valid. No other site evaluations are necessary. R1

3.3 Element 309.05 - Engineering Training

Issue 309.05-1 - Training on actual plant equipment (WBN)

Concern IN-85-495-001 pertained to insufficient training for craft and engineering personnel on plant-specific equipment and was not validated. Training for craft and engineering personnel on the specifics of plant equipment is decided by their immediate supervisors as detailed by a WBN procedure. This procedure also contains specific courses that may be selected by a supervisor for his/her personnel. Additionally, the Plant Operations Training Center (POTC) publishes, on a monthly basis, the courses that are to be taught in the next month. This notification is sent to line management at each plant and they may enroll personnel at their discretion. Further, there are many specialized courses offered at manufacturers' facilities that are utilized.

Conclusion

R1

This issue was not verified as factually accurate.

Issue 309.05-2 - Personnel Performing Technical Reviews are not Properly Trained (WBN) |R1

Concern IN-86-091-001 is in regard to technical reviews of data being performed by personnel with neither the proper training nor expertise. This concern was not validated based on a review of training records, particularly those training records of Preoperational (Preop) Test Personnel. These individuals perform the majority of technical reviews of tests/data. The evaluator found that the requirements for Preoperational Testing Section personnel qualifications were fully met. Training within the section was found to be well-implemented and supported by written examinations and records validating section personnel knowledge and capability.

Conclusion |R1

This issue was not verified as factually accurate.

Issue 309.05-3 - System engineers do not get adequate formal training (WBN)

One concern (IN-86-209-005), of broad scope, pertained to WBN technical support engineers not getting adequate formal training to prevent design control errors which could impact plant safety. Although no instance was identified where an engineer did not understand system operations as alleged, the concern was validated based on a finding that training procedures do not adequately implement ONP training requirements for engineers. Furthermore, the evaluator found an organizational interface problem of unestablished responsibility for plant-specific training for WBN personnel in the Division of Nuclear Engineers (DNE), Division of Nuclear Construction (DNC), Division of Nuclear Quality Assurance (DNQA), and Division of Nuclear Safety and Licensing (NS&L). |R1

In general, the evaluator found the training programs to be soundly structured and functional. However, two potential problems were identified with the training program. One potential problem results from a Training Management oversight that system engineers in some organizations (mentioned above) do not get site-specific training because they are not subject to the WBN governing training procedure. Another potential problem results from the failure of

the WBN administrative instruction to specifically implement the requirements from TVA's Nuclear Training Program Manual. With respect to these two potential problems, the evaluator found a necessity for revision of the applicable administrative instruction to provide more detail with respect to training paths for engineers with system responsibility. An additional finding was that WBN line management appeared to be behind on Orientation Phase training for engineers.

Six CATDs were issued to address the concern for inadequate formal training for engineers with system responsibility. One CATD was issued to Corporate Training and another to POTC. The remaining four CATDs were issued to WBN line management.

CATD 30905-NPS-01 issued to Corporate Training noted that the WBN site procedure for technical staff training (AI-10.1) does not apply to site personnel from DNE, DNC, DNQA, or NS&L. Furthermore, the CATD noted that the AI is not responsive to the TVA upper tier procedure which specifies training for site assigned personnel (Area Plan 0202.17). Finally, the CATD noted that there were no responsibilities assigned to ensure that this training program is accomplished.

CATD 30905-NPS-02, which was issued to POTC, noted that a section of Area Plan 0202.17 is not accurate in that responsibility has been transferred from Supervisor, Personnel Service Staff to POTC. R1

CATD 30905-WBN-01 issued to WBN line management noted that AI-10.1 does not implement the requirements of Area Plan 0202.17, and as a result, does not provide guidance for engineers. Also, CATD 30905-WBN-03 to WBN line management noted that AI-10.1 fails to provide sufficient detail on engineering training programs.

CATD 30905-WBN-02 noted that the orientation phase course implemented under Area Plan 0202.17 had not been successfully completed by anyone via classroom attendance and examination. CATD 30905-WBN-04 to WBN line management noted that plant management is lax in sending plant personnel to required training programs.

Conclusion

This issue was verified as factual, and presents a problem for which corrective action is being taken as a result of the evaluation. |R1

Issue 309.05-4 - Inexperienced Shift Technical Advisor (STA) Course Instructor

WBN

Concern IN-86-209-012 pertained to the inadequate qualification of STA Course instructors because they had little or no experience as STAs. Investigation 309.05 SQN was performed and addressed all aspects of the concern. The situation involved joint WBN/SQN class Shift Technical Advisor (STA) training. Someone alleged that an STA student was scheduled to instruct a portion of the next STA class with no experience of having fulfilled the actual watch station as an STA. It was determined that two individuals, indeed, completed the STA training and became instructors with little or no STA experience. However, a review of these individual's qualifications indicated that they were well-prepared for the subject matter they were to teach and their qualifications were within TVA's training instruction requirements. This evaluation concurs with the content of 309.05 SQN as presented in the SQN section below. No problems were identified; no corrective action is necessary. |R1 |R1 |R1

SQN

This issue was substantiated in that there were two instructors performing STA training with little or no STA experience. However, the evaluator found the qualifications of these two individuals well-matched to the subject matter assigned. The duties assigned were also within TVA's requirements for STA instructor qualification. Therefore, no deficiencies were identified.

Conclusion

This issue was verified as factual at WBN and SQN, but what is described is not a problem. |R1

Generic Applicability

This concern was evaluated at SQN and WBN and found to be not valid at both sites. No other site evaluations are necessary.

