

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 assigned 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 emphasis should be. A change in management philosophy was needed. It was line management's 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. 3FN 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 exceptions to 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:

- o 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 Deficiencies."

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

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 outstanding NCRs at BFN, SQN, and WBN (see paragraph V.C.3).

b. Interface Problems - OC

OC personnel at WBN, BLN, and at 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.

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.

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.

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.

- o 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."

- o 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.

- o (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.

- o 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.
- o Solving quality problems was not on the "highest priority" list of most managers. The highest priority appeared to be meeting the schedule.
- o 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.
- o 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 with cover letter stating that OE responses had not been meaningful. OE was requested to respond to recommendations by June 21, 1985.  
(Q01 850607 050)  
  
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. Responses were incomplete. Specific areas requested by NSRS, to be addressed, were not.  
(B41 850624 003)
- 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:

- o Allegations from TVA employees (TVA has already taken steps to improve the employee concerns program).
- o SALP history including BFN RPIP.
- o 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:)
- o 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.)
- o 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 practices 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:

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

- o 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:

- o Establish an onsite audit and quality evaluation QA organization with the responsibility for assuring that all site organizations perform quality work.
- o The organization should be staffed with sufficient numbers of personnel with expertise in conducting programmatic audits of all onsite activities.
- o Assign responsibility to onsite QA for planning and directing performance of product-oriented audits.
- o The onsite QA organization should be responsible to the Site Director for quality program implementation.
- o 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.
- o 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 untimely 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 BEN 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.