Attachment 1

ANNUAL ASSESSMENT

OF THE OFFICE OF ENGINEERING

QUALITY ASSURANCE PROGRAM

FISCAL YEAR 1985

Performed By
The Division of Quality Assurance
Procurement Evaluation Branch
Engineering and Construction Evaluation Group

Prepared By: J.R. Jones

Reviewed By: D.J. Ward

Approved By: J.A. Cattanach

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ANNUAL ASSESSMENT
OF THE OFFICE OF ENGINEERING
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I. SCOPE

This report covers the period October 1, 1984 to September 30, 1985, and is based on an analysis of information pertaining to quality-related activities of the Office of Engineering (OE). Documents reviewed to perform the assessment included: Nuclear Safety Review Staff (NSRS) reports, Nuclear Regulatory Commission (NRC) inspection reports, Institute of Nuclear Power Operations (INPO) reports, OE-Quality Management Staff (QMS) audit and surveillance reports, OE-QMS quarterly assessments of OE quality, and Procurement Evaluation Branch (PEB) reports. Copies of the specific documents reviewed are in the PEB files.

ANSI N45.2, ANSI N45.2.11, and the TVA Topical Report identify the quality assurance program requirements to which OE is committed. For purposes of this report, the OE quality assurance program was assessed by addressing the elements listed in these documents. These elements include: program requirements, design input requirements, design process, interface control, design verification, document control, design change control, nonconformance and corrective action, records, verification of program compliance, and procurement.

II. OVERALL PROGRAM ASSESSMENT

OE has continued this past year to put forth major efforts to align its operating philosophy and resources to better support the nuclear program under the owner-operator concept. Those efforts have resulted in location of personnel onsite to improve communication and responsiveness to the plant operations staff and redesigning the written program to control all activities of OE. These efforts, with a strong commitment to quality by management, will assist in achieving quality objectives.

Losing key personnel due to staffing reductions, changing operating philosophies, restructuring the quality program, discipline staffing, and locating personnel at the sites may have contributed to decreased effectiveness in some areas of OE's quality assurance program.

During FY 85, OE has made progress in defining program requirements and reducing the average age of conditions adverse to quality (CAQs). They have continued to perform adequately in the areas of records and procurement and have taken steps in recent months to strengthen their verification program. Significant problems have been identified in the areas of configuration control, interface control, documentation of design bases, and timely resolution of conditions adverse to quality. These areas of the program need immediate and continued management attention to correct the problems. Although these problems

were documented during FY 85, it is now apparent that many of them originated in previous years. OE is presently working to correct the problems. However, during FY 85 the OE quality assurance program was not adequate to assure design bases were documented; that interfaces were documented and controlled; that nonconformances were documented, generic implications considered, root causes identified, and corrective actions taken to prevent recurrence; and that the verification program identified significant problem areas in the program or implementation of the program.

III. ASSESSMENT OF INDIVIDUAL PROGRAM ELEMENTS

A. Program Requirements

On June 28, 1985, the new procedure system defined by the Office of Engineering Procedures (OEPs) was issued for use in the Engineering Program Directives Manual. These OEPs are written in general terms and are designed around a concept of conveying standard office-level policy and requirements on 18 separate subjects to all OE organizations. These subjects range from project management to training. The level of detail contained in the OEPs is designed to provide flexibility to the OE organizations to use their independent judgments in devising their own methods and schemes for implementing the policies and requirements. Prior to June 28, 1985, OE's quality assurance program was defined by the many volumes of EN DES Engineering Procedures (EPs). These EPs were very prescriptive and perceived to be inflexible in that they dictated to all organizations the same methods for implementing policies and requirements. In many of the EPs it was very difficult to distinguish what was office-level policy and requirement versus organizational preference or licensing commitment.

The new OEPs, when supplemented by branch and project procedures, should adequately describe the OE program and provide the necessary flexibility. We reserve our judgment as to whether restructuring the written program improves the effectiveness of OE design activities until we evaluate implementation of the program.

B. Design Input Requirements, Design Process, Design Verification, Design Change Control

All TVA nuclear plants continue to suffer the consequences of breakdowns in the control of design configuration. Analysis of the many findings of evaluations of TVA's design process activities indicates the most recurring design problems are symptomatic of:

1. Deficiencies in design bases documentation (e.g., design criteria, calculations, FSAR); and

2. Inadequate reconciliation of the as-constructed equipment and systems of the plant (e.g., installed piping and pipe supports at Browns Ferry) with the design bases (e.g., design criteria, calculations, etc.).

Many of the 35 problems identified as a result of the OE/OC evaluation of the electrical systems at Bellefonte Nuclear Plant (BLN) were attributed to OE's delinquency in verifying the design meets all applicable criteria. The INPO evaluation at Watts Bar Nuclear Plant (WBN) has identified several findings where documentation of the design bases has not been adequately established and/or maintained current, and where engineering evaluations have not been performed to verify the design meets all design criteria. The management review of TVA's program for environmental qualification of electrical equipment has revealed that OE did not adequately document the design bases used in qualifying safety-related electrical equipment for all TVA nuclear plants. The NSRS investigation of piping and support design for Browns Ferry Nuclear Plant (BFN) has uncovered similar type problems to those at WBN. NSRS determined that the design bases for piping and support analysis and design were not adequately documented. There also was no documentation to support the engineering evaluation and justification for accepting "as-built" configurations of installed piping.

To address corrective actions for NSRS findings R-81-14-OEDC(BLN)-23, "Documentation of Systems Design Bases"; and R-82-02-WBN-10, "Inadequate Documentation of Systems Design Bases," OE established controls and requirements for generation and maintenance of system description documents in procedure EP-3.38 R0. NSRS closed these findings during the second quarter of FY 85 based on the adequacy of the procedure and the progress made in the development of system descriptions for WBN and BLN. Requirements for system description documents are now found in OEP-08, "Design Output."

System descriptions are being prepared for TVA nuclear plants. As of September 30, 1985, none were issued for BFN and SQN. However, 37 of a planned 61 have been issued for WBN, and 42 of 83 have been issued for BLN. These system description documents will benefit the nuclear plant operators by providing in a single source for each system a detailed description of the system, its performance characteristics, precautions and limitations, system interfaces, and special operations.

These elements of the OE program were not adequate to assure that design bases were documented or considered during the design of specific systems or components. Without this documentation, OE cannot ensure that systems and components were adequately designed. These elements of the program need immediate management attention to establish controls to ensure design bases are documented, are included in the design, and the as-constructed systems/components accurately reflect the design.

C. Interface Control

In the day-to-day activities involving the design process, coordination of some design information appeared to be lax. An example of this was the failure to process the NCR and failure evaluation report involving the SQN containment pressure transmitter problems and to notify responsible individuals in prescribed timeframes. This was determined to be a common occurrence within OE and one that has been identified by OE's internal audit organizations prior to and since the SQN pressure transmitter incident.

The conclusion drawn in the evaluation report on the electrical area at BLN that "the design and construction process is not sufficiently defined and controlled across all inter- and intra-organizational boundaries to ensure the continuity of actions needed to provide a quality product" is not only true in the electrical area for BLN but is also true in other areas for other TVA nuclear plants.

NRC has identified concerns at WBN that procedures are lacking or do not exist to address all administrative controls and responsibilities between OE and NUC PR. In the SALP report for WBN issued March 26, 1985, NRC indicated that TVA's inadequate review of the Appendix R requirements for fire protection had been compounded by the lack of coordination between OE and NUC PR in the implementation of the total plant fire protection program. The overall conclusion of the SALP report was the TVA fire protection program for WBN was incomplete and fragmented and that discrepancies noted would have been violations had the plant been licensed.

Interfaces between OE and external organizations (e.g., OC, and NUC PR), were not adequately documented or, in some cases, were not adequately implemented. This element of the program needs immediate management attention to identify, document, and resolve problems in interface areas.

D. Document Control

Document control systems are generally effective in controlling the initial issuance of design documents and subsequent document changes. Violations of procedures and guidelines for controlling design documents appear to be isolated occurrences and can be generally attributed to individual negligence and/or inattention to procedural details.

This element of the program appears to be adequate to assure that documents are properly controlled.

E. Nonconformance and Corrective Action

OE's corrective action program has been criticized by many organizations evaluating OE performance in this area. For much of the year, OE did not appear to be moving expediently and in a direction toward resolving identified problems and their root causes. Many of the problems identified by all parties evaluating OE's performance were repetitive in nature. This is because corrective actions for years tended to "band aid" specific problems identified in one organization but did not adequately address all actions to prevent recurrence in other OE organizations.

Timeliness and responsiveness in resolving CAQs continued to be a problem during the year. The average age of open CAQs tracked and reported by OE steadily increased between December 1984 and June 1985 from 620 days to 714 days. This is perceived to be due to top priorities being assigned to the WBN unit 1 fuel load effort and not to solving quality problems. However, between June and September 1985 the average age dropped to 549 days. The average age of OE open audit findings also decreased from 15 months to 5.2 months during the year.

The nonconformance and corrective action elements of the program were not adequate to assure that problems were documented, generic implications were considered, root causes were identified, and appropriate corrective actions were taken to prevent recurrence. Management attention should continue to be focused on this element of the program to ensure that root causes are identified and appropriate and timely corrective actions to prevent recurrence are taken.

F. Records

The evaluation results pertaining to records management systems were minimal during this reporting period. However, it appears the systems for collecting, storage, and maintenance of design documentation and records are adequate in meeting the requirements of ANSI N45.2.9.

G. Verification of Program Compliance

Responsibility for the OE verification program rests with the Quality Management Staff (QMS). One group within QMS is responsible for the review of OE procedures to assure that all applicable requirements have been included. The other group in QMS is responsible for auditing to assure that the OE written program has been adequately implemented.

QMS was criticized by NRC in violation 390, 391/85-06-06 for not auditing all organizations performing quality-related design activities. QMS responded by increasing the number of audits planned to include the design organizations located at the nuclear sites. It appeared that the audits planned by QMS, if executed as

scheduled, would satisfy the internal audit requirements for OE. In closing the violation, NRC concluded that the QMS audit program was adequate in meeting the minimum requirements of ANSI N45.2.12.

For much of the year, some deviations from program requirements were documented as problems rather than audit deficiencies; audits appeared to be limited in depth due to the rigid timeframes established for the length of audits (usually 3 days); audit plans and schedules did not appear to be revised to consider significant problem areas identified by other organizations; and only a limited number of surveillances were performed.

In recent weeks procedures have been revised to more clearly describe how to distinguish between problems, areas for improvement, and audit deficiencies. This should help to properly classify program deviations and ensure that audit deficiencies receive the appropriate management attention. Also, in recent months more technical people from the design organizations have been participating in QMS audits. This has resulted in the identification of more technical problems. In addition, QMS has also reduced the average age of open audit findings from 15 months to 5.2 months.

However, for much of the year, the verification program was not adequate to identify significant problem areas with the written OE program or implementation of the program. This conclusion is based on the results of a PEB audit of the QMS verification program; comparison of the results of the QMS surveillances for evaluating OE environmental qualification activities with the results of the recent management review of the TVA Environmental Qualification Program; and NSRS finding I-85-06-WBN-04, "The QA Verification Program Ineffectiveness," which was written as a result of the NSRS review and investigation of the cable problems at WBN.

The Manager of OE should continue to emphasize the importance of an aggressive QMS verification program in order to identify and seek timely resolution of problems.

H. Procurement

The evaluation results gathered for this assessment are not sufficient to address all aspects of procurement control. A few specific procurement activities were addressed in the documents used in this assessment. Analysis of the results of those indicate that procurement-related responsibilities and activities of OE are adequate; however, some problems were identified in procurement training and procurement practices between OE and NUC PR due to inconsistent terminology.

Attachment 2

The following are the Procurement Evaluation Branch's recommendations for improvement of the OE quality assurance program in the corresponding areas identified in the Annual Assessment Report for FY 85.

1. Design Input Requirements, Design Process, Design Verification, and Design Change Control

To adequately control the configuration of the design, OE should establish controls to "freeze" the design of a plant system at a specified point in the design process. This design "freeze" should prohibit any major modifications or revisions to all design documents for any specified system or plant feature. After "freezing" the design, a comprehensive design review should be performed to determine the adequacy and completeness of the design documentation for that system or feature. This design review should be performed by OE, OC, and operating plant engineers to ensure all design bases documentation is complete, accurate, and supports the current design. These reviews should also ensure that all design changes and requests for changes have been adequately evaluated and correctly incorporated in the design. After the design bases documentation has been established as complete, all future design changes and requests for change should be reviewed in a similar manner for impact. These should be incorporated or rejected in accordance with established OE design control measures.

This recommendation should be implemented with INPO recommendations 2.5-3, 2.5.-5, and 2.5-7 (reference A02 851017 006) to provide the necessary assurances that nuclear plant systems and components are adequately designed.

2. Interface Control

OE should become more involved in defining and documenting interfaces and responsibilities with other organizations (e.g., OC, operating plants, support organizations). Interdivisional procedures, (i.e., ID-QAPs) have proven to be a useful vehicle for accomplishing this in the past. Procedures used in establishing interfaces should also define the "language" to be used by all organizations to ensure effective communication. Examples where the "language" has not been clear and needs to be defined are: quality levels, "Q" lists, class 1E equipment lists for harsh environment versus mild environment, CSSC lists, and nonconformances.

We endorse the recommendations for enhancement of the design control program found in the Gilbert/Commonwealth report, "Assessment of the Design Control Program for the Sequoyah Nuclear Plant," for all TVA nuclear projects. This report recommends that OE internal interfaces be detailed procedurally either in the OEPs or in Section VI, "Interface Control," of the Project Manual and that additional training be provided to ensure that site personnel responsible for identifying

appropriate design interfaces are fully aware of the work performed by Knoxville groups and its potential impact upon site designs. This report also recommends that interfaces between OE and operating plant organizations in areas of Plant Modifications Unit work, as-constructed drawing control, and site quality assurance activities related to design and procurement be defined. This should be accomplished by making procedures for activities in these areas available to OE site personnel or including a condensed version of these requirements in the Project Manual.

We also endorse INPO's recommendation 2.5-9 (reference A02 851017 006) to improve communications and teamwork between OE and NUC PR.

3. Nonconformances and Correction Action

OE should begin performing diagnostic reviews of all conditions adverse to quality (CAQ) to determine real root causes in addition to correcting identified problems. We agree with the INPO recommendation 2.5-8 (reference A02 851017 006) that a root cause analysis should be conducted for all major deficiencies recently identified in the OE programs. The deficiencies listed by INPO include the equipment qualification program deficiencies, long-term commitment tracking program deficiencies, and seismic analysis program deficiencies. INPO further recommends that this analysis requirement be established "as an ongoing effort to feed back lessons learned for program improvements."

OE management should continue to emphasize to all OE personnel the importance of complying with H. G Parris's recently issued "Policy Regarding Denial of NRC Identified Violations." This policy should be implemented in addressing all identified problems or potential problems.

Upper management should continue to place top priority on resolving quality problems and their root causes. During the last few months of FY 85 the average age of open items was decreasing. This trend should continue with appropriate management attention and encouragement.

OE's corrective action program should also be revised to explicitly and adequately address corrective actions taken to assure the quality of items affected prior to discovery of the adverse condition.

OE's program should be revised to address the escalation of responsibility for resolving all CAQs, i.e., NCR, SCR, PIR, and audit findings. We recognize that the Quality Management Staff has recently issued a procedure for escalating audit deficiencies within their organization. In general, this procedure is too limited in scope and does not establish criteria for escalating a deficiency.

4. Verification of Program Compliance

While audit reports in recent months seem to have improved in providing more detail, additional improvement needs to be made in the overall planning, scheduling, execution, and reporting of audits.

TVA 64 (05-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

L20 860127 997

TO : R. W. Cantrell, Manager of Engineering, W12 A12 C-K

FROM : R. J. Mullin, Director of Quality Assurance, LP 4N 45A-C

DATE : January 27, 1986

SUBJECT: ANNUAL ASSESSMENT OF THE OFFICE OF ENGINEERING (OE) QUALITY ASSURANCE PROGRAM - FISCAL YEAR 1985

The attached report (Attachment 1) is based on information gathered from sources identified in the report and represents the Division of Quality Assurance's assessment of quality-related activities of OE during FY 85. Recommendations are included in Attachment 2 for improving the areas identified in the report. If effectively implemented, I believe these recommendations will lead to improvements in OE's quality assurance program.

The program elements assessed included program requirements, design input requirements, design processes, interface control, design verification, document control, design change control, nonconformance and corrective action, records, verification of program compliance, and procurement. Although the overall OE quality assurance program is considered in compliance with 10 CFR 50, Appendix B, it was noted in the report that significant improvements are required in several areas and acknowledged that OE is taking corrective action.

In this transmittal memorandum some additional comments on the "Records" and "Verification of Program Compliance" Sections of Attachment 1 may be helpful. Although the assessment indicates that evaluation results pertaining to records management systems were minimal during this reporting period, I am aware of the ongoing efforts of the team established to resolve the Quality Engineering Branch vendor records concerns that were highlighted as a result of the Nuclear Review Staff (NSRS) follow-up review (NSRS Report No. R-85-07-NPS) conducted in March and April 1985. Although team meeting reports indicate that some progress is being made, there remain several obstacles to effective use of vendor records at the sites, and this situation warrants continued OE management attention and support. (See R. A. Pedde's memorandum to files [C01 860107 004] dated January 7, 1986.)

With respect to verification of program compliance, I find the OE audit reports and quarterly reports to be well structured, but suggest that the current Quality Management Staff (QMS) audit program be reviewed and consideration be given to:

1. Organizing the audits and/or audit staffs along project or activity lines in order to provide improved verification services and product confidence to design project managers.

2. Increased scheduling flexibility, i.e.; the audit duration and team size should better reflect the complexity and level of activity of the process or engineering product being audited.

R. W. Cantrell
January 27, 1986

ANNUAL ASSESSMENT OF THE OFFICE OF ENGINEERING (OE) QUALITY ASSURANCE PROGRAM - FISCAL YEAR 1985

3. Decreased emphasis on audits of OE staffs and more time spent examining the engineering "product" organizations; take the audit more to the "worker level" in the field.

4. Eliminating or significantly reducing any time spent auditing the fossil and hydro aspects of OE work that may interact or merge with OE's nuclear work.

5. Significantly increasing the technical design focus of audits and decreasing the proportion of time spent on the contractual and routine administrative compliance aspects associated with the Office of Engineering Procedures (OEPs).

6. Increasing the technical depth and specificity of audit checklists.

7. Continuing the use of technical line personnel to augment audit teams, but using teams of such personnel rather than just one or a few individuals.

8. Continue counteracting the perceived emphasis on a low-key approach (there has been a significant drop in audit findings identified since the fall of 1984 for both WBN and BLN).

In summary, I believe both the auditors and the QMS managers to be qualified and well intentioned, but recommend a careful review of the OE audit process as soon as possible.

As a final note, I believe that the new OEPs have the potential to improve the effectiveness of OE design activities, but suggest that continued emphasis and attention be placed on thoroughly and promptly supplementing these as appropriate with branch and project procedures.

Please call if you have any questions concerning the preceding comments or the annual assessment.

R. J. Mullin

RJM:MCC
Attachments: 2
cc (Attachments):
RIMS, MR 4N 72A-C
W. R. Brown, 9-169 SB-K
J. A. Crittenden, LP 4N 104A-C (w/o attachments)
J. P. Darling, NUC PR, Bellefonte
C. C. Mason, LP 6N 37A-C
F. A. Szczepanski, BR 1N 76B-C

PROCUREMENT EVALUATION BRANCH
JAN 30 '86

	Note	Action	Reply
Chief	✓		
SEG			
PP&SS			
E&C	✓		
RIMS			
FILE	✓		

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

B05 '860616 001

TO : R. B. Kelly, Director of Nuclear Quality Assurance, LP 4N 45A-C

FROM : J. Frederick Weinhold, Manager of Engineering Assurance, W12 B34 C-K

DATE : JUN 16 1986

SUBJECT: ANNUAL ASSESSMENT OF THE ENGINEERING QA PROGRAM FOR FISCAL YEAR 1985

Reference:
1. Memorandum from R. J. Mullin to R. W. Cantrell dated January 27, 1986 (L20 860127 997)
2. Memorandum from M. P. Berardi to Those listed dated May 7, 1986 (B05 860512 002)
3. The Nuclear Performance Plan
4. Memorandum from R. G. Domer to Those listed dated March 24, 1986 (B20 860325 001)

Reference 1 was the Division of Quality Assurance annual assessment of OE's Quality Management Staff for fiscal year 1985. The reorganization of all engineering functions into the Division of Nuclear Engineering, the establishment of Engineering Assurance, the additions of about 15 consultants to the Engineering Assurance organization, the internal strengthening of the permanent Engineering Assurance staff, and the rewrite of the engineering procedures go further than the recommendations in reference 1. The body of the reference contained eight suggestions for review and consideration. These eight items are addressed in attachment 1. Attachment 2 to reference 1 contained Procurement Evaluation Branch's four recommendations for improvement. These four recommendations for improvement are addressed in attachment 2.

This memorandum fully addresses the annual assessment with the exception of two parts to one recommendation in attachment 2 that are no longer applicable due to the reorganization of Power and Engineering, and one part of one recommendation dealing with escalation of problems is being addressed separately. Therefore, we request that the item be closed and the Sequoyah restart item PEB-27 be considered as complete.

J. Frederick Weinhold

EGB:JW
Attachments
cc (Attachments):
RIMS, SL 26 C-K
R. G. Domer, W12 A5 C-K
W. C. Drotleff, W12 A12 C-K
J. A. Kirkebo, W12 A8 C-K
E. G. Beasley, W12 B34 C-K

QA Record

DNE1 - 0833I

Attachment 1

ITEMS FOR REVIEW AND CONSIDERATION

(The item numbers are keyed to the items in the body of the memorandum from R. J. Mullin to R. W. Cantrell dated January 27, 1986.)

1. The audit organization and the audit program being developed in Engineering Assurance will include both programmatic and technical audits. The present plan is that the new audit program will include audits along the project and activity lines as well as audits of organizational units.

2. In the new Engineering Assurance audit program the schedule of the audit duration and the determination of the audit team size will be adjusted to reflect the complexity level of the activity being audited.

3. The Engineering Assurance audit program will emphasize the auditing of the engineering products, primarily design output. The Engineering Assurance independent oversight review for Sequoyah Nuclear Plant Design Baseline and Verification Program outlined in M. P. Berardi's memorandum to Those listed dated May 7, 1986 (B05 860512 002), is a good example of the emphasis placed on auditing of engineering products.

4. The reorganization of the Power and Engineering into separate engineering organizations for nuclear work and for fossil and hydro work has resolved this concern. The Engineering Assurance organization is involved only with the nuclear engineering function.

5. The technical audit function has been separated from the programmatic audit function in the new Engineering Assurance organization. This technical audit function will result in considerable additional effort in technical audits of the engineering program.

6. The technical depth and the specificity of the audit checklist and audit task sheets are being increased through the reinforced audit effort.

7. Technical line personnel will continue to be involved in technical audits and the team approach is being used. The independent oversight review of the Sequoyah design baseline is a good example of the continued use of line technical personnel. In the Sequoyah endeavor, the team approach is being used in that every technical discipline is represented by one or more persons from the line organization.

8. The emphasis on the low key approach was counteracted with the elimination of the owner/operator program and the establishment of the strong Engineering Assurance organization. Further, Engineering Assurance auditors only identify deficiences and make recommendations thus eliminating "problem" as a category of concern; this will deemphasis the low key approach and will increase significantly the number of audit deficiencies. Please note, we do not consider a bean count on the number of audit finding a valid indicator.

Attachment 2

RESPONSE TO PROCUREMENT EVALUATION BRANCH RECOMMENDATIONS

(The item numbers are keyed to the recommendations in attachment 2 to the memorandum from R. J. Mullin to R. W. Cantrell dated January 27, 1986.)

1. Design Input Requirements, Design Process, Design Verification, and Design Change Control

   This recommendation correctly identifies the major problem area for TVA nuclear plants. The Sequoyah Design Baseline and Verification Program that was established for the Sequoyah restart and the Engineering Assurance independent oversite review of this program as it is implemented are addressing the problem area. Design baselining will be done on the three other plants. The OEPs are being reworked into NEPs and include essential controls previously missing from the OEPs. In light of these major undertakings, it does not appear that the design freeze method of control is appropriate at this time. This is especially true since time is of essence and the Engineering Assurance review and oversite are being conducted concurrently with the actual work performance.

2. Interface Control

   During fiscal year 1985, OE had very limited control of external interfaces due to the owner/operater definition of responsibilities that gave all controls to the site directors. The establishment of the Office of Nuclear Power resolved this situation. Presently, Engineering's major involvement provides a role in the interface development. Several factors in the reorganization of the Office of Nuclear Power should resolve the engineering external interface problems. First, all engineering is being consolidated in DNE. Second, a strong working relationship has been developed between engineering and the modification and construction organizations through the DNE project engineer. Third, the elimination of the design service organization at each site has eliminated one major interface through which engineering information previously flowed.

   The development of the new procedures for Office of Nuclear Power will also clear up some interface problems. DNE has had limited participation in the development of these procedures and the revised NQAM. DNE will review these procedures and provide input to ensure that the interface control is defined and documented.

   With respect to internal interfaces, two major changes are underway. First, the role of the project engineer has been expanded; he has been given lead responsibilities on essentially all items affecting his specific nuclear project. The stage was set for this expanded project engineer responsibility in R. G. Domer's memorandum to Those listed dated March 24, 1986. Assignment of work in the attachment to that memorandum will clear many of the interface problems between projects and the central staff.

The second major effort is the strong interaction between the Director of Nuclear Projects, Director of DETS, the Manager of Engineering Assurance. The strengthing of these roles and the participation in the Engineering Assurance function will be reflected in the new NEPs and the project manual expansion to cover the new role of the project engineer.

3. Nonconformances and Corrective Action

This recommendation really contains five separate independent recommendations and each will addressed separately.

OE has initiated a diagnostic review of conditions adverse to quality through an expansion and implementation of the trend program. CAQs have been entered into the trend data base. The trend program has been used to sort these by subject and organization. These sorts with identified trend information have been forwarded to the line organizations. The line organizations are actively pursuing and analyzing these conditions. In addition, the trend effort is being reinforced in the new Engineering Assurance organization. The reinforcement will consist of elevating the trend program to a problem identification organization that will contain two subunits. One unit deals with the trends and expansion of the DNE program into the TVA wide TROI trend program. The other unit in the problem identification organization will deal with problems identified by other organizations that could be applicable to engineering.

The second and third recommendations concern emphasis on Power and Engineering policies that have been discontinued.

The baseline programs being established for each nuclear plant will ensure the quality of all nuclear safety-related items will be brought up to an acceptable level prior to restart or initial fuel load. Ongoing programs to maintain the design baseline will include the lookback each time a CAQ is identified to ensure that products previously produced do not contain the same defects or if they do contain the defects to get defects corrected.

The escalation of responsibility for resolving problem areas is being addressed in a separate memorandum covering DNEs escalation procedure.

4. Verification of Program Compliance

These four recommendations concerning the Engineering Assurance audit program will be rolled into the new Engineering Assurance audit effort.

Audits will be based on activities as well as the organization units and 10CFR50, Appendix B criteria. The audits will be conducted at appropriate times relative to the conduct of the work. The rigid timeframe and use of auditors that were necessary under the limited resource condition will be resolved through assigning the manpower and time necessary to adequately sample and review the work being audited. Lastly, the task and audit checklist will be documented in sufficient detail to determine what was reviewed and the criteria used in the audit.

ENCLOSURE 1

INFORMATION ONLY

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS REPORT NO. R-85-11-NPS

SUBJECT: MAJOR MANAGEMENT REVIEW OF CORRECTIVE ACTION

DATES OF REVIEW: MAY 13 - JULY 10, 1985

TEAM LEADER:

A. G. DEBBAGE DATE

REVIEWERS:

H. W. BENNETT DATE

R. J. GRIFFIN DATE

J. T. MUECKE DATE

APPROVED BY:

M. S. KIDD DATE

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I. BACKGROUND

At the end of 1984 NSRS scheduled a management review of the corrective action process to begin approximately April 1985. In January 1985, Browns Ferry Nuclear Plant (BFN) was still operational and the BFN Regulatory Performance Improvement Program (RPIP) had been in existence for one year. The NRC Systematic Assessment of Licensee Performance (SALP) Board had reviewed TVA activities during the period January 1, 1983, through February 29, 1984, and issued its report June 12, 1984. The overall evaluation stated that TVA still experienced difficulty in preventing problems identified at one site from recurring at one or more of the other sites. Lack of timely corrective action continued to be a problem when interdivisional coordination was required for resolution of issues. BFN was given a low SALP rating. One cause of the problem areas was lack of management attention to the identification of the root cause of problems and inadequate corrective action.

At BFN on August 14, 1984, overpressurization of unit 1 core spray system occurred and resulted in a civil penalty of $100,000. During the return to service of unit 3 on October 22, 1984, the NRC stated that BFN violated its technical specifications, failed to follow plant procedures, and failed to ensure adequate management control. This was the first serious indication that the BFN RPIP had not reached the level of implementation expected. In January 1985 the Office of Engineering (OE) issued a nonconformance report (NCR) identifying the potential inaccuracy of the Sequoyah Nuclear Plant (SQN) pressure differential transmitters. These transmitters measure the pressure differential between the inside and outside of the steel containment vessels, and the ability of the transmitters to perform accurately in the environment following a design basis accident was questioned. The Failure Evaluation/Engineering Report (FE/ER) for the NCR was issued in March. The NRC was concerned with the time taken to issue and process the NCR. The NCR issued an order modifying SQN and BFN operating licenses while the NSRS corrective action review was in progress.

At BFN unit 2 had been shutdown for refueling September 15, 1984. Unit 1 was shutdown March 19, 1985, following problems identified during local leak rate testing. Unit 3 was shutdown March 9, 1985, following discrepancies in instruments measuring the level of cooling water above the core and improper operator actions. This resulted in a civil penalty of $150,000. At the time of the NSRS review, BFN was completely shutdown. The management review of corrective action began May 13, 1985, and ended July 10, 1985.

