Omaha Public Power District
1623 Harney, Omaha, Nebraska 68102
402/536-4000

December 23, 1987
LIC-87-691
Docket No. 50-285

R. D. Martin, Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

References: See Page 3

Dear Mr. Martin:

SUBJECT: Update of Response to Notice of Violation concerning Safety System Outage Modification Inspection (SSOMI)

By reference 10, OPPD provided our response to the Notice of Violation and Proposed Civil Penalty, Reference 6, dated January 6, 1987. Reference 10 contained five attachments. Attachment 1 addressed the proposed Civil Penalty and this issue has been resolved. Attachment 5 clarified issues which arose as a result of earlier communication regarding deficiencies and unresolved items identified during the inspection. Attachments 2 and 3 responded to the specific Level IV and V violations and examples cited in the Notice of Violation. Attachment 4 outlined OPPD's comprehensive Corrective Action Implementation Plan. This plan augmented the responses to the specific violation examples given in Attachments 2 and 3 and then addressed programmatic actions necessary to improve our performance.

Implementation of the corrective actions is in progress. Many specific actions have been completed. Some programmatic actions have been modified as the Corrective Action Implementation Plan has progressed to improve results or enhance implementation. The need to modify the Plan as efforts progressed was anticipated during discussions of corrective actions with NRC Region IV prior to the submittal of Reference 10. At that time, OPPD committed to provide the NRC with periodic updates which reflect both the progress of corrective actions and necessary changes to commitments.

Accordingly, OPPD has prepared an update to attachments 2, 3, and 4 of Reference 10.

An index summarizing changes that have been made to the original response is included. The changes are also annotated by change bars in the margin of the updated document. The majority of the changes document that corrective actions have been completed and describe the nature of the final action. Some changes amplify the methodology which has been implemented to accomplish committed corrective actions, subsequent to defining specific details.

If you have any questions, please contact us.

Sincerely,

R. L. Andrews
Division Manager
Nuclear Production

RLA/me

cc: LeBoeuf, Lamb, Leiby & MacRae
1333 New Hampshire Ave., N.W.
Washington, DC 20036

A. Bournia, NRC Project Manager
P. H. Harrell, NRC Senior Resident Inspector

REFERENCE INDEX

1. Docket No. 50-285

2. Letter dated January 21, 1986, from NRC (J. M. Taylor) to OPPD (B. W. Reznicek) - Safety System Outage Modification Inspection (Design) 50-285/85-22

3. Letter dated March 19, 1986, from NRC (J. M. Taylor) to OPPD (B. W. Reznicek) - Safety System Outage Modification Inspection (Installation & Test) 50-285/85-29

4. Letter dated April 15, 1986, from OPPD (B. W. Reznicek) to NRC (J. M. Taylor) - Safety Systems Outage Modification Inspection (Design) 50-285/85-22

5. Letter dated May 22, 1986, from OPPD (R. L. Andrews) to NRC (R. D. Martin) - Safety Systems Outage Modification Inspection (Installation and Testing) 50-285/85-29

6. Letter dated January 26, 1987, from NRC (R. D. Martin) to OPPD (R. L. Andrews) - Notice of Violation and Proposed Imposition of Civil Penalty (NRC inspection Reports No. 50-285/85-22 and No. 50-285/85-29)

7. Letter dated February 12, 1987, from NRC (J. E. Gagliardo) to OPPD (R. L. Andrews) - July 10, 1986 Enforcement Conference; August 7, 1986 Working Meeting

8. Letter dated February 20, 1987, from OPPD (R. L. Andrews) to NRC (J. E. Gagliardo) - Request for Extension of Time to Respond to Enforcement Action

9. Letter dated March 16, 1987, from NRC (J. E. Gagliardo) to OPPD (R. L. Andrews) - Approval of Request for Extension of Time to Respond to Enforcement Action

10. Letter dated April 10, 1987, from OPPD (R. L. Andrews) to NRC (J. M. Taylor) Response to Violation and Proposed Civil Penalty

INDEX OF CHANGES

| PAGE | VIOLATION REFERENCE | SUMMARY OF CHANGE |
|---|---|---|
| 2-2 | A | Recognized completion of 50.59 procedure and reported results of QA audit of safety evaluations for the 1987 outage mods |
| 2-3 | B | Changed verb |
| 2-9 | F | Described OPPD's implementation of Systematic Root Cause Analysis and that the program would include a Human Performance Evaluation system; indicated completion of Procedure Guide to cover personnel performance and require knowledge of craft practices; committed to another guide to address installation procedures |
| 2-11 | H | Change "as a replacement" to "to supplement" |
| 2-12 | H | Changed verb - described improvements made on craft training and welding. |
| 2-13 | I | Deleted reference to contract for warehouse design |
| 2-14 | I | Verb changes, and updated progress of the warehouse construction project |
| 3-2 | A.1 | Reported that the fifth modification has been included in the USAR update |
| 3-3 | A.2 | Reported acceptance by SAC of MR-FC-85-07; reported that an auditable train of documentation now exists |
| 3-8 | D.1 | Reported completion of training; described status of air accumulator evaluation; updated status of functional criteria definition and set date of April 1988 for completion of study |
| 3-9 | D.1 | Changed date for completion of air accumulator testing to July 1988 |
| 3-11 | D.3 | Reported completion of training and implementation of specification for shop and field surface preparation |
| 3-12 | D.4 | Updated the system temperature collection to reflect current program of searching design basis documents and revised completion date to March 1989 |
| 3-17 | D.9 | Reported Tech Spec update; reported USAR update |

| PAGE | VIOLATION REFERENCE | SUMMARY OF CHANGE |
|---|---|---|
| 3-18 | E.1 | Reported scheduled completion date |
| 3-19 | E.2 | Described QA certification of the three outstanding items |
| 3-20 | F.1a | Reported results of manual isolation simulation; reported completion of functional tests; changed date for air accumulator testing to 1988 refueling outage |
| 3-21 | F.1b | Reported completion of battery load test and described results |
| 3-24 | F.1d | Reported completion of training |
| 3-26 | F.1f | Described qualification matrix for craft personnel |
| 3-27 | F.1g | Described qualification matrix for craft personnel |
| 3-28 | F.1h | Described qualification matrix for craft personnel |
| 3-29 | F.1i | Described qualification matrix for craft personnel; and reported completion of training |
| 3-30 | F.1j | Described qualification matrix for craft personnel |
| 3-31 | F.1k | Reported inspection of separation criteria for 1987 outage modifications |
| 3-34 | F.2a | Reported progress on control of computer analysis documentation |
| 3-35 | F.2b | Updated progress on preparation of installation procedures and established date of March 1989 for completion |
| 3-38 | F.2e | Reported completion of training |
| 3-40 | F.2g | Changed wording to correspond to F.2f |
| 3-49 | G.3 | Reported completion of G-30 revision and of training |
| 3-51 | H.1 | Reported retest of weld |
| 3-52 | H.2 | Reported changes to strengthen NDE |
| 3-55 | H.4 | Reported incorporation of G-72A into plant procedures |
| 3-56 | H.5 | Established date of March 1988 for separation criteria standard |

| PAGE | VIOLATION REFERENCE | SUMMARY OF CHANGE |
|---|---|---|
| 3-57 | I.1 | Reported QA surveillance of safety related storage areas using Q-1 as a guideline and construction of new warehouse. Deleted "Corporate" (QA). |
| 4-13 | 7.1.6.1.2b | Reported implementation of calculation index system |
| 4-13 | 7.1.6.1.2c | Added date |
| 4-14 | 7.1.6.2 | Reported completion of Design Basis Documentation program plan |
| 4-14 | 7.1.6.3 | Editorial |
| 4-23 | 7.2.5.2 | Reports completion as part of the OPPD Policy and Procedures for the USAR |
| 4-23 | 7.2.5.4 | Reports that draft Policy and Procedures are undergoing review. Revised Date |
| 4-23 | 7.2.5.5 | Reports that draft Policy and Procedures are undergoing review. Revised Date |
| 4-23 | 7.2.5.6 | Revised date |
| 4-27 | 7.3.5.3 | Revised date |
| 4-28 | 7.4.3 | Changed Licensing Procedures to Nuclear Production Procedures |
| 4-32 | 7.4.5.2 | Described new approach for reviewing correspondence and revised date to July 1988 |
| 4-32 | 7.4.5.3 | Revised date. Changed paragraph number to 7.4.5.3 |
| 4-33 | 7.4.5.4 | Revised Date. Change paragraph number to 7.4.5.4 |
| 4-33 | 7.4.5.5 | Revised date. Changed paragraph number to 7.4.5.5 |
| 4-33 | 7.4.5.6 | Deleted reference and revised dated. Changed paragraph number to 7.4.5.6 |
| 4-36 | 7.5.5.2 | Revised completion date |
| 4-40 | 7.6.5.1 | Described preparation of GEG-2 and that special training was not needed. Revised date for Standard Criteria. |
| 4-40 | 7.6.5.2 | Described QADP-12 |
| 4-40 | 7.6.5.3 | Revised date |
| 4-41 | 7.6.5.5 | Described GEG-2. Matched date with 7.6.5.1 |
| 4-41 | 7.6.5.6 | Described QADP-12 |