4.0 COLLECTIVE SIGNIFICANCE |R1

This subcategory consisted of concerns about the adequacy of engineering programs, adherence to procedures, and the adequacy of engineering training. A collective assessment of the findings for this subcategory showed that the issues reflected upon plant-wide programmatic deficiencies and maintenance practices more fully addressed in |R1 Subcategory Report 30700, "Nuclear Power Site Programs/Procedures," and Subcategory Report 30800, "Maintenance." It was determined that a meaningful assessment of the issues presented in Subcategory 30900 could not be accomplished without also examining the findings in the other two subcategory reports. Therefore, no subcategory-level conclusions were made in Subcategory 30900.

5.0 ROOT CAUSE, PRELIMINARY ANALYSIS |R1

Section 3.0 discussed the specific findings for each of the element evaluations of this subcategory. This section presents the results of an independent review and analysis done on these specific element-level findings to identify overall root causes at the subcategory level. Patterns of recurring findings called symptoms were derived from the elements and were tested for root causes. The root causes for all elements were then analyzed collectively to identify those occurring most frequently for the subcategory overall. Details of the symptoms and root causes derived for each element are presented in Attachment D, "Summary of Symptoms and Root Causes." |R1

The review and analysis of the symptoms and root causes pointed to two subcategory level root causes as follows:

a. Some procedures governing engineering training and control of consumables are incomplete or fail to incorporate all technical requirements (WBN, SQN)

b. There have been instances of inadequate controls for temporarily altered equipment and use of consumables to ensure compliance with commitments (WBN, SQN)

These two subcategory level root causes derived from root cause analysis are supported by several element-level findings at two of TVA's four nuclear plants. The first root cause is supported by a) need for revision of the WBN administrative instruction for technical staff training to provide more detail on training paths for engineers with system responsibility (section 3.3), and b) no working level instructions at SQN to address the use of Teflon tape (sections 3.1). |R1

Examples supporting the second root cause include a) two instances at WBN when there was improper identification of the status of temporarily altered equipment (section 3.2), and b) use of Teflon tape at SQN in violation of upper-tier requirements (sections 3.1). |R1

Corrective Action Tracking Documents (CATDs) were not issued specifically on these subcategory-level root causes. It was believed that corrective actions being taken already by line management as part of the commitments made in the Nuclear Performance Plan were helping to address these root causes. However, line management was expected to use the subcategory-level root cause information as an aid in preparing corrective action responses to subcategory-level CATDs that would preclude recurrence of the deficiency noted. The ECTG's process for judging the adequacy of line corrective action response to subcategory-level CATDs included a determination of how well the applicable root causes were addressed by the response. |R1

The significant root causes for all subcategories in the Operations category provided part of the input for determining programmatic areas of weakness at the category level and the associated causes. In the Operations category report, these programmatic weaknesses and associated causes are presented along with a discussion of how they are being corrected through implementation of the Nuclear Performance Plan and other corrective action programs. |R1

6.0 CORRECTIVE ACTION

6.1 Corrective Action at Element Level

6.1.1 Element 309.01 - Adequacy of Procedures |R1

Three CATDs were issued to address problems dealing with usage of Teflon tape. One Non-Plant-Specific (NPS) CATD (30901-NPS-01) was issued to corporate management, and |R1

the other two CATDs (30901-SQN-01,-BFN-01) were sent to SQN and BFN line managers.

NPS

CATD No. 30901-NPS-01

CATD 30901-NPS-01 sent to corporate management noted that inconsistencies exist between WBN, BFN, and SQN on the restrictions of use of Teflon tape. It also made the observation that identification of an acceptable substitute for Teflon tape has not been aggressively pursued. The acceptable corrective action response received from corporate management was as follows:

"The current status of the program to identify an approved, unrestricted thread sealant is outlined in a memorandum from W. E. Pennell to R. A. Sessoms dated February 26, 1987 (B45 870212 259). Some of the information contained in the discussion of Concern IN-85-977-001 in Fact Sheet 309.01-WBN has been updated by a memorandum from H. B. Bounds to George Toto dated March 16, 1987 (B26 870316 001). Site procedures on the use of Teflon tape at BFN, SQN, and WBN may vary somewhat, within the restrictions imposed on Teflon tape usage in G-29M and DPM N73M2, P. S. 4.M.1.1 (R10). Deviations from these engineering requirements are grounds for initiation of a CAQ. Such a CAQ is presently under review for disposition at SQN."

Excerpts from the Pennell to Sessoms memorandum referenced in the corrective action response above are as follows:

Problem

"Application of Teflon thread sealant tape outside the limits imposed by G-29M and DPM N73M2 was identified at SQNP in SCRSQNNEB8525 (reference 3) and at Watts Bar in NCR W-231-P (C24 850501 104).

"In order to avoid misapplication of certain thread sealants in restricted areas, it is desirable to identify a thread sealant material(s) with the following features:

(1) Effects a seal at 650°F/2200 psia on threaded stainless steel joints to gamma radiation doses of 10^9 rads

(2) Contains low levels of halogens, sulfur, and low melting point metals so that it does not promote corrosion/stress-corrosion of these joints under the above conditions

(3) Is easily applied to small-diameter instrument lines by craft personnel wearing C-zone clothing

(4) Provides sufficient lubricity such that galling is prevented during joint construction

(5) Allows the joint to be easily disassembled for maintenance or repair work

"Grafoil tape has been the recommended unrestricted material for thread sealant applications. DNE recognizes the difficulty of applying this tape to small-diameter lines and has been actively pursuing an alternative which will be qualified for use at temperatures up to 650°F and at doses up to 10^9 rads (gamma, 40-year integrated plus accident dose).