II. SCOPE

This major management review was undertaken to determine the corrective action program adequacy and the effectiveness of its implementation. The review was conducted at the Office of Engineering (OE) and Office of Construction (OC) in Knoxville, the Office of Nuclear Power (NUC PR) in Chattanooga, Browns Ferry Nuclear Plant (BFN), Sequoyah Nuclear Plant (SQN), Watts Bar Nuclear Plant (WBN), Bellefonte

Nuclear Plant (BLN), and OC/OE activities at the plants. The review included examination of longstanding problems identified both within TVA and by NRC or other external organizations.

NSRS interviewed senior managers, supervisors, quality assurance staff, and other personnel involved in the corrective action process, reviewed commitments, procedures, reports, tracking records, and other documents pertaining to the control of corrective action activities.

III. MANAGEMENT SUMMARY

A. Program Adequacy

At the commencement of the corrective action review the quality assurance (QA) program was examined. This consisted of examinations of upper tier documents to determine that they met all requirements and commitments for corrective action controls, then verifying that implementing procedures were adequate. The elements of a corrective action program were adequately addressed in the upper tier documents with two exceptions. There was no approved ID-QAP governing interoffice control of nonconformances, and a Topical Report commitment for monthly reporting of unresolved nonconformance reports to the Quality Manager and Construction Engineer was not included in QC QA procedures. Four areas of program weakness were noted in the OE Engineering Procedures (EPs). These concern how deficiencies identified by review organizations are distributed, no interface document for resolution of corrective actions affecting both OE and NUC PR, trend analysis program responsibilities not defined, and the restrictions on OE funding by NUC PR.

Five recommendations were made to plant implementation procedures. Interface with OE, site OE, Site Director, Plant Manager and others should be clearly defined and compatible with Design services interface controls and OE Procedure OEP-17. Dispersed corrective action instructions should be consolidated wherever possible. One duplicate procedure (SQN) was identified and one contained interface information from a cancelled document (SQN). The informal draft CAR/DR process instituted by section instruction letter PQA-SIL-3.1 had caused non issue and substantial delays in issuing CARs at WBN. NSRS recommends that the informal process be eliminated.

B. Program Implementation

The program implementation and its effectiveness was determined by the review of corrective action activities in OE, OC, and NUC PR central offices; OE, OC, and NUC PR at WBN and BLN; and OE and NUC PR at BFN and SQN. The training center was not included in the review. The "Selected Program Implementation Functions" in this report (sections V.C.1 through V.C.9) were developed from this review.

The Inspection Rejection Notices (IRNs) and Quality Bulletins reviewed were specific to OC only. IRNs are generated differently at WBN and BLN with the BLN method being preferred by NSRS. The Quality Bulletin program was found to be effective as a communication tool. The Corrective Action Reports (CARs)/ Discrepancy Reports (DRs) were specific to NUC PR only. The use of the number of CARs or DRs issued as a performance indicator was not considered desirable. The use of the age of CARs/DRs as a performance measure is better, but the review showed that this also has limitations. All other program implementation functions were reviewed in OE, OC, and NUC PR. These included NCRs, tracking systems, trend analysis, corrective action priority, quality assurance, interface problems, and management attitudes.

Examination of significant NCRs generated in OE indicated that many had not received prompt corrective action. Major problems with closing NCRs were ineffective interfacing within OE and with NUC PR and the inability to establish realistic commitments concerning the time needed for OE to complete a job. Examples are given showing that even after years of NUC PR/OE interfacing on specific issues, differences of opinion still exist. Examination of the handling of the NCRs in OC indicated that the NCR program appeared to be functioning properly with the exception of possible failures to write NCRs based on inspections as identified by INPO. NCRs were examined at the OE units in BFN, WBN, and SQN. Many of the open NCRs were over three years old, the average age to closure being for BFN-28.2 months, SQN-31 months, and WBN-19.1 months. The Design Services budgets at BFN and SQN were reviewed and they included line items for completion of ECNs, NCR preparations and responses, and new DCRs. With the exception of WBN where a Design Services Manual was being developed, no formal procedures had been established to control the local OE/NUC PR activities. During an audit on NCRs maintained by the Compliance section at BFN, one finding identified inadequate documentation of the current status and closure of approximately 50 NCRs. NSRS observed that BFN responded promptly to the audit findings.

OE and OC utilize TROI to track and monitor the status of NCRs, audit deficiencies, NSRS items requiring closure, NRC identified items, 50.55(e) reports, part 21 reports, Commitment Tracking Records for licensing commitments, and stopwork orders. There was a problem of dates being established for action items on TROI listings which had not been coordinated previously with a responsible party. This resulted in actions coming due before the responsible party received documentation of the problem and corresponding tasks. These problems typically involved interfaces between branches and OE/OC. The interface problem with NUC PR appeared to be at the other extreme of not being able to assign realistic action dates so a future date of 1999 would be used. Three tracking systems were intended to meet the needs of OC, these being TROI, the NCR Log, and the Commitment Tracking Index (CTI). A Commitment Tracking Program (CTP) was established in 1983 and in 1985 OC committed to proceduralize the CTI. This was implemented at BLN but not at WBN as of August 13, 1985.

In NUC PR commitment tracking was maintained in the Nuclear Central Office (NCO) and also at each plant. The movement is toward central commitment control at NCO but that was not in place during the review. BFN was using the NCO tracking system but there were also numerous plant tracking systems in use. The audit which found the problem with NCRs also identified over 24 automated and manual tracking sytems for handling identified deficiencies. At SQN the major printout for C/A items was called the Corrective Action Tracking System (CATS). WBN used a CATS Log and also an action item list. BLN had a tracking system for CARs and DRs and employed a monthly corrective action summary report.

Examination of the Trend Analysis program in OE indicates that the effectiveness of the trending program has been negligible. IRN trending in OC appeared to provide useful information at BLN. At WBN the information usefulness was questionable because IRNs were not necessarily written for every appropriate instance. BLN trended NCRs by cause rather than by deficiency, which is more useful and informative than the WBN NCR trending. The Quality Problem Resolution Summary is prepared by DQA for the Monthly Top Management Meeting (MTM) held by NUC PR. Items are trended for each plant, other nuclear support divisions, and DQA. The trends so far did not indicate any improvement in the age of the quality problems being trended.

The priority of performing corrective action is tied to meeting a schedule that does not allow managers to place the appropriate priority to ensure prompt C/A on all identifed problems. In general the high priority items get management attention and other items generally get ignored until the schedule turns them into high priority items.

The Quality Assurance review of the OE Quality Management Staff (QMS) included interviews with management, review of QMS audits that included corrective action in the scope, and a review of "QMS Quarterly Assessment of OE Quality" reports. The quarterly assessments agreed with the overall observations made by NSRS during the corrective action review. The audit program had not supported the assessments by conducting aggressive audits of the corrective action program to determine why timeliness and resolution of past deficiencies remain a problem. NSRS believes that these audits should be of a sufficient duration and depth to provide meaningful output to OE management concerning program implementation and effectiveness.

The role of quality assurance in the OC C/A process was evaluated by interviewing personnel inside and outside the quality asurance organizations and by reviewing audit reports and associated responses. NSRS found that responses to audit deviations were generally adequate and timely. But the scope, depth, and adequacy of the audits could be improved.

Quality Assurance in NUC PR included a review of the function performed by the Division of Quality Assurance (DQA) management in the identification of problem areas and the corrective action process. Corrective action/correction of deficiency audits were examined. A random sample of other reports and correspondence related to the deficiencies identified in these reports were reviewed. During the interviews with DQA management all agreed that more line involvement was needed in improving the corrective action process. Interviews with auditors revealed that only too frequently a problem would be identified to a plant and basically nothing was done to correct the problem. At a later date the NRC would issue a notice of violation to the plant for the same problem.

Interface Problem review included internal interfaces and external interfaces. No problems were identified in OE when corrective action was limited to involvement of one discipline within a project. However, a general perception existed of not being able to resolve corrective action quickly when multiple disciplines were involved.

Personnel interviewed in OC generally indicated no problems in interfacing with other organizations in OC. Communication on a personal level appeared to be good at each of the sites, though very little need for communication between WBN and BLN was recognized.

For the OC/OE interface OC personnel expressed the concern that when NCRs must be handled by the OE branches, they have no effective interface. OC personnel stated that they have had difficulty finding the proper contact and that often the responsible OE branch person was unresponsive and seemed to place little priority on the site NCRs.

The NUC PR/OE interface had been, in theory, improved for operating plants due to locating OE personnel at the plant site. However, the locating of OE people at the sites had not eliminated interface problems. OE still maintained NCRs which required NUC PR to perform corrective action. During the review no procedure existed which addressed the OE/NUC PR interface on NCR corrective action and disposition.

Management attitudes in OE were examined by a historical review of OE corrective action. In general, a lack of timeliness and responsiveness towards corrective action had been acknowledged by OE Management for years. This awareness had led to years of discussions, action plans, task forces, and memorandums and had resulted in a policy of corrective action that was directly related to meeting either OC or NUC PR schedules. A recent example is given in this report of an NSRS review of OE activity completed March 29, 1985 and as of July 30, 1985 the response was still unacceptable. Management attitudes in OC toward C/A were evaluated by interviewing managers and their subordinates and by reviewing various C/A taken. C/A emphasis or priority appeared

to be dependent on the good intentions of individuals rather than being built into the system.

Management attitudes in NUC PR were obtained during interviews. There was general agreement among those contacted that TVA has to do a better job with timely and effective corrective action. The problem was in how to change old thoughts and mindsets. There is an attitude change needed regarding correcting problems. That is, when deficiencies are recognized, the need is to correct them, not to skirt around the issue.

TVA was felt as not having defined itself adequately to the NCR. What was regarded as necessary was a well defined focal point and a clear-cut organizational structure. The recent appointment of Hugh Parris as head of TVA's nuclear business was regarded as a strong step in this direction. The need for "getting your signals straight" had to start at the top. The need for more realistic goals and objectives was expressed. TVA would have to get good at the nuclear business before aiming at being the best.

C. Special Problems

A summary of NSRS report R-85-08-OE/NUC PR dealing with the OE/NUC PR interface handling of nonconformance reports is included as an example of failure to take timely, responsive, corrective action. A summary of NSRS report I-85-06-WBN dealing with cable routing, installation, and inspection practices is included to show that the corrective action system in place from 1979 through early 1985 was incapable of correcting difficult problems in a timely manner. The need for a procedure to control the interdivisional handling of nonconformance reports was first identified early 1981 in an audit report. The history of the effort to produce the procedure has been summarized. As of August 1985 the procedure had still not been issued. The Quality Problem program was initiated by OQA to identify and address long-standing problems. During this NSRS review it was noted that it had been omitted from the transition plan when responsibilities for QA were transferred from OQA to DQA.

A review was conducted on how TVA is seen and responds to outside agency reviews. Included were the NRC, INPO, and the Management Analysis Company (MAC) review of BFN. Instances were found of inadequate responses by TVA to NRC notices of violation. NRC SALP reports were examined and extracts from the SALP report January 1, 1983 to February 29, 1984 are included. It was concluded that positive corrective action to NRC concerns would have provided an improved regulatory environment. INPO evaluations conducted from 1981-BFN, 1982-SQN, 1984-BLN, 1985-WBN, plant responses to INPO identified problems, and plant subsequent actions were examined. It is concluded that management did not ensure that all identified items were corrected, or that problems identified at one plant were reviewed for applicability to other plants. The MAC report was an excellent summation of the situation at BFN around May 1984. When issued, the report received

NUC PR top management review. It is observed that not all of the recommendations made have been implemented.

The BFN Regulatory Performance Improvement Program (RPIP) was reviewed since it is the largest corrective action program undertaken by NUC PR, excluding the BFN fire restoration program. It had been preceded by a 6-point program which had replaced the 8-point program neither of which had been successful. BFN management worked hard on the RPIP and some major accomplishments were made. But the RPIP failed to attain the desired level of regulatory performance. The control of as-built drawings was selected for review since it was first identified as a problem at BFN in 1975 and subsequently in a 1981 audit.

D. Root Causes

Interviews were conducted with Site Directors, Plant Managers, OE, OC, and NUC PR Managers and Supervisors, the Director of QA and his staff, and others involved in the correction action process, to obtain their perspective on the handling of problems experienced by TVA in the nuclear power program. This listing of root causes was largely developed from these interviews. No attempt has been made to place the root causes into any special order of importance.

RDS 11/17

1 ~~a.~~ Lack Of Strong Management Controls

a ~~(1)~~ Failure to Take Ownership of Problems

The review team observed a need to assign responsibility for correcting items identified in the various corrective action processes and to hold people accountable for their results (or lack of results). This was similar to a common thread found at plants which had a reputation within INPO and NRC for controlling outages successfully. They assigned responsibility and authority for each outage item to one person. (See NSRS Report No. R-84-27-SQN/BFN, page 4.) During this review too much layering of responsibility and authority within the TVA nuclear organization was observed which strapped the resources available. Responsibilities for C/A appeared to be diffused to the point that individuals generally dealt only with very small parts of any specific C/A. There appeared to be a need for clean-cut lines of responsibility top to bottom.

b ~~(2)~~ Lack of Good Performance Indicators

Management was perceived to be sending out the wrong signal on what they wanted in the corrective action processes by tracking and reporting on the number of

open items requiring corrective action and in some cases setting goals in hopes of limiting their number. (For a discussion of the negative aspects of this numbers game or "bean count" as it was widely referred to, see the CAR/DR section V.C.2.) A good performance indicator would be one which provides management with a measure of the success of their C/A program without discouraging people from identifying problems.

c ~~(3)~~ Office Level Interfaces

Office level interfaces in C/A have been known to be deficient in various ways for many years. Organizational pride and/or territorial jealousy have kept these interfaces from being properly addressed (see sections V.C.9, V.D.1, and V.D.6).

2 ~~b.~~ Lack of Stability

a ~~(1)~~ Lack of Stability in Organization Structure

For various reasons the TVA organization assigned to handle the nuclear program was reorganized several times in recent years. At the time of this review major restructuring was taking place barely a year after a major reorganization. The state of flux resulting from these changes was mentioned most often by the managers interviewed as a root cause of TVA's problems. It was felt that TVA lacked self-discipline as an organization and that it needed to establish a program and stay with it.

Reorganizing itself was not the problem but the prolonged, indecisive way in which TVA went about the process created confusion and demoralization. Each reorganization was presented as a concept which then gradually evolved over a long period of time rather than as a well thought-out, detailed package which could serve as a guideline to the new way of doing business.

This was pointed out also in IR-83-18-NPS which you may wish to reference RDS 11/17

b ~~(2)~~ Lack of Stability in Upper Tier Documents

While the review was in progress the entire corporate level of documents was being reviewed for planned major changes. The Nuclear Quality Assurance Manual (NQAM) which documented the overall quality assurance program for TVA's nuclear plants was initially issued on December 31, 1984 by combining and replacing four other sets of manuals: The Office of Power Quality Assurance Manual (OP-QAM), OEDC Quality Assurance Program Requirements Manual for Design, Procurement, and Construction (PRM), Division of Nuclear Power Operational Quality Assurance Manual (OQAM), and Interdivisional Quality

Assurance Procedures Manual (IPM). Then, just months later, efforts were underway to rework or completely dismantle the entire NQAM.

A similar fate was being planned for the Office of Power Area Plan Manuals. The area plan concept, developed after an earlier reorganization, was an attempt to take the Divison Procedures Manual (DPM) and other corporate level documents in areas such as Health Physics, Radiological Emergency Planning and Occupational Safety and group them into nineteen areas of expertise. This area plan concept was also to determine the grouping of central office support, and even budget categories. The area plan concept was never fully implemented nor understood, but now it was considered necessary to transfer control of most of the area plans to the individual sites as a result of the decentralization.

It had been shown at Sequoyah that even minor changes in upper tier documents (such as title changes) caused large perturbations in site level document control systems. Large upheavals such as those just described have required a major rework of the plant documents. The result had been a strain on the plant document control system and the review process. (For a further discussion of the upper tier documents, see the Program Adequacy Section, V.A.1.)

3 ~~c~~. Misconceptions About Quality Assurance (QA)

a ~~(1)~~ Not Understood to be a Line Function

When TVA first established a QA group within the nuclear system, the perception arose that quality assuring and quality control were something that the QA/QC people took care of. The result was craftsmen who came to rely on the inspectors to "inspect in" or "audit in" quality. Even some managers came to rely on QA to tell them if corrective action was complete and accurate rather than establishing their own methods of tracking and verifying. These attitudes were felt to be gradually being erased but there was still a definite need for line management to take aggressive ownership of the corrective action process and to find innovative ways to make it work better.

b ~~(2)~~ Quality Assuring Versus Paperwork

Too often the corrective action process was looked on as getting in the way of productive work. There was a lack of appreciation for or understanding of the need to document all the steps necessary for successful

corrective action such as tracking, root cause analysis, and generic problem identification by other sections or other plants. As mentioned in the section on CARs/DRs (section V.C.2) auditors were told by management at one plant that all emphasis was placed on immediate correction of a problem and that the paperwork process would only hinder their efforts to correct the deficiency.

Similarly, the efforts by internal auditors seemed to be unappreciated and generally ignored until the same problems they had identified over and over were cited by the NRC.

d. Failure to Set Priorities

(1) Trying To Do Too Much at Once

TVA is considered by NRC and others as good at problem identification but poor at problem solving. Part of this was felt to be an over-commitment to regulating authorities, such as in the area of plant modifications, which led to backto-back outages and eventually overlapping outages. TVA was acknowledged to have the manpower and other resources, but without strong leadership, these resources were not being properly utilized. There is a need to assign ownership to individual problems, analyse them and decide what is and what isn't going to be done. Once major problems are identified, efforts need to be concentrated on fixing one problem before moving on to the next one. A major result of years of failure to properly scope problems is a large backlog of incompleted problems which skew any attempts to prioritize and manage new ones.

(2) Lack of Follow-Up

There was evidence that symptoms of problems were being treated without doing adequate root cause diagnosis. This failure in the corrective action process was cited time and again by the NRC as a major TVA problem. One suggestion to overcome this would be for line managers to assign each item to an individual who was required to follow it through to completion.

e. Failure to Eliminate Root Causes

Identifying the real root causes of failures in the corrective action process and taking actions to eliminate the root causes has been an impossible task for OE. Historically, OE has repeated a cycle of acknowledging the problems of the system through memorandums, establishing task forces to provide recommendations, implementing recommendations, and

then identifying similar problems in the corrective action system a few years later.

The following four root causes are taken from the 1982 Action Plan for Quality Improvement. These root causes still existed during the corrective action review in spite of years of work and expended manpower on various task forces to resolve root causes. The quotes are excerpts from the December 31, 1981 report. The references listed provide an example of the same type of root cause identified during the current corrective action review.

(1) Positive Attitude and Approach

"The lack of positive attitude and approach in responding to and resolving issues and deficiencies which have been identified by NRC OI&E and by QA and QC organizations has contributed to our low evaluation by NRC . . . . The lack of an OE positive attitude toward resolving problems identified by NSRS is discussed in paragraph V.C.10.b.

(2) Authority, Responsibility, and Accountability

"The size and complexity of our organization, and our failure in some areas to clearly define authority, responsibility, and accountability has resulted in inadequate treatment of some issues, buckpassing, and lack of accountability for inadequate action or lack of action."

The root cause was initially written for OEDC. However, this root cause can be expanded to the entire Office of P&E (Nuclear). An example of the lack of accountability for inadequate corrective action was identified in section V.C.3. This section on TROI, emphasized that OE utilizes dates of 1999 for unscheduled NUC PR actions. OE basically does not have responsibility to see that the action is completed in a timely manner.

(3) Timeliness

"The timeliness and thoroughness in implementing corrective action and in documenting and reporting the concerns and conditions adverse to quality have often been inadequate."

An example of this inadequacy was identified during NSRS review, R-85-08-OE/NUC PR. This report is briefly summarized in Section V.D.1. The NSRS report concluded that there was a failure of management to correct problems with timeliness and responsiveness involving the NCR-FE/ER process. Section V.C.3 also documents examples of NCR's which have untimely corrective action.

(4) Procedures

"Failure to follow procedures and inadequate procedures are the cause of almost one-half of the findings, violations, and nonconformances against OEDC."

This original root cause for OEDC can also be expanded to the Office of Nuclear Power. "Failure to follow procedures" has historically resulted in a continual revising of organizational procedures. There are also cases of inadequate or non-existent procedures defining interfaces between NUC PR/OE/OC to accomplish corrective action. (Refer to V.C.11 and V.D.6 for details.)

An additional root cause identified during the corrective action review:

(5) Trend Analysis Program

The OE trend analysis program has been developing for over 10 years. (The present trend system is discussed in V.C.5). Management has not developed and utilized the trend analysis system to provide timely identification of trends and correct root causes to preclude repetition in the future.

f. QA/QC Organizations Inadvertantly Contributing to C/A Problems

QA/QC organizations have set poor examples of attitudes toward quality. Line organizations can be expected to perform no better than the organizations identifying their problems. The following are examples of such problems in the QA/QC organizations.

(1) Audits

QA organizations responses and follow-up have often been untimely and they have sometimes accepted inadequate corrective actions. The QA organization in place at the time of this review made audit recommendations and suggestions which did not require responses. This leads the line organizations to believe that only deviations are important enough to require attention (see section V.C.8).

(2) Quality Performance Feedback For QC Inspectors

Job performance ratings for QC inspectors are generally not based on the quality of their inspections. This fosters inconsistency in inspectors attitudes toward quality (see section V.C.1).

(3) CAR/DR Process

The plant QA organization at WBN circumvented the CAR/DR process by implementing the "draft" CAR/DR (see section V.C.2).

(4) Quality Problems

DQA and OQA failed to properly address Quality Problems indentified by OQA beyond the normal audit process (see section V.D.7).

E. Summary of Results

The corrective action process has been found to be inadequate and forty recommendations have been made by NSRS.

F. Conclusions/Recommendation Summary

R-85-11-NPS	P&E	NUC PR	BFN	SQN	WBN	OE	OC	WBN-OC
01						X		
02						X		
03							X	
04			X	X	X			
05			X					
06				X				
07				X				
08							X	
09								X
10					X			
11					X			
12	X	X				X		
13			X	X		X		
14		X		X	X			
15						X		
16						X		
17							X	
18						X	X	
19						X		
20								X
21								X
22							X	
23		X					X	
24						X		
25						X		
26							X	
27						X	X	
28						X		
29							X	
30						X		
31	X	X	X	X	X			
32			X					
33		X						

R-85-11-NPS	P&E	NUC PR	BFN	SQN	WBN	OE	OC	WBN-OC
34		X						
35		X	X					
36			X					
37	X	X				X		
38	X	X				X	X	
39	X	X						
40	X	X				X	X	

IV. CONCLUSIONS/RECOMMENDATIONS

A. Program Adequacy

R-85-11-NPS-01, Inadequate Procedures - OE

Conclusion

Procedures to distribute information concerning deficiencies identified by various review organizations such as INPO, are inadequate (refer to section V.A.3.a for details).

Recommendation

OE should establish program controls to ensure that deficiencies identified by organizations external to OE are adequately distributed and reviewed for corrective action.

R-85-11-NPS-02, Trend Analysis Program Responsibility Not Defined - OE

Conclusion

Trend analysis program responsibilities are not adequately defined for branches and projects (refer to V.A.3.d for details).

Recommendation

NSRS recommends that OE establishes in branch and project procedures adequate details and definitions of responsibilities for the trend analysis program.

R-85-11-NPS-03, Commitment Not In Procedures - OC

Conclusion

Monthly reporting of unresolved NCRs to the Quality Manager and the Construction Engineer is specifically required by TVA-TR75-1A, section 17.1.16.2 but QAP-15.1, QCI-1.02, and QCP-10.4 do not include this requirement (refer to section V.A.4.~~a~~ for details).

Recommendation

NSRS recommends that the lower tier program documents be revised to implement the topical report commitment.

R-85-NPS-04, Dispersion of Corrective Action Instructions - Generic

Conclusion

The ~~plant~~ BFN implementing instructions for the corrective action process were dispersed throughout the Administrative Instruction and Standard Practice Manuals (refer to section V.A.5 for details).

Recommendation

Consolidate these documents ~~whenever possible~~ as ~~the site~~ BFN gradually takes control of the Area Plans and NQAM material.

do you have examples where they can be consolidated?

what is they don't

The Area Plan & NQ does this go a way 1/30 RDA

R-85-11-NPS-05, Clarification of Interface Procedure - BFN

Conclusion

BFN Standard Practice BF-10.7 does not distinguish between BFN site OE and OE (refer to section V.A.5 for details).

OE Mngr or the other 4 identified in V.A.5. ?

Recommendation

Interfaces with OE site OE, Site Director, Plant Manager, and others should be clearly defined and procedure BF-10.7 revised to reflect this and compatibility with OE procedure OEP-17 and Design Services interface controls verified prior to issue.

V.A.5. states BF-10.7 "Detailed" now. How can we? This does not say you need OE operations with OE not the others. Is this correct? RDA 1/30

R-85-11-NPS-06, Duplication of instructions - SQN

Conclusion

Procedures SQA-26 and SQA-101 both discussed NRC-IE bulletins, circulars, and information notices (refer to section V.A.6.b for details).

Recommendation

Procedure SQA-101 should be cancelled.

why this procedure vrs SQA-26? shouldn't you give them the choice to omit the one they want to? RDA 1/30

R-85-11-NPS-07, Obsolete Material In Procedure - SQN

Conclusion

Procedure SQA-95 contained interface information from documents that were cancelled on January 18, 1985 (refer to section V.A.6.c for details).

Recommendation

Procedure SQA-95 should be revised or cancelled.

See comments p 31 RDA 1/30

B. Program Implementation

Conclusions and recommendations are contained in the following paragraphs C and D.

C. Selected Program Implementation Functions

1. Inspection Rejection Notices

R-85-11-NPS-08, Inspector Job Performance Feedback - QC

Conclusion

There is a general lack of feedback to QC inspectors concerning job performance from their supervisors. Most supervisors apparently did not observe their inspectors in the field (refer to section V.C.1 for details).

Recommendation

An inspectors performance appraisal should be based primarily on the supervisor's field evaluation of the quality of a representative sample of the inspectors work.

R-85-11-NPS-09, Failure to Prepare IRNs - WBN

Conclusion

WBN allows IRNs not be prepared for deficiencies that can be corrected in the inspectors presence. This practice skews the data used for trend analysis (refer to section V.C.1 for details).

Recommendation

The practice of not writing IRNs at WBN if a problem can be corrected in the inspector's presence should be terminated, appropriate procedural changes implemented, and WBN inspectors trained to write IRNs on as-found conditions.

2. Corrective Action Reports/Discrepancy Reports

R-85-11-NPS-10, Incorrect Handling of CARs/DRs - WBN

Conclusion

Handling of CARs/DRs at WBN is outlined in AI-7.3, but PQA uses section instruction letter PQA-SIL-3.1 which established "draft" CARs/DRs. This has caused undue delays in issuing CARs/DRs (refer to section V.C.2 for details).

Recommendation

The informal draft CAR/DR process should be eliminated and PQA-SIL-3.1 modified accordingly.

R-85-11-NPS-11, Conformance to Procedure - WBN

Conclusion

Three CARs that were not issued were considered important by NSRS. The Q-list was reviewed internally by PQA starting in January and a report of their findings issued on August 26, 1985 (Quality Evaluation Report QE-85-09) and an NCR issued (W-269-P). The breakdown in the PORC review process was neither documented nor reviewed (refer to section V.C.2 for details).

Recommendation

AI-7.3, section 5.3 requires that a CAR be issued if the originator cannot be convinced that no problem exists. This should be strictly adhered to by PQA.

The CAR concerning the PORC review process should be issued.

3. Nonconformance Reports

R-85-11-NPS-12, Funding of OE Open Items - P&E

Conclusion

OE is unable to initiate prompt corrective action or perform generic investigations of CAQs unless funding is approved by NUC PR (refer to V.A.3 for details).

Recommendation

Evaluate present interface structure between NUC PR and OE to ensure that controls are in place that allow for prompt corrective action and generic issues evaluation by OE.

R-85-11-NPS-13, Inadequate Design Service Interface Program Controls - Generic

Conclusion

With the exception of WBN, no formal procedures were being developed to clearly define interface controls between Design Services Manager, Site Director, Plant Manager, and Supervisors, and Design Project Manager (refer to section V.C.3.c for details).

Recommendation

Interface controls should be developed to reflect the current onsite/offsite organizations.

R-85-11-NPS-14, Verification of Status of NCRs - NUC PR

Conclusion

DQA audit at BFN on NCRs had resulted in a deviation No. QBF-A-85-0014-D03 requiring corrective action which should result in satisfactory handling of NCRs at BFN (refer to section V.C.3.c(2) for details.

Recommendation

It is recommended that a similar review of all past NCRs to determine current status, providing documentation supporting corrective action on all closed NCRs and placement in a commitment tracking system with adequate commitment dates be implemented at the other plants.

4. Tracking Systems

R-85-11-NPS-15, Tracking and Reporting of Open Items (TROI) Schedule Dependent - OE

Conclusion

A system/method of establishing priorities for completing open TROI items does not function independent of the CONST or NUC PR schedules (refer to V.C.6 for details).

Recommendation

Review significance of old items and establish priorities for completion.

R-85-11-NPS-16, TROI Action Dates Not Realistic - OE

Conclusion

The tracking of open items system (TROI) is being utilized by management to control and document the status of open items. TROI action dates of 1999 are listed when the date of an activity is unknown. The dates usually involve interface with NUC PR (refer to V.C.3 and V.C.4 for details).

Recommendation

Establish realistic time frames for completion of activity. Establish interface channels with NUC PR to resolve unknown action dates.

R-85-11-NPS-17, Commitment Tracking Index - OC

Conclusion

The proceduralization of the Commitment Tracking Index should improve its effectiveness (refer to section V.C.4.b for details).