| PAGE | VIOLATION REFERENCE | SUMMARY OF CHANGE |
|---|---|---|
| 4-41 | 7.6.5.10 | Revised date and added explanation |
| 4-44 | 7.7.5.2 | Reported definitions of keyword or phrases |
| 4-45 | 7.7.5.3 | Reported preparation and implementation of 50.59 procedures |
| 4-45 | 7.7.5.4 | Reported completion of training |
| 4-48 | 7.8.5.3 | Reported that experienced personnel are assigned as checkers |
| 4-49 | 7.8.5.5 | Changed verb |
| 4-51 | 7.9.5.3 | Reported that audits of SSOMI commitments are in progress |
| 4-52 | 7.9.5.5 | Reported that lessons learned were prepared and modification packages were reviewed during the 1987 outage |
| 4-52 | 7.9.5.6 | Reported use of technical experts for QA audits |
| 4-52 | 7.9.5.8 | Editorial, verb change |
| 4-55 | 7.10.5.1 | Reported change in dye penetrant procedure |
| 4-55 | 7.10.5.5 | Editorial changes |
| 4-58 | 7.11.5.2 | New scheduled completion date |
| 4-61 | 7.12.5.1 | Reported numbering system for field changes |
| 4-61 | 7.12.5.2 | Reported designation of responsibility for tracking field changes |
| 4-61 | 7.12.5.3 | Reported development of field change summary form |
| 4-61 | 7.12.5.4 | Explained revised FC-1033 Form |
| 4-62 | 7.12.5.7 | Changed new S.O. to revised S.O. |
| 4-67 | 7.14.5.1 | Reported establishment of minimum requirements for Emergency Modification Design Package |
| 4-67 | 7.14.5.3 | Reported requirement for full independent reviews of approvals and reviews by telephone |
| 4-67 | 7.14.5.4 | Revised date |
| 4-67 | 7.14.5.5 | New scheduled completion date |

| PAGE | VIOLATION REFERENCE | SUMMARY OF CHANGE |
|---|---|---|
| 4-69 | 7.15.5.2 | Changes "normal" to "minor" |
| 4-78 | 7.17.5.4 | Explained Technical Staff/QA training implementation including scheduled dates |
| 4-79 | 7.17.5.5 | Reported the appointment of responsible person to monitor training in each group |
| 4-83 | References | Added new reference |

ATTACHMENT NO. 1

10 CFR 2.201 RESPONSE TO LEVEL III

VIOLATION ASSESSED A CIVIL PENALTY

ATTACHMENT NO. 1

10 CFR 2.201 Response to Level III
Violation Assessed a Civil Penalty

10 CFR 50.59(a) allows the holder of a license to make changes in the facility as described in the safety analysis report (SAR) without prior Commission approval unless it involves a change in the Technical Specification or involves an unreviewed safety question. An unreviewed safety question is created if the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR may be increased, if a possibility for an accident or malfunction of a different type than any evaluated previously in the SAR may be created, or if the margin of safety as defined in the basis for any Technical Specification is reduced.

10 CFR 50.59(b) requires, in part, that the licensee maintain records of changes in the facility to the extent that such changes constitute changes in the facility as described in the SAR. These records shall include a written safety evaluation which provides the bases for the determination that the change does not involve an unreviewed safety question.

Section 14.14 of the Fort Calhoun Updated Safety Analysis Report (USAR) states that during a steam generator tube rupture incident, gaseous fission products would be released to the atmosphere from the secondary system at the condenser vacuum pump discharge. Those fission products not discharged in this way would be retained by the main steam, feedwater and condensate systems.

Contrary to the above:

1. From March 1980 to January 1985, the licensee failed to meet the requirements of 10 CFR 50.59 in that a change was made to the facility as described in the USAR without conducting and documenting a review to determine that the change did not involve an unreviewed safety question. The change to the facility involved the modification of the auxiliary feedwater pump turbine common steam admit valve (YCV-1045) from the "fail close" to the "fail open" design mode, completed in March 1980, without the addition of a safety-related air accumulator system for the individual "fail open" steam supply valves (YCV-1045 A and B). The inability to close the "fail open" steam supply valves upon the loss of non-safety-related instrument air would result in an additional fission product release path, not analyzed in the USAR, for a steam generator tube rupture incident. Consequently, the change involved an unreviewed safety question because the consequences of an accident previously evaluated in the USAR may have been increased.

2. On January 15, 1985, the licensee improperly analyzed the change to its facility as described above and concluded that an unreviewed safety question did not exist when, in fact, an unreviewed safety question did exist.

This is a Severity Level III violation (Supplement I).

Civil Penalty - $50,000

I. Admission or Denial of the Alleged Violation

OPPD admits the violation; however, in accordance with 10 CFR § 2.205, OPPD respectfully requests remission of the Civil Penalty based upon a re-evaluation of the Severity Level of the Violation as a result of the information included in Attachment No. 6.

II. Reasons for the Violation if Admitted

OPPD has completed a detailed review of the documentation of events pertaining to the implementation of the associated modifications MR-FC-78-43 and MR-FC-83-138. Several contributors to the violation have been identified and are summarized below.

A. The "fail closed" position of YCV-1045 potentially placed the AFW system in an inoperable condition during an event involving loss of offsite power. Plant personnel, responding to concerns from TMI and IE Bulletin 79-06B, installed MR-FC-78-43 on an "EMERGENCY" basis. These personnel may not have been aware of design basis information or, as discussed in Attachment No. 6, may have concluded that calculations, if performed, would have supported their decision not to install the air accumulators on branch valves YCV-1045A and YCV-1045B.

B. Evaluations conducted in accordance with 10 CFR 50.59 prior to installation and during the closeout of MR-FC-78-43 were not sufficiently comprehensive. Until the current 10 CFR 50.59 evaluation (included in Attachment No. 6) was performed, an adequate analysis was not completed to support a comprehensive safety evaluation. The previous evaluations were performed without the advantage of uniform and consistent guidance documents that would have provided an orderly format for use in the performance of safety evaluations.

C. The modification implementation process was not timely, thus allowing the partially completed MR-FC-78-43 configuration to remain installed for over five years.

When personnel familiar with the accident scenario affected by the modification became aware of the history and current status of the actual installation, a meeting was held. Based on this January 12, 1985 meeting, OPPD management directed that the air accumulators be installed. It was additionally concluded that an unreviewed safety question did not exist. In coming to this conclusion, it was assumed that timely operator response could substitute for remote YCV-1045A/B actuation capability. Actions to proceduralize operator action during a steam generator tube rupture (SGTR) were promptly implemented; design and procurement proceeded based on installation during the September 1985 outage.

III. The Corrective Steps that have been Taken and the Results Achieved

A. During the 1985 refueling outage, MR-FC-83-158 was installed to add air accumulators to YCV-1045A/B, thereby eliminating the release path of concern and providing remote operator capability to isolate the affected steam generator during a SGTR incident.

B. A new procedure for performing 10 CFR 50.59 evaluations has been drafted. This procedure will be implemented by August 1987 and will provide detailed guidance to aid OPPD personnel in performing and documenting 10 CFR 50.59 evaluations.

