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.

QC 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 QC 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 NOAM 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 MEB 8304	Heat dissipated from the diesel may be greater than originally used as the design basis.	3/30/83	9/9/99
BFN MEB 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 MEB 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.

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 QC in the same manner as QC NCRs. QC 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. QC 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 QC appears to be functioning properly with the exception of possible failures to write NCRs based on inspections as identified by INPO. Interfaces between QC and OE and between QC 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.

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.)

A DQA audit conducted June 24 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. ID-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 QWE-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 - QC

There were three tracking systems in QC 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. Tracking Systems - NUC PR

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.

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.

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

3. Watts Bar

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.

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.

- 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. Projects 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 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