Recommendation

Complete the proceduralization of the Commitment Tracking Index currently in progress.

R-85-11-NPS-18, TROI - Generic

Conclusion

TROI is used by OE and OC to assign responsiblities for C/A and to track completion of C/A, which are quality program functions. Controls on quality program functions should be part of the quality program (refer to section V.C.4.b for details).

Recommendation

Include the controls applied to TROI for assignment of responsibilities and tracking of completion of C/A in the program documents, or assure that these functions are provided within the system by some means other than TROI.

5. Trend Analysis

R-85-11-NPS-19, Inadequate Use of Trend Data Base - OE

Conclusion

The trend analysis program has a data base with the capability of producing meaningful, useable output to OE management. This information receives minimal attention from OE management (refer to section V.C.5 for details).

Note: In 1981, NSRS concluded that the trend analysis program was not functional (R-81-14-OEDC (BLN)-39) and had not evolved to the point of producing meaningful,useable output.

Recommendation

Utilize trend data base for early identification of problems. Hold OE Management accountable for utilizing trend data base effectively.

R-85-11-NPS-20, Quality Trend Analysis Reports - WBN (OC)

Conclusion

The WBN quality trend analysis report does not synopsize the effectiveness of past remedial actions as required by QAP-16.5 (refer to section V.C.5.b for details).

Recommendation

Future WBN quality trend analysis reports should synopsize the effectiveness of past remedial actions as required by QAP-16.5.

R-85-11-NPS-21, NCR Trending - WBN (OC)

Conclusion

Trending of NCRs at WBN does not address root causes, remedial action, or effectiveness of past remedial actions. (refer to section V.C.5.b for details).

Recommendation

Change the NCR trending program at WBN to address root causes, remedial actions, and effectiveness of past remedial actions similar to the BLN program.

6. Corrective Action Priority

R-85-11-NPS-22, Corrective Action Priority - OC

Conclusion

Involvement of managers in C/A tends to be limited to dealing with the management tools for C/A rather than the C/A itself. This focuses attention on timeliness rather than adequacy of the C/A (refer to section V.C.6.b for details).

Recommendation

Steps should be taken to involve managers more in specific C/A in order to increase awareness of C/A quality and consequently shift the perceived management priority toward quality in C/A.

7. Quality Bulletin Program - OC

R-85-11-NPS-23, Quality Bulletins - Generic

Conclusion

OC and NUC PR both have documents called Quality Bulletins which are numbered in the same manner and serve a similar purpose. This results in confusion (refer to section V.C.7 for details).

Recommendation

OC and NUC PR should collaborate to change the name and/or numbering scheme of one of the Quality Bulletin programs.

8. Quality Assurance

R-85-11-NPS-24, Increase Audit Depth - OE

Conclusion

QMS has failed to recognize and document significant deficiencies in the corrective action process (e.g. NCR FE/ER process).

Recommendation

Increase the depth of audits and concentrate on problem areas (refer to V.C.8 for details).

R-85-11-NPS-25, Audit Process Not Used - OE

Conclusion

Significant problems identified by QMS in the OE quarterly assessment report have not been pursued or investigated utilizing the audit process. In fact, the assessment and audit reports are inconsistant in the general appraisal of the corrective action process (refer to V.C.8 for details).

Recommendation

Significant problems identified by QMS in the OE quarterly assessment report to be pursued or investigated utilizing the audit process.

R-85-11-NPS-26, Audit Deviations - OC

Conclusion

Audit deviations are written only for instances of departure from specific written requirements. Other problems may be addressed in the audit report or suggestions which require no response, and seldom are addressed by the audited organizations (refer to section V.C.8.b for details).

Recommendation

All problems identified in audits should be written as deviations so they must be addressed.

9. Interface Problems

R-85-11-NPS-27, Interface-Problems - OE/OC

Conclusion

OC site personnel have problems identifying the responsible OE individual for NCRs that must be handled by the OE branches rather than the Design Project Organization (DPO). When the responsible branch individuals are known, they are generally not as responsive as the DPO personnel (refer to section V.C.9.b for details).

Recommendation

OE should coordinate with OC to establish a mechanism to identify responsible branch individuals for specific OC NCRs to the WBN and BLN CEOs and to ensure these individuals are responsive to CEO personnel on site NCRs.

10. Management Attitudes

R-85-11-NPS-28, Quality Policy Not Fully Implemented - OE

Conclusion

The quality policy issued by the OE Manager on August 21, 1984, has not been reflected in OE activities concerning prompt identification, documentation, and correction of adverse conditions (refer to V.C.10 for details).

Recommendation

Hold management accountable for adhering to quality policy.

R-85-11-NPS-29, Corrective Action Responsibility - OC

Conclusion

Deficiencies in the "corporate attitude" toward C/A that result in failure to take timely C/A are due, at least in part, to diffused responsibility for specific C/A (refer to section V.C.10.b for details).

Recommendation

Responsibility for coordinating the resolution of a specific problem, including specific C/A and action to prevent recurrence, be assigned to an individual. These individuals should have the authority to contact any person in P&E about specific problems.

11. Root Causes

R-85-11-NPS-30, Failure to Correct 1982 OEDC Action Plan Root Causes - OE

Conclusion

Root causes which were identified in the 1982 OEDC Action Plan for Quality Improvement were not corrected with the Action Plan and still exist within OE (refer to III.D.e for details).

Recommendation

Management must address root causes and establish an adequate program to eliminate root causes.

D. Special Problems

2. NRC/Outside Agency Review

R-85-11-NPS-31, Inadequate Responses to NRC Notice of Violation - Generic

Conclusion

NSRS review of responses by TVA to NRC notice of violations shows that we continue to send inadequate responses (refer to section V.D.2.a for details).

Recommendation

Instructions should be given to all personnel involved in the preparation of responses to the NRC. This could take the form of required reading or formal instructions. The instructions should include the impact on top management and on TVAs credibility when inadequate responses are made.

R-85-11-NPS-32, Increased NRC Inspections - BFN

Conclusion

As a result of the NRC Executive Director for Operations communications with the TVA Board of Directors, it is highly unlikely that Region II will reduce inspection levels and almost certain that inspection will be intensified at BFN (refer to section V.D.2.a for details).

Recommendation

Management must ensure that supervisors stress the necessity of prompt corrective action and demonstrate it in practice, for credibility with the NRC to be restored.

R-85-11-NPS-33, Corrective Action to INPO Reviews - NUC PR

Conclusion

From a review of INPO evaluations and related TVA actions, corrective action has not always been effective (refer to sections V.D.2.b and V.D.8 for details).

Recommendation

When problems are identified by INPO positive steps should be taken to correct these problems in a timely manner.

R-85-11-NPS-34, INPO Evaluation Reviews - NUC PR

Conclusion

The findings in an INPO evaluation of one nuclear plant could well be applicable to the other plants (refer to sections V.D.2.b and V.D.8 for details).

Recommendation

INPO evaluations performed at one plant and TVA responses should be reviewed for applicability to the other plants.

R-85-11-NPS-35, Management Analysis Company (MAC) Report Recommendations - NUC PR

Conclusion

The MAS report was an excellent summary of the situation at BFN. They made several recommendations some of which have not been implemented (refer to section V.D.2.c for details).

Recommendations

The report received top management review when issued in June 1984. NSRS recommends that those recommendations not implemented be re-evaluated to determine improvement potential in any present or proposed future organization changes.

3. Browns Ferry Regulatory Performance Improvement Program

R-85-11-NPS-36, Engineering Morale - BFN

Conclusion

Conditions contributing to low morale and identified in NSRS report R-84-20-BFN do not appear to have been fully addressed (refer to NSRS report R-84-20-BFN for details).

Recommendation

The concerns expressed in NSRS report R-84-20-BFN should be reviewed by upper management and resolutions, favorable or otherwise, should be conveyed to engineering and other affected personnel.

4. Drawing Control

R-85-11-NPS-37, Maintenance and Distribution of Drawings - P&E

Conclusion

The current methods used to maintain drawing originals and distribute copies appears to be awkward and inefficient (refer to section V.D.4 for details).

Recommendation

The drawing task force should evaluate a valley-wide computer system for drawing control to determine its potential usefulness and cost effectiveness for improving accuracy and efficiency.

6. Interoffice Control Of Nonconformances

R-85-11-NPS-38, Interoffice Control of Nonconformances - P&E

Conclusion

There is a need for an interoffice procedure to control the handling of NCRs as evidenced by the SQN containment pressure instrument problem and other examples (refer to section V.D.6 for details).

Recommendation

Issue immediately the ID-QAP governing interoffice control of nonconformances which was being held by DQA at the time of this review.

7. Quality Problems

R-85-11-NPS-39, Failure to Evaluate the Applicability of Quality Problems P&E

Conclusion

The OQA quality problem program was omitted from the transition plan without documentation of the reasons when responsibility for QA moved from OQA to DQA in 1984 (refer to section V.D.7 for details).

Recommendation

P&E should review the OQA quality problem files for problems that are not being pursued and other useful information. The decisions concerning whether a quality problem should be pursued or not should be documented.

R-85-11-NPS-40, Staff to Resolve Quality Problems - P&E

Conclusion

Aggressive identification and resolution of quality problems is essential for a successful nuclear power program. There is no organization currently charged with this responsibility (refer to section V.D.7 for details).

Recommendation

NSRS recommends that P&E consider the establishment of a staff whose only responsibilities are identification and coordination of resolution of quality problems. The staff should have the authority to address quality problems across organizational boundaries and resources to ensure satisfactory completion.

V. DETAILS

A. Program Adequacy

1. Upper-Tier Program Adequacy

The Topical Report represents the TVA quality assurance (QA) program for design, construction, and operation of TVA nuclear plants. The Nuclear Quality Assurance Manual (NQAM) documents the overall quality assurance program for TVA's nuclear power plants. A review of the Topical Report and the NQAM was performed to determine if the quality assurance program relating to corrective actions met all the requirements and commitments. The references used for the review included:

- Title 10, Code of Federal Regulations (10 CFR)
- Final Safety Analysis Report (FSAR)
- Technical Specifications (TS)
- NRC Regulatory Guides (RG)
- Industry Codes and Standards (ANSI N45.2, ANSI N.18.7-1976, ASME Section III, NA 4000)
- Area Plans 1200 R03, 1200 R05, 1601.01, 0601.01, 0602.1, 0604.01, and 0605.01.

With the exception of approved interface procedures for nonconformance controls between NUC PR, OE, and OC, it appeared that the elements of a corrective action program were adequately addressed in the Topical Report, Area Plans, and the NQAM. DQA was preparing a procedure 1D-QAP-16.1 for interface nonconformance controls but it had not been issued (refer to section V.D.6, Interoffice Control of Nonconformances).

The NSRS was concerned, however, with the plans for the major upper tier documents, namely the NQAM and the Area

Plan Manuals. Because of the decentralization of control brought about by the Site Director concept, the Nuclear Central Office (NCO) control of these documents was to be mostly eliminated and each site was to establish its own documentation. The NSRS concern was based on what was anticipated may result from this diffusion of control documents. Even under the old NCO control, the Westinghouse "sister" plants of Sequoyah and Watts Bar had developed very different sets of plant documents. The decentralization, it was felt, would only accentuate this situation. The site documents would become very personality dependent resulting in changes every time the key position of Site Director was changed. An example of this personality dependency influencing the conduct of business occured at each site while they were still under the influence of the NCO. When the site directors were appointed at three plants, they each took a different approach to the control of their plant standard practices. At Watts Bar, there was no change from the one set of WBN Standard Practices and all of them continued to be signed by the Plant Manager. At Sequoyah, there was still one set of Sequoyah Standard Practices with some signed by the Site Director and the balance by the Plant Manager. At Browns Ferry, the Site Director chose to establish an entire new level of documents - the Site Director's Standard Practices. This was felt by NSRS to be indicative of the tailoring that may take place each time a Site Director is changed and would result in continuing the perturbations of the plant documentation which was felt to be a root cause of TVA's corrective action problems (refer to section III.D.b, Root Causes).

RDS 11/17

I don't think you have built a strong case for your concern. I'm not sure what you mean by the differences between the documentation the sister plants developed on their own procedures as opposed to the same procedures in the same position in the organization and organizations in your discussion of root causes? RDS 11/17

should not be refs back to Mgt. summary. details should support Mgt summary. RDS 11/17

2. Program Review

For the conduct of program reviews in OE, OC, and NUC PR, all procedures were reviewed with a detailed checklist to verify that the program required or provided for:

a. Identification of problems by the line organization, QA audits and inspections, NRC Letters, external audits and reviews, and other sources such as OE and NUC PR.

b. Evaluation of problems for significance, nuclear safety, generic implications, and adverse trends.

c. Authority to initiate specific, long-term and generic corrective actions, identifications of individuals responsible for initiating corrective action, segregation of nonconforming items, and control of processing of nonconforming items pending disposition.

d. Prompt notification to TVA management and other plants and reporting to the NRC.

e. Maintenance of records of deficiencies and deficiency evaluations and documentation of corrective actions.

f. Tracking of corrective actions to completion, requirement of interim reports, and follow-up QA audits.

g. Immediate notification of higher management for urgent problems, periodic summary, and trend analysis reports, incorporation of experience into design and training, and for OC, reporting unresolved NCR's to the Quality Manager and Construction Engineer monthly.

what was found?

3. Office Of Engineering (OE) Program Adequacy

The corrective action program was reviewed for adequacy using 10CFR50 Appendix B criteria, TVA Topical Report, and ANSI N45.2 as the basis for review. The EN DES EP system was in effect during the corrective action review. The new OEPs went into effect on June 28, 1985. The majority of review effort involved the EN DES EP system. The review of the OE corrective action program identified the following program weaknesses:

a. Inadequate procedures to distribute information concerning deficiencies identified by various review organizations, e.g., INPO.

The review of the EPs identified one procedure which could be used in making a generic evaluation of a CAQ (condition adverse to quality). The procedure (EP 1.52) was directed more towards an NCR and was not intended for use as an evaluation for conditions identified by review groups at one plant that could be applicable to another. It is acknowledged though that OE has been reorganized to reflect a concept of discipline staffing. The concept was to provide consistancy within a given discipline between various projects. Meetings are held on a regular basis between project engineers and branch chief. These meetings provide a forum for discussing similar problems between projects. This sharing of information is beneficial but should be addressed by a branch procedure. The branch chief should have a system in place which could evaluate and distribute pertinant information (such as INPO reports, NRC reports, QMS and DQA audit reports) to various projects and also monitor resulting actions.

Note: An example of inability to evaluate and distribute information for various projects is ~~was~~ described in section V.C.8.a. This example cited a recurring problem with NCRs which was identified at multiple sites by the Quality Management Staff.

b. Inability of OE to initiate prompt, timely corrective action on OL plants until funding is approved by NUC PR.

OE does not have authority to initiate specific, long-term and generic corrective actions for operating plants. This decision remains with NUC PR who have historically chosen to ignore some nonconforming conditions identified by OE. Examples of OE identified conditions which have not been addressed by NUC PR are discussed in section V.C.4.

c. No interface documents exist? describing resolution of corrective action on conditions adverse to quality which affect both OE and NUC PR.

The lack of interface documents was initially identified and documented within TVA in an audit report (JA8000-13) issued January 9, 1981. This condition has been allowed by management to exist for over four years and remains a continuous reminder that divisional splits inhibit productive work within TVA (refer to section V.C.6 for details). OE, OC, and NUC PR have been unable to resolve differences in a draft procedure which involves delineating the authority and responsibility of these groups when prescribing nonconformance activities. The procedure has still not been issued.

d. Inadequate definition of program responsibilities for branches/projects in trend analysis process.

The trend analysis program has existed in some form within TVA for over ten years. The responsibilities of those involved on the program are still in transition however. The EP 1.51 provided some guidance in how to distribute and respond to trend information but was not being adhered to. The new OEP-17 briefly addresses a trend program but proper emphasis and detail must be included in branch and project manuals. (These were not available during the review and were due to be issued September 30, 1985.) Refer to section V.C.5 for details of trend analysis program.

4. Office Of Construction (OC) Program Adequacy

OC office level and site procedures for WBN and BLN were reviewed to verify that corrective action program requirements applicable to OC activities in 10CFR50, Appendix B; NASI N45.2; Quality Assurance Manual for ASME Section III Nuclear Power Plant Components (NCM); and the Topical Report were included. Various OC Quality Assurance Program Policies (QAPP), Quality Assurance Procedures (QAP), Quality Engineering Staff Procedures (QESP), WBN Quality Control Instructions (QCI), and BLN Quality Control Procedures (QCP)

were reviewed for appropriate program requirements. OE Engineering Procedure EN DES-EP 1.26 was also reviewed for OE handling of OC NCRs.

The program was found to adequately address the upper-tier document requirements with the following exception.

Monthly reporting of unresolved NCRs to the Quality Manager (QM) and the Construction Engineer (CE) is specifically required by the QA Topical Report TVA-TR75-1A, section 11.1.16.2. TROI provides this information to the QM and CE, but QAP-15.1 revision 11, WBN QCI-1.02 revision 14, and BNP-QCP-10.4 revision 12, do not include this requirement. NSRS recommends that the lower-tier program documents be revised to implement the Topical Report commitment.

5. Browns Ferry Nuclear Plant (BFN) Program Adequacy

A review of plant administrative procedures and instructions was performed to determine if the applicable requirements of the Topical Report, NQAM, ANSI N18.7, 10CFR50 Appendix B, and Technical Specifications were adequately addressed in site implementing procedures.

This review entailed the examination of the following documents: Site Director Standard Procedure (SDSP) - 3.1 (replacing Standard Practice BF-10.3), and Standard Practices BF-1.1, -3.8, -10.7, -15.17, -15.23, -19.32, and -21.17.

Interdivisional controls had been a problem in TVA and good interface procedures between NUC PR-BFN and OE, particularly in the handling of NCRs/SCRs was essential. Handling of NCRs and interface with OE was detailed in BFN Standard Practice BF-10.7, "Handling of Nonconformance Reports (NCR's)." Interfacing occurs with OE, Design Services Manager (DSM), Site Director, Plant Manager, Compliance Supervisor, and for inadequate information back to OE. The procedure did not clarify whether it is BFN site OE when actions are usually requested by the DSM--and stated in section 4.4 of BF-10.7--or Manager of Engineering, or the chief nuclear engineer in OE, or a branch manager. NSRS recommends that interfaces with OE and within NUC PR be clearly defined and the procedure BF-10.7 revised to reflect this. It should be verified that OE procedure OEP-17, "Corrective Action," and Design Services interface controls are compatible with a revised BF-10.7 prior to issue.

6. Sequoyah Nuclear Plant (SQN) Program Adequacy

A review of plant administrative procedures and instructions was performed to determine if the applicable requirements of the Topical Report, NQAM, ANSI N18.7, 10CFR50 Appendix B, and Technical Specifications were adequately addressed in site implementing procedures.

This review entailed the examination of the following documents: AI-12, -13, -18, -23; SQN-84, -94, -95, -97, -101, -118, -124, and -135. Overall, it appeared to the NSRS that the program for corrective action was adequately addressed in the SQN procedures.

The NSRS did have three observations:

a. The plant implementing instructions for the corrective action process were dispersed throughout the AI and Standard Practice Manuals.

The NSRS recommends that these documents be consolidated wherever possible as the site gradually receives control of the Area Plan and NQAM material.

b. There was at least one example of overlap in the documents reviewed. SQA-26 and SQA-101 both discussed NRC-IE Bulletins, Circulars, and Information Notices. The NSRS recommends that SQA-101 be cancelled.

c. There was one example of obsolete material in the documents reviewed. SQA-95 contained interface information from documents that were cancelled on January 18, 1985. The NSRS recommends that SQA-95 be revised or cancelled.

7. Watts Bar Nuclear Plant (WBN) Program Adequacy

A review of plant adminstrative procedures and instructions was performed to determine if the applicable requirements of the Topical Report, NQAM, ANSI N18.7, 10CFR50 Appendix B, and Technical Specifications were adequately addressed in site implementing procedures.

This review entailed the examination of the following documents: AI-1.3, -2.8.1, -2.8.3, -2.8.4, -2.8.9, -2.8.11, -2.19, -4.4, -7.3, -8.5, -8.8, WB-1.8, -2.1.10, -6.3.13, -11.5, -11.6, -11.8 and PQA-SIL-3.1.

With one exception, it appeared that the requirements of the upper-tier documents were adequately addressed in the plant documents.

The Corrective Action Reports (CAR's) and Discrepancy Reports (DR's) which are plant mechanisms for initiating timely identification and corrective action to conditions adverse to quality are properly scoped in AI-7.3, "Adverse Conditions and Corrective Actions." However, the Plant Quality Assurance Staff's Instruction Letter, PQA-SIL-3.1 "Corrective Action Procedures CAR/DR," undermined the CAR/DR processes by establishing a separate draft CAR/DR process which preceded the formal systems as described in AI-7.3 (refer to section V.C.2 of this report). NSRS recommends that the informal draft CAR/DR processes be eliminated.

The NSRS did have the following observation.

The plant instructions which implemented the Corrective Action Program were dispersed throughout the AI and Standard Practice Manuals. The NSRS recommends that these documents be consolidated wherever possible as the site gradually takes control of the Area Plans and NQAM material.

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8. Bellefonte Nuclear Plant (BLN) Program Adequacy

A review of plant adminstrative procedures and instructions was performed to determine if the applicable requirements of the Topical Report, NQAM, ANSI N18.7, 10CFR50 Appendix B, and Technical Specifications were adequately addressed in site implementing procedures.

This review entailed the examination of the following documents: BLA 4.3, 5.13, 5.3, 9.3, 11.4, 11.28, 16.1, 16.3, 16.5, and QASIL 4.3. It appeared to the NSRS that the program for corrective action was adequately addressed in the BLN procedures.

why is BLN different than WBN where consolidation was recommended

B. Program Implementation

1. Office of Engineering Program Implementation

The scope of the program implementation portion of the review was limited to corrective action activities within CEB, MEB, TAS (trending), QMS, WBN, and BLN. Specific problems relating to the corrective action process have recently been identified within EEB, QEB, NEB and are documented in NSRS reports I-85-06-WBN, R-85-07-NPS, and R-85-08-OE/NUC PR. Due to the extensive nature of these reports, additional NSRS effort addressing the corrective action process in these branches was not included in this review.

The method used to verify program implementation included extensive document review and selected interviews. The documents reviewed included QMS audit reports/responses, QMS CAQ reports, NSRS reports/responses, TAS trend reports/responses, NRC violations, OE interim reports on 50.55(e) items, INPO reports, NCR's, TROI printouts, and memorandums generated by OE management pertaining to corrective action.

Interviews were conducted to verify the emphasis placed by management on corrective action and to identify problems which delay the corrective action process.

The following general problems were identified in program implementation:

a. Failure of branches and projects to utilize trend information to preclude or minimize future errors.

b. Failure to respond or correct audit deviations in a timely manner.

c. Failure to take prompt corrective action on identified NCR's.

Specific details and examples are provided in paragraphs V.C.5.a, V.C.8.a, and V.C.3.a.

2. Office of Construction Program Implementation

Implementation of the portions of the OC Quality Assurance Program dealing with C/A (discussed in section V.A) were evaluated by personnel interviews and reviews of numerous documents such as nonconformance reports (NCR's), Quality Trend Analysis Reports (QTARs) Quality Bulletins (QBs), and audit reports. The program was found to be adequately implemented except for the following problems: ~~discussed in paragraphs V.C.1, V.C.3.b, V.C.5.b, V.C.8.b, and V.C.9.b.~~

a. Allowing failed inspections to be corrected without writing IRNs. (See Section ---- for additional Details)

b. Failure to write NCRs. ( )

c. Inadequate trend reports for NCRs and failure to synopsize past remedial actions on NCRs. ( )

d. ~~Depth of~~ audits should ~~be improved~~ have increased Depth? ( ) TBD 1/30

e. Personnel in OE branches responsible for OC NCRs not identified to OC. ( )

3. Office of Nuclear Power Program Implementation

The program implementation and its effectiveness was determined by the review of corrective action activities at NUC PR-Chattanooga, BFN, SQN, WBN, and BLN. The method used included selected interviews and an extensive document review.

Interviews were conducted with site directors, plant managers, supervisors, and others involved in the corrective action process to obtain their perspective on the handling of problems experienced at the nuclear plants. The review of a large number of documents included Section Instruction Letters, NRC policy statements, inspection reports and responses, DQA audit reports, deviation reports and responses, BFN Regulatory Performance Improvement Program and BFN history, INPO evaluation report and responses, NUC PR task force reports, Management Analysis Company report, Nonconforming Condition Reports (NCR), Discrepancy Reports (DR),

Corrective Action Reports (CAR), NSRS reports and responses, memorandums related to corrective action, and tracking systems used.

The following problems were identified in the program implementation:

a. Interfaces not clearly defined between OE and NUC PR
b. Inadequate responses to NRC notices of violation
c. INPO evaluations not reviewed for general applicability
d. Quality problem program omitted from QA transition plan
e. Incorrect handling of CAR's/DR's.

Specific examples are given in paragraphs V.A.5, V.D.2.a, V.D.2.b(2), V.D.7, and V.C.2.

incl. with above statement

C. Selected Program Implementation Functions

1. Inspection Rejection Notices

The Inspection Rejection Notice (IRN) was not part of the QC corrective action system as defined by the QC program documents. It was, however, used to identify needed correction identified by rejected QC inspections and to provide trending information, and as such fell within the scope of this review. In order to evaluate the IRN system, program and implementing procedures were reviewed and personnel in Knoxville, WBN, and BLN were interviewed.

The following definitions appeared in WBN QCI-1.02-1, Inspection Rejection Notice."

> "Inspection Rejection Notice (IRN)--A communication tool used by inspection personnel to inform craft and engineering of an unacceptable condition of work in progress. An IRN form is used to document and indicate disposition of these conditions."
>
> "Work in Progress--The status of any work activity prior to inspector acceptance."

The following definitions appeared in BNP-QCP-10.43, "Inspection Rejection Notice."

> "Inspection Rejection Notice (IRN)--A communication tool used by inspection personnel to inform craft and/or engineering of a failed inspection. An IRN form . . . is used to document these conditions."
>
> "Failed Inspection--Those inspections performed prior to acceptance of the item which identify conditions that are not within the scope of reference 3.1."

Reference 3.1 in the definition of failed inspection is BNP-QCP-10.4, "Control of Nonconformances," which includes the following statement in its scope.

> "This procedure does not apply to failed inspections of work in progress prior to inspector acceptance."

WBN QCI-1.02, "Control of Nonconforming Items," includes the following statement within the definition of nonconformance.

> "Failed inspections of work in progress before inspector acceptance and documentation are not nonconformances."

With different wording, WBN and BLN achieved the same end, defining the point at which NCRs would normally be written as after documentation of QC inspector acceptance.

OC personnel at various levels were questioned about justification for the definitional split between NCRs and IRNs. The response was that some starting point for writing NCRs must be chosen, and the point OC has chosen exceeds industry practice in what is considered a nonconformance. It was also noted that, the NRC has examined the NCR program several times and has not noted concern in this area. While none of the invidivuals questioned could identify documentation of the acceptability of this approach to the NRC , it appears to be reasonable and consistent with practices in OE and NUC PR. For example, NCRs written on procedures or drawings are written only on the finished product--an issued procedure or drawing. If it is unnecessary to write an NCR on a drawing still on the drawing board, it follows that it is unnecessary to write an NCR on an item still in the hands of the craftsman.

Review of the IRN and Trend Analysis (TA) procedures for WBN and BLN indicates the IRN programs are essentially the same with the following exceptions.

a. At WBN, the inspector is charged with deciding whether the IRN goes to the craft or to engineering. At BLN, the inspector gives all IRNs to the craft with a copy to engineering, and the craft contacts engineering for resolution if necessary.

b. WBN maintains unit files of IRN's for 60 days after completion. BLN maintains unit files until closure or voiding and completion of applicable TA.

c. WBN documents inspection of unacceptable work on an IRN if the problem is not corrected before the inspector leaves the work area. BLN documents failed inspections on an IRN when found.

The first two noted differences were not considered significant. The third difference would be inconsequential if the only purpose of the IRN were to communicate the need for further work to the crafts or engineering. However, the IRN was the designated data base for trending of work activities. Allowing deficiencies to be corrected without being trended can skew the data and could prevent or delay identification of root causes of problems. Therefore, NSRS recommends that the practice of not writing IRNs if a problem can be corrected in the inspector's presence be terminated at WBN, procedural changes effected as necessary, and inspectors trained to write IRNs on as found conditions.

Interviews were conducted with QC personnel, craft management, and engineering management concerning inspections and the IRN process. Inspectors at both plants said that their relations with craft personnel were good, and they were not harassed in the field. WBN craft management felt that inspectors had a "quota" for IRNs, but the inspectors at both plants said they had no quota and felt no pressure to write IRNs. BLN inspectors said they write IRNs based on what they find and not on repairs that may be made in their presence. One WBN inspector said he allowed repairs to be made. One said he did not, but knew it was allowable and that some other inspectors did allow repairs.

Interviews indicated different work practices in the various QC units at each plant in such areas as how inspection assignments are made, whether the IRN form is completed in the field or the office, the number of problems to be documented on one IRN, and if reinspections are handled by any inspector or only by the original inspector. These differences were attributable to supervisor preference and to differences in the activities involved in different types of inspections. The reviewers found no evidence that these differences in practice had any impact on the quality of inspections.

Six QC inspectors and supervisors were questioned about how inspector performance was appraised. Significantly, the number of inspections completed was considered to be an appraisal factor by only one inspector. Unfortunately, the inspectors generally did not know what the appraisal factors were. One inspector felt he could "sit on his can all day" and receive the same rating as everyone else in the unit. One inspector felt that promotions were based on "who you know." It appeared to this inspector that all the promotions were going to inspectors who had previously worked at the same plant as the supervisor. One supervisor said that he occasionally inspected his inspector's work in the field and used his observations in performance appraisal, but that he had no program to evaluate inspector performance. Most supervisors apparently did not observe their inspectors in the field. All of the inspectors expressed a

desire to do their jobs well, but some frustration was evident due apparently to a general lack of feedback concerning job performance. They felt that good performance was not acknowledged and that service reviews would be about the same for everyone in the unit unless there was a real problem with an individual.