C. As an interim measure, many key personnel performing and responsible for reviewing 10 CFR 50.59 evaluations have received two days of training, including 10 CFR 50.59. This initial training was completed during February 1987. This training has increased awareness and has resulted in more thorough 50.59 evaluations.

D. The modification control procedure has been revised to maintain administrative control of "EMERGENCY" modifications to the same level as "NORMAL" modifications. This classification has been enhanced to assure that the conventionally accepted sequence of design control is maintained for future modifications.

E. Implementation of the modification process has steadily improved since 1980. Significant improvements have been made as a result of SSOMI. The modification control procedure now requires that safety evaluations which address both the design and the installation and testing aspects of the modification be completed prior to the start of construction. These safety evaluations are required to be reviewed by engineering personnel, who are responsible for the design bases, prior to the start of construction.

F. Timeliness of the implementation process has been extensively reviewed by OPPD as reported in Section 7, Attachment 4, of this response. Improvements are being implemented.

G. For installed "EMERGENCY" modifications that have had modification completion reports forwarded to engineering for review and closeout, reviews have been completed to assure that the safety analyses have been performed as required for design and installation.

IV. Corrective Steps which will be taken to Avoid Further Violations

A. OPPD initiated a Design Change and Modification Program Review. The purpose, scope, actions, and schedules associated with the Corrective Action Implementation Plan resulting from the Program Review are presented in Attachment No. 4.

B. Reviews of all completed CQE related "EMERGENCY" modifications installed since initial full power operation have been initiated to assure that safety analyses have been performed as required for design and installation. This review will be completed July 1987.

C. All completed CQE related "EMERGENCY" modifications installed since initial full power operation, that do not require seismic updates, will be closed by July 1987. All drawings and applicable plant procedures will be updated as a part of this effort.

D. "EMERGENCY" modifications requiring seismic updates will be closed out soon after completion of OPPD's seismic update procedure, scheduled for October 1987.

Items B, C and D will provide documentation that completed "EMERGENCY" modifications have not had an adverse effect on plant safety.

V. The Date when Full Compliance will be Achieved

Remote isolation capability for FW-10 was provided during the September 1985 outage by the installation of MR-FC-83-158. As demonstrated in the above responses, Omaha Public Power District is currently in full compliance with the requirements of 10 CFR 50.59 relative to this violation. With the training that has been provided and the increased awareness of the need to improve the quality of safety evaluations, OPPD believes a recurrence is minimized. Implementation of the new safety evaluation procedure will further increase the quality of safety evaluations.

ATTACHMENT NO. 2

10 CFR 2.201 RESPONSES

TO LEVEL IV AND V VIOLATIONS

NOT ASSESSED A CIVIL PENALTY

ATTACHMENT NO. 2

10 CFR 2.201 Responses
to Severity Level IV and V Violations
Not Assessed A Civil Penalty

A. 10 CFR § 50.59(a)(1) states, in part, that the licensee may make changes in the facility as described in the safety analysis report, without prior Commission approval, unless a proposed change involves an unreviewed safety question.

10 CFR § 50.59(b) requires, in part, that records of changes in the facility shall be maintained and the records shall include written safety evaluations which provide the bases for the determination that the changes do not involve unreviewed safety questions.

Contrary to the above, documented safety evaluations to determine whether changes constituted unreviewed safety questions were not available for five (5) examples cited. These examples are given in Attachment 3.

This is a Severity Level IV Violation (Supplement 1).

Admission or Denial of the Alleged Violation

OPPD admits the violation.

The Reasons for the Violation if Admitted

OPPD had established methodologies and interpretations for addressing the requirements of 10 CFR 50.59 which were intended to provide compliance with the regulatory provisions of the rule. Standing Order G-46 requires that 10 CFR 50.59 be completed for specified areas. This Standing Order has been in affect since March 1976. Procedures in place at the time of this inspection did not specify that safety evaluations must be performed for non-CQE related modifications for systems described in the USAR. Inadequacies in formal documentation of some "temporary" changes have resulted from a lack of emphasis in procedures for performing 10 CFR 50.59 evaluations for these types of changes. Personnel reviewing 50.59 evaluations were cognizant of the effect of the proposed changes but did not adequately document the results of those evaluations.

The Corrective Steps That Have Been Taken and the Results Achieved

One of the major topics of the Design Change Modification Review Program was the process of safety evaluations conducted in accordance with 10 CFR 50.59. Actions have been taken as discussed in Sections 7.1 and 7.7 of Attachment 4. The safety evaluations documented for the 1987 outage modifications have shown improvement.

The Corrective Steps Which Will Be Taken to Avoid Further Violations

The planned actions to be taken are described in Sections 7.1 and 7.7 of Attachment 4.

A. (Continued)

The Date When Full Compliance Will Be Achieved

The safety evaluations (10 CFR 50.59) that have been prepared for modifications to be installed during the 1987 outage were reviewed by the Quality Assurance Department. The Quality Assurance Department conducted QA Audit #16, Design Change Administration, on the modification process for Fort Calhoun Station. The audit included the modification packages developed for the 1987 refueling outage. As part of the audit, QA reviewed safety evaluations which had been prepared for modifications to be installed during the 1987 refueling outage. Weaknesses in safety evaluations which were identified during the Audit were brought to the attention of the responsible persons. Supplemental analyses were performed to the satisfaction of the auditor to correct the identified weaknesses. As a result of the QA Audit program, changes made to Standing Order G-21, and implementation of the new procedures for conducting safety evaluations, the overall safety evaluation process at Fort Calhoun Station has been enhanced. Training on the use of the new procedure has been given to applicable staff members. Implementation of other corrective actions addressed in Sections 7.1 and 7.7 of Attachment 4 will improve the overall safety evaluation program.

B. Technical Specification, Section 2.19(8), requires, in part, that a continuous fire watch be posted and backup fire suppression equipment be provided when the Halon fire suppression system is disabled in the switchgear room.

Contrary to the above, no continuous fire watch or backup fire suppression equipment were provided in the switchgear room during December 6-10, 1985, when the Halon fire suppression system was disabled. (IR 50-285/85-29, D2.4-2)

This is a Severity Level IV violation (Supplement I).

Admission or Denial of the Alleged Violation

OPPD admits the violation.

The Reasons for the Violation if Admitted

During the period cited from December 6 through December 10, 1985, while installing modification MR-FC-85-105, the control room logs indicate that the switchgear Halon Fire Suppression System was alternately taken out of service and returned to service five (5) times during the 5 day period.

On December 10, 1985, during refueling outage modification activities in the switchgear room, the halon fire suppression system was disabled to allow welding of cable tray and conduit seismic supports. A firewatch was posted for the welding operations in accordance with Station Standing Order M-9, Fire Protection During Flame Cutting and Welding Operations. However, because the individual performing the firewatch was inadequately briefed on the duties and responsibilities required during halon system inoperability, he left the area after ensuring the welding operations would not start a fire without verifying that the halon system had been returned to service. Technical Specification (TS) 2.19(8) requires a continuous firewatch anytime the halon system is rendered inoperable.

The Corrective Steps That Have Been Taken and the Results Achieved

During the event of December 10, 1985, an NRC inspector noted the lack of a firewatch on a tour of the area. Upon being informed of the error, the plant staff immediately posted a replacement firewatch. The period of time in which no firewatch was posted was estimated to be less than four hours. The Fort Calhoun Station Fire Protection Program utilizes the "defense in depth" philosophy. The fire detection system for the area remained operable and alternate means of fire suppression were available in the form of fire hoses and hand held portable fire extinguishers.

The control room logs did not specifically indicate that a fire watch was established. However, the flame cutting/welding permit under which the work was being installed specified designated personnel by name to perform the duties of firewatch. Operators were instructed by interoffice memo FC-1692-85 dated 12/11/85, to ensure that continuous fire watches are established per TS 2.19(8) and to make special notations in the log books whenever firewatches are instituted to provide accountability to the required procedures.

B. (Continued)

To help ensure future compliance, Standing Order M-9 "Fire Prevention During Flame Cutting and Welding Operations", was revised in March 1986 to require a more comprehensive briefing of individuals performing a firewatch and their duties. Additionally, Standing Order O-38, "Firewatch Duties and Turnover Practices", was revised in March 1986 to emphasize the importance of remaining in the firewatch area until fire detection/suppression systems have been returned to operation. A training hotline was provided when these changes were incorporated into the Operating Manual.

The Corrective Steps Which Will Be Taken to Avoid Further Violations

Necessary corrective actions have been completed. Effectiveness of the revised procedures will be reviewed to ensure the adequacy of the firewatch program.

The Date When Full Compliance Will Be Achieved

OPPD is presently in full compliance.

C. Technical Specification 5.8.2 requires that procedures, which meet or exceed the minimum requirements of Section 5.1 and 5.3 of ANSI N18.7-1972 and Appendix A of USNRC Regulatory Guide 1.33, and changes thereto, shall be reviewed by the Plant Review Committee (PRC) and approved by the Manager-Fort Calhoun Station, prior to implementation.

Contrary to the above, procedure change 13494 to Operating Instruction OI-FW-3 for the steam generator level control was not reviewed by the PRC until November 8, 1986, after both the approval of the change by the Plant Manager on November 2, 1984 and implementation of the change on November 1, 1984. (IR 50-285/85-29, D2.3-3)

This is a Severity Level IV violation (Supplement I).

Admission or Denial of the Alleged Violation

OPPD admits the violation.

The Reasons for the Violation if Admitted

The violation resulted from a misinterpretation of the procedure for controlling procedure changes, and a misinterpretation of "Committee" function vs. functions of "Committee members."

The Corrective Steps That Have Been Taken and the Results Achieved

The Technical Specification governing Plant Review Committee (PRC) functions was reviewed against the implementing procedure for procedure changes. The Technical Specification requirements appear to have been adequately addressed, but left room for an improper interpretation. The "Committee" function of the PRC was reemphasized in a PRC presentation. Also present was the procedure change clerk. The presentation stressed the manner in which procedure changes are to be processed, and the reasons for those requirements. The quorum requirements given in the Technical Specifications were specifically addressed. The revision of Standing Order G-30 is complete. The procedure clearly identifies the requirement to have procedure changes reviewed by a quorum of the PRC as required by the Technical Specifications.

The Corrective Steps Which Will Be Taken to Avoid Further Violations

Further discussion of corrective actions related to the subject are addressed in Attachment 4, Sections 7.8., Review and Approvals and Section 7.12, Installation Procedures and Field Changes. Specific instruction will be provided to ensure that no procedure change is implemented before receiving PRC (quorum) review. A re-emphasis of these requirements to the PRC members and the procedure change clerk will preclude further occurrences of this type.

The Date When Full Compliance Will Be Achieved

OPPD is currently in full compliance.

D. 10 CFR Part 50, Appendix B, Criterion III, Design Control, requires, in part, that measures shall be established to control design activities.

The OPPD Quality Assurance Plan (QAP), Section A.4, Design Control, implements this requirement and commits the licensee to the provisions of Regulatory Guide 1.64/ANSI N45.2.11 - 1974.

ANSI N45.2.11, Section 3.0, "Design Impact Requirements;" Section 4.0, "Design Process;" Section 5.0, "Interface Control;" Section 6.0, "Design Verification;" and Section 8.0, "Design Change Control" require, in part, that design activities are to be controlled and planned in a manner that is correct and traceable and design changes are to be subject to design control measures commensurate with those applied to the original design.

Contrary to the above, nine (9) examples were cited.

This is a Severity Level IV violation (Supplement I).

Admission or Denial of the Alleged Violation

OPPD admits the violation.

The Reasons for the Violation if Admitted

The reasons for the examples cited in this violation are discussed in the responses to the specific items. Programmatically, this violation can be attributed to the following:

1. Lack of Design Basis Records which has been identified by OPPD and NRC as a generic concern (Examples 2,5,7,9),

2. Lack of emphasis in OPPD's procedures for documentation and justification of assumptions, engineering judgements and design inputs (Examples 1,3,4,8), and

3. Inadequate planning. (Examples 1,6)

The Corrective Steps That Have Been or will be Taken and the Results Achieved

With regard to programmatic concerns identified in this violation refer to Sections 7.1, 7.3 and 7.16 of Attachment 4.

The Date When Full Compliance Will Be Achieved

The corrective actions for the examples cited in this violation have been or will be completed as described in the applicable sections of Attachment 3.

Implementation of corrective actions outlined in Attachment 4 will further reduce the possibility of non-compliances in this area.

E. 10 CFR Part 50, Appendix B, Criterion IV, Procurement Document Control, requires, in part, that measures shall be established to assure that applicable regulatory requirements, design bases, and other requirements which are necessary to assure adequate quality are suitably included or referenced in documents for procurement of equipment and services.

The OPPD QAP, Section A.5, "Procurement Document Control," implements this requirement, and specifies the establishment of procedures to ensure that quality data be included in procurement documents.

Contrary to the above, examples 1 and 2 are cited.

This is a Severity V violation (Supplement I).

Admission or Denial of the Alleged Violation

OPPD admits the violation.

The Reasons for the Violation if Admitted

The violation occurred as either failure to follow procurement procedures or failure to have adequate procedures.

The Corrective Steps That Have Been Taken and the Results Achieved

Refer to Attachment 3, items E.1 and E.2 for discussion of the specific examples of the violation.

A topic of the Design Change Modification Review Program was the procurement process. The corrective steps that have been taken are discussed in Section 7.6 of Attachment 4.

The Corrective Steps Which Will Be Taken to Avoid Further Violations

The steps to improve programmatic concerns relating to the procurement process are discussed in Section 7.6 of Attachment 4.

The Date When Full Compliance Will Be Achieved

OPPD is currently in full compliance. Enhancements to the procurement program will be implemented as discussed in Attachment 4.

F. 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, requires, in part, that activities that affect quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, and drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria.

OPPD QAP, Section A.6, "Instructions, Procedures, and Drawings," implements this requirement, and specifies, in part, that quality-related activities for plant operations, fabrication, processing, assembly, inspection, and test be accomplished in accordance with the instructions, procedures, or drawings and that such documentation adequately reflects all applicable quality requirements and contain the appropriate quantitative acceptance criteria (such as dimensions, tolerances, and samples) for determining that important activities have been satisfactorily accomplished.

Contrary to the above, twenty-six (26) examples were cited.

This is a Severity Level IV violation (Supplement 1)

Admission or Denial of the Alleged Violation

OPPD has evaluated the individual examples cited in this violation. Although we do not agree with some of the individual examples, we admit the violation.

The Reasons for the Violation if Admitted

The reasons for the individual examples cited in this violation are discussed in Attachment 3 under each example of the violation. On a generic basis, this violation can be attributed to the following:

1. Reliance on the expertise of OPPD craft personnel and planners for ensuring proper installation and workmanship in lieu of including more detail in the installation procedures,

2. Inadequate guidance for the preparation and review of post-modification test procedures and test results,

3. Weaknesses in the field change procedures,

4. Errors and omissions in compliance with established procedures,

5. Inadequate preoutage planning.

The Corrective Steps That Have Been or will be Taken and the Results Achieved

For a comprehensive discussion of the programmatic concerns 1, 2, 3 and 5, refer to Sections 7.11, 7.12, and 7.16 of Attachment 4.

F. (Continued)

OPPD management is concerned about procedural non-compliances. The need for procedural compliance has been emphasized at all levels. A group of individuals from OPPD were sent to INPO's Human Performance Evaluation Conference to learn techniques for ensuring greater procedural compliance. Systematic root cause analyses are being implemented by OPPD. This process will include a Human Performance Evaluation System (HPES) which will address procedural non-compliance issues.

A procedure writer's guide has been developed, and will continue to be improved through experience and use. One of the purposes of the guidance document is to enhance the documentation requirements for personnel performing the procedure and to require the procedure preparer and/or reviewer to be knowledgeable in craft practices.

The results achieved will be determined by audits performed by OPPD Quality Assurance Department.

The Date When Full Compliance Will Be Achieved

For the items cited as examples in this violation, the date for achieving full compliance or a schedule to provide the dates is given in Attachment 3. Further improvements are expected as the recommendations of the Design Change and Modification Program Review Committee are implemented.

G. 10 CFR Part 50, Appendix B, Criterion VI, "Document Control," requires, in part, that measures be established to control the issuance of documents, including changes thereto, which prescribe all activities affecting quality.