While it is important to assure that inspectors are not pressed to rush inspections or accept substandard work, it is also important to provide job performance feedback to inspectors in order to maintain their desire to do quality work. NSRS recommends that this be done by performance appraisal based on the supervisor's field evaluation of the quality of a representative sample of the inspectors work.

2. Corrective Action Reports/Discrepancy Reports

a. Definition and General Discussion

Two important methods of initiating corrective action at nuclear plants are Discrepancy Reports (DRs) and Corrective Action Reports (CARs). They are defined by the NQAM, Part III, Section 7.2 as follows:

(1) DRs

"DRs shall be used to report conditions adverse to quality when:

(a) The condition consists of isolated noncompliances with no generic implications.

(b) The condition is not significant . . .

(c) Recurrence control actions and failure analyses are not required.

(2) CARs

CARs shall be used to report conditions adverse to quality when:

(a) The condition involves generic rather than isolated problems or

(b) Recurrence control as well as remedial corrective action is required or

(c) Higher level management needs to be involved with the problem and/or involved in its resolution.

These documents had been receiving more attention at the plants because of the increased emphasis on

corrective action. They were also considered as an indicator of the effectiveness of the corrective action process. The problem was in what criteria to pick to measure them. If the raw number of DRs or CARs generated in a given time frame were used as a yardstick, the accepted catch phrase was that management was "bean counting." This was not considered desirable. For one reason a large number of DRs might be the result of a conscientious attempt to aggressively seek and identify items needing correction and should be endorsed rather than criticized. In addition, the actual number of DRs issued can vary if findings are combined, rather than written as separate items. A danger in using the number of CARs or DRs issued as a performance indicator is that it could easily lead to corruption of the corrective action process by the temptation to control (by any means) how many actually get issued.

There were those who advocated using the age of CARs/ DRs as a performance measure. The age is the time frame from issuance to closure. Since timely correction of problems identified is a major goal of corrective action, age would seem like a good criteria. Unfortunately, it also was not without problems. As will be discussed later on in this section, two plants employed techniques which impacted any attempt to use age as a valid measure. Sequoyah closed out CARs after the initial plant response and then used a DR to track the problem until closure. Watts Bar used a "DRAFT CAR" system without time restraints which preceeded the issuance of a formal CAR (when the timeclock for age of a CAR starts).

A more desirable approach would be for middle management to become involved enough with the details of their DR and CAR programs so that they could ensure that they are being properly tracked and trended.

b. Browns Ferry CARs/DRs

All 1984 and 1985 (January thru May) CARs and DRs were reviewed. All open ones were checked for age and status and all closed ones were evaluated as to method of closure. Overall, the programs appeared in good order, however, a major attitude problem was identified by DQA later during audit No. QBF-A-85-0014. The audit team had noted that 95 percent of the CARs and DRs issued during the first six months of 1985 had been initiated by the plant QA staff. When it was pointed out to plant management during the postaudit conference

that the line organization was not using the CAR/ DR system, they were told that all emphasis was placed on immediate correction of a problem and that the CAR/DR systems would hamper action to correct the deficiency. This response reflected a poor understanding or appreciation of the corrective action process. While correcting a deficiency is the major goal of any corrective action process, the companion chores of documenting, tracking, and trending are vital steps necessary to prevent recurrence not only in the section involved but possibly in other sections or other plants. NSRS recommends that this be emphasized strongly as positive mechanisms for a good corrective action program.

c. Sequoyah CARs/DRs

All 1984 and 1985 (January thru May) CARs and DRs were reviewed. The age and status of all open items were checked and the method of closure was evaluated for all those that had been closed. The program appeared to be acceptable, with one exception. The plant practice is to close out a CAR once their initial response is made and then a DR is issued to track the item to final closure. As discussed earlier in this section, this gives a false impression of the time taken to effect corrective action and invalidates any use of the "average age of CARs" as a measure of the program. NSRS concluded that this practice is inconsistent with the intent of the CAR program.

d. Watts Bar CARs/DRs

All 1984 and 1985 (January thru July) CARs and DRs were reviewed. All open ones were checked for age and status and all closed ones were evaluated for method of closure. Samples of DRAFT CARs and DRs (unique to WBN) were obtained. The program for Watts Bar's corrective action reports (CARs) was outlined in AI-7.3, Section 5.4. It defined who could fill out the CAR form and to whom it was to be submitted. If the initiator was not a member of plant quality assurance (PQA), then the CAR was submitted to his section supervisor for concurrence and then sent to PQA for processing. PQA assigned the CAR number and determined if the CAR was significant or not and whether a root cause analysis was required. The initial response for a significant CAR was 14 working days and 30 calendar days for a nonsignificant CAR. It stated that if a CAR was cancelled before a number had been assigned, the CAR was to be sent back to the initiator with an explanation. However, if the initiator still felt that a CAR was necessary, the CAR was to be issued. The method for handling discrepancy reports (DRs) was also described in AI-7.3, section 5.3, and had similar requirements for up-front numbering when received by PQA.

In practice, the mechanism for handling CARs and DRs by PQA at Watts Bar was contained in their section instruction letter, PQA-SIL-3.1, "Corrective Action Procedures CAR/DR." Section 6.1.1 of this instruction established a "draft" copy system for CARs and DRs. A copy of the draft CAR or DR was to be stamped "DRAFT" and given to the responsible section supervisor. This was to give him an opportunity to discuss whether the deficiency as written was correct and properly stated. This was also intended to give the PQA representative a chance to discuss proposed corrective action(s). Only after both parties were satisfied that the deficiency was adequately stated was the CAR/DR to be typed. It then had to be approved by the QA supervisor before a number was assigned.

The section instruction letter thus established a two-stage CAR/DR process--the informal "draft" system with no time restraints which preceded the formal CAR/DR process, thus rendering its time restraints meaningless.

When asked why the "draft" CAR/DR process had evolved, the answer given by PQA supervision was that it helped strengthen the interface with the plant sections by involving them with the preliminary work. By having these sections see the CARs and DRs in draft form, vague or inaccurate wording was avoided. They felt strongly that the overall corrective action process was best served by this improved interface which had resulted in less animosity towards PQA and more polished, accurate CARs and DRs.

An additional problem was identified with the CAR program at Watts Bar while reviewing the draft CAR/DR process on July 10, 1985. The reviewer examined three CARs which had been submitted from two to five months earlier and had not even been put into the draft CAR process. One of these proposed CARs listed eight surveillance instructions which were presented to PORC and approved by the Plant Manager without the review requirements of AI-3.1 being fulfilled. The reviewer was later told that this potential CAR was dropped when the originator was told by his supervision that all the SIs involved had gone through a subsequent plant review and Plant Manager approval. He was told that this rendered the issue moot.

A proposed CAR dated February 20, 1985, (and resubmitted by the originator to his supervisor in May) had also not been issued even as a DRAFT CAR. It dealt with the plant's Q-list which was intended by NUC PR to identify and control components that perform a "major safety function" but which had been prepared for Watts

Bar by OE to include both safety and nonsafety related items. Meanwhile, at least two Q-list reviews had been performed internally by PQA and OE had become involved in order to determine if any NCRs needed to be initiated.

A proposed CAR, dated May 13, 1985, addressed the CSSC listings from the NQAM and their status at Watts Bar. Both the CSSC lists and its successor, the Q-list, are complicated issues, but the failure to docket them as items to be tracked in an approved corrective action mechanism was contrary to AI-7.3.

Regardless of the intended purpose for the draft CAR/DR system, its use is not acceptable when it undermines timely response and realistic tracking of the time from identification to closure required of corrective action processes. NSRS recommends that the separate, draft CAR/DR systems be abolished.

A good corrective action program demands prompt identification and timely resolution. Failure to docket a concern for whatever reason can lead to corruption or subversion of the program. The three CAR's that were not issued were important. The Q-list was reviewed internally by PQA starting in January and a report of their findings issued on August 26, 1985 (Quality Evaluation Report QE-85-09) and an NCR issued (W-269-P). The breakdown in the PORC review process was neither documented nor reviewed. The requirements of AI-7.3, section 5.3 that requires that a CAR be issued if the originator cannot be convinced that no problem exists should be strictly adhered to by PQA.

3. Nonconformance Reports

a. Nonconformance Reports-OE

The OE procedure for handling nonconformances was described in EN DES-EP 1.26 (Nonconformances - Reporting and Handling by EN DES). It basically stated that it was the responsibility of all OE employees to identify to their management any condition adverse to quality. This condition would then be promptly documented and corrective action would occur expeditiously. (Note: The OE Quality Policy issued August 21, 1984 by the Manager of OE was consistant with the EP policy and stressed the timely notification, documentation, and correction of adverse conditions).
The "expeditious" corrective action was to meet the following procedural timeframes:

- Determination of required action to correct the condition adverse to quality to occur within 60 days of significance determination.

- Action required to prevent recurrence should be completed within six months of the date significance was determined.

- There is no timeframe given to complete the corrective action. However, corrective action is defined as "the immediate action taken to correct the deficiency and improve the safety of the plant."

The OEP-17, "Corrective Action," maintained the 60 day timeframe for identifying the corrective action. Priority was also given to resolving CAQs identified on operating plants. However, there was no timeframe given to complete corrective action.

It is acknowledged that each CAQ has unique characteristics, but a review of TROI listings identified excessive time delays if adhering to a policy of timely corrective action.

The following table (A) of significant NCRs serves as examples of potential excesses in time taken to complete corrective action. The items were randomly taken as listed on the TROI printouts obtained from MEB (7/9/85), CEB (5/14/85), and WBN (6/15/85) and are considered representative of current problems which have not received prompt, corrective action.

TABLE A

NCR	Description	Date Identified	Projected Date Closed
BFN BWP 8311*	EECW heat exchangers maximum pressure/temp. less than EECW system.	4/12/83	9/9/99
BFN MEB 8201*	HPFP-CS piping corrosion	8/26/82	12/2/85
BFN NEB 8304	Heat dissipated from the diesel may be greater than originally used as the design basis.	3/30/83	9/9/99
BFN NEB 8001	RBCCW APC break with consequential containment leak path.	2/11/80	9/9/99
SQN MEB 8203	HPFP-CS piping corrosion.	8/26/82	6/5/86
SQN NEB 8126	ERCW traveling screens electrical components not class 1E due to wrong specification by EN DES.	5/13/81	9/1/85

TABLE A (continued)

NCR	Description	Date Identified	Projected Date Closed
SQN SWP 8216	SQN nuclear plant drawings 47W496-1 and 47W862-1 were revised and issued under TVA ECN 2842 which was applicable to Watts Bar Nuclear Plant.	10/15/82	9/15/85
BLN NEB 8010*	Corrosion of carbon steel piping.	12/30/80	3/03/86
BLN CEB 8301	Issued design drawings without having equipment nozzle qualified.	1/24/83	3/1/89
BLN CEB 8404	Error in the seismic analysis of the auxiliary control building.	3/30/84	9/9/99
BLN CEB 8408	Unconservative normalization factor used in design calculations.	5/29/84	9/9/99
BLN CEB 8420	Error in rigorous analysis handbook.	12/4/84	9/9/99
BFN CEB 8203 R3	Incorrect seismic analysis of RB crane.	9/10/82	9/9/99
BFN CEB 8402 R1*	Effect of cumulative loads on drywell floor steel not addressed.	3/22/84	9/9/99
SQN CEB 8413	Calculations not initialed as being checked.	7/18/84	9/9/99
SQN CEB 8412	Calculations missing or not readily retrievable.	7/18/84	12/1/86
SQN PWP 8305*	Numerous attachments made to plate on crane wall that was erected to protect an area of weak concrete and was not be used as a support plate.	8/5/83	9/15/99

*Will be commented on further.

Selected NCRs from table A were reviewed to determine the causes/justification for time delays. RIMS was used as the controlled documented history file for these NCRs. The following summaries highlight the history and documentation available on NCR's BFNBWP 8311, BFNMEB8201, BLNCEB8420, BFNCEB8402, and SQNPWP8305.

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The review of the NCR documentation identified two major problems with closing NCR's - ineffective interfacing within OE and with NUC PR and the inability to establish realistic commitments concerning the time needed for OE to complete a job.

Summary of BFN BWP 8311 Heat Exchangers of Safety-Related Systems

4/12/83 (BWP 830413 008)	NCR was written to combine seven previous NCRs which involved design discrepancies between various heat exchangers of safety-related systems and the interfacing EECW system.
4/15/83 (NEB 830415 255)	NCR BFN BWP 8311 forwarded to NUC PR by NEB NLS with statement that "no failure evaluation is required for this NCR. Failure evaluations have been prepared and transmitted for all of the NCRs referenced in this nonconformance."
6/20/83 (BWP 830620 009)	Meeting notes defining the OE organizational responsibilities for the preparation of the failure evaluation for NCR BFN BWP 8311.
12/29/83 (NEB 831229 251)	Revised failure evaluation sent to NUC PR.
1/4/84 (BWP 840104 003)	EN DES sends nine recommendations to NUC PR of corrective actions to be done to resolve BFN BWP 8311 and requests a DCR for approval of work.
1/6/84	NRC performs unannounced inspection of TVA's actions associated with the diesel generator heat exchanger. Fourteen technical concerns were identified during this inspection.
4/16/84	EN DES revises corrective action recommendations to NUC PR which supersedes the action of 1/4/84.
7/23/84	NRC issues inspection report citing one violation against TVA for "Incomplete Design Change Analysis."
10/16/84	NUC PR requested EN DES to perform analysis required for NCR under DCR 2997 by January 1, 1985. (Note: Approval given almost one year after original OE request of 1/4/84.)
12/27/84	EN DES determines that analysis cannot be completed prior to March 15, 1985.
1/23/85 (BFP 850123 014)	Notes are issued which document December 18, 1984, OE-BFN meeting. Purpose of the meeting was to determine the scope of work and to assign organizational responsibilities for the subject DCR.

Conclusion: As of 7/9/85, the TROI listing lists the OE action item as "Issue ECN" 9/9/99. After years of coordinating and reviewing a problem, no definitive action had been completed yet.

Summary of NCR BFN MEB 8201 - HPFP System, Corrosion of Carbon Steel Piping

3/19/79 (DES 790320 013)	P PROD requests EN DES to perform an analysis on the effect of modification to common piping systems on plant reliability. The analyses were to include deterioration of plant equipment.
4/23/79 (MEB 790424 364)	EN DES requests $80,000 from P PROD to perform work to be completed by October 1980.
6/19/79 (DPC 790619 003)	EN DES receives NUC PR approval for analysis work.
8/27/82 (MEB 820827 002)	NCR issued to document potential problems resulting from the corrosion of carbon steel piping found in the high pressure fire protection (HPFP) system.
10/25/82 (DES 821026 012)	NUC PR requests EN DES to complete analysis in timely manner.
12/1/82 (MEB 821202 011)	EN DES projects a September 1983 completion date for HPFP analysis (to NUC PR).
3/9/84 (BWP 840309 012)	EN DES requests authorization from NUC PR for 550 hours due to corrosion effects on the carbon steel piping.
3/30/84 (DES 840402 038)	NUC PR determines that no analysis is required based on EN DES failure evaluation. Note: No failure evaluation was identified in RIMS.
4/11/84 (MEB 840411 001)	EN DES issues analysis to NUC PR five years after original NUC PR request. One conclusion states that the HPFP system is not adequate for the reactor building fire.
4/23/84 (MEB 840423 023)	EN DES issues memorandum to NUC PR requesting authorization to complete further analyses for additional safety-related cases.
8/12/85	No further documentation exists in RIMS. No corrective action has been noted on the NCR form as required by EN DES-EP 1.26.

Conclusion: Apparently after six years of NUC PR/OE interfacing on this issue, a difference of opinion still exists between NUC PR

and OE. NUC PR has stated that no analysis is required. OE has stated that the HPFP is inadequate for the reactor building fire.

Summary of Action on NCR SQN PWP 8305

(Numerous attachments made to plate on crane wall that was erected to protect an area of weak concrete and was not to be used as a support plate.)

8/5/83 (PWP 830808 001)	NCR written because numerous attachments have been made to or through a 1/4-inch plate on the unit 2 crane wall.
8/12/83 (NEB 830817 278)	Failure evaluation states, "Not acceptable for some design loading combinations or design conditions. A component(s) failure or functional impairment is likely.
8/29/83 (DES 830831 011)	NUC PR requests another failure evaluation with more detail.
9/20/83 (NEB 830920 273)	Failure evaluation concludes that the deficient condition is "acceptable for all design loading combinations and design conditions."
10/12/83 (PWP 831012 007)	Corrective action documented on NCR form. OE to revise design drawings based on NUC PR DCR or FCR.
3/27/84 (DES 840329 013)	NUC PR memorandum--". . . the Field Service Branch at Sequoyah painted the 1/4" plates located on the unit 2 crane wall with a sign forbidding any attachments in weak concrete areas in the crane wall. Since NUC PR has already implemented this corrective action, a design change request is not necessary."
5/14/85	TROI listing--"NUC PR to provide CAT D FCR/action completion 9/9/99."

Conclusion: OE action is indefinitely waiting for a DCR which NUC PR has documented as not being necessary.

Summary of Action on NCR BLN CEB 8420 (Error in the BLN rigorous analysis handbook.)

12/4/84 (CEB 841204 002)	NCR issued which identified a problem in the handbook policy that defines incorrect temperatures to be used in flange qualifications.
1/7/84 (L44 850107 806)	First interim report to NRC.
2/4/85 (CEB 850204 001)	Corrective action and action to prevent recurrence identified on NCR.

5/22/85 (B45 850522 253)	Second interim report to NRC. Eighteeen problems for BLN units 1 and 2 were identified to be affected by this NCR. Only one problem needs to be reanalyzed, and the remainder will require documentation change.
5/14/85	TROI printout status. Completed action to be accomplished 1999.
Conclusion:	Based on second report to NRC, the 1999 completion date is not timely corrective action.

Summary of Action on NCR BFN CEB 8402 (Effect of cumulative loads on drywell floor steel not addressed.)

3/30/84 (CEB 840330 008)	NCR issued.
6/29/84 (CEB 840629 005)	Completed NCR form for corrective action and action to prevent recurrence. Corrective action completion identified is 1986.
9/18/84 (NEB 840918 256)	Request for BWP to provide NLS with overdue FE/ER.
9/25/84	FE/ER identifies NCR as Category II.
5/14/85	TROI status--No actions or comments shown. Completion date 1999.
Conclusion:	Discrepancy in time to complete corrective action. 1999 is not prompt action for Category II item.

b. Nonconforming Condition Reports (NCRs)- OC

At the time of this review, OC requirements for NCRs were specified by QAP-15.1, "Reporting and Correcting Nonconformances" revision 11; and QAP-16.1, "Evaluation of Nonconforming Condition Reports" revision 6. At WBN, QAP-15.1 was implemented by QCI-1.02, "Control of Nonconforming Items" revision 14; and QAP 16.1 was implemented by QCI-1.02-2, "Review of Significant NCR Action Required to Prevent Recurrence" revision 0. At BLN, both QAPs were implemented by BNP-QCP-10.4, "Control of Nonconformances" revision 12. For this review, these documents and numerous WBN and BLN NCRs were reviewed, personnel involved in the NCR process were interviewed, numerous NCRs selected at random from the WBN and BLN files and RIMS were reviewed, NCR logs were reviewed, and selected NCRs were followed through the system to verify proper handling.

Personnel interviewed at the sites, in CQAB, and in OE projects and branches were aware of their responsibilities regarding NCRs. Engineering personnel understood

what situations required an NCR and felt that they were free to write NCRs. QC personnel interviewed said they could write NCRs but rarely had the need to do so. In their latest review of WBN, the Institute of Nuclear Power Operations (INPO) found cases where NCRs should have been written by QC but were not.

Dispositioning and closure of NCRs that did not have to be referred to the Design Project Organization (DPO) were generally very timely. Personnel interviewed felt that DPO support and timeliness were good except when the engineering branches had to be involved. See sections V.C.3.a and V.C.6 for more information and examples of OE timeliness.

NCRs generated by NUC PR were handled by OC in the same manner as OC NCRs. OC personnel at WBN indicated that in the past, NUC PR NCRs often had to be returned for correction or additional information, but this was no longer a problem. OC personnel at BLN had no problems with NUC PR NCR's, but had received very few (see sections V.D.6 and V.C.3).

The C/A and action required to prevent recurrence (ARPR) were reviewed on approximately 25 randomly chosen NCRs from each plant. C/A and ARPR were found to be appropriate.

In summary, the NCR program within OC appears to be functioning properly with the exception of possible failures to write NCRs based on inspections as identified by INPO. Interfaces between OC and OE and between OC and NUC PR are problems or potential problems (see sections V.C.9 and V.D.6).

c. Nonconformance Reports-NUC PR

(1) OE - NUC PR Interface

Following the NUC PR 1984 reorganization, a memorandum (J. P. Darling to R. W. Cantrell, dated September 19, 1984) established a new interface. Design Change Requests, Engineering Change Notices, Field Change Requests, Design Study Requests, Nonconformance Reports, and all related correspondence to these items were to be handled directly between the Site Design Services Manager and the OE Project Manager for the specific plant. Established procedures were to be revised as soon as possible. Interdivisional procedures would continue to be handled betweeen the Manager, NUC PR and the Manager, OE.

On March 13, 1985 (memorandum E. G. Beasley to R. J. Mullin) a listing of all NCRs initiated by OE (or EN DES) on work originally performed by OE for BFN and SQN were transmitted to NUC PR. There were 253 NCRs for BFN and 390 NCRs for SQN. Of these, 36 (BFN) and 109 (SQN) were still open in the OE tracking record and required NUC PR assistance to resolve such as providing information, taking action, or releasing funds for OE work. It was pointed out that many of the open items were over 36 months old. The memorandum stated that Failure evaluations/ Engineering reports, or additional engineering information at NUC PRs request had already been transmitted to NUC PR. The other NCRs were being resolved within OE and a preliminary review by QMS had indicated that many items on the list had been closed in OE.

(2) Browns Ferry

The handling of NCRs at BFN was discussed with the Design Services Manager, Mechanical Design Project Engineer, Project Control Supervisor, and Compliance Supervisor. The Project Manager had transmitted the list of the 253 NCRS to the Design Services Manager on March 22, 1985 (memorandum N. R. Beasley to G. R. Hall). A subsequent memorandum by the Project Manager, dated April 17, 1985 identified that 158 NCRs on the list of 253 NCRs were found to be closed and required no further action by NUC PR. The Design Services Manager said that he had a budget of $20.7 million for Fiscal Year (FY) 1986. Plant modifications had specific funding but engineering evaluations were funded in a lump sum. The impact of NRC commitments and other priorities were solicited from OE. For NCR priority, the information was forwarded to the planning and scheduling (P&S) Manager for incorporation in the total P&E effort. He said that schedules were continuously exchanged and updated. The FY 1986 budget was reviewed (memorandum N. R. Beasley to G. R. Hall dated February 20, 1985). Completion of outstanding ECNs for previously approved DCRs was allocated $11.9 million and NCR responses $262,000. A more detailed breakdown was examined (memorandum N. R. Beasley to G. R. Hall dated March 15, 1985). The values had been obtained from Authorized Funds, Cost Estimates, and activities in the PC III computer schedules. NCR preparation was allocated $217,000 and new DCRs $2.6 million. As of May 30, 1985 no formal procedures had been developed for the organizational structure in place. A Project Manual was expected and issued September 27, 1985.

what does this mean? specific funds for what? RDS 11/1

what is the point of all this? is there sufficient funding in the right areas or not! RDS 11/17

The Design Project Engineer said that he was ultimately responsible for all open NCRs whether worked on in OE, Knoxville, or at BFN. There was a master list of NCRs and each design discipline had their own list managed and distributed from Knoxville. Altogether 516 NCRs had been written for BFN; 116 were open and 79 of these would require some NUC PR action for closure. The current average age for closure was 28.2 months. The initial goal set by the Manager of Engineering was to work on the old items and get the average age to closure not greater than 19 months. Problems in expediting NCR closure had been discipline staffing and the back-and-forth transfer of responsibility. If the ECNs are not completed, i.e., both work and drawings completed, the NCRs have stayed open. The last ECN closed out was in 1978. To close out ECNs, they had to examine old ECN drawings against the as-constructed drawings and generate an updated as-constructed drawing. This work was getting less priority compared to the NRC mandate on environmental qualification. The commitment tracking system for BFN fell under the supervision of the compliance supervisor. The system is capable of accepting and tracking NCRs, but none were on the system. (See Tracking Systems section V.C.4.C.)

RRL 11/24

A DQA audit QBF-A-85-0014 conducted June 24 through July 16, 1985 determined that no systematic tracking had been developed for controlling corrective action to the NCRs maintained by Compliance. Audit Deviation No. QBF-A-85-0014-D03 cited inadequate documentation of the currentstatus and closure on approximately 50 NCRs. The required corrective action required was:

- Review all past NCRs to determine current status and ensure proper handling as stated in the 6-26-85 memorandum from G. T. Jones to J. A. Coffey.

- Provide documentation supporting corrective action on all closed NCRs.

- Place all open NCRs in a commitment tracking system and verify that commitment dates are adequate.

- Complete all above corrective actions prior to unit startup.

On June 26, 1985 a small team of NUC PR/OE representatives was formed to review the NCRs. The

Browns Ferry Engineering Project report dated September 17, 1985 noted that seven NCRs required corrective action or documentation of completion of corrective action prior to unit 2 or 3 start up. While maintenance of the NCR status was extremely poor, BFN did respond promptly to the audit finding. Providing corrective action to the audit finding should result in satisfactory handling of NCRs at BFN. NSRS recommends that a similar review and controls be implemented at other plants. 1D-QAP 16.1 should address this activity (see paragraph V.D.6.e).

A sample of BFN NCRs were examined to verify the status of NCRs.

NCR	Status	TROI Status
BFN TDP 8001	Closed (3/22/85)	Not in TROI
BFN BWP 8401	Open	Open in TROI
BFN BWP 8406R2	Open	Open in TROI
BFN NEB 8410	Open	Open in TROI
BFN EEB 8502R1	Open	Open in TROI
BFN EEB 8501	Closed (2/15/85)	Not in TROI

BFN EEB 8502 R1 was awaiting environmental documentations. Both NCR's shown "closed" required no further action and consequently had been removed from TROI. The tracking of these BFN NCR's in TROI was being performed satisfactorily. No attempt was made to assess the effectiveness of TROI.

(3) Sequoyah

The handling of NCRs at SQN was discussed with the Plant Manager, Design Services Manager, SQN Engineering Project Manager, Staff Engineer Supervisor, and Regulatory Engineer. The Project Manager had transmitted the list of the 390 NCRs to the Design Services Manager on March 19, 1985 (Memorandum J. P. Vineyard to H. B. Rankin). The Design Services Manager said that he had a budget of $10 million for FY 1986. The FY 1986 Budget was reviewed (memorandum J. P. Vineyard to H. B. Rankin dated February 25, 1985) and FY 1986 Power and Engineering Work Plans (memorandum J. P. Vineyard to H. B. Rankin dated March 15, 1985). NCRs had been allocated $76,000 and DCR/ECN reviews $118,000. As of June 4, 1985 no formal procedures had been developed for the organizational structure in place. All NCRs generated by OE are sent to the Chief Nuclear Engineer, Engineering Project Manager, and Site Services Branch supervisor who handles distribution of the

NCR. NCRs were now hand carried instead of being mailed. A total of 884 NCRs had been written for SQN, 321 being open at that time. The current average age for closure of NCRs was 944 days. Under the procedures in existence at that time, OE could not close out NCRs until the work was completed by NUC PR. On June 28, 1985, the new procedures would permit the closure of NCRs on transfer to NUC PR. It was estimated about one-half of the 321 open NCR's would be closed.

OE procedures OEP - 17, "Corrective Action," provides for prompt notification of the Site Director for significant NCR's (now SCR's) and providing engineering reports to the plant. SQN procedure SQA-118, "Handling of Nonconformance Reports and Conditions Adverse to Quality Received from Office of Engineering," provides for prompt notification to the plant manager of deviations or conditions adverse to quality identified in an engineering report and subsequent action by Regulatory Engineering Section. SQA-118 was being revised and subsequently issued on July 2, 1985.

DQA audit report QSQ-A-85-0009, "Correction of Deficiencies", was reviewed. The audit was conducted June 10-18, 1985. The team examined the NCR files and reviewed computer printouts provided by the Regulatory Engineering Supervisor. The individual NCR information was readily retrievable and maintained as QA records. A review of 5 NCR packages indicated that the requirements of SQA-118 were being met. The report stated that the commitments made by the NCR task force will be reviewed in the audit scheduled December 1985.

A sample of SQN NCRs was examined to verify the status of the NCRs.

NCR	Status	TROI Status
SQN MEB 8401	Closed (5/31/85)	Closed in TROI
SQN MEB 8402	Closed (5/31/85)	Closed in TROI
SQN MEB 8405	Closed (3/14/85)	Closed in TROI
SQN MEB 8406	Closed (1/16/85)	Closed in TROI
SQN MEB 8407	Closed (2/27/85)	Closed in TROI
SQN MEB 8411	Closed (1/15/85)	Closed in TROI
SQN MEB 8201R8	Open	Open in TROI
SQN MEB 8202R2	Open	Open in TROI
SQN MEB 8301R2	Open	Open in TROI
SQN MEB 8409	Open	Open in TROI

The tracking of these SQN NCR's in TROI was being performed satisfactorily. It was noted that two closed NCRs, MEB 8401 and MEB 8405, had been opened as a result of evaluating generic implications of a similar NCR on WBN.

(3) The handling of NCRs at WBN was discussed with the Plant Manager, Design Services Manager, and Site Project Engineer. The Design Services Manager reports to the Site Director, interfaces with the Plant Manager, and has direct contacts with the Site Services Supervisor, Modifications Manager, OE/WBN Project Manager, and Site Project Engineer.

On the subject of formal procedures for the organization in place it was stated that a Design Services Instruction Manual was being developed. NSRS recommends that similar type procedures be developed at BFN and SQN. Special emphasis should be made on interface controls which are likely to be different at each site and should reflect the current onsite/offsite organizations.

The Design Services Manager stated that when a copy of an NCR goes to the OE licensing staff, a copy is sent to him and he forwards it to the Regulatory Engineering Group so that they will be ready to respond to any subsequent NRC questions. He stated that concerns that may be identified for WBN unit 2 and written as an NCR could well be applicable for unit 1--perhaps leading to a limiting condition for operation. It could also impact SQN or even BFN. Commencing mid-June, meetings were to be held every two weeks between the NRC resident inspector and OE representatives. The Design Service Managers for BFN, SQN, and WBN have monthly meetings rotating at each site to discuss problem areas.

The Site Project Engineer responsibility at this time is in budget, scheduling, and organization functions. The main purpose was to provide interface on unit 1 but not on unit 2 as yet. The Plant Manager had requested the Design Services Manager to review the commitments in the SER. There are 330 commitments and of 53 selected for review all were found implemented. They are to continue and verify that all have been met. Of the NCRs written for WBN, 103 were open and the average age of open items to closure was 19.1 months.

QAB Audit Report QWB-A-85-0009 dated April 5, 1985 identified problems in the handling of NCRs as related to 10 CFR 50.55e. The audit team selected eleven recently closed NUC PR initiated NCRs for review and found that all contained errors and omissions. Two of the NCRs were closed prior to corrective action completion. This was identified on Deviation Report No. QWB-A-85-0009-D01. The response and subsequent action by WBN was not examined in this review.

A sample of WBN NCRs were examined to verify the status of the NCRs.

NCR	Status	TROI
WBN CEB 8209	Open	Open in TROI
WBN CEB 8225	Open	Open in TROI
WBN CEB 8301	Open	Open in TROI
WBN MEB 8303	Open	Open in TROI
WBN MEB 8425	Open	Open in TROI

The tracking of these WBN NCR's in TROI was being performed satisfactorily.

(4) No design services were in place at BLN. The DQA audit QBL-A-85-0003 conducted July 8-11, 1985 reviewed NCRs to ensure that they were processed correctly. They identified a problem concerning the time of initiation of a plant-imposed five day limit on verbally reporting the NCR to OE nuclear licensing. The report noted that the plant had previously identified this problem on BLN-DR-85-63-R.

The review of handling of NCRs by NUC PR at BLN was limited to those NCRs reported by NUC PR to OE. Only seven NCRs had been generated at that time. All NCRs had been processed and corrective action taken. Control and tracking of NCRs was performed by the Regulatory Engineering Section. The control of actions for these NCRs is adequate. With the small number of NCRs involved, computer tracking is not needed at this time.

4. Tracking Systems

a. Tracking Systems - OE

OE utilized the Tracking and Reporting of Open Items (TROI) system to track and monitor the status of NCRs, audit deficiencies, NSRS items requiring closure, NRC identified items, 50.55(e) reports, part 21 reports, Commitment Tracking Records for licensing commitments,

and stopwork orders. EN DES-EP 1.56 defined the responsibilities and procedures for using TROI. However, the EPs were replaced by OEPs on June 28, 1985. OEP-5, "Control Monitor," now addressed the TROI system and stated that the project manager had lead responsibility to monitor and control design schedules, budgets, and commitments. The review was performed using EP 1.56 and not OEP-5. It is emphasized that during the review, implementation of the new OEPs was not yet understood by project engineers or other OE personnel interviewed.

EN DES-EP 1.56 stated that the project manager/branch chief defines, establishes corrective actions, closes items, and verifies the accuracy of data in TROI for which his branch/ project is responsible.

After the 1984 reorganization the project engineers became the branch chief's representative in the project. The majority of the project NCRs were also transferred to the branches. Therefore, the project engineers became responsible for open item tracking within their discipline. The project engineers were asked how priorities were established on the open items.

The following two questions were asked during interviews of OE personnel concerning priority setting:

(1) Who establishes the priority for the working (completing) of NCRs?

(2) How is priority relayed to employees who perform the work?

The typical responses to these questions were:

- "TROI establishes priorities."
- "No priorities other than schedule" (i.e., CONST/ NUC PR schedules).
- "Anything needed before fuel load is priority."
- "The responsible section establishes priorities. The responsible supervisor relays that information to employees."
- "Any TROI item is priority."
- "TROI meetings are held to emphasize closure of old problems."

Note: One employee answered these questions very directly and completely. This WBN project engineer appeared to be knowledgeable and in control of the work under his responsibility. He attempted to schedule work in an efficient manner to minimize unnecessary future rework. The professional attitude he projected was refreshing. He was willing to acknowledge past failure and mistakes and could clearly explain the actions taken to correct them.

The TROI system appeared to be a useful tool that had been misused by management as the means to demonstrate a schedule that was in control.

It is acknowledged that regular TROI meetings are held by management; but, when OE personnel were questioned concerning the TROI meetings, the responses were similar. Basically, the oldest open items are looked at but there was not much that could be done.

TROI can be an effective tool if the responsible management takes an aggressive stand towards establishing priorities of the open items.

One problem in the TROI utilization was identified repeatedly to NSRS. There was a problem of dates being established for action items on TROI listings which had not been coordinated previously with a responsible party. This resulted in actions coming due before the responsible party received documentation of the problem and corresponding tasks. These problems typically involved interfaces between branches and OE/CONST. The interface problem with NUC PR appeared to be at the other extreme of not being able to assign realistic action dates so a future date of 1999 would be used.

b. Tracking Systems - OC

There were three tracking systems in OC that collectively were intended to meet all the C/A tracking needs of the office. These systems were the NCR Log, the Commitment Tracking Index (CTI), and Tracking and Recording of Open Items (TROI).

QAP-15.1 revision 11 included the following requirement: "A log or computer program shall be used to record the NCR identifier, the date assigned, the date the NCR was closed, and the initiator." WBN QCI-1.02

revision 14 and BNP-QCP-10.4 revision 12 specify a log to meet this requirement, and assign the responsibility for maintaining the log to the Document Control Unit (DCU). These logs were examined at WBN and BLN and found to meet the current requirement. The log entries were compared to a number of NCRs in RIMS and in the plant files and no notable discrepancies were found.

In response to a need identified in the 1982 CONST Action Plan, CONST established a Commitment Tracking Program (CTP) in 1983 (see references B.65 and B.66) which was designed to track the procedural implementation of commitments made in upper tier documents as well as commitments made in response to audit findings, NRC violations, etc. The CTP has been maintained informally with some success since that time. In February 1985, DQA addressed Quality Bulletin 85-01, "Commitment Verification" (reference B.67) to the NUC PR Site Directors. Even though it was not addressed to OC, OC chose to respond (reference B.68) with the promise to proceduralize the Commitment Tracking Program by June 30, 1985. In May 1985, BLN issued BNP-QCP-10.52, "Commitment Tracking Index" to control the CTI at BLN. In July 1985, QES distributed a draft QAP-5.3, "Commitment Tracking Index" (reference B.70) to WBN and BLN for comment. As of August 13, 1985, WBN had not commented on this draft QAP or issued a procedure to control the WBN CTI. The original CTP was certainly an improvement over no system, but there still have been instances of procedure revisions deleting or changing commitments, such as the example cited in NUC PR Quality Bulletin 85-01. Proceduralizing the CTI system should further improve its effectiveness by removing its dependence on particular individuals and by providing consistency.

Tracking of action items and listing of the responsibility for these items was provided by TROI. This is a common system shared by OC and OE consisting of a computer data base with controlled/restricted input access and essentially unrestricted output access. (See section V.C.4.a for more information about the TROI system.) Interviewees generally felt that TROI is useful, but it was noted that sometimes C/A and completion dates have been assigned to supervisors without their input. This has resulted in due dates being missed before the responsible supervisor received the item. Some people also felt that TROI is now the "master instead of the servant" in that supervisors may have to spend more time addressing missed TROI due dates than with addressing their assigned C/A.

c. <u>Tracking Systems - NUC PR</u>

1. Browns Ferry

There were numerous tracking systems in use at Browns Ferry. Commitment tracking was done by a weekly "Safety Issues List" which identified and gave the status of Licensee Event Reports (LERs), potential LERs, NRC inspection report items and NRC safety concerns. The "QA Staff Monthly Report" tracked items such as CARs, DRs, various management attention items, QE, QC surveys, and audits.

A major change had taken place in commitment tracking at Browns Ferry about two months before the review team's arrival. Prior to that time there were two commitment tracking systems - one maintained by the plant and one by the Nuclear Central Office (NCO). Beside the obvious duplication of effort in maintaining two sytems to track the same information, the systems suffered from lack of proper updating. For example, the NCO had no method of closing out items because the plant ignored their system (they had their own). The plant finally decided to drop their own system and use the NCO tracking system. Initial reaction was that the cross checking of information by both the plant and NCO was an improvement. Subsequently, an audit by the Quality Audit Branch (Report No. QBF-A-85-0014) identified a problem with approximately 50 NCRs (see section V.C.2).

This same audit identified over 24 automated and manual tracking systems for handling identified deficiencies. DQA recommended that consideration be given to using one system to serve the information and tracking needs for the entire site. NSRS concurs that any time duplicating or overlapping tracking systems can be combined a more efficient system should result.

2. Sequoyah

Sequoyah had separate printouts for items such as LERs and Possible Reportable Occurrances (PROs). Their major printout for corrective action items was called the Corrective Action Tracking System (CATS). It listed the description and status of open LERs, inspection followup items, audits, NRC IE Notices, INPO Evaluation items, and Westinghouse Technical Bulletins. A good practice noticed was the tracking of a verbal commitment to the NRC.

Is this something new? When started? How compared to previous method? How are we being assured we are not finding in the same deficiencies in Trop as in V.C.2.?

A review of the monthly CAR/DR status reports for the previous year showed a marked improvement in the number of overdue/delinquent CARs/DRs. This appeared to be attributable to the increased visibility they were given by being tracked and individually highlighted with the responsible section listed in ~~this~~ report. The CAR/DR status?

TPM 11/24

As mentioned in section V.C.2.c Sequoyah had the practice of closing out some CARs and using DRs to track them to closeout.

RBV 11/24

3. Watts Bar

Fine but how used in relation to corrective action? Are items being committed or just tracked?

A listing of the categories of items covered in Watts Bar's CATS LOG gives an indication of the variety of corrective action items being tracked. It includes such items as NRC, INPO, NSRS, DQA, insurance, FSAR, LER, PRO, and miscellaneous. The plant also employs an action item list which tracks any activities which either top management or the individual sections recognize as items needing identification, tracking, and commitment to a completion date. This comprehensive program was a commendable good practice.

4. Bellefonte

Bellefonte had in place a tracking system for CARs and DRs and employed a monthly corrective action summary report. Because of the distance to fuel loading of this plant, no further systems were reviewed.

week. What was [illegible] on this on? Is it Good? Is it Bad? Is it Used?

5. Trend Analysis

a. Trend Analysis - OE

A key element in an effective corrective system is the ability to identify trends and correct the root causes for the trend to preclude repetition in the future. The trend analysis process must provide timely identification of trends and root causes if it is to be effective in the corrective action process.

OE has attempted to provide an effective trend analysis system for over ten years. The following represents a brief history of trend analysis development in OE and an evaluation of the current status of OE trending.

Something appears to be missing RBV 11/25

- In 1977 the Manager of OEDC transferred the responsibility for trending from OEDC to EN DES and CONST status of trend development: "Since initiation of the trend analysis activity in January 1974, the

major emphasis has been placed in developing a tool which would provide a mechanism for alerting management to potentially adverse impacts of a trend in the number of quality deficiencies as it is developing in some areas of OEDC activities . . . " The original goal of establishing a quality trend analysis sytem has been met. The system as presently structured can identify and report to management for their action adverse quality trends early in their development. The system needs refinement to provide a means for using trend data to:

(1) Identify problems more specifically.
(2) Indicate the organizations affected by an identified problem.
(3) Establish problem causes.
(4) Specify alternative solutions to an identified problem.

- In 1980 the trend program received a full go ahead by the EN DES manager. The responsibility of generating the data base was given to the Quality Assurance Branch (QAB).

- In 1981 (May-July) a major management review of the Office of Engineering Design and Construction was performed by NSRS. It was concluded that the trend analysis program was not functional (R-81-14-OEDC(BLN)-39). The NSRS report stated that "considerable effort had been expended by QAB on the NCR trending function; however, the program had not evolved to the point of producing meaningful, useable output."

- In 1982 (February-March) a management review of WBN was conducted by NSRS (R-82-02-WBN). It was concluded that no procedure describing the trend analysis program had been prepared as committed in a 1980 memorandum from Sprouse to Kimmons (QAS 800630 001).

- May 1983 - A procedure (EN DES-EP 1.51), "Conditions Adverse to Quality (CAQ) Trend Analysis Program," was issued addressing the trend program. (Note: This procedure had initially been committed for issue by October 1, 1982.)

- 1983 - OQA recommends closure of R-82-02-WBN-16 (OQA 830722 500, GNS 830801 050). Item closed based on procedure issuance. No verification of actual implementation performed.

- April 1985 - Office of Nuclear Power (Procurement Evaluation Branch) conducted audit POE-A-85-0001. The audit was designed to generally assess management policies affecting quality. The following statements summarize the management attitude on Trend Analysis Reports: "All of the managers were familiar with these reports (Trend), but not many of them read or acted on the items listed. None of the managers interviewed liked the trend analysis system in its present form, and some believed that the information generated was not meaningful. The audit team was informed that a task force had been formed to revise the entire Trend Analysis Program."

- May-June 1985 - The present status of trend analysis could be stated as "in transition." The documentation available and interviews conducted during the corrective action review indicated that the branches/projects and TAS need to further establish and clarify their responsibilities for generating, utilizing, and acting on meaningful trend analysis data.

The effectiveness of the trending program has been negligible. The resources have been available for many years although no "trend" has been "turned around" based on the trend analysis program. The following examples are given on the usefulness and effectiveness of the trend program. These examples are not isolated cases. They are given to reflect a recurring theme for corrective action within TVA of identifying problems, generating memorandums which "eliminate" the problems, and subsequently not correcting the root cause of problems. It should be emphasized that the current staff of the trend analysis appear to be dedicated to correcting problems within OE and are attempting to provide a useable data base for OE management. However, without the proper management support of this activity the work will remain ineffective.

Example A - (Identifying problems which do not receive adequate management attention to resolve root causes).

The June 30, 1980 semiannual report issued to the Manager of OEDC included four of the most significant adverse trends identified to date. The list included the improper installation of structural steel plates, the improper installation of electrical/cables/conduit, the improper documentation of electrical cables/conduits, and vendor inadequacies.

The electrical cable problems were to be alleviated by reviewing the appropriate EN DES specifications and

drawings to CONST to assure sufficient clarity for use by CONST personnel. Time constraints on the corrective action review did not allow for a study of each of the four items. It is emphasized, however, that a recent NSRS investigation (I-85-06-WBN) substantiated an employee concern that there were significant and fundamental problems with establishing, implementing, and enforcing QA/QC program requirements for cable activities. The report identifies areas (inadequate or incomplete design standards and/or construction specifications as well as failure to responsively resolve the identified problems) which have resulted in an indeterminate quality of cable installation at WBN.

Identifying a trend in the electrical area had minimal effect on the overall cable problem.

Example B - (Identifying problem trend after corrective action has begun)

Ruskin Fire Dampers - Failure of fire dampers to close against system Air Flow.

The subject report was issued to MEB by the Trend Analysis Section approximately 18 months after corrective action had begun by MEB. The effort placed in generating this trend report appears to be misguided. Trend reports are intended to identify problems, not to highlight existing known problems which are already being resolved. In this particular example, the same person responding to the TAS trend reports from MEB has also been coordinating the NCR effort to resolve the inherent problems with Ruskin fire dampers.

Example C - (Identifying problems which then receive untimely resolution by branches)

The Trend Analysis Section issued a report of an adverse trend, "Inadequate Seismic Analysis by OE," on January 22, 1985, to the CEB (TAS 850122 002).

The report results are summarized as follows: "A review of CAQ reports has identified problems with seismic analysis performed by OE. There are 75 CAQ reports documenting inadequate seismic analysis by OE in the timeframe of 1977 through 1984. These problems have been identified at Browns Ferry, Sequoyah, Watts Bar, and Bellefonte Nuclear Plants. If the adverse trend is not corrected, the identification of erroneous seismic analyses can be expected to continue." Assignable causes on the CAQs reviewed were typically grouped into three areas of procedures not followed, lack of training, or design errors. (Note: Another trend

report which had specifically addressed the incorrect analyses of pipe and cable tray supports had been issued November 29, 1984. CEB does reference these reports in their responses.)

CEB responded on February 21, 1985 (CEB 850221 003) by stating the inaccuracies of the TAS seismic analyses report and identifying the CEB approach to resolving the problem. CEB proposed to further explore the 75 CAQs and group them into four categories and then determine if a trend existed. This work was to be completed by May 1, 1985. On May 24, 1985, the responsible CEB individual stated that no work had been completed on this due to other priority commitments.

On July 23, 1985, a request was again made by NSRS concerning the status of the CEB work. CEB issued a response on August 5, 1985 (B41 850805 009) to include the results of the study outlined in their February 1985 memorandum. This response reviewed by NSRS to evaluate the overall effectiveness of the trend program is summarized below.

CEB had evaluated four categories under the trend of "Inadequate seismic analyses." The four categories were: (1) piping and piping supports, (2) seismic qualification of equipment, (3) seismic analyses/design of category I structures, and (4) seismic analyses/design of substructures (ladders, doors, block walls, etc.)

The corresponding corrective actions proposed by CEB for these four categories are briefly stated as follows:

Category (1) The corrective action to review and update criteria, checklists, and analysis handbooks is an ongoing commitment. Duke Power recommendations will be implemented after costs and priorities are determined. TPIPE computer program to be enhanced.

Category (2) A technical review of the modifications to hand-wheel-operated valves at BLN will be conducted and selected valves evaluated to see if adverse trend exists.

Category (3) No corrective action needed.

Category (4) No trend observed. However, a technical review of cable trays is being developed.

It is evident that the amount of time and effort spent by both CEB and the trend analysis section have resulted in minimal benefit. CEB in eight months time has generated pages of memorandums which first state what is wrong with the trend reports, second how they will properly and correctly evaluate the situation, and finally present their conclusions. The conclusions were subsequently considered empty by NSRS because after all the time and effort expended in writing memorandums, no real work has yet been accomplished. NSRS was also disturbed by the manipulation of words in the memorandums. For example, the February 21, 1985 response to TAS in the inadequate seismic analyses trend stated that Duke Power "recommendations are presently being implemented" in the design of piping and piping supports (Note: Duke Power was under contract by TVA to perform this evaluation.) However, in the July 30, 1985 response, CEB states that the "date for full implementation of the Duke recommendations will be established when costs and priorities are determined."

It was also noted that project engineers involved in piping analyses were not aware of the trend analysis reports or involved in generating the responses.

The basic question resulting from this example is: When will the prompt correction of the identified trends begin?

In conclusion, the only real trend identified in reviewing the documentation was that CEB maintains a corrective action response position of providing generalizations such as:

1. Procedures will be reevaluated and corrections made as necessary.

2. Actively review and upgrade design criteria, construction specifications, computer program manuals, checklists, and analysis handbooks for consistency, clarity, completeness, and current requirements.

3. The design of supports will continue to be monitored.

4. An active program of improvements and enhancements to the TPIPE computer program has and continues to be pursued.

The responses sound positive but conflict with the actual corrective action performed in the NCRs. Of the

32 NCRs reviewed for the trend analysis, approximately half remain open.

b. Trend Analysis - OC

(1) General

IRN trending was intended to provide information to managers on the quality of work to allow them to focus work control improvement efforts in areas where the largest benefit can be realized and manpower can be most efficiently used. What activities were trended, what constituted acceptable rejection rates, and how trend information was presented were factors best defined by those who must use the end product--the OC site managers. Consequently, selection of these factors was not considered in this review. The intent was to verify that the Trend Analysis (TA) program fulfilled its intended purpose within the requirements of appropriate procedures.

Trending of items other than IRNs (NCRs, NRC violations, audit findings, etc.) was handled and reported differently than IRN trending because of the nature and number of these items. The basic intent was the same, however, and all TA activities were controlled by the same procedures.

The OC TA program was prescribed by Quality Assurance Procedure QAP-16.5 revision 1 and implemented by QCI-1.58 revision 3 for WBN and BNP-QCP-10.41 revision 2 for BLN. These documents, four WBN QTARs, five BLN IRN QTARs, and two BLN quarterly QTARs--were reviewed. WBN, BLN, and central office personnel were interviewed concerning the administration, use, and usefulness of QTARs. Note that six of the ten Quality Trend Analysis Reports (QTARs) reviewed were not issued within 30 days of the end of the reporting period as required by QAP-16.5.

(2) BLN

The BLN TA program included monthly IRN trend reports and quarterly NCR trend reports. These reports together satisfied the intent of QAP-16.5. The narrative portions of the reports provided useful information, including discussion of remedial actions and the effectiveness of past remedial actions. The graphs and tables were effective and easy to understand.

Interviewees at all levels felt the IRN TA program was useful and better than past efforts. The trending output was generally thought to be meaningful, but interviewees noted that trending current rejections of "old" work served no purpose for trending and can skew the output. An example was work done in the intake pumping station several years ago but not inspected until 1984. The inspections conducted to current standards resulted in numerous IRNs because the old work had not been checked by the crafts just prior to inspection to verify that current standards were met. Indicating adverse trends based on high rejection rates for this work was a useless evolution because remedial actions specified for the procedures, organizations, or personnel involved years ago was now inappropriate. BLN recognized this problem and, as noted in the January QTAR, now required the crafts and engineering to check old work against current requirements before they call for inspections. Some feeling was expressed that the current program trended only things that are already known to be problems and that "everything" should be trended in order to identify other problems.

The NCR trending program categorizes NCRs as one of three types:

(a) "Failure to fully implement procedural requirements which affect quality."

(b) "Items which do not conform to contractual requirements as received from the vendor."

(c) "Items which do not conform to specs, drawings, and/or procedures after being documented as acceptable by inspection instructions."

In the first quarter of 1985, BLN began breaking "failure to follow procedures" into five subcategories to aid in the determination of remedial action (reference B30). The subcategories were not being trended, but the decision to use them came apparently as a result of "failure to follow procedures" being the major cause of NCRs in several previous trend reports. This was an example of the TA program highlighting a problem and BLN taking action to improve their identification of root causes and thereby make it easier to specify appropriate corrective action.

(3) WBN

The WBN TA program utilized a monthly report for all quality trending. While the formats of the WBN and BLN reports were quite different, the information provided was similar. The WBN report, however, did not synopsize the effectiveness of past remedial actions as required by QAP-16.5. A decreasing rejection rate was evidence of effective remedial action, but a synopsis was required. It was unclear whether the TA reports were being used to properly indicate the effectiveness of past remedial actions. An example was that an increasing trend was shown for QCP-3.03 activities for February, March, and April; but the remedial action noted in the April QTAR was the same as that noted for March.

The major problem with IRN trending at WBN, however, was not within the TA program at all. The problem was that the validity of the IRN rejection rate data used for TA was in question because craft personnel were sometimes allowed to fix problems "on the spot" to preclude IRNs being written (see section V.C.1).

NCR trending in the monthly QTARs appeared to be simply a listing of NCRs or groups of NCRs being trended. It did not discuss root causes, remedial action outside the framework of the NCR corrective action, or effectiveness of remedial actions.

(4) QES

QES prepared some of the reports used by QC management, but they did not officially perform any trending activities. An individual charged with reviewing NCRs and maintaining an NCR log indicated that he watched for trends, but his trending efforts were not required by procedure and were dependent upon memory.

(5) SUMMARY

IRN trending appeared to perform its intended function of providing information. At WBN, the usefulness of that information was questionable because IRNs were not necessarily written for every appropriate instance. See section IV for recommendation on the IRN program V.C.1. One of the benefits of TA was that it could identify ineffective past remedial action so that additional or different remedial action could be

implemented. An example of failure to take advantage of this by continuation of ineffective remedial action was noted at WBN.

BLN changed the NCR trending in the first quarter of 1985 to trend by cause rather than by deficiency. This method appears to be more appropriate, more useful, and more informative; and NSRS recommends that WBN also trend NCRs by cause.

The WBN QTAR did not synopsize the effectiveness of past remedial action as required by QAP-16.5. NSRS recommends that WBN QTARs be revised to synopsize the effectiveness of past remedial action as required by QAP-16.5.

c. Trend Analysis - NUC PR

On June 6, 1984 the Management Analysis Company (MAC) issued an assessment of the Browns Ferry Nuclear Plant RPIP and its related administrative burden. One of the ten problem areas identified by MAC was that "deficiency trending and analysis has not been developed into an effective, positive line management tool for improving performance." This item was later incorporated into the RPIP program as item 84-07-07. The result of this effort was a Performance Monitoring Program which was still in draft form for trial usage at the time of this review. It was too early to assess its impact as a management tool.

INPO is a source of trending information which draws on the experience of all the contributing utilities.

One evidence of the increased emphasis on improving the corrective action process was the Quality Problem Resolution Summary prepared by DQA for the Monthly Top Management (MTM) held by the Division of Nuclear Power. This summary trended the average age of LERs, CARs, conditions adverse to quality identified by DQA, NRC violations, INPO findings, and NSRS findings. These items were trended for each plant and for DQA and other nuclear support divisions (as applicable). Unfortunately, the trends so far (September 84 to May 85) did not indicate any improvement in the age of the quality problems being trended (see paragraph V.C.8.c).

6. Corrective Action Priority

a. Corrective Action Priority - OE

Questions concerning the priority of performing corrective action on adverse conditions were generally answered positively. That is, everyone interviewed

stated that corrective action was a high priority in their branch/project. Unfortunately, the priority of performing corrective action is tied to meeting a construction/operating schedule that does not allow managers to place a priority of prompt, corrective action on all identified problems. For example, BLN unit 2 adverse conditions will not be addressed presently due to the extended construction schedule. Project~~s~~ engineers stated that if similar conditions existed in units 1 and 2, only unit 1 would be addressed. Unit 2 would be a future item.

One employee defined priority as "the current hot item or wherever the fire was." NSRS found this definition to be accurate. The OL projects work to support outages, WBN was pushing for fuel load and BLN was concentrating on Unit 1. The continuous fire fighting has accounted for the average age of old open items remaining so high. These items do not receive the same type of priority as a hot item and can get lost in TROI by revising action dates (refer to V.C.4 - Tracking Systems).

b. Corrective Action Priority - OC

Interviewees at various levels of the OC organization were questioned about what priority their managers placed on C/A, how C/A priorities were communicated to them, and how they emphasized C/A priorities to people below them. These interviews indicated that C/A priorities were a matter of schedule. That is, priorities were assigned to C/A by assigning due dates in TROI according to commitment dates, relative importance, and schedule restraints, and by adding work activities to the construction schedule as necessary. Once a C/A was scheduled, it lost its identify as a C/A and became just another scheduled activity. NSRS believes that this is the reason that interviews indicated a gradient exists within OC in the perception of priorities. Individuals in high positions felt that performing C/A was given high priority, but the lower an individual's position in the organization, the stronger was the feeling that the schedule was the priority. Upper management was perceived as getting involved in C/A only when dates were not met. This fostered the impression that the priority was in meeting dates, not properly completing C/A, regardless of the intended priority. It could be argued that, in order to close a C/A item, it must have been satisfactorily completed; however pressure to meet dates can adversely affect the quality of work, resulting in timely but less than adequate C/A.

The management tools used to track the C/A process had not included indicators of the quality of C/A, only indicators of timeliness in the form of missed due dates. Because the "degree of lateness" was the primary output of TROI, it was the factor that was most readily addressed by management. Therefore, minimizing the "degree of lateness" or meeting due dates became the functional priority regardless of what the philosophical priority have been. In audit POC-A-85-0002 "Management Roles and Involvement in the Control of Quality," DQA concluded that the OC approach to priorities appeared to be crisis management. NSRS recommends that steps be taken to involve managers more in specific C/A, in order to increase awareness of C/A quality and consequently shift the perceived management priority toward quality in C/A.

c. Corrective Action Priority - NUC PR

A series of internal reviews and audits topped by NRC observations of the recurring failures to take timely corrective action had forced TVA into a heightended awareness of the need to establish corrective action priorities. The long-standing practice appeared to be to ignore internally generated corrective action items (whether from QA, NSS or NSRS) until they ripened into INPO or NRC findings. The priorities seemed to be: LEVEL ONE - NRC items; LEVEL TWO - INPO and other outside agencies; LEVEL THREE - TVA findings -and there was only time for Levels ONE and TWO.

This was exemplified by the policy statement in Browns Ferry Standard Practice (BF.1.1). There the commitment priorities are listed as:

1. NRC

2. Other government regulatory agencies

3. TVA

Such as ordering of priorities is acceptable only if the intent and practice is to fulfill all commitments in a timely manner.

Overall, NUC PR seemed to be operating in a reactive mode. The high priority items got management attention at meetings, scheduling sessions and memorandums. The more routine items were ignored until they festered into high priority items themselves.

7. Quality Bulletin Program - OC

The Quality Bulletin (QB) Program was prescribed and implemented by QAP-16.7 revision 1, WBN QCI-1.54 revision 0, and BNP-QCP-10.44 revision 0. Under this program, QES reviewed NCRs, audits, high-level correspondence, etc., to determine potential applicability to other specific plants. When appropriate, QES addressed a QB to the potentially affected plant for investigation or information. The QMO at the plant evaluated the QB for applicability and initiated appropriate action, such as an NCR. Feedback to QES was required if the QB was sent for investigation. Completion of specified C/A is then tracked in TROI and further action on the QB is not required.

Interviews indicated that personnel responsible for handling QBs were familiar with the program, aware of the significance of QBs, and felt that the QB program was useful. Unfortunately, awareness of the QB program in general was limited. Even some upper-level managers were not familiar with the process involved in handling QBs. This may be attributable to the relative newness of the program and confusion with the Project Information Notice (PIN) which the QB replaced.

Twenty-two QBs and responses were reviewed and all were felt to be appropriate. While more widespread knowledge of the QB program was desirable, it was apparent that the program worked well as a communication tool. NSRS believes that the QB program worked because: 1) each plant was charged with investigating only items that had been screened for possible impact rather than being burdened with reviewing numerous documents they normally need not see, and 2) a response including the results of the evaluation and actions taken was required. Had this simple system for communicating problems been employed years earlier and used by other organization, many of TVA's problems in corrective action could have been averted.

It was noted that NUC PR also uses a document called a Quality Bulletin, but it does not perform the same function. Also, the OC and NUC PR Quality Bulletins use the same numbering scheme which results in confusion, especially with outside organizations such as the NRC. NSRS recommends that OC and NUC PR collaborate to change the name and/or numbering system of one of the Quality Bulletin programs.

8. Quality Assurance

a. Quality Assurance - OE

The review of the Quality Management Staff (QMS) included interviews with management, review of QMS audits that included corrective action in the scope, and a review of "QMS Quarterly Assesment of OE Quality" reports.

(1) Audit Function - The QMS staff anticipates the completion of 38 audits this year. The audits generally focus on one area of a branch/project and include a review of most Appendix B program requirements during a three-day period. QMS audits selected for review by NSRS included 85-37 (Technical and Administrative Staff), 85-28 (Civil Engineering Branch Pipe Analysis and Pipe Support Design Activities), and 85-15 (Nuclear Engineering Branch Staff).

The scope of all audits selected included corrective action. The purpose in reviewing the audits was to determine the status of responses received by QMS to identified audit deficiencies and to also determine the effectiveness of QMS in identifying problems within the corrective action process. The following summarizes the results of the NSRS review in these two areas.

(a) QMS Audit 85-37 (May 1-3, 1985)

This audit evaluated Technical and Administrative Staff (TAS) engineering activities. No deficiencies were identified. Three problems areas were discussed in the report (issued May 21, 1985) with a request that TAS address them and respond to QMS within 30 days. No responses on these problems areas had been generated by TAS as of July 2, 1985.

No problems with the trend analysis process were identified during the audit based on the checklist for EN DES EP-1.51 which showed no deficiencies identified. However, the NSRS was informed by TAS on May 22, 1985, that the EN DES EP-1.51 had not been implemented for "many months" and the responsiblity of NEB in the trending process had been removed.

The importance of trending in the corrective action process has been previously identified. Although QMS reviewed this area, no deficiencies, problems, or concerns were identified. The reason for this may be the limited review given to the trending process. QMS personnel, questioned during this review, stated that this audit covered only the TAS responsibility in trending due to manpower and time constraints. They essentially had verified that TAS issued trend reports but did not pursue the utilization of the reports or their effectiveness. No branch/project personnel were questioned further by QMS about trending during other audits.

(2) QMS Audit 85-28 (May 13-16, 1985)

This audit evaluated the Browns Ferry Civil Design Project engineering activities which included processing nonconformances and performing corrective action. The audit team determined that activities in the areas audited were being accomplished in accordance with the intent of procedural requirements. Five problem areas were identifed and four deficiencies were written. One problem (not deficiency) involved the handling of nonconformances. Specific examples of NCRs which had not been dispositioned properly were included. A similar problem was identified in QMS Audit 85-04 (January 1985). The 85-04 audit report specifically stated that this problem had a high potential for Bellefonte, Browns Ferry, and Sequoyah projects. Although the nonconformance handling problem was highlighted to all projects, no attempts to correct the situation were made prior to QMS performing an audit.

It was also noted in audit 85-28 that NCRs involving NUC PR should establish a more realistic completion in TROI instead of 1999. QMS did not consider this situation as a deficiency or problem. The purpose of this audit was to review corrective action and it failed to establish the actual reasons why corrective action had not been scheduled for more timely completion other than a date of 1999.

(3) QMS Audit 85-15 (March 13-18, 1985)

This audit of the Nuclear Engineering Branch staff included a review of OE licensing activities, handling of nonconformances, and corrective action. Two deficiencies were identified and six "observations" were made. The two deficiencies have been closed. One observation made involved the processing of significant NCRs. It stated, "The actual work flow for processing significant NCRs and failure evaluation/engineering reports on plants with an operating license is not entirely in accordance with the procedural requirements of EN DES EP-1.48 R1, "Preparation of Failure Evaluations/Engineering Reports of Deficient Conditions for Operating Nuclear Plant", and EN DES EP-2.02 R8, "Handling of Conditions Potentially Reportable Under Title 10 of the Code of Federal Regulations, Part 21, 50.36, and 50.55.e)." In general, the audit concluded that activities were "being conducted in accordance with procedural requirements

and were commensurate with TVA quality assurance program requirements."

NSRS concluded a special review in April 1985 of the circumstances surrounding the issuance and handling of the NCR-FE/ER (R-85-08-OE/NUC PR). Some conclusions relating to the NCR-FE/ER included:

- Inadequate OE and NUC PR procedures for initiating and processing NCR-FE/ERs.

- Failure of management to correct problems with timeliness and responsiveness involving the NCR-FE/ER process noted above.

The QMS Audit 85-15 had failed to recognize and document the significant problems involved with the NCR-FE/ER process.

It is emphasized that the QMS audit function will be reviewed further in the NSRS QA review scheduled for October-December 1985. These three examples are not intended to be inclusive as to the quality and effectiveness of the overall audit program.

What has been observed by NSRS during this corrective action review can be summarized as follows:

(a) Problems/deficiencies identified at a specific project/branch are not reviewed by OE management for applicability to other projects/branches even when highlighted by QMS.

(b) Deviations from procedures are not considered problems as long as the "intent" of the procedure is being met. The auditing to the intent of procedures is not formally documented in QMS procedures nor is it condoned by NSRS. Intent was verbally defined by the QMS supervisor as achieving the desired result without necessarily going through all the procedural steps.

(c) QMS failed to identify and document as deficiencies problems within the NCR-FE/ER process and inadequacies of the procedures.

(d) QMS audits of corrective action have typically been reviews of NCR logs to verify that the correct branch/project was delegated the NCR after discipline staffing. Problems with

timeliness and responsiveness do not appear as deficiencies in the QMS audit reports. The general conclusion of QMS has been that the corrective action process is functioning well within OE.

(4) QMS Quarterly Report

As previously stated, the QMS will perform approximately 38 audits this year. The audits typically include all Appendix B criteria and applicable OE procedures. These audits are usually conducted by a team of one - three people in three days. The implementation of specific procedures is reviewed but the effectiveness of the overall programs (i.e. corrective action, design control) is not addressed.

However, QMS does issue a quarterly report, "Quality Management Staff (QMS) Quarterly Assessment of OE Quality" which attempts to assess the overall quality based on QMS audit findings, trend data, NCRs, and NRC-OIE inspection reports. The first and second quarter reports were reviewed.

The following quotes are from Section IV, Assessment of the two reports.

(QMS 85 0131 202)

"We still need to improve by clearing out the backlog of corrective work, in our response time to problems and concerns, in the implementation of changes in the way we do business to correct identified deficiencies, and in overall design control and documentation."

(QMS B05850430 006)

"The efforts in timeliness of corrective action and the resolutions of the backlog of corrections to past deficiencies leave something to be desired. The backlog is still large, and overall we have not made adequate progress. The NCR program appears somewhat soft as real root causes have not been identified and corrected."

The quarterly assessments agreed with the overall observations made by NSRS during the corrective action review. The audit program had not supported the assessments by conducting aggressive audits of the corrective action program to determine why timeliness and resolution of past deficiencies remain a problem. In fact, some problems

identified in the corrective action process had not been documented as deficiencies as demonstrated in the previous discussion of audit reports.

QMS had been aware of problems in the corrective action process as demonstrated in the quarterly assessment reports but had failed to use the audit process as a tool to initiate change within OE. The QMS program should have provisions to conduct special reviews or audits of known problem areas (e.g. corrective action).

These audits should be of a sufficient duration and depth to provide meaningful output to OE management concerning program implementation and effectiveness, excluding problems identified and root causes for the problem.

b. Quality Assurance - OC

The role of quality assurance in the OC C/A process was evaluated by interviewing personnel inside and outside the quality assurance organizations and by reviewing audit reports and associated responses.

Line organization personnel interviewed understood the need for audits and generally felt that they were useful in identifying problems. There was, however, one complaint voiced almost universally: there were too many audit and review organizations identifying problems. For example, during this review at WBN, NRC, INPO, and NSRS were simultaneously conducting reviews in addition to the ongoing plant audit and surveillance activities and NSRS investigations of employee concerns. While frustration with the problems of dealing with many different organizations identifying problems is understandable, NSRS believes that all these groups are necessary as long as they are identifying legitimate problems.

Line personnel felt they were generally timely in response to audits and reviews and diligent in specifying C/A. Site QA personnel felt that timeliness in responses by the line organizations had improved in recent years and was generally no longer a problem. They also felt that the quality of responses was generally adequate, but tended to be just adequate and not better. One quality manager referred to this as a "band-aid" approach and felt that C/A should often be broader and more thorough. Although no examples were cited, they noted that actual C/A taken was sometimes better than that stated in the responses. This indicated an interest on the part of line personnel in

fixing the problems tempered by concern that responses might be over committal and consequently difficult to implement.

The audit program provided for writing deviations only for problems that were clearly deviations from established requirements such as failure of a site procedure to incorporate a QAP requirement. Other problems, suggestions for program enhancement, etc., were included in the reports, but audited organizations were not required to address them. No evidence could be found that these suggestions were officially addressed. NSRS believes that any issue that the auditor feels strongly enough about to make a suggestion should require a documented response. Therefore, NSRS recommends that these suggestions be issued as deviations so that they must be addressed. The scope and depth of audits appeared to be similar to the scope and depth of the OE audits (see section V.C.8.a).

Audit BL-A-85-06 "Deviation Control and Corrective Action" addressed programmatic adequacy, organizational performance, and program effectiveness. This audit appeared to be adequate and yet failed to find that QCP-10.4 did not include a specific requirement from the topical report (see section V.A.4).

Implementation of C/A, verification of C/A, and closure of deviations generally were timely. For 17 recent audits (15 in 1985, 2 in 1984), there were 66 deviations issued with 6 remaining open as of August 30, 1985. C/A was ongoing for all the open deviations and extension of planned completion dates had been requested where appropriate.

The procedurally imposed 30-day time limit for responses to deviations by the line organizations was usually met. Verification of completion of C/A and closure of deviations was accomplished by QA in a reasonable time after notification that the action was complete. One closed deviation was found with the C/A verification unsigned by the cognizant evaluator. This apparent oversight was corrected by the cognizant evaluator when identified to him.

In summary, responses to audit deviations were generally adequate and timely. But the scope, depth, and adequacy of the audits could be improved. (This will be addressed in an NSRS review of Quality Assurance in 1985.)

c. Quality Assurance-NUC PR

This section reviews the function performed by the Division of Quality Assurance (DQA) management in the identification of problem areas and the corrective action process and also the function of DQA auditors during conduct of corrective action/correction of deficiencies audits.

(1) Division of Quality Assurance Management

Improvements in the quality assurance program have been the issue of Quality Bulletins and scheduled meetings between Site Directors and the Director of Quality Assurance to discuss corrective action. Quality Bulletin 85-01 dealt with a long-standing problem that commitments made to the NRC were not always adequately tracked and completion verified. Completion verification should always be performed before an item is closed out. Monitoring by DQA through the audit and surveillance program is intended to verify the effectiveness of the commitment program.

Quality Bulletin 85-02 discussed corrective action and it was issued March 14, 1985. The bulletin addressed a repetitive, generic lack of prompt and effective corrective action for conditions adverse to quality that had been observed at plants and central office divisions. Details of the bulletin will not be repeated here. It is an excellent summary of the problem; root cause analysis and the recommended actions are endorsed by NSRS. The bulletin discusses primarily CARs, DRs, and audit deviation reports. The principles outlined in the bulletin apply to any type of problem area.

Discussions were held with the Director of Quality Assurance and his senior managers. The Director stated that any identified problem requires assignment to an individual if it is to be effectively pursued. A QA engineer was to be assigned to every CAR issued. He was required to maintain pressure to close out the identified problem but still maintain integrity. Also, he stated that old CARs were not be closed if the corrective action has not been effective. An example was given that the BFN QA supervisor would not close out a CAR on training because although there has been training, there has not been enough evidence of improvement. NSRS noted that QA participation in solving problems were not supported in the MAC report (see paragraph V.D.2.c(3)). At the Site Director's meetings, the emphasis is on the timeliness to fix the CARs, and site pressure is

exerted by the Site Director. The Director emphasized that timeliness must not reduce the needed action to close the CAR thoroughly. The goal of DQA is to reduce items requiring corrective action whether identified internally or by NRC or others. This depends greatly on site responsiveness to the problems. DQA plans to improve QA inspector training and the surveillance program is expected to improve. The intention is to identify and resolve problems before the NRC has to. DQA will encourage line participation in identifying problems for correction.

All managers agreed that more line involvement is needed. Site QA was making efforts to get help from plant personnel for audits with the intent of using their expertise and to point out where the audit empahsis should be. A change in management philosophy was needed. It was line managements responsibility to fix problems as they are identified and the organization should be sufficient to respond promptly with adequate corrective action. Management was putting more emphasis on corrective action but the NRC forced that issue. They saw the need for a review group to closely examine commitments before they were made and for tough managers who will go back to the regulators. All want line participation to identify problems for correction but found that a negative atmosphere is prevalent with no positive aspects. It was noted that the QA engineer assignment did not apply to DRs although it was generally agreed that DRs become NRC problems in time. TVA did not have a clearly defined corrective action program. Also that there were approximately 400 open items which were more than one year old - a strong symptom of lack of prompt corrective action.

The documents provided by DQA to the Assistant Manager of P&E for presentation at the MTM meeting on the May performance and attachment 2, which was not presented, were reviewed. The analysis of inspections, audits, and average age to closure is generally arbitrary, particularly for performance improvement or performance degradation indicators.

There were approximately 400 open items and the average age to closure was one year. The problem is that as approximately 45 items are closed another 45 are opened, so that there is not a significant impact on the total number of open items. Some average ages can be misleading. BFN CARs indicate an increase from 12 months to 17.6 months over a 3-month span--most likely caused by

closure of recently issued CARs with the long-standing CARs remaining open. NSRS findings have an open age of 20 months. The significant point of this information is that the corrective action system is not working because it is not significantly reducing the number of open items. Also, the fact that open items have an average age of one year confirms that the response to correct problems is untimely (see section V.D.2.c(4)).

(2) Quality Assurance Audits

The scope of this activity was to review audit reports relating to corrective actions/corrections of deficiencies, conduct discussions with the auditors who had performed these activities, and review of a random sample of other audit reports and the correspondence related to the deficiencies identified in these reports (section VII.C.8-24). Discussions were also held with other QA personnel in DQA and onsite, and plant personnel responsible for interfacing with auditors, to determine the general attitude towards the audit personnel.

A review of the audit reports indicates that with a few exceptions there appeared to have been a marked improvement in the corrective action audit function and reports, as compared with eighteen months earlier (see paragraph V.D.2.c). The audit scope was well defined and of adequate depth to identify problem areas. This was expressed in a slightly different way by plant personnel who said that in the past audits used to be shallow but were now regarded as fairly tough.

The auditors who had performed corrective action audits were well experienced individuals and they expressed genuine concern for the raising of performance levels within TVA. The auditors stated that audits were not as effective as they could be since priority to resolve identified problems is given to problems identified by organizations outside TVA. Frequently a problem would be identified to a plant and basically nothing was done to correct the problem. At a later date the NRC would issue a notice of violation to the plant for the same problem.

One example is audit report SQ-8400-10, deviation -06, May 18, 1984 where misuse of yellow bags and lack of labels was identified. NRC report 50-327/85-20, identified the same problem May 20, 1985, and issued a level IV violation. The auditors said that when audit findings are made known,

there is a general reaction to deny the audit finding or regard it as nit-picking. If a way to evade the finding can be found, it is usually pursued. The general theme from both QA personnel and plant personnel was that QA gets little respect. Although audits are perceived as tough, NSRS did not find any marked improvement in attitude. One person posed the question, "In five years of NSRS and QA activities, have we really made any marked improvement?" The general view expressed was that audit staff and others are often too busy in scheduled activities to be able to schedule sufficient time to make the plant identify and correct root causes.

(a) Sequoyah Audit SQ-8400-14, "Sequoyah Chemistry Program."

From the review of the random sample of other audits four were selected to show the type of problems being identified and in one case the effort involved in resolving a simple issue. NSRS believes that it is sound common sense and good working practice to label containers identifying contents with further warning if the materials are corrosive, poisonous, radioactive, etc., irrespective of NRC regulations. During the audit of SQN chemistry program conducted September 24 through October 3, 1984, it was identified that, "Contrary to the requirements of 10 CFR 20.203(f), some radwaste samples are not properly identified as radioactive material." The audit report was sent to the plant by memorandum dated November 2, 1984. The SQN response dated January 9, 1985, was that they did not consider the requirements of 10 CFR 20.203(f) applied to routine samples as well as composite samples in the chemistry laboratory of a nuclear power plant. This was allowed by the exemptions defined by paragraphs (f)(3)(i), (f)(3)(ii), and (f)(3)(vi) of 10 CFR 20.203.

The evaluation of this response by the audit team was lengthy and indicative of the effort sometimes forced on QA to prove that a problem exists and needs to be fixed. The evaluation dated March 14, 1985, has been shortened:

"The primary issue of this deviation involves the detailed paragraphs of 10CFR20.203(f) which you have identified in your response as

reasons for not labeling chemistry laboratory sample bottles.

"We note that paragraphs 10 CFR 20.203(f)-(3)(i) and (f)(3)(iii) both make exception statements based on known radioactive quantities. That is, if the contents of the containers are known and are below the limits set forth in these two paragraphs, labeling of the containers is not required. Since many of these containers are of unknown quantities, there is always an ever present risk that SQN is in violation of this regulation. In addition, the practice of not labeling containers of unknown quantities is certainly not a conservative practice and could easily lead to unnecessary radioactive spills and contamination of personnel, equipment, and facilities.

"The exceptions noted in paragraph 10 CFR 20(f)(3)(vi) address personnel accessibility to radioactive containers not labeled.

"We contend that the SQN chemistry laboratory facilities do not approach the examples cited in footnote No. 3 to 10 CFR 20.203 since they are readily accessible to large numbers of personnel other than laboratory analysts.

"In addition to the above, we would like to bring attention to the fact that a lack of radiological control practices such as those described in this deviation has led to an NRC violation (NRC I&E Report Nos. 50-259/84-37, 50-260/84-37, and 50-296/84-37) at Browns Ferry Nuclear Plant which now labels all chemical laboratory sample bottles containing radioactive materials."

SQN revised response dated April 16, 1985, was, "Since the time of DQA's audit in September, the SQN chemistry laboratory policy has been changed to comply with the requirements of 10 CFR 20.203(f)."

NSRS observations on this audit are:

- Three months elapsed from time of audit finding to the response denial and up to six months to correct a minor thing such as putting a label on a bottle.

- The revised response claimed that corrective action had been taken in September 1984 when the response of January 9, 1985, denied the deviation.

- There was the possibility of an NRC citation such as occurred at BFN, while the correspondence was in progress.

(b) Watts Bar Audit QWB-A-85-0009, "Correction of Defiencies."

The Watts Bar audit completed April 5, 1985, confirmed the lack of corrective action to audit finding JA-8000-13, identified December 5, 1980. The deviation has been shortened:

"No upper-tier TVA procedures are in place to describe and detail the interdivisional responsibilities associated with NCRs. No NUC PR procedures are in place to ensure that potential 10 CFR 50.55(e) nonconformances are physically identified to prevent inadvertent use, properly reported and documented, and documentation required to support the NCR form (10 CFR 50.55(3) reportability evaluations, etc. A new deficiency was not written since this deficiency is still open pending appropriate corrective action by the DQA, Quality Systems Branch." NSRS report R-85-08-OE/NUC PR also found the same problem.

(c) Browns Ferry Audit QBF-A-85-0004, "Operating Status,"

Several audit reports pointed out that problems identified during the audit had been previously identified by the plant QA staff. The inability of QA staff to achieve commitment for corrective action to prevent recurrence is evident in this BFN audit completed March 6, 1985. The shortened deviation is as follows:

"The temporary alteration control program's effectiveness has been hampered by numerous instances of failure to follow procedural requirements. The plant QE staff identified over 100 instances of failure to comply with procedural requirements in a survey conducted in February 1984. During the past year many deficiencies related to temporary alteration control forms (TACFs) have been identified by

the plant staff, however, there was no objective evidence of any corrective action being taken. Several of the same type problems identified by QE and the plant staff were also identified during the audit."

(d) Browns Ferry Audit QBF-A-85-0013, "Fire Protection."

The Browns Ferry audit completed April 29, 1985, is interesting in that the subject was fire protection and that the BFN fire was the initiating event for the development of formal fire protection regulations by the NRC.

INPO had identified a personnel smoking problem in 1981. One deviation in the 1985 audit report is as follows:

Plant performance in the area of transient fire loads was generally inadequate. A large potential for accident exists because of lax enforcement of procedures and inadequate attention to this critical area. In general, no-smoking policies were adequately incorporated in plant standard practices. However, lax enforcement of the requirements and inadequate training of employees was noted. Not all signs were conspicuously displayed. An employee seen smoking in the immediate proximity of a medium transient fire load was unaware of the requirements even though a sign was properly posted. This is a potentially dangerous practice, and more training and management emphasis on fire protection and safety is needed.

From these reports it is clear that when problems of a minor nature are identified, the plants appear to be non-responsive.

9. Interface Problems

a. Interface Problems - OE

The purpose of this portion of the review was to determine the type of interface problems within each organization (OE, OC, and NUC PR) and the external interfaces between organizations.

(1) Internal Interfaces

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Interfaces and coordination required between the branches and projects to perform corrective action have been improved due to the concept of discipline staffing. No problems were identified at this time when corrective action was limited to involvement of one discipline within a project. However, a potential for interface problems was identified to NSRS. Although no specific examples were given, a general perception existed of not being able to resolve corrective action quickly when multiple disciplines were involved.

(2) NUC PR/OE

The NUC PR/OE interface had been, in theory, improved for operating plants due to locating OE personnel at the plant site. However, the locating of OE people at the sites had not eliminated interface problems. OE still maintained NCRs which required NUC PR to perform corrective action. During the review no procedures existed which addressed the OE/NUC PR interface on NCR corrective action and disposition. For a discussion of the status of office level NCR interface procedures (see section V.D.6).

The interface of plant site OE and NUC PR was examined during the review of handling NCRs at BFN, SQN, and WBN (see paragraph V.C.3.c).

b. Interface Problems - OC

OC personnel at WBN, BLN, and in Knoxville were interviewed concerning problems in interfacing with organizations and personnel within OC and outside OC (OE, NUC PR, NRC, NSRS) in the C/A process.

Personnel interviewed generally indicated no problems in interfacing with other organizations in OC. Communication on a personal level appeared to be good at each of the sites, though very little need for communication between WBN and BLN was recognized. Site procedures that clearly define responsibilities appear to be one reason that interfaces at the sites were effective. Personnel knew generally who to contact in various organizations when questions or conflicts arose and felt comfortable doing so.

The primary C/A interface between OC and OE was the NCR. OC personnel felt that the established interface with the Design Project Organization (DPO) worked but could be more timely (see section V.C.3). OC personnel expressed the concern that when NCRs must be handled by the OE branches, they have no effective interface. OC

personnel stated that they have had difficulty finding the proper contact and that often the responsible OE branch person was unresponsive and seemed to place little priority on the site NCRs. NSRS recommends that OE establish a mechanism to identify responsible branch individuals for specific NCRs to the WBN and BLN CEOs and to ensure these individuals are responsive to CEO personnel on site NCRs.

The primary C/A interfaces between OC and NUC PR occurred at the sites in activities such as system turnover and NCRs written by NUC PR that must be handled by OC. This NCR interface is discussed in section V.C.3. Necessary interfaces for system turnover were covered by interdivisional procedure ID-QAP 1.2, "Transfer of Responsibility for the Plant from OE and OC to NUC PR" (now NQAM, Part V, Section 1.2). This interface, as used for corrective action, had been adequate and no problems were indicated in interviews. OC personnel indicated no interface problems with outside organizations such as NRC, INPO, and NSRS, although they sometime had problems in addressing some findings.

See comment p48 on no problem RDS 11/2

c. Internal Interface - NUC PR

One apparent breakdown in effecting timely corrective action was observed in the methods used to transmit commitment items to the individuals who were assigned to respond to the problem. If a cryptic line item from a computer printout used to track commitments was all the information the person had from which to determine the problem, he often would waste time (his time and others) digging up additional information. Worse yet, he might attempt to address the wrong problem because of this lack of detail.

Is it wasted T to get additional information? are there exc or this or just a fear on the authors part? R 11

An example of a program to improve the commitment responses at Browns Ferry and the interface necessary to accomplish this had been put in place shortly before this review started. Compliance had started a green folder system. Each folder was a package containing a reply memorandum with tracking number, a printout of the commitment, any related correspondence or background material and a closure sheet for the response. The green color immediately keyed its recipient as to what it was. Similarly, yellow folders were used for assignments from the site director and red folders for those from the plant manager.

Is this something SQN + WBN should use RDS 11/2

10. Management Attitudes

a. Management Attitudes - OE

A brief history of OE corrective action is presented below. The excerpts are given to demonstrate the level of management awareness involving failure of the corrective action system and actions taken to preclude repetition. In general, a lack of timeliness and responsiveness towards corrective action had been acknowledged by OE management for years. This awareness had led to years of discussions, action plans, task forces, and memorandums and had resulted in a policy of corrective action that was directly related to meeting either OC or NUC PR schedules.

- December 1, 1982 (Kimmons to Mull, All Nuclear Plants - Lack of Timeliness - EDC 821201 001).

  "The problem of prompt resolution of identified problems and the timeliness of corrective action have been emphasized on several previous occasions without success. Lack of timeliness is especially important when the problem relates to a requirement not being identified or a procedure inadequacy."

- December 7, 1982 - The OEDC Action Plan for Quality Improvement was issued.

  Note: The 1982 Action Plan for Quality Improvement was developed to address root cause problems. Identification of these problems resulted from an intensive evaluation by QA managers and line managers of five major independent evaluations by NSRS and NRC of the OEDC QA program.

- (Beasley to Kimmons, OEDC 1982 QA Action Plan, EDC 821209 014)

  "Every indication is that the 1982 Action Plan was worth the effort. There have been definite improvements in all of the root cause areas. However, there is definite - evidence that some of the root causes require further attention such as the timeliness of corrective actions as we recently discussed." (Line added for emphasis by NSRS.)

As noted above, the timeliness of corrective action was to receive further management attention. However, this attitude was not reflected in the following memorandum generated by the EN DES

Manager, or represented in further action taken through the OEDC Action Plan.

- o December 15, 1982 (Sprouse to Kimmons, All Nuclear Plants - Lack of Timeliness (NEB - 821215 253)

  "Lack of timeliness has been a longstanding problem in resolving outstanding issues in EN DES. A number of steps have been taken to alleviate this problem, primarily as addressed in the 1982 Action Plan for Quality Improvement."

Subsequent reports issued on the OEDC 1982 Action Plan did not revise the original action item. Each report (EDC 821209 014, EDC 830811 401, EDC 840217 002) stated the following:

"Status reports and tracking systems currently provide line organizations and management the status of open items and commitments. Full implementation and utilization of the TROI system will further enhance this information into a consistent format . . . ."

The action initiated in 1982 remained unchanged in spite of having minimal results. The TROI system was consistently considered the main solution for the lack of timeliness on open items. The realities (limitations and effectiveness) of TROI were discussed in section V.C.4. Therefore, it should be understandable why minimal results in corrective action were acknowledged by OEDC management, NRC, NSRS, and OQA in 1983.

- o May 25, 1983 - Meeting held with TVA management representatives and NRC-OIE Region II management to discuss TVA's failure to properly and promptly respond to identified problems (reference EDC 830815 017).

- o May 31, 1983 - Kimmons to Those listed, OEDC Responsiveness in Resolving Findings and Open Issues Which Have Been Identified by NRC, NSRS, TVA QA, and Others (EDC 830601 012)

  "OEDC's failure to promptly correct deficiencies and to promptly resolve open issues has been identified repeatedly over the past few years by NRC, NSRS, the TVA quality assurance organization, and others as a major organizational problem. Each time this lack of

responsiveness has been brought to my attention we have, together, determined that we would correct the situation and have assured the NRC and our management that this would be done. We have failed to achieve the needed results." (Line added for emphasis by NSRS.)

- o August 21, 1984 (Cantrell to OE Employees, All Projects - Quality Policy, DES 840821 - 017). The OE policy on corrective action is documented in the quality policy in this memorandum issued by the Manager of the Office of Engineering. This policy emphasized the establishment of a strong corrective action program. The program stressed the following key elements:

  - Corrective action to the design process was to be prompt and stress real root causes rather than generalization and excuses.

  - Corrective action was not to result in the proliferation of written procedures or more complex procedures.

  - Corrective action was to provide a feedback mechanism to other organizations performing similar work.

  - Branch chiefs and project managers would personally commit sufficient time and attention to ensure proper and adequate corrective action.

The documented policy was clear and concise, but the actions taken by OE in the corrective action process have not reflected it. (Refer to paragraph V.C.10.b for an example.) This example is not to be addressed as an isolated problem. It is included to represent an OE management attitude and philosophy.

One reason for the lack of positive action may be the unfamiliarity of management with the corrective action policy. The unfamiliarity was observed and documented in a NUC PR audit of OE dated April 20, 1985. This audit was designed to generally assess management policies affecting quality. Excerpts from the audit report (POE-A-85-0001, Management Roles and Involvement in the Control of Quality) are listed below.

- All managers had read the memorandum (Cantrell, Quality Policy); but based on responses to interview questions, the audit team concluded that not all managers were familiar with key points of the policy.

- Solving quality problems was not on the "highest priority" list of most managers. The highest priority appeared to be meeting the schedule.

- When asked how the Manager of OE's policy on timely and responsive identification and resolution of quality problems was being implemented, most managers referred to the TROI system.

- The audit team concluded that the top management policy towards quality had not been translated into specific goals and objectives.

The NSRS substantiated these documented observations during the corrective action review. The OE corrective action system was tied to the TROI system. TROI input was essentially tied to the schedule. In reality, the corrective action system was tied closely to the schedule.

Although an effort had been underway to reduce the age of open items, no real reductions had yet been realized. Managers were anticipating the implementation of OEP-17 which would provide a means of transferring open items to NUC PR and closing the item in OE records if OE has completed their involvement. This was seen by OE as a positive step in reducing open items. Questions on how NUC PR would track these items or how actual NUC PR work on these items would be verified were answered with uncertainties and statements of, "Why should OE care?"

(1) Example of Current OE Management attitude concerning the implementation of OE quality policy

The following example documents the OE responses to an investigation of Browns Ferry piping analysis/support design activities (I-84-33-BFN). The example was not isolated. The consistent nonresponsiveness to NSRS reports had also been recently acknowledged by the Manager of Power and Engineering. A consultant was currently being utilized by

P&E to review responses before they are issued in an attempt to have meaningful responses generated by P&E.

3/29/85 o NSRS completed investigation. Discussed eight recommendations with OE management at exit meeting.

OE committed to reviewing recommendations and initiating corrective actions. Agreement established that OE would respond to draft NSRS report before final report was issued.

5/1/85 o Draft NSRS report (I-84-33-BFN) was issued. OE was to provide response to recommendations within 30 days.

5/24/85 o Inquiry by NSRS as to status of OE response. OE misunderstood that a response was required to draft report and committed to having "as much as possible" before 5/31/85.

5/31/85 o OE issued "draft" comments. NSRS considered responses to be incomplete and nonresponsive.

6/7/85 o NSRS issued final report for I-84-33-BFN
(Q01 850607 050) with cover letter stating that OE responses had not been meaningful. OE was requested to respond to recommendations by June 21, 1985.

OE was given specific areas that responses must address (i.e., scheduled completion dates, corrective actions taken, results achieved).

6/24/85 o OE issued response to NSRS report.
(B41 850624 003) Responses were incomplete. Specific areas requested by NSRS, to be addressed, were not.

7/30/85 o Meeting held between NSRS and OE management. Another response to be generated by OE by 9/1/85.

Conclusion: Six months after identification of specific problem areas, corrective action responses were not acceptable to NSRS. OE action has neither been prompt nor stressing the real

root cause. Most OE effort has been to provide generalizations and excuses. Actions taken by OE have not been in keeping with the OE manager's issued quality policy.

b. Management Attitudes--OC

Management attitudes in OC toward C/A were evaluated by interviewing managers and their subordinates and by reviewing various C/A taken.

The attitudes of individuals in OC toward their own responsibilities in C/A were generally good. All personnel interviewed appeared to understand what C/A is, though some felt it important to distinguish between C/A and action required to prevent recurrence (ARPR). However, responsibilities of individuals in C/A tended to be very limited in scope, so that generally no single individual had overall responsibility for any particular C/A. See sections V.C.4 and V.C.6 for related discussion and sections V.D.1, V.D.6, V.D.7, and V.D.8 for examples of apparent attitude problems. Almost every OC manager interviewed expressed at least one frustration with the system ranging from "the QAPs change too often" to "the C/A program can't work as well as it should because the responsibilities for C/A are too widespread." These frustrations indicated a deficiency in the "corporate attitude" toward C/A in that the organization, the program, and the management tools in use for C/A did not place emphasis on C/A automatically. C/A emphasis or priority appeared to be dependent on the good intentions of individuals rather than being built into the system.

Deficiencies in the "corporate attitude" toward C/A that manifest themselves in failure to take adequate and timely C/A, result, at least in part, from diffused responsibilities. The responsibility for coordinating, and expediting if necessary, the resolution of a specific problem, including specific C/A and action to prevent recurrence, should be assigned to an individual. This is not intended to circumvent the use of tracking systems but to enhance their use by resolving coordination problems when necessary. These responsible individuals should have the authority to contact any person in P&E about specific problems.

c. Management Attitudes - NUC PR

There was general agreement among those contacted that TVA has to do a better job with timely and effective corrective action. The problem was in how to change old thoughts and mindsets. Most lower and middle

managers did not have other nuclear experience to draw on, and promoting from within had led to inbreeding of management practices. There was a need for infusion of fresh ideas by gaining experience at other plants and other utilities.

There was still too much emphasis on the negative aspects of the corrective action process. Managers were often critical of QA, stating that they were held accountable, not QA. A proposed response to this attitude would be to suggest that more managers be rotated through QA positions as part of their management development. There is an attitude change needed regarding correcting problems. That is, when deficiencies are recognized, the need is to correct them, not to skirt around the issue.

TVA was felt as not having defined itself adequately to the NRC. What was regarded as necessary was a well defined focal point and a clear-cut organizational structure. The recent appointment of Hugh Parris as head of TVA's nuclear business was regarded as a strong step in this direction. The need for "getting your signals straight" had to start at the top. The need for more realistic goals and objectives was expressed. TVA would have to get good at the nuclear business before aiming at being the best.

Overall, the reorganization was looked on favorably. There was a perception that more direct control and accountability would result. Also, better communication was expected to develop from Central Office and Knoxville Personnel being brought to the sites.

D. Special Problems

1. Nonconformance Report OE/NCU PR Interface

NSRS report R-85-08-OE/NUC PR is summarized and included in the corrective action report to emphasize the results of inadequate management controls over a system (NCR-FE/ER) shown to be defective. It is intended to be an example of failure to take timely, responsive, corrective action.

A summary of both the draft and issued responses from Power and Engineering is also included. It is intended to be an example of a TVA response to identified deficiencies.

In April 1985 NSRS conducted a special review of the circumstances surrounding the issuance and handling of the nonconformance report (NCR) SQNNEB8501, which addressed the accuracy of the SQN instruments used to monitor containment pressure during postaccident conditions.

The review concluded that the "NCR identifying the potential problem and its associated failure evaluation/engineering report (FE/ER) were not processed in accordance with established OE procedures. Further review of NCR-FE/ERs issued by OE to SQN indicated that noncompliance with established process timeframes was a common occurrence within OE. The root cause for this deficiency was inadequate management controls to assure that the process was carried out as intended. It appeared that this was not a problem that had just occurred but one that had been identified by internal review and audit organizations in the past. Decisive and effective management actions had not been taken to correct this longstanding problem.

The NSRS report contains recommendations "considered pertinent to an improved NCR process with effective management controls to make it work." Two conclusions/recommendations relevant to the corrective action review are R-85-08-OE/NUC PR-02 and R-85-08-OE/NUC PR-06. They are summarized as follows:

R-85-08-OE/NUC PR-02: Inadequate OE and NUC PR procedures for initiating and processing NCRs-FE/ERs.

- No central responsibility or formal action tracking system to assure the timely processing of NCR-FE/ERs through OE.
- OE and NUC PR procedures do not interface properly.
- Scope of the FE/ER process was not well defined regarding component versus system/plant applicability.

Recommendations:

- Formal definition of an up-to-date and effective interface between all participating TVA organizations.
- NCR-FE/ERs should also be tracked across major organizational interfaces.

R-85-08-OE/NUC PR-06: Failure of management to correct problems with timeliness and responsiveness involving the NCR-FE/ER process.

- Problems with timeliness and responsiveness in identifying, documenting, and correcting nonconforming conditions adverse to quality represent a longstanding problem. They have been identified by audit organizations and recognized by TVA management as a problem as far back as 1980 but are yet to be corrected.

Recommendations:

- Establish improved management controls and intensify (depth and frequency) the audit activities in these areas to assure compliance with NCR-FE/ER procedures.

- Take prompt and decisive management actions to correct any identified weaknesses.

The initial draft response of Power and Engineering to item -02 (inadequate procedures) was to establish a task force to review the NCR-FE/ER process and then revise related procedures.

The draft response to item -06 (failure of management to correct problems with timeliness and responsiveness involving the NCR-FE/ER process) was to emphasize the new OEP system which became effective June 28, 1985. "With the implementation of this new comprehensive system and the associated training of all OE employees in its philosophy and requirements, we believe that the proper emphasis on management controls and accountability will be in place to significantly improve our timeliness and responsiveness." However, during the course of the review, a variety of personnel were interviewed and questioned concerning the new OEP-17 (corrective action). Most individuals stated that it involved new forms and words for the same old thing. No one indicated or perceived that the system would enhance timeliness or responsiveness.

The overall draft response to the NSRS report was not acceptable. A revised "final" response was subsequently issued by NUC PR on August 6, 1985. The response further detailed the steps taken by the task force in their review and revision of procedures.

In theory, the approach to corrective action was acceptable. The success to this approach will be in the prompt and continued implementation of the revised procedures. The TVA QA organizations are to "ensure that the depth and frequency of verification activities are increased in order to monitor NUC PR and OE compliance with procedure requirements and timely and responsive processing of CAQs." The minimal effectiveness of QA organizations in identifying problems with corrective action has been previously detailed in V.C.8. Management must ensure that positive, aggressive verification activities are initiated by all QA organizations.

2. Nuclear Regulatory Commission/Outside Agency Review

a. NRC Inspection and Review

This section examines interface activities such as TVA responses to notices of violation, SALP reports, and NRC impact on TVA organization and policy impact.

A review of responses by TVA to NRC notice of violations shows that we frequently send inadequate responses. Each notice of violation contains the following statement:

> Pursuant to 10 CFR 2.201, you are required to submit to this office within 30 days of this Notice, a written statement or explanation in reply, including: (1) admission or denial of the alleged violations; (2) the reasons for the violations if admitted; (3) the corrective steps which have been taken and the results achieved; (4) corrective steps which will be taken to avoid further violations; and (5) the date when full compliance will be achieved.

A response which does not address each of these items is considered inadequate and usually results in a "request" for an additional response. As well as the additional paperwork, tracking requirement and management time for review, it lowers the credibility that the corrective action has been effective. Training for personnel preparing responses is essential and review of responses for adequacy by Compliance (or QA) should be mandatory. Failure to do this will only result in escalation and increase the administrative burden on top management. An example is the Watts Bar response to violation 50-390/84-59-02 where as a result of an inadequate response, WBN committed to a formal adequacy review of responses to NRC violations by senior management before response transmission. This review was to include the Site Director, Plant Manager, Plant QA Staff Supervisor,and the Compliance Group Supervisor. NSRS recommends that instructions be given to all personnel involved in the preparation of responses to the NRC. This could take the form of required reading or formal instruction. The instruction should include the impact on top management when inadequate responses are made.

The NRC Systematic Assessment of Licensee Performance (SALP) report provides an objective view of TVA management controls. Positive corrective action to concerns expressed at NRC enforcement meetings and SALP reports would have provided an improved regulatory environment. The following are extracts from the SALP report covering the period January 1, 1983 through February 29, 1984.

"TVA has the largest professional staff of any utility in the country and is regarded as having one of the more technically competent staffs in the industry. However, TVA is still experiencing difficulty in focusing this staff talent sufficiently to prevent problems

identified at one site from recurring at one or more of the other sites. In addition, lack of timely corrective action continues to be a problem when interdivisional coordination is required for resolution of issues.

Although Browns Ferry performance remains acceptable, all of the areas identified in the previous SALP as having major weaknesses (plant operation, radiological controls, maintenance, security and safeguards, and quality assurance) still have major weaknesses and still need additional management attention. Major weaknesses were also identified in refueling operations which require additional management attention. The weaknesses are believed to have been caused by the lack of management attention to the identification of the root cause of problems and inadequate corrective action, filling key management positions with managers having a minimum of actual BWR operating experience (first and second level supervision of licensed operators, senior reactor operators and reactor engineers), a failure to develop procedures which ensure that regulatory requirements are met, weaknesses in the general employee training program relating to the need for strict compliance with procedures and other regulatory requirements and the lack of an effective QA program."

"The Sequoyah facility has improved in overall performance since the last SALP period. Major strengths were noted in the radiological controls, maintenance, surveillance, fire protection, and refueling areas. Operations was also strong during much of the period, but a temporary decline in performance later in the period reduced the overall performance level. Weaknesses, requiring management attention, appeared in emergency preparedness and quality assurance. Problems in emergency preparedness relate to the weak organizational structure of this area. Quality Assurance weaknesses stem primarily from the management of the offsite audit organization. Although not a true strength, the security and safeguards area did improve from the previous SALP, due mainly to the reorganization of the corporate nuclear security organization."

On July 3, 1985, the NRC Executive Director for Operations wrote to the TVA Chairman, Board of Directors. His letter stated that the staff was concerned about performance deficiencies at TVA's nuclear facilities as indicated by a sustained and consistent history of poor performance and from a number of more recent events at TVA's nuclear facilities. The area of staff concern was:

- Allegations from TVA employees (TVA has already taken steps to improve the employee concerns program).

- SALP history including BFN RPIP.

- Review of Enforcement History (TVA had received over one thousand violations in the past four years and 14 civil penalties with a total dollar value of $910,625. The disproportionate magnitude of violations, number and severity level of civil penalties, and management related nature of the violations when compared to other utilities served to highlight the overall management weakness.)

- TVA Operating Experience (In a comparison with other utilities, it appeared that TVA had encountered operational problems at a greater frequency than most other facilities.)

- Management Structure and Experience (The NRC staff believed that there was a significant lack of nuclear operations experienced key managers which could be a prime cause for the problems being encountered.)

On July 18, 1985, the Chairman, TVA Board of Directors, informed the NRC Executive Director for Operations that the Board had been concerned about TVA's nuclear program performance for some time. On July 9, 1985, they had announced a clear assignment of responsibilities under H. G. Parris for all TVA nuclear activities.

The Board also was making a major effort to remove the salary constraints for key personnel in TVA's nuclear program. They were working with the Congress to hopefully have an early resolution of this problem.

As a result of the NRC Executive Director for Operations intervention, it is highly unlikely that Region II will reduce inspection levels and almost certain that inspection will be intensified at BFN. Therefore it is extremely important for supervision to stress the necessity of prompt corrective action and demonstrate it in practice, for credibility with the NRC to be restored.

b. INPO Reviews

Review of the INPO evaluations of Browns Ferry and Sequoyah revealed the following examples which show that commitments given to these findings were either not met or that the corrective action taken was inadequate and followup not performed.

(1) INPO Evaluation of Browns Ferry Nuclear Plant

Uncontrolled Instructions

The 1981 finding was that approved procedures and policies were not in effect to prevent the use of uncontrolled instructions, notes, or drawings attached to plant components or consoles. This finding was repeated in the 1982 and 1984 INPO evaluations.

BFN response to the 1984 finding was that a standard practice is being written on "Use and Control of Informal Notes, Instructions, and Drawings in the Plant." The standard practice would be PORC approved and in use by June 1985.

During the review ending July 10, 1985, NSRS determined that no standard practice of this title was in use at BFN illustrating lack of timeliness in completing action committed to. It was verified that this item was still open on the commitment tracking system under control number NCO-85-0041-006.

Operations Control

The 1982 finding (OP.2-1) was that operators allowed some annunciators to flash in an alarmed condition for prolonged periods without investigating the cause of the alarm. The 1984 finding (OP.3-2) noted that alarming annunciators were not routinely checked.

BFN response to the 1984 finding was that unit operators would be instructed to routinely determine if the annunciator's condition was clear and to notify the Operations Supervisor of any problem annunciators. The Operations Supervisor would initiate action using the approved jumper and lifted lead procedures to disable problem annunciators, when possible.

During the review ending July 10, 1985, NSRS could not determine whether this problem still existed since all three reactor units at BFN were shut down. The action item to develop alarm response instructions was being tracked under control number NCO-85-0246-018.

Status of Plant Systems

The 1981 finding (Criterion E) was that tagout status was not verified by persons responsible for

work on the tagged out equipment before beginning work.

The 1981 finding (Criterion G) was that tagout audits or an assessment of the status of tagouts was neither required nor conducted.

The 1982 finding (OP.3-5) was that a periodic review and audit of the status of outstanding tagouts is needed.

The 1984 finding (OP.3-1) was that administrative controls governing the use of caution tags needed to be improved. Caution tags were sometimes incorrectly used, often remained installed for extended periods of time, and conveyed operating information that had not been incorporated into operating procedures.

The BFN response to the 1984 finding was that the quarterly review of clearance tags was now being used to release and incorporate as many caution orders as possible into the appropriate procedures and to verify that existing tags were legible and still applicable.

During this review NSRS did not examine the effectiveness of tag utilization and control at BFN.

Radiation Surveillance And Control

The 1981 finding (General Criterion - Personnel Controls) was that reasonable controls should be established and enforced to prevent unnecessary exposure of personnel to radioactive materials through ingestion or inhalation. Contrary to this generally accepted practice, eating, drinking, smoking, and chewing were permitted in radiologically controlled areas of the plant (exclusive of posted contamination areas). Personnel were observed to be smoking and eating in the health physics lab immediately adjacent to radioactive sample counting stations.

The 1982 finding was that smoking and chewing were permitted in some potentially contaminated areas of the plant.

The 1984 finding (RP.5-1) was that the plant policy prohibiting eating, smoking, and drinking in the regulated areas was not being complied with by workers.

The BFN response to the 1984 finding was that additional management and supervisory attention would be given to enforce plant policy on eating, smoking, and drinking in regulated areas.

Plant activity was not inspected by NSRS during this review. However, a QAB audit report QBF-A-85-0013 dated May 29, 1985, noted "lax enforcement of the no smoking requirements."

Operational Procedures

BFN 1984 finding (OP.2-1) was that assistant unit operators (AUO) watchstanding practives needed improvement. Many instances were noted in which AUOs did not fully investigate, correct, or report abnormal indications and material deficiencies. It should be noted that this was the first time this item had been identified by INPO at BFN, but it had been previously identified by INPO in 1982 at SQN.

BFN response was that annual requalification training would be used to stress the responsibilities associated with watchstanding practices. The assistant shift engineer on shift would be required to periodically monitor AUO rounds to ensure conformance with program requirements. These actions would begin in March 1985.

The effectiveness of the corrective action taken at BFN was not examined by NSRS during this review.

(2) INPO Evaluation of Sequoyah Nuclear Plant.

Operation Control

The 1982 finding (OP.3-5) was that operators did not always properly monitor the common annunciator panels in the control room. Annunciators on this panel were allowed to be in an alarmed condition for extended periods of time.

The 1984 finding (OP.5-1) was that some control room and local panel annunciators did not have response procedures. Some existing response procedures did not correspond to the proper alarm window. As a result, operators relied on memory and supervisory assistance when responding to these alarms. It was recognized that review and updating of procedures was in progress.

The SQN response to the 1984 finding was that an ongoing review and updating of control room annunciator responses had been in progress since March 1983 and would be completed by October 1984. Preparation of local panel annunciator response instructions for major local panels was initiated in November 1983 and would be completed by January 1985.

Verification of completion of annunciator response instructions was not performed during the NSRS review.

Operational Procedures

The 1982 finding (OP.3-1) was that some assistant unit operators (AUO) did not notice or taken appropriate action to report and identify material deficiencies during routine plant tours.

The 1984 finding (OP.3-1) was that some assistant unit operators (AUO) did not identify or take appropriate actions on material deficiencies. Numerous water or steam leaks and improper lubrication of rotating equipment were not being reported or corrected.

The SQN response to the 1984 finding was that emphasis would be placed on identifying and reporting material deficiencies during AUO requalification training. Training would be completed by June 1984. The training evidently was successful since numerous maintenance requests initiated by AOUs were observed during the NSRS 1985 maintenance program review (reference VII. C.73).

Summary

It is clear from this review of INPO evaluations and related TVA actions that the corrective action to INPO identified findings has not always been effective. NSRS recommends that when problems are identified by INPO, that positive steps be taken to fix them in a timely manner. Also, INPO findings at one plant location could well be applicable to other plants. NSRS recommends that INPO evaluations performed at one plant and TVA responses be reviewed for applicability to other plants.

c. Management Analysis Company Review

(1) Major Problem Areas - RPIP

The BFN RPIP commenced January 27, 1984. Shortly afterwards TVA gave a contract to Management Analysis Company (MAC) to perform an assessment of the BFN RPIP and related administrative burdens. This review of the MAC report covers only those items which appear to impact the corrective action process.

The MAC report confirmed that five problem categories stated in the RPIP accounted for the large majority of documented deficiencies at BFN:

- "Failure to follow procedures, both when the procedure is clear as well as when the procedure is unclear or inadequate.
- Failure to provide adequate, workable procedures.
- Failure to perform work correctly and completely.
- Not enough time to perform adequate, in-depth evaluation of events and methods.
- Not enough time to follow through to completion of corrective action."

(2) Perceptions of Management

MAC stated that the organization did not perceive management as people oriented and dedicated to achieving a high level of quality in job performance. The report states:

> This perception could be considered as one of the environmental factors influencing the implementation of RPIP. It was included as one of the underlying reasons for past compliance problems, because it was quite widespread, well beyond the heightened level of conflict between the line and quality organizations expected in an organization experiencing quality problems. The RPIP does not address this perception and hence tends to be viewed by the organization as a negative or punitive approach. If this perception is allowed to persist it will reduce the effectiveness of the RPIP because it does not have the full support of the personnel.

Interviews of TVA supervisory staff by MAC resulted in receipt of typical remarks such as the following:

- "Too much emphasis on just meeting minimum requirements."
- "Management does not want to hear about problems."
- "Management says that if the NRC does not say that this was a problem then it is not a problem."
- "Management only responds when NRC leans on them."
- "We know where most of the problems are and can solve them if management will listen and provide the resources and backing."

(3) QA/QC/OE

The MAC report stated that the Quality Assurance (QA), Quality Engineering (QE), and Quality Control (QC) functions were not effective or properly utilized by line management to help in achieving a satisfactory level of compliance.

o Interviews indicated that:

- The Office of Quality Assurance (OQA) did not spend enough time in the field conducting meaningful audits.

- The level of training and experience within the field QE/QC organization (particularly QC) was insufficient to command respect from the line organization.

- Input from QC/QE to the line management on problem identification has had low credibility.

- Management had been unwilling to delegate effective stop-work authority to the field QE function. As a result, QE used 100 percent reviews and withheld signatures to correct problems.

- QE was operating as part of the line organization review and approval process.

- Management's emphasis on reducing the number of deficiencies combined with assigning QE a role in solving the problems they identified had tended to submerge problem identification.

- Review of NRC and TVA deficiency documents indicated that:

  - The OQA audit program did not cover all areas important to compliance, and audits were not conducted in sufficient depth.

  - Deficiency trending and analysis had not been developed into an effective, positive line management tool for improving performance.

The MAC report noted that it was common for organizations experiencing quality and compliance problems to increase the involvement of the quality organization to assure that the work is satisfactory. Unfortunately, this approach does not cure the problems which led to poor quality and tends to place the responsibility for quality on the QA organization rather than on the organization performing the work.

Recommendations made by MAC were:

- Establish an onsite audit and quality evaluation QA organization with the responsibility for assuring that all site organizations perform quality work.

- The organization should be staffed with sufficient numbers of personnel with expertise in conducting programmatic audits of all onsite activities.

- Assign responsibility to onsite QA for planning and directing performance of product-oriented audits.

- The onsite QA organization should be responsible to the Site Director for quality program implementation.

- The NCO QA organization should be responsible for assuring that all offsite organizations perform quality work and that the onsite QA organization performs its assigned functions.

- The QC inspection function should be strengthened by acquiring more experienced inspectors or training experienced craftsmen as inspectors.

- The QC organization should be responsible to the line management for meeting their inspection needs.

- The QC organization need not be an integral part of the site QA organization. However, it must be structured with sufficient independence to preclude intimidation by the individuals performing the work or their immediate supervision.

(4) Lack of Timely/Effective Corrective Action

The MAC report noted that corrective action by the line organization to resolve problems identified through normal channels such as line supervision, field change requests (FCR), and the test program or through external channels such as QA/QC, INPO, and NRC had been utimely and/or ineffective.

- Review of the NRC and TVA deficiency records indicated that:

  - A large backlog of open CARs, some several years old, had been allowed to accumulate.

  - The fire protection enforcement problem was due largely to untimely corrective action.

(5) RPIP Contents/Provisions

The MAC report noted that the RPIP had not addressed strengthening the organization's ability to respond successfully when stressed. Keeping the first line supervision in the field with clear direction and responsibility for the defined work is the first step, and this was already included in the RPIP. The second step involved strengthening the organization's ability to solve problems without resorting to crisis management. The MAC report was an excellent summary of the situation at BFN and it predicted the reductions of RPIP effectiveness early in the program life. The report received top management review when issued in June 1984. NSRS recommends that the MAC recommendations not already implemented be reevaluated to determine improvement potential in any present or proposed future organization changes.

3. Browns Ferry Regulatory Performance Improvement Program

The Browns Ferry Regulatory Performance Improvement Program (BFN RPIP) is the largest corrective action program undertaken by TVA, excluding the BFN fire restoration program. It was prompted by NRC expressed concern that violations cited against BFN had continued to rise. The RPIP was not the first such program initiated by TVA. In October 1981, an 8-point program was announced with the formal goal of achieving a SALP rating above average. The 8-point program was replaced by a 6-point program in 1982.

In January 1984, a memorandum from the BFN Plant Superintendent noted that violations of NRC regulations in 1983 had increased. A review of the recent SALP report, INPO audit reports, NRC violations, and Licensee Events Reports indicated the same degrading level of performance. Seven goals were identified for improving BFN performance. In addition, steps were taken to reduce the number of hourly personnel assigned to unit 3 refueling outage and plant maintenance sections to a level where management controls could maintain regulatory compliance.

The BFN RPIP was issued by the Director of Nuclear Power, on January 27, 1984.

The stated intent of the plan was to provide immediate improvement in regulatory performance. The program was divided into two distinct phases. The first, known as the Short Term Action Plan, was intended to attain positive management control and organizational discipline and provide individual accountability. The second phase known as the Long Term Action Plan was intended to establish the environment for continued improvement. The Director of Nuclear Power had total responsibility for ensuring that the BFN RPIP was implemented and all desired results were achieved. The implementation planning document for short-term action items was issued by February 6, 1984. This identified responsible managers and employees, established the schedule and sequence for implementing tasks, criteria for completion, and the need for task status. The implementation planning for long-term action items was to be established consistent with progress in completing short-term activities. Criteria were established for measuring the overall effectiveness of the program.

The RPIP meetings were held every two weeks until July 30, 1984, and every month thereafter. They were well attended and had representatives from activities affecting BFN. It was recognized that the program encompassed a great number of activities and that it could be quite some time period to

see results. Support by the attendees was evident and some had confidence that positive results would emerge in a few months. This was not the position of some observers. At a meeting in Atlanta on February 17, 1984, to discuss the BFN RPIP, the NRC strongly stated that for the improvement program to be successful there must be involvement of the working level people. They questioned the level of input that working level people had on the RPIP. In May 1984, Management Analysis Company (MAC) reported that BFN personnel did not perceive management as people-oriented and dedicated to achieving a high level of quality in job performance (see section V.D.2.c). In July 1984, NSRS report R-84-20-BFN pointed out the low morale of engineers at BFN. However, significant improvements were made with the RPIP short-term objectives.

NRC Region II increased their effort to monitor progress of the RPIP. A third resident inspector was assigned and a Regional Supervisor conducted monthly on-site reviews of TVA-BFN efforts to effect improvement in performance. Also, quarterly meetings between senior regional and TVA management were arranged. The RPIP was officially recognized by confirmatory NRC Order EA84-54 on July 13, 1984.

The RPIP program was not conducted in isolation. The plant continued to operate which placed the burden on fewer plant staff while personnel were removed from duties for training. Offices were constructed for maintenance engineering, training, QA staff, RPIP personnel, and for design staff transferred from Knoxville to BFN during December 1984.

Organizational changes also occurred. On February 21, 1984, the Offices of Power, Engineering Design, and Construction were combined. On April 30, 1984, the Office of Nuclear Power was established. The Director of NUC PR became Site Director, Browns Ferry, and the BFN Plant Manager reported to the Site Director. A RPIP manager was selected during October 1984.

During the return to service of unit 3 on October 22, 1984, the NRC stated that BFN violated its technical specifications, failed to follow plant procedures, and failed to ensure adequate management control. Two independent TVA review teams substantiated NRC's findings and concluded that management control of the operational activities of Browns Ferry was the area which most contributed to the incident. This was the first serious indication that the RPIP had not reached the level of implementation expected.

A number of events occurred which resulted in all units being in a shutdown mode by March 19, 1985. On August 14,

1984, overpressurization of unit 1 core spray system occurred and resulted in a civil penalty of $100,000. On December 5, 1984, a safeguards violation resulted in a $50,000 civil penalty. A number of violations, principally concerned with inadequate plant maintenance, have not been included in this summary. Unit 2 was shut down for the fifth refueling outage on September 15, 1984, Unit 1 was shut down on March 19, 1985, and Unit 3 was shut down on March 9, 1985, following discrepancies in instruments measuring the level of cooling water above the core and improper operator actions. This resulted in a civil penalty of $150,000.

Work on the RPIP continued. One encouraging activity was the personal contact of the Site Director with groups of 25-50 persons known as "Involvement Sessions." The discussions centered around improving performance by doing things right, following the rules, attitude, teamwork and employee involvement. As of May 28, 1985 the Site Director had met with 1800 employees. He stated that some of the better ideas came from the middle management level.

NRC Region II, including J. Nelson Grace, were present at the RPIP meeting on May 28, 1985. All short-term items and 87 out of 118 long-term items were considered complete. Procedural changes are in process with a goal for completion within 18 months from May 28, 1985. The updating of system drawings, which involves a physical walkdown of each system and review of all work plans, is scheduled for completion by August 1, 1986. With the help of Edgerton, Germeshausen, and Greer, Inc., (EG&G), TVA had developed an analytical tree to determine what had to be done to prepare both personnel and equipment for startup of unit 3.

Dr. Grace stated that it remained to be seen whether the program would be successful in bringing about necessary improvements and in developing the necessary discipline and mutual respect throughout the organization.

On July 3, 1985, the NRC Executive Director for Operations in a letter to the Chairman, TVA Board of Directors, referred to the RPIP as part of the NRC staff concerns. It stated, "In spite of increased attention by management, the performance at Browns Ferry improved only marginally."

On July 9, 1985, H. G. Parris was assigned sole responsibility for the management of TVA's nuclear program. On July 22, 1985, changes in BFN management were made. The positions affected were Plant Manager; Superintendent, Maintenance; and Supervisor, Operations Group.

At the conclusion of the NSRS review, BFN was still in a shut-down mode. Although the RPIP failed to meet the desired

level of regulatory performance improvement, accomplishments were made. These included the office construction program which improved personnel working conditions, thorough identification of the problem areas, positive steps to resolve long-standing issues such as drawing control and vendor manual control, and the "Involvement Sessions." If the Involvement Sessions had been held at the commencement of the RPIP, the results may have been different. NSRS recommends that the concerns expressed in NSRS report R-84-20-BFN be addressed by upper management, resolved, and conveyed to engineers (and others). While this is not a regulatory requirement, NSRS believes that it will strengthen the initial contacts created in "Involvement Sessions."

4. Drawing Control

The NRC issued IE Information Notice No. 85-66 on August 7, 1985, entitled "Discrepancies Between As-Built Construction Drawings and Equipment Installations." The intent of the notice was to alert licensees of a potentially significant generic problem concerning as-constructed drawings not correctly or completely reflecting the equipment installed. This was not the first indicator to TVA that such a problem could develop at a nuclear plant. When the restoration began on units 1 and 2 at BFN after the March 1975 cable fire, it was soon discovered that a reliable set of drawings did not exist which accurately reflected the actual "as-built" plant configuration. The practice by EN DES at that time was to consider as the latest drawing the one that represented all approved ECNs, whether worked or not. Although this practice presented some problems for a plant under construction (where systems usually were assembled at different times for each unit at a site), it was even more confusing for an operating plant (where the differences in drawings used to construct each unit were compounded by the different timeframes in which ECNs were worked for each unit). An attempt to overcome these discrepancies was initiated by the Outage Group at BFN during the restoration program by "as-constructing" drawings on a unitized basis as part of the workplan program to rework the cable repairs and additional modifications.

In 1981, the Office of Engineering Design and Construction (OEDC) conducted an audit of Design and Design Modification Control (audit No. JA8100-06). Finding No. 0-9 of this audit stated that it was widely acknowledged in both EN DES and NUC PR that the BFN "as-constructed" drawings showing equipment location and arrangement contained many errors and inaccuracies and that the "as-constructed" drawings used by NUC PR did not agree with the "as-designed" drawings on file in EN DES.

As recommended by that report, a task force was established to do an indepth study of the problems identified in the report and to suggest corrective actions to management. The task force findings and recommendations were issued in February 1983, and a final set was issued on June 3, 1983. In summary, the findings were:

- Many ECNs had been added to EN DES drawings which were not going to be implemented by NUC PR.

- A number of vendor drawings had never been baselined by EN DES.

- If an "as-constructed" drawing differed from the actual plant configuration, a design change request (DCR) had to be issued. Even if NUC PR discovered a drawing error on an EN DES drawing, a DCR was often required. The DCR process was considered too cumbersome for making drawing changes.

- NUC PR unitized drawings and usually worked ECNs for one unit at a time. In spite of this, when EN DES issued an ECN, they revised all drawings at the same time.

- EN DES's responsibilities for the "as-constructed" drawing process were not clearly defined.

- The mechanism for determining when EN DES could close out an ECN was not clear. Notification by means of issuing "as-constructed" drawings was being used but was not considered adequate.

- ECNs were being worked out of sequence, yet Unreviewed Safety Question Determinations (USQDs) which were required by 10CFR50.59 were being performed by EN DES using the latest "as-designed" drawings. Furthermore, NUC PR was working partial ECNs although a USQD was only valid for a completed design change (unless specifically stated otherwise in the ECN).

On June 22, 1983, a joint task force including EN DES and NUC PR personnel was formed to address the "as-constructed" drawing problems. After the RPIP was established for BFN, a special program review of the As-Constructed Drawing Task Force was conducted. At the May 10, 1984, RPIP meeting, the newly appointed BFN Site Director assigned an RPIP action item (84-07-01) to reassess the scope of the as-constructed drawing program. At the same time, a companion action item (84-07-02) was created to survey other plants to determine the scope of their as-constructed drawing programs.

The results of these efforts was to create task forces for each plant and to identify common activities relating to

as-constructing systems or configuration control. Activities included: vendor drawings, vendor manuals, unitizing drawings, a uniform drawing management system, design change supplements, design change requests, a definition of configuration control, as-constructed drawing procedures, and system descriptions.

A backlog team was established on site at BFN to perform system walkdowns to "as-construct" critical systems, to close out old workplans, review ECNs, and handle FCRs. At the time of this review, there were 35 engineers in this site group.

In spite of these efforts, there still appeared to be long-term problems with drawing control which had not been addressed:

(1) OE still maintained the master copy of their "as designed" drawings on mylar. The effects of time and numerous changes would impact future usefulness and quality.

(2) There was a time lapse of days and even weeks between when a drawing was issued by OE or by site drawing control units and when these drawings were received by the users.

(3) There was not a convenient method for plant operations personnel to mark up drawings to show temporary changes (such as electrical jumpers) so that an accurate status of the systems could be shown at any time.

There was a heightened awareness of the need to establish and maintain accurate "as constructed" drawings. The current methods used to maintain drawing originals and to distribute copies appear to be awkward and inefficient when needed for the lifetime of the multi-billion dollar nuclear plants. The drawing task force should evaluate a valley-wide computer system for drawing control and determine its potential usefulness and cost effectiveness.

The efforts to improve the quality of "as constructed" drawings should be given the highest priority by all involved in order to avoid the serious safety implications of inaccurate drawings.

5. Cable Routing, Installation, and Inspection

NSRS report No. I-85-06-WBN addressed an employee concern regarding cable routing, installation, and inspection practices. NSRS reached the following conclusions.

- There was insufficient documentation, justification, and engineering basis to substantiate the disposition

of some NCRs, and that a sampling program used to justify as-installed conditions lacked engineering support.

- The OE and OC cable pulling programs (past and present) have been inadequate, inconsistent, and in violation of industry standards.

- Evidence of performance of voltage drop and short circuit calculations for voltage level 3 power cables was not available.

- The OE QA verification program was inadequate.

- The limited QA program was not properly implemented, and the NQAM inadequately addressed the limited QA program.

- OE has been very lax in resolving a longstanding cable bend radius problem. Progress made toward resolution of problems identified by INPO and TVA's Bellefonte Electrical Evaluation (BEE) team has been less than adequate. The INPO and BEE findings are significant enough to warrant an immediate evaluation to ensure WBN unit 1 meets licensing requirements prior to exceeding a power level of 5 percent. The OE Action Team report intended to initiate corrective actions/studies had not been approved. Necessary corrective actions have been postponed by the formation of task forces, evaluation teams, etc. More effort and time are expended on adminstration of reviews, studies, and problem verification than on implementation of corrective actions.

Although this investigation was initiated by an employee concern at WBN, NSRS found that the problems in general exist also at BLN. The report chronicled events since the cable bend radius problem was identified in 1979, including INPO reports, the BEE team report, OE and OC Action Plans, and quality assurance organization activities. Despite the meetings, evaluations, reviews, and corrective actions taken over the past five years, the problems have not been resolved.

In conclusion the C/A system in place from 1979 through early 1985 was incapable of correcting difficult problems in a timely manner.

6. Interoffice Control of Nonconformances

The need for a procedure to control the interoffice handling (interdivisional control at the time) of nonconformances was first identified early in 1981 in an audit report. This section recounts the history of the effort to produce such a procedure.

a. Audit report JA8000-13 issued January 9, 1981 found that contrary to the requirements of 10CFR50, Appendix B, Criterion V, there were no Quality Assurance Procedures which delineate authority and responsibilities among TVA divisions prescribing nonconformance activities. This deficiency was assigned both to OEDC and to POWER.

The recommended corrective action was to develop an Interdivisional Quality Assurance Procedure (ID-QAP) for the nonconformance activity. There were no responses to these findings.

b. Between January 1981 and June 1983 there was no official action taken. Audit report CB-83-02 issued June 8, 1983, deficiency 4, found that contrary to the requirements of 10CFR50, Appendix B, Criterion XV, there were no ID-QAPs that identified the organization responsible for processing NCRs, determining cause of the deviation or determining and verifying corrective action and action required to prevent recurrence.

The recommended corrective action was to revise and/or issue procedures specifying the responsibilities of both CONST and NUC PR in properly identifying and reporting nonconformances.

The response from OQA on July 26, 1983 (reference B.5) stated that Management Policies and Requirements (MPRs) 2.6.1, "Deviation Control," and 2.6.2, "Corrective Action System," were being developed to provide upper tier guidance in the subject areas and resolve the identified audit deficiencies. These MPRs were to be issued by January 1, 1984.

The MPRs were never fully implemented by OQA and were cancelled entirely when the NQAM was issued. The NQAM did not address the proposed corrective action.

c. Deviation report WBCA-835-01 issued August 22, 1983 found that, contrary to the requirements of 10CFR50, Appendix B, Criterion XVI, prompt corrective action for conditions adverse to quality that required corrective action by other divisions or offsite organizations were not being handled in a timely manner.

The recommended corrective action was to issue an interdivisional procedure covering the requirements for timely corrective action and to establish necessary management controls to assure prompt correction and follow up. The initial response from OQA on October 18, 1983 (reference B.7) stated that OQA/SEB would develop TVA Management Policies and Requirements 2.6.1,

"Deviation Control" to require prompt action and communication and that specific responsibility for the identifying organization and affected organization would be identified. A revised response on March 6, 1984 (reference B.8), stated that issuance of MPR 2.6.1 would be delayed to June 30, 1984, and a TVA Quality Bulletin would be issued by March 30, 1984, to provide quality assurance instructions and requirements regarding deviations in the interim. This Quality Bulletin was never issued. On May 1, 1984, the author of the deviation report advised by memorandum (reference B.9) that the Quality Bulletin, as drafted, would not resolve the deviation. He restated the need for an interface procedure and provided recommendations, and pointed out the fact that the QA organization was a poor example because of its failure to take timely corrective action for this identified deviation. No response had been made to this memorandum at the conclusion of this review.

d. As a result of the November 8, 1984, Quality Assurance Program meeting, a series of meetings involving OC, OE, NUC PR (DQA), PMO, and OQA were held to discuss "TVA's compliance with Appendix B criteria for identification, documentation, and corrective action of nonconformances." These meetings were held on November 21, 1984, December 5, 1984, January 31, 1985, and February 21, 1985. Drafts of ID-QAP-15.1 and 16.1 were presented for review at the first meeting. The final product was a coordinated draft ID-QAP-15.1, "Deviation Control," which contains basic requirements and responsibilities and a general procedure appropriate for an upper-tier procedure. The meeting attendees expected DQA, responsible for ID-QAPs which are now part of the NQAM, to issue the ID-QAP in April or May 1985.

e. Audit report QWB-A-85-0009 issued April 5, 1985 found that no interdivisional or upper tier procedure was in place to implement the nonconformance requirements of 10 CFR 50.55(e); 10 CFR 50, Appendix B; ANSI N45.2; and ANSI N18.7 for NUC PR identified items. Since this was previously identified in Joint QA Audit JA-8000-13 and remained open, no deviation was written.

The response on May 2, 1985 (reference B.15), stated that an interdivisional procedure to control interoffice corrective action activities developed by a task force comprised of representatives of OE, OC, NUC PR, and associated quality assurance organizations was scheduled for issuance by May 31, 1985. The response also stated that due to the containment pressure transmitter problem at SQN, issuance of this procedure had been delayed pending possible revision. When contacted

by NSRS on July 25, 1985, DQA indicated that the procedure (renumbered to ID-QAP-16.1) was still being held, pending possible revision.

In conclusion, the TVA organization in place in recent years did not lend itself to adequate communications among OE, OC, and NUC PR for the purpose of solving problems. NSRS believes this was largely due to not having a single individual in charge of the nuclear power program. This resulted in power struggles among the major organizations, often exascerbated by the personalities involved. Organizations often appeared to have assumed that their systems were perfect, and any changes necessary would have to be made by other organizations. NSRS recommends that NUC PR issues the ID-QAP governing control of nonconformances immediately, and maintain it (see paragraph V.C.3.c(2). Implementation of this procedure should be verified by DQA.

7. Quality Problems

When the responsibility for QA in the TVA nuclear program shifted from OQA to DQA in 1984, a transition plan was established to assure that necessary OQA activities were assumed by appropriate organizations. One OQA activity that was omitted from the transition plan was the Quality Problem (QP) program initiated to identify and address long-standing problems.

As of January 1984, OQA Quality Improvement Branch (QIB) had identified 31 QPs including such items as "Cable Bend Radius," "Q-Lists," "Configuration Control," and "Resources for Problem Solving." Two QPs had been issued to the OQA branches for use: 83-1, "Deviation Control and Corrective Action Systems," and 83-25, "Vendor Quality Assurance Records." Issued QPs included a brief discussion of the problem, a plan of action, and assignment of responsibilities. No QPs were issued outside OQA, and all files were maintained in OQA.

Documentation of the reasons behind the decision to omit QPs from the transition plan could not be found. QIB personnel interviewed noted that the scope of OQA activities after the transition did not include the QP program so no further work was done. QIB had expected to transfer QPs to DQA, and the decision not to transfer them was apparently made at the office level.

There were a number of possible reasons for excluding QPs from the transition plan, but failure to document the choice not to pursue them represents a poor management attitude toward quality. NSRS notes that several of the worst problems facing TVA today appeared in the list of QPs; and even if aggressive pursuit of the QP program may not have forced resolution of these problems in time to preclude the current

TVA situation, pursuit of resolution of the remaining problems can only help TVA in the future.

NSRS believes that an aggressive approach to quality problem identification and resolution is essential for a successful nuclear power program and consequently recommends that P&E establish a staff whose only responsibilities are the identification and coordination of resolution of quality problems. This staff should evaluate the OQA QP files for applicability and usefulness and document the evaluation. The staff should have the authority to address quality problems across organizational boundaries and the resources to coordinate resolution of problems to completion.

8. Institute Of Nuclear Power Operations (INPO) Construction Evaluation of WBN and BLN

In February 1984, INPO conducted an evaluation of construction activities at BLN. The final report, issued June 29, 1984 (reference B148), found a number of beneficial practices and accomplishments as well as areas that needed improvement. The six areas needing improvement considered most important were: the project quality inspection program, some aspects of the Quality Assurance Program, control of permanent plant records and control of drawings during construction, implementation and coordination of the safety tagging programs, the electrical portion of the Bellefonte project, and taking advantage of industry operating experience for input to project design.

In May 1984 (reference B149), WBN CEO evaluated the applicability of the BLN INPO findings to WBN. The report addressed the specific INPO findings, comparing the BLN and WBN programs and practices. In most cases the report concluded that WBN did not have the same problems or in other cases described actions recently taken to eliminate problems.

Between August 1984 and January 1985, WBN performed a mini-internal INPO review and officially reviewed the BLN INPO findings (references B150 through B153). In February 1985, the Assistant Manager of Construction (Nuclear) personally commented on the WBN responses (reference B154) noting a general concern that many of the responses stipulated C/A by reemphasis, memo, reinstruction, and that historically these "paper fixes" had not rectified implementation problems. He stated that management involvement at first-line supervision was the only way those types of problems would be solved. WBN revised responses based on the general and specific comments made by the Assistant Manager of Construction (Nuclear) (reference B155). Also in January 1985, the BLN Electrical Evaluation (BEE) Report was distributed to initiate actions necessary to resolve the associated findings (reference B163).

In June 1985, the Watts Bar Engineering Project submitted summaries of the BEE findings applicable to WBN with action plans for unit 2 (reference B156) to the Project Manager, and received responses (reference B157). On June 20, 1985, the INPO Evaluation Team held an exit meeting at WBN and on June 24, 1985, the Project Manager assigned responsibilities for responses (reference B158). An exit meeting attendee stated that the INPO evaluation team expressed dismay that they had found many of the same problems found in the BLN INPO evaluation, particularly those in the electrical areas. INPO was concerned that TVA apparently did not learn from their mistakes. Concerning the electrical problems and TVA's evaluation of them, one TVA manager said that TVA was waiting to see if INPO would find the same problems TVA had found before implementing some of the planned corrections (see section V.D.5). While this may not be TVA policy, it represents a very poor attitude.

In July 1985, TVA finalized responses (references B159 and B160) and on August 15, 1985, met with INPO in Atlanta to discuss the TVA responses (reference B161). All findings and responses were finalized at this meeting except one concerning "Management of System Completion" where INPO felt the efforts described in the TVA response would not result in adequate improvement. This response was revised slightly when revised and updated findings, responses, and supporting data were submitted to the Manager of Power and Engineering for transmittal to INPO (reference B162).

TVA demonstrated an interest in correcting problems identified by INPO but failed to follow through. An example is the self-initiated internal INPO-type review of WBN unit 2. The internal review was appropriate, but failing to include unit 1 in the review was not appropriate. This was an intentional choice apparently based on the potential impact of the review on unit 1 fuel loading. Another example is the failure to implement solutions to problems in the BEE report prior to the WBN INPO evaluation. Whether TVA intentionally delayed implementation of solutions to these problems or were simply untimely in doing so was not clear. In either case, the inaction indicates that the TVA attitude toward C/A, as of June 1985, was inappropriate.

Adequacy of the TVA implemented and proposed C/A for the INPO reports could not be assessed at the time of this review.

VI. PERSONNEL CONTACTED

A. Office of Engineering

E. G. Beasley	Manager, Quality Management Staff (QMS)
J. S. Colley	Group Head, Audit Group, QMS
W. E. Troutt	Engineer, QMS

J. F. French	Engineer, QMS
R. A. Thompson	Supervisor, Performance Evaluation Section, Engineering and Technical Services
C. E. Harmon	Engineer, Engineering and Technical Services
R. H. Lichtenstein	Engineer, Engineering and Technical Services
J. E. Ellis	Engineer, Administrative Services, Civil Engineering Branch
J. W. McReynolds	Assistant to Branch Chief, Civil Engineering Branch
D. R. Denton	Staff Specialist, Civil Engineering Branch
E. H. Cole	Project Management Staff, Watts Bar Engineering Project
W. L. Smothers	Supervisor, Support Design Section, Watts Bar Engineering Project
O. D. Wertz	Project Management Staff, Watts Bar Engineering Project
W. I. Dothard	Project Management Staff, Watts Bar Engineering Project
T. C. Cruise	Analysis and Support Design Project Engineer, Watts Bar Engineering Project
J. K. Hannifin	Mechanical Project Engineer, Watts Bar Engineering Project
R. R. Reeves	Electrical Design Project Engineer, Watts Bar Engineering Project
C. L. Butler	Electrical Supervisor, Bellefonte Engineering Project
H. N. Benninghoff	Mechanical Design Project Staff, Bellefonte Engineering Project
C. W. Hatmaker	Civil Project Engineer, Bellefonte Engineering Project
J. L. Wright	Supervisor, Project Management Staff, Bellefonte Engineering Project
W. E. Alkire	Engineering Services, Mechanical Engineering Branch
G. A. Silver	Engineer, Mechanical Engineering Branch
P. G. Biljak	Engineer, Mechanical Engineering Branch

B. Office of Construction

1. Central Office

R. A. Pedde	Assistant Manager of CONST (Nuclear)
R. W. Dibeler	Chief, CONST Quality Assurance Branch (CQAB)
M. J. Ritter	CQAB
J. T. McGehee	Quality Engineering Support Staff (QES)
E. L. Larrabee	QES
D. G. Oakes	QES
F. A. Roemer	QES

2. Watts Bar Nuclear Plant

G. W. Wadewitz	Project Manager
C. H. Jetton	CONST Superintendent
A. W. Rogers	Supervisor, Watts Bar Quality Assurance Unit
F. Smith	CONST Engineer
S. Johnson	Quality Manager
T. W. Hayes	Supervisor, Nuclear Licensing Unit/ Procedures & Training Unit
R. G. Paul	Procedures & Training Unit
B. L. Majors	Quality Manager Organization
D. R. Spangler	Quality Manager Organization
G. H. Braisden	Supervisor, Hanger Quality Control Unit
Quality Control Inspectors	

3. Bellefonte Nuclear Plant

L. S. Cox	Project Manager
D. R. Bridges	Quality Manager
E. D. Rose	Supervisor, Procedures & Training Unit
R. E. Young	CONST Engineer
B. F. Painter	CONST Superintendent
J. T. Barnes	Supervisor, Bellefonte Quality Assurance Unit
W. T. Whittle	Supervisor, Nuclear Licensing Unit
Quality Control Inspectors	

C. Office of Nuclear Power

1. Central Office

W. E. Andrews	Chief, Operations Quality Assurance Branch
R. J. Mullin	Director, Division of Quality Assurance
F. M. Siler	Instrument and Controls
J. E. Law	Chief, Quality Systems Branch DQA-QSB
W. D. Poling	Assistant to the Manager
D. E. McCloud	Licensing Support Supervisor
R. B. Bruce	Planning and Support Staff, QAB
G. W. Killian	Chief, Quality Audit Branch, DQA/QAB
F. A. Szczepanski	Supervisor, Nuclear Safety Staff
T. M. Galbreth	Nuclear Engineer, NSS
R. C. Parker	Assistant Director, DQA
M. W. Alexander	Chief, Programs and Procedures Staff
C. E. Bosley	Quality Assurance Evaluator - SQN
D. O. McCloud	Group Head Plant Evaluation - WBN
R. L. Newby	Quality Assurance Evaluator - WBN
T. L. Pitts	Quality Assurance Evaluator - WBN
P. B. Border	Group Head Plant Evaluation - BFN Acting Group Head Plant Evaluation - BLN
M. M. McGuire	Quality Projects Staff, QSB

2. BFN

N. R. Beasley	Browns Ferry Engineering Project Manager (OE)
R. C. Nixon	Project Manager, Procedures
J. E. Swindell	Superintendent, Operations and Engineering
B. C. Morris	Compliance Supervisor
J. M. Rigden, Jr.	QA Engineering Associate
D. C. Mims	Engineering Group Supervisor
W. T. Reid	Project Engineer
R. D. Guthrie	Staff Chief, Design Services
M. L. Bartholomae	Project Manager, Support Services
H. E. Crisler	Mechanical Design Project Engineer (OE)
P. A. Lunn	Project Control Superivsor (OE)
D. R. Simms	Project Control Technican (OE)
G. R. Hall	Design Services Manager
J. D. Carlson	Plant Quality Assurance Supervisor
W. C. Burke	Quality Assurance Evaluator
E. D. Loope	Quality Assurance Engineer
J. R. Pittman	Superintendent, Maintenance

3. SQN

H. L. Abercrombie	Site Director
P. R. Wallace	Plant Manager
H. B. Rankin	Design Services Manager
G. B. Kirk	Compliance Supervisor
D. L. Cowart	Quality Surveillance Supervisor
J. H. Sullivan Jr.	Regulatory Engineer Supervisor
R. C. Birchell	Mechanical Engineer, Compliance
J. P. Vineyard	SQN Engineering Project Manager
J. D. Smith	Nuclear Engineer
Z. M. Kabiri	Support Services Supervisor
J. R. Griggs	Compliance Engineer
F. C. Higdon	Supervisor, Drawing and Vendor Manual Unit
R. H. O'Donnel	Staff Engineer Supervisor
J. E. Ownby	Supervisor, Project Services Coordinator
J. M. Stitt	Quality Surveillance Staff

4. WBN

W. T. Cottle	Site Director
E. R. Ennis	Plant Manager
T. L. Howard Jr.	Plant Quality Assurance Supervisor
D. W. Wilson	Design Services Manager
R. C. Sauer	Plant Compliance Supervisor
M. Shymlock	NRC Resident Inspector
R. Heatherly	Document Control Supervisor
L. E. Wallace	Quality Assurance Engineer
L. J. Smith	Quality Surveillance Section Supervisor

5. BLN

J. E. Peters	Quality Assurance Staff Supervisor
R. N. Russell	Site Services Manager

M. Holland	Document Control Unit Section Supervisor
A. M. Qualls	Plant Manager
M. E. Hollins	Regulatory Engineer
D. C. Smith	Chemical Engineer, Compliance

VII. REFERENCES

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20. Memorandum from E. Gray Beasley to G. H. Kimmons dated August 11, 1983, "All Nuclear Plants - OEDC 1982 QA Action Plan," (EDC 830811 401)

21. Memorandum from G. H. Kimmons to H. H. Mull and M. N. Sprouse dated December 1, 1982, "All Nuclear Plants - Lack of Timeliness," (EDC 821201 001)

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SQNCEB8411	SQNPWP8305
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SQNCEB8413	BFNCEB8005
SQNCEB8414	BLNNEB8417
BLNNEB8010	SQNMEB8203
BFNNEB8304	SQNSWP8216

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    c. QMS85-31 - Engineering and Computer Methods Branch Technical Services Group
    d. QMS85-20 - Browns Ferry Engineering Project Nuclear Design Project
    e. QMS85-28 - Browns Ferry Civil Design Project
    f. QMS85-37 - Technical and Administrative Staff
    g. QMS85-15 - Nuclear Engineering Branch Licensing Activities

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    ENDES EPs 1.26, 1.53, 2.11, 2.10, 1.15, 1.48, 1.51, 2.02, 6.0, 5.0

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5. Memorandum form John R. Lyons II to R. W. Dibeler, dated July 26, 1983 "Audit CB-83-02, Nonconformance/Deviation Control and Corrective Action" (OQA 830725 453)

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13. Memorandum from F. E. Laurent to Attendees, dated February 28, 1985 "TVA Compliance with Criteria XV and XVI - Meeting Notes" (PMO 850228 705)

14. Memorandum from G. W. Killian to W. T. Cottle and R. J. Mullin, dated April 5, 1985 "Transmittal of QAB Audit Report No. QWB-A-85-0009" (L17 850405 800)

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20. Memorandum from Guenter Wadewitz to Those listed, dated March 29, 1985, "Watts Bar Nuclear Plant - Quality Trend Analysis Report - February 1985" (C24 850329 009)

21. Memorandum from Guenter Wadewitz to Those listed, dated May 2, 1985, "Watts Bar Nuclear Plant - Quality Trend Analysis Report - March 1985" (C24 850502 008)

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23. Memorandum from Lonnie S. Cox to Those listed, dated December 20, 1984, "Bellefonte Nuclear Plant - Quality Trend Analysis Report - November 1984" (BLN 841220 152)

24. Memorandum from Lonnie S. Cox to Those listed, dated February 28, 1985, "Bellefonte Nuclear Plant - Quality Trend Analysis Report - January 1985" (BLN 850228 152)

25. Memorandum from Lonnie S. Cox to Those listed, dated April 3, 1985, "Bellefonte Nuclear Plant - IRN Quality Trend Analysis Report - February 1985" (C20 850403 681)

26. Memorandum for J. A. Crittenden to C. Bonine, dated April 18, 1985 "Audit Report POC-A-85-0002 - Management Roles and Involvement in the Control of Quality" (L19 850418 801)

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28. Memorandum from Lonnie S. Cox to Those listed, dated May 29, 1985, "Bellefonte Nuclear Plant - IRN Quality Trend Analysis Report - April 1985" (C20 850530 681)

29. Memorandum from Lonnie S. Cox to Those listed, dated May 8, 1985, "Bellefonte Nuclear Plant - Quality Trend Analysis Report - 1st Quarter 1985" (C20 850508 682)

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31. Memorandum from Shelton Johnson to Watts Bar Nuclear Plant files, dated March 26, 1984, "Watts Bar Nuclear Plant - Review of Monthly Trend Analysis Summaries of Nonconforming Items" (WBN 840326 476)

32. Memorandum from E. L. Larrabee to Horace W. Bennett, dated March 26, 1984, "Trend Analysis Reporting System" (QES 840326 002)

33. Memorandum from Guenter Wadewitz to R. A. Pedde, dated May 23, 1984, "Watts Bar Nuclear Plant - Trend Analysis Program" (WBN 840525 008)

34. Memorandum from B. J. Thomas to Quality Manager's Files, dated May 14, 1984, "Bellefonte Nuclear Plant - Quality Trend Analysis Inspection Activities" (DOC 840521 004)

35. Memorandum from G. H. Kimmons to Roy H. Dunham and Horace H. Mull, dated August 29, 1977, "Transfer of Responsibilities for Quality Trend Analysis" (EDC 770830 003)

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41. Memorandum for Guenter Wadewitz to R. W. Dibeler dated April 25, 1985, "Watts Bar Nuclear Plant - Quality Bulletin 85-10" (C24 850425 010)

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48. Memorandum from Guenter Wadewitz to R. W. Dibeler dated February 20, 1985, "Watts Bar Nuclear Plant - Quality Bulletin 85-03" (WBN 850220 003)

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ENCLOSURE 2

June 6, 1986

INFORMATION ONLY

Mr. R.O. Barnett
Chief Civil Engineer
Tennessee Valley Authority
400 W. Summit Hill Drive W9 D244
Knoxville, TN 37902

Dear Mr. Barnett:

Enclosed is the report by RLCA addressing our scope of work as defined by the four questions in your letter of June 4, 1986 to Dr. R.L. Cloud.

We believe the report provides sound technical support for affirmative answers to the four questions posed to us. If there are questions, please do not hesitate to ask them.

It has been a pleasure providing this service. We look forward to the next opportunity.

Very truly yours,

Walter R. Mikesell

Walter R. Mikesell

WRM/js