The OPPD QAP, Section A.7, "Document Control," implements this requirement and requires, in part, that document control requirements are to be established to assure that documents, including changes and documents related to contractors and subcontractors activities, are reviewed for adequacy and approved for release by authorized personnel and are distributed to the location where the prescribed activity is performed.

Contrary to the above, four (4) examples were cited.

This is a Severity Level IV violation (Supplement 1).

Admission or Denial of the Alleged Violation

OPPD admits the violation.

The Reasons for the Violation if Admitted

Review of NRC concerns has concluded that the practices presently used at Fort Calhoun Station for modification installation procedures and field changes are generally in compliance with regulatory requirements and industry practices. However, some practices were not included in approved procedures.

The Corrective Steps That Have Been or will be Taken and the Results Achieved

Refer to Attachment 3 for the responses to the examples cited in the violation for specific corrective actions which have been taken.

The results achieved will be assessed by the performance of audits by OPPD's Quality Assurance Department.

The Date When Full Compliance Will Be Achieved

OPPD is in full compliance with respect to the corrective actions as cited in the violation.

H. 10 CFR Part 50. Appendix B, Criterion IX, Control of Special Processes, requires, in part, that measures shall be established to assure special processes are controlled.

OPPD QAP, Section A.10, "Control of Special Processes," implements this requirement and requires, in part, that written procedures and controls be prepared to assure that special processes, including welding and nondestructive testing, are accomplished by qualified personnel using qualified procedures in accordance with the applicable codes, standards, specifications, criteria, and other special requirements.

Contrary to the above, the control of welding and nondestructive examination was inadequate as shown by the five (5) examples cited.

This is a Security Level IV Violation (Supplement I).

Admission or Denial of the Alleged Violation

OPPD admits the violation.

The Reasons for the Violation if Admitted

OPPD believes that the violation resulted from the following weaknesses:

1. Failure to diligently apply inspection procedures, resulting in the initial acceptance of a weld which should have been rejected and application of an NDE procedure below the minimum temperature for which it was qualified.

2. QC acceptance of poor craft workmanship (welds were technically acceptable in spite of poor workmanship).

3. OPPD's welding procedures are not sufficiently detailed in the areas of technical performance and QC inspection requirements.

The Corrective Steps That Have Been Taken and the Results Achieved

OPPD has completed an initial review of the welding program, the procedures written to control welding and non-destructive testing, and the quality of OPPD and contract QC inspectors. Changes have been made to the welding program and welding procedures to improve the requirements for documentation of welding information and traceability. The procedures for non-destructive examination have also been reviewed and revised to provide more detailed guidance for QC inspectors. OPPD feels that OPPD QC personnel are adequately trained. The Quality Control group at the Fort Calhoun Station is implementing actions to help prevent recurrence of the types of Quality Control concerns that arose during the 1985 refueling outage. OPPD's inspectors have recently completed a triennial recertification/upgrade program to meet ANSI SNT-TC-1A requirements. An ongoing QC training program was implemented in 1986 to supplement the triennial certification program.

H. (Continued)

This program has improved the methods for documentation of weld design, installation, and QC inspection. The actual weld procedures used at the Fort Calhoun Station have been revised and expanded. The training given to Contract QC inspectors has been strengthened.

In addition to the revised welding program, a documented set of criteria for the indoctrination of contractor QC inspectors has been developed to ensure that they are aware of the requirements of OPPD's NDE procedures.

The Corrective Steps Which Will Be Taken to Avoid Further Violations

An in-depth review of the welding program for the Fort Calhoun Station is presently in progress. This review includes the assistance of consultants and an Authorized Nuclear Inspector. This review is expected to result in further upgrades to the welding and documentation procedures. These upgrades will be in place by January 1988.

Improved training programs for craft personnel are being implemented and procedural requirements regarding the assignment of qualified personnel to critical tasks have been strengthened. For additional information see Section 7.16 of Attachment 4.

The Date When Full Compliance Will Be Achieved

The welding program has been improved since the SSOMI. Substantial additional enhancements will be completed by January 1988. OPPD is presently in compliance, but we are currently implementing program changes to increase the number of weld procedures and review the documentation requirements associated with the welding program.

I. 10 CFR Part 50, Appendix B, Criterion XIII, Handling, Storage and Shipping, requires, in part, that measures shall be established to control the handling, storage, shipping, cleaning and preservation of material and equipment.

OPPD QAP, Section A.14, "Handling, Storage, and Shipping," implements this and requires, in part. that instructions or guidance for plant handling, preservation, storage, and control (including identification and segregation) of products are prepared and approved prior to arrival of the products at the plant.

Contrary to the above, the program for the control of material in storage was inadequate as shown by the six (6) examples cited.

This is a Severity Level V Violation (Supplement I).

Admission or Denial of the Alleged Violation

OPPD admits the violation.

The Reasons for the Violation if Admitted

The reason for the violation was lack of procedural requirements, ease of access to the temporary CQE storage areas, and an inadequate warehouse facility.

The Corrective Steps That Have Been Taken and the Results Achieved

OPPD has revised procedure Standing Order G-22 to ensure that tighter controls are placed on CQE material placed in Temporary Storage areas. The upgrade will include more frequent surveillances during times of increased activity such as outages. The procedure also has been expanded to include specific instructions relative to placement, control, and removal of material in Temporary CQE Storage areas.

OPPD had recognized the inadequacies of warehouse and temporary storage facilities prior to the SSOMI. These inadequacies had been identified by both the NRC and OPPD QA in past audits. At the time of the SSOMI, OPPD had completed a space utilization study which addressed additions and alterations to plant buildings, a new training facility and a new warehouse facility. The study was in the process of being implemented during the SSOMI.

The Corrective Steps Which Will Be Taken to Avoid Further Violations

The warehouse design and siting will provide expedient access to the plant. Provision for storage of material needed for plant modification and maintenance has been incorporated into the warehouse design. This will reduce the need for temporary CQE Storage areas which were the source of most of the findings in this violation. When the warehouse is complete, materials will be located in the plant only when necessary for staging prior to installation.

I. (Continued)

The warehouse design incorporates fully qualified Level A, B., and C storage areas which meet the requirements of ANSI N45.2.2. This will provide OPPD with a warehouse facility which enhances the capability for receipt inspection, storage and delivery of CQE materials in compliance with regulatory requirements.

Several long term corrective actions which depend upon completion of the new warehouse facility will not be in force until its completion. OPPD initiated short term corrective actions intended to prevent recurrence of the infractions which have been identified by SSOMI. Standing Order G-22, which governs the use of temporary CQE storage areas, was revised to ensure that tighter controls are placed on CQE materials and temporary storage areas.

The Date When Full Compliance Will Be Achieved

The design plans and specifications for the warehouse are complete and construction bids have been received. The site preparation work was completed on October 1, 1987. Warehouse construction began at the completion of site preparation. The warehouse is planned to be operational by August 1988.

J. 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, requires, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected.

The OPPD QAP, Section A.17, "Corrective Action," implements this and requires, in part, that conditions adverse to quality are promptly identified, reported, and corrected.

This is a Severity Level IV Violation (Supplement I).

Contrary to the above adequate corrective actions were not taken for two areas.

Admission or Denial of the Alleged Violation

OPPD admits the violation cited in the examples.

The Reasons for the Violation if Admitted

Procedures in place at the time of this inspection addressed the elements which were subject to findings described by SSOMI. The cause of this violation was a lack of prescriptive definition given by the procedures to assign responsibility for corrective action completion and limitations on the time frame in which corrective actions must be performed. Review and consideration of this violation has revealed a programmatic deficiency in procedure format. Some procedures concentrate on prescribing what must be done and how it must be accomplished but do not adequately address who is specifically responsible for completion and when corrective actions must be finalized.

The Corrective Steps That Have Been Taken and the Results Achieved

The specific corrective actions to address each of the examples of this violation are discussed in Attachment 3 of this response. More general corrective actions to correct the root cause of the SSOMI concerns have been enacted as a result of the Design Change and Modification Review Committee recommendations. Corrective actions to address the concern of prompt identification and correction of conditions adverse to quality is the total thrust of the Review Committee's actions. First, the programmatic improvements recommended for implementation are directed at eliminating or drastically reducing the occurrences of such conditions. This includes establishing mechanisms which provide follow-up to ensure continued compliance with commitments. Secondly, improvements in procedures which will provide specific identification of individuals who are assigned responsibility for completing corrective actions will ensure that attention to a problem is not interrupted by conflicting work priorities. Thirdly, time limits for completing corrective actions will ensure that actions are not deferred past reasonable limits because of work assignments and other priorities. Lastly, new and improved methods of tracking and reporting will ensure that supervisors and managers are kept appraised of the status of corrective actions which are in progress.

J. (Continued)

The Corrective Steps Which Will Be Taken to Avoid Further Violations

Based on the corrective actions taken, no additional actions are required unless audits and surveillances conducted by OPPD Quality Assurance indicates that results have not been as effective as they anticipated.

The Date When Full Compliance Will Be Achieved

OPPD is in full compliance for the examples cited in this violation.

ATTACHMENT NO. 3

COMMENTS/STATUS OF SPECIFIC ITEMS
CITED BY NRC AS EXAMPLES OF THE
VIOLATIONS DISCUSSED IN ATTACHMENT 2

ATTACHMENT NO. 3

Comments/Status of Specific Items Cited
by NRC as Examples of the
Violations Discussed in Attachment 2

Specifics cited by the NRC as examples of the violations addressed in Attachment No. 2 are addressed in this attachment. The content of the response is based on status of the referenced deficiency or unresolved item as given in the February 12, 1987 letter from J. E. Gagliardo to R. L. Andrews (Reference 7 in the cover letter). It should be noted that Reference 7 closed 45 of 68 deficiencies and unresolved items based on previous OPPD responses. Reference 7 classified deficiencies as being either closed or open.

For each item that is closed, a summary of those actions that have been or will be taken are restated to help ensure complete understanding.

For deficiencies or unresolved items that were classified as open, a summary of the reason for the occurrence, summary of corrective actions that have been or will be taken and a statement indicating that OPPD is in full compliance or a statement of the actions that OPPD believes needs to be completed to close the item. For actions that need to be completed and where a scheduled implementation date is known, the date is provided. For actions that do not have a specified completion date, a commitment is stated to report the completion of the item to the NRC.

The responses provide any corrections or clarifications to information provided in previous responses or discussions concerning each deficiency. The generic implications associated with the deficiencies, if applicable, are discussed under responses provided in Attachment 2.

A.1 Five (5) modifications to nonsafety-related systems described in the USAR. (Inspection Report (IR) 50-285/85-22, Deficiency (D6.1-1)

This item is closed per Reference 7, based on the following information that documents corrective steps that have been or will be taken.

The procedure for the preparation of design packages (GSE Procedures Manual B-2) has been revised to require a design safety evaluation any time a modification introduces changes which impact facilities or procedures described in the USAR, including drawings. Safety evaluations for the five (5) modifications cited in this violation have been prepared and support the previous conclusions that the modifications did not constitute an unreviewed safety question. The appropriate USAR changes were made to reflect two of the modifications and were incorporated in the 1986 USAR update. Two of the planned modifications were not installed and therefore were not included in the USAR update. The fifth modification, MR-FC-85-008, "Boric Acid Addition System," was added to the 1987 USAR update.

A.2 The installation of lead shielding which had existed on safety-related piping for at least the past 2½ years. (IR 50.285/85-29, D2.2-I)

This item is closed per Reference 7, based on the following information that documents corrective steps taken.

A walkdown of plant areas was completed to identify where temporary lead shielding existed. The temporary lead shielding was subsequently removed. Temporary shielding log numbers 1, 6, and 7 have been analyzed by MR FC-85-07. This modification has been accepted by the System Acceptance Committee. The original calculations for the permanent installation of lead shielding on ½" pipe in Room 60 have been found and will be placed in the file. Documentation now exists for this installation.

Locations where lead shielding was removed were physically inspected. It has been concluded that no degradation was caused because of the temporary lead shielding installation.

Changes were made to Standing Order G-57, Installation of Temporary Lead Shielding, in March, 1986. The Standing Order has been rewritten using INPO Good Practice TS-411, Temporary Lead Shielding, as a guideline. The new procedure outlines specific types of analyses which must be considered before installing temporary shielding and requires a safety evaluation be performed and attached to the Temporary Shielding Request Form. The Plant Engineer or his alternate must sign the Temporary Shielding Request Form, giving his concurrence for the shielding to be installed after ensuring the required analysis and safety evaluations are performed and attached.

Procedures have also been enacted to ensure that lead shielding that is approved for installation in accordance with Standing Order G-57 will be properly secured and supported in accordance with appropriate seismic and structural design requirements.

Health Physics, Maintenance and Plant Engineering personnel have been trained on the procedures to install temporary lead shielding.

A.3 A design change involving a penetration through a fire barrier which had been completed for several years. (IR 50-285/85-29, D2.2-2)

This item is closed per Reference 7, based on the following information that documents corrective steps taken.

The subject penetration is a small (3/8") stainless steel tube which penetrated the fire barrier transom above door 1013-1. Door 1013-1 is a 3-hour fire rated door between the switchgear room and the upper electrical penetration room. The tubing connected the west switchgear room and the upper electrical penetration room when the tube was uncapped and fire door 1013-1 was closed. When not in use, the penetration was capped on both ends immediately adjacent to the door.

OPPD has examined and evaluated the subject penetration. A safety evaluation in accordance with 10 CFR 50.59 has been completed and concluded that the penetration did not involve an unreviewed safety question. The penetration was a bulk-head type fitting and its presence did not degrade the rating of the fire barrier.

The following facts supports OPPD's determination that the penetration did not degrade the fire barrier or create a safety concern.

1. OPPD is committed to Branch Technical Position 9.5-1 regarding penetrations through fire barriers, which states: "Openings through fire barriers for pipe, conduit and cable trays which separate fire areas should be sealed or closed to provide a fire resistance rating at least equal to that required of the barrier itself." The stainless steel Swagelok fittings were noncombustible and provide a fire resistance rating at least equal to that of the barrier itself.

2. The size of the penetration was less than ¼" diameter. The plant criterion for the minimum penetration size that does not have to be sealed is ¼" per Standing Order G-58. The criterion is in agreement with 10 CFR 50 Appendix R interpretations.

3. There were no combustible materials located directly opposite the fittings on either side of the door.

Procedures to control Fire Barrier Penetrations are in effect at Fort Calhoun Station. In September 1985, Standing Order G-58 was issued to provide additional controls. Standing Order G-58, specifically addresses the concerns of this finding. The purpose of the Standing Order is:

1. To identify Fire Barrier Penetrations in safety related areas of Fort Calhoun Station.

2. To define the various approved methods of Fire Barrier Penetration sealing and their applications.

3. To delineate the inspection requirements of sealed Fire Barrier Penetrations.

A.3 (Continued)

4. To provide instructions for maintaining an updated list of Fire Barrier Penetrations.

5. To provide requirements for personnel qualifications and training.

6. To implement the Technical Specification requirements.

This procedure provides effective control of the condition identified by this finding. In addition, fire barriers are periodically inspected using approved surveillance tests. Corrective actions are implemented, if necessary.

As a separate action regarding UL qualification of the door latch, the door has been replaced and the transom has been eliminated. The penetration in question no longer exists. The fire barrier penetration has not been reinstalled. If or when it is, it will be done in accordance with Standing Order G-58.

A.4 Safety-related electrical jumpers which had been installed for as long as 18 months. (IR 50-285/85-29, D2.2-3)

This item is closed per Reference 7, based on the following information that documents corrective steps taken.

Standing Order O-25 was revised on March 21, 1986 to require that a technical assessment and a safety evaluation be performed and documented prior to approval for installing any safety related jumpers or blocks. This revision also includes guidance for the person performing the technical assessment and safety evaluation. Safety evaluations are performed in accordance with 10 CFR 50.59. The OPPD procedure was revised using INPO Good Practice, OP-202; "Temporary Bypass, Jumper, and Lifted Lead Control" as a guide. This Standing Order was further revised on August 18, 1986 to prescribe documentation requirements for review of this jumper log, initiating Engineering Evaluation Assistance Requests for resolution of permanent jumpers and incorporating these EEARs into the modification schedule on a timely basis.

OPPD has reviewed the electrical and mechanical jumper logs. The review has justified the continued use of each jumper; determined if the jumper should be made permanent and appropriate design documentation prepared; and formal documentation in accordance with 10 CFR 50.59 for safety related jumpers left in place has been completed.

These actions provide assurance that the safety aspects of jumpers and blocks are adequately considered and documented.

A.5 Three emergency modifications performed in 1983 and 1984 (MR 483-129 and MR 483-152 associated with the emergency diesel generators and MR 484-84 associated with safety injection valves). (IR 50-285/85-22, Unresolved Item (U6.1-2)

This item is closed per Reference 7, based on the following information that documents corrective steps taken.

OPPD procedures did not specify that separate safety evaluations are required for design and construction phases, consequently, only one safety analysis was performed for modifications MR-FC-84-84, MR-FC-83-129 and MR-FC-83-152. However, these construction reviews tended to concentrate on installation of the modification as opposed to the design characteristics of the modification. While it is believed that design safety issues were inherently considered by Technical Services and Generating Station Engineering personnel when their telecon approvals of modifications MR-FC-84-84, MR-FC-83-129 and MR-FC-83-152 were given, no documentation of the design safety analysis is evident.

Standing Order G-21 has been revised to assure a safety analysis (per 10 CFR 50.59) covering both the construction and design aspects of the modification is completed prior to the installation of an emergency modification. The design safety analyses for the three Modification Requests have been completed.

D.1 The calculation associated with modification MR-FC-81-21.B, regarding containment isolation valves (HCV-438B and HCV-438D) in the component cooling water system supply and return lines, contained incorrect and inappropriate assumptions without identification of their sources or justification for their use. (IR 50-285/85-22, D2.2-1)

OPPD agrees with the following:

1) the volume in the tank was overestimated and that the correct volume is approximately 1325 cubic inches,

2) the minimum air pressure of 80 psig should have been used in the calculation, the system leakage was not quantified in the original calculation, the amount of allowable leakage can be inferred from the margin between the minimum pressure required and the system pressure following actuation of the accumulator. The amount of margin in the original calculation was such that system leakage was a moot point. The revised calculation, using the correct parameters, indicates that the margin is approximately 40%.

A second calculation has been performed utilizing the correct parameters. This calculation has verified the adequacy of the design. This calculation has been finalized, checked, and independently reviewed.

To improve the design and checking process, OPPD has developed and given a special training session to applicable design engineers in GSE for preparing and checking calculations. This training session stressed the need for following exactly the appropriate design procedures. A very limited number of engineers could not attend the initial training session. They were rescheduled and their training was completed.

A program has been initiated to provide a comprehensive evaluation of systems which depend upon air accumulators for proper functioning during an accident event. Information developed by this program has been transmitted to Combustion Engineering for their review and comment. The program will accomplish the following:

- Identify CQE valve operators which are equipped with air accumulators.

- Determine the operating criteria of the valve during each applicable postulated accident. This will include parameters such as:

  - Operating pressure and temperature
  - Time duration after an initiating event when valve operation will commence
  - Length of time that the valve operator must function

- Criteria for functional testing each valve operator which was identified according to the above criteria has been developed. Several of the accumulators were tested during the 1987 refueling outage.

  Evaluation of the criteria identified some valve operators that could be required to function as long as 1000 hours after the postulated accident. OPPD is conducting a study of those valves to determine the time that the accumulators must function. The study is scheduled to be complete in April 1988.

- Develop appropriate periodic testing to ensure that the systems continue to function as required

At the completion of this evaluation, a systematic program will be initiated to perform testing of the installed air accumulators to verify that the equipment can reliably perform the required accident function.

Because of the unforseen requirement to perform more extensive evaluations with respect to the corrective actions, the date for providing the schedule for completing air accumulator testing has been extended to July 1988.

D.2 The plant design specifications used for plant piping and equipment were not controlled and subject to design control measures commensurate with those applied to the original design. (IR 50-285/85-22, D3.1-1)

OPPD agrees that Contract No. 763 has not been maintained as a controlled document.

The contract has been annotated to be an uncontrolled document and to be used for reference only.

For a long term resolution, OPPD will factor Contract 763 information into the Design Basis Documentation Program.

D.3 The design inputs for modification MR-FC-84-162 were not controlled nor the final design related and traceable back to the source of design. (IR 50-285/85-22, D3.2-3)

The NRC concern can be summarized by stating the design calculations were incomplete. The following is a summary:

1. Thermal loads were not considered.
2. Natural frequency of duct was calculated unconservatively.
3. Combination of vertical and horizontal loads in the transverse direction was not considered.
4. Painting was specified rather than using galvanized metal (as originally specified on contract document).

These parameters were considered by the Design Engineer during the design process. Because of the mass of the ventilation ducting, the engineer decided that these items would have negligible affect on the design. This engineering evaluation was not documented.

OPPD has revised the calculations to address items 1, 2, and 3 above. They are complete, checked and verified. The modification design did not require change as a result of the revised calculations. In lieu of galvanized material, galvanized paint was utilized. This was considered adequate.

OPPD has developed and given a special training session for the applicable design groups on calculational methods for the determination of the natural frequency of ductwork. A very limited number of engineers could not attend the initial training session. Their training has since been completed. It is OPPD's understanding that this item would remain open pending the preparation or identification of a controlled document for use by design personnel which specifies shop and field surface preparation of Seismic Category 1 materials inside containment. The specification has been prepared and has been implemented.

D.4 The operating and accident temperatures developed as design input for piping analyses pursuant to IE Bulletin 79-14 were not subject to design control measures commensurate with those applied to the original design, including provisions for necessary control of design interfaces. (IR 50-285/85-22, D3.1-2)

This issue occurred because of the lack of emphasis on documenting the communication of design information between OPPD departments.

As a result of the NRC inspection finding, OPPD is reviewing the design basis documentation for operating temperatures. The information is being documented using an Operations Support Analysis Report (OSAR). OSAR's are documented per Technical Services Procedure N-TSAP-5 and developed per procedure N-TSAP-6.

Documenting design information using an OSAR meets the requirements of OPPD QA Manual Sections 3.1 and 5.1. OPPD will ensure that the transfer of design information between departments is conducted in accordance with these procedures and result in design control measures which include necessary control of design interfaces.

It is OPPD's understanding that this item will remain open until we are able to confirm that the operating and accident temperatures as documented by the OSAR are reflected in the piping analyses performed as a result of IE Bulletin 79-14. The schedule for completing the analysis is March 1989.

D.5 The support spacing criteria differed from the seismic design criteria detailed in the USAR for piping penetrating the containment. (IR 50-285/85-22, 03.1-3)

OPPD admits to not having a controlled design document that documents the support spacing that is required by the seismic design criteria stated in the USAR for small diameter piping.

The significance of the finding can be better understood by referring to the USAR and noting that the difference in design "G" forces between a piping system at 6 Hz and one at 12 Hz is approximately 1g. What this basically means is that if a piping system was installed with a natural frequency of 6 Hz it must be designed to withstand roughly 1 more "g" of acceleration force (or roughly double the restraint loading) than that of a system installed with a natural frequency of 12 Hz.

However, to add additional conservatism to the curves, the original A/E assumed that mass 2, containment shell, had structural damping of 2%. (in comparison to the 5% assumed for the auxiliary building). This is the primary reason for relatively greater magnitude of the indicated response for mass 2. The actual damping would be closer to 5%. This would have the effect of lowering the "blip" in the response curve at 6 Hz to the value derived for the auxiliary building, (i.e., would effectively resolve the issue in question).

There is a significant amount of evidence which indicates that pipe damping values should be increased. This can result in a reduction in forces (and therefore stresses) of approximately 50%. It can be shown for the Fort Calhoun Station specific response that if a 5% equipment damping (pipe damping) is assumed, the "g" force for a system at 6 Hz is approximately 1.0 "g". The difference in "g" forces is not significant between 6 Hz system and a 12 Hz system. Increasing equipment damping has the effect of reducing the "g" forces significantly.

During previous discussions, OPPD said that this would be resolved as part of Safety Issue A-46. Since that time, the generic letter for A-46 has been issued and does not include the scope of this finding. This item should remain open until such time that it is formally reconciled during a complete review of recommendations to address Unresolved Safety Issues.

OPPD will evaluate the Fort Calhoun Seismic Design Basis. The design basis will not be finalized until recommendations are given on unresolved safety issues.

Refer to Attachment 4, Section 7.1 for scheduled completion date.

D.6 An adequate design analysis was not performed to support the sizing of air accumulators for valves YCV-1045A/B. (IR 50-285/85-22, D2.1-1)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

The modification has been installed and has been functionally tested. The functional test confirmed that OPPD's engineering decision was correct and that the size of the accumulator was adequate.

D.7 The support for the modification of junction box JB-432A, which supplies power for auxiliary feedwater turbine steam admission valve (YCV-1045B), was not subject to design control measures commensurate with those applied to the original design in that the junction box was restrained by a pair of unistrut supports, which were in turn, supported by conduits. No seismic analysis for the configuration was performed. (IR 50-285/85-22, D3.2-4)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

A separate seismic support for the junction box for YCV-1045B was designed, analyzed, and installed during the 1985 refueling outage per modification MR-FC-85-201. The present design change process requires seismic criteria to be considered in the design of CQE and Limited CQE electrical equipment supports.

D.8 The design verifier did not ensure that the seismic requirements were correctly selected and incorporated for modification MR-FC-83-158. (IR 50-285/85-22, D2.1-2)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

The engineering decision to not include seismic requirements was based on the following analysis:

> These type of manual and check valves are rigid bodies and do not exhibit natural frequencies below 33Hz. They are not subject to seismically induced vibrations which may cause internal damage. OPPD has calculations that confirm that valve bodies (control or manual) can be subjected to as much as 100 g's of acceleration without being over stressed.

The system has been seismically restrained. The system, as installed, is seismically qualified.

D.9 The design engineer in the OPPD Generating Station Engineering organization did not refer to the original design analysis when preparing modification MR-FC-81-21B. This resulted in a safety evaluation based on an incorrect assumption and methodology for the component cooling water system heat loading. (IR 50-285/85-22, D2.2-6)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

OPPD believes that the Design Engineer did utilize correct assumptions and methodologies. A typo was discovered in OPPD's Technical Specifications. The Technical Specification has been amended to incorporate the correct CCW system heat capacity of 402 x $10^6$ BTU/hour.

Also, the information in the USAR which was used as design basis was correct, however, it was presented in a confusing manner. OPPD has also reviewed the USAR text to determine if clarifications were necessary. The update of the USAR was submitted on July 22, 1987, in accordance with 10 CFR 50.71(e) and included clarifications to the "Component Cooling Water Heat Load", Table 9.7-2.

E.1 The procurement document for services associated with valves HCV-438B and HCV-438D (Modification MR-FC-81-21B completed in 1983) did not address seismic analysis requirements. (IR 50-285/85-22, D2.2-2)

OPPD admits the referenced procurement document did not address the requirement for 10 CFR 50 Appendix B.

It was not intended that this vendor analysis would be utilized as the basis for the seismic design. Due to similarities between the old and new actuators an engineering judgement was made that a new seismic analysis was not required. An outside vendor was retained to perform an analysis to seismically qualify the new valve/actuator combination because OPPD desired to perform an additional check to confirm the new actuator/valve combination would perform as required during a seismic event.

After the deficiency was written, OPPD retained the vendor that performed the original analysis to again perform the analysis in accordance with 10 CFR 50, Appendix B. The analysis has been completed and has verified that the new valve/actuator combination is seismically qualified.

A previous response to the referenced deficiency stated that the seismic supporting of CQE air accumulators would be addressed under OPPD's evaluation of IE Information Notice 85-84. As discussed at the enforcement conference, this review of accumulators will be handled as a separate licensing item. Scheduled completion will be after the 1988 refueling outage.

E.2 The procurement documents for the steam generator nozzle dams (Modification MR-FC-84-92) did not address seismic requirements. (IR 50-285/85-22, D3.2-6)

The lack of adequate procedures or guidelines for the Technical Services Section of OPPD for the purchasing of CQE items and services was the cause of the violation.

The seismic analysis was performed on the nozzle dams. This analysis was completed prior to the initial installation. Also, a Technical Services Section procedure (N-TSAP-14) has been developed and approved. This procedure provides guidelines and instructions for the special purchasing requirements involved with the procurement of CQE and Limited CQE items and services. The effectiveness of N-TSAP-14 will be evaluated during biennial reviews.

A review of the majority of Technical Services' requisitions issued since 1982 has determined that procurement of hardware, services, and software was either appropriately specified or reviewed to assure that if the specification omitted requirements, this omission did not result in the procurement and use of inappropriate or deficient hardware, services, or software. Three purchases were identified where QA certification was desireable; these have subsequently been reviewed and their associated documentation upgraded to fulfill CQE requirements. Two of the purchases were for services related to surveillance capsules and it was determined the CQE requirements were fulfilled by issuance of equipment certificates. The remaining document was reviewed by the vendor under his vendor QA program.

F.1 Instructions, procedures, or drawings were not adequate or appropriate for controlling the following safety-related activities.

a. The installation/testing procedures for modifications MR-FC-83-158 and MR-FC-81-21B were incomplete in that they did not contain acceptance criteria for acceptable air leakage and would not have confirmed that the modifications produced the expected results. (IR 50-285/85-22, D2.1-7 and IR 50-285/85-22, D2.2-3)

The reason a functional test was not originally specified for MR FC-83-158 is because a functional test would have required the feedwater system to be pressurized. This could only be accomplished during plant operation. It was OPPD's opinion that the static test originally specified was adequate.

Subsequent to the NRC audit, a functional test was performed for MR FC-83-158. The system performed as required. An operator was also timed as he went from AI-100 and simulated manual isolation of HCV-438 B & D. It was found that he could easily perform this operation in six (6) minutes, well below the 20 minutes allowed in the design.

Functional testing of modification FC-81-21B was discussed between the engineer and plant operations. The reason a functional test was not performed for 81-21B is because the shift supervisor and the design engineer were concerned that valve cycling during system operation would cause transients in the system, which could have had an adverse affect on plant operation.

The functional test for MR FC-81-21B was completed prior to the end of the 1987 outage. This functional test is included in the scope of OPPD's generic review of functional testing requirements for CQE air systems. This program has been initiated to provide a comprehensive evaluation of systems which depend upon air accumulators for proper functioning during accident events. The program is described in the response to violation D.1.

OPPD understands that this item will remain open until the programmatic evaluation is complete. Several of the accumulator/valve combinations were tested during the 1987 refueling outage. The criteria for the remaining air accumulators are being developed as discussed in the response to Violation D.1. Functional testing is scheduled to be completed during the 1988 refueling outage.

F.1b The test procedure included in MR-84-119 (replacement of instrument inverters) did not contain adequate requirements for verifying acceptance during load testing of battery charger #3. (IR 50-285/85-29, D2.8-1)

OPPD has reviewed the circumstances of the battery charger acceptance test several times and we continue to believe that no violation occurred. The battery charger acceptance tests were designed to supplement the factory acceptance tests performed by the vendor. In addition, the recommendations of IEEE Standard 415-1976 were followed. The tests were not intended to duplicate the extensive design tests used by the vendor to verify performance under all postulated design conditions. The design engineer selected the appropriate tests which would provide reasonable assurance that the battery chargers were properly installed and calibrated. Consequently, the one hour local test was performed only at the float voltage. The ability of the battery charger to operate at maximum load without overheating was established. Further data taken at varying loads, input voltage, input frequency and output voltage were not necessary because this type of testing had already been performed by the vendor.

The test procedure utilized acceptance criteria which were prepared as guidance for knowledgeable electrical engineers, such as the Planner for this modification and the Supervisor - I&C and Electrical Field Maintenance, to evaluate the test results. Specific correlation between procedure steps and acceptance criteria was not deemed necessary because of the technical review which was specified and accomolished.

In addition, the new battery chargers were used to recharge the batteries following the performance capacity test of ST-DC-1. No charger problems were noted during this activity. Also, ST-DC-2 has been used to perform monthly checks on the new battery chargers since they were installed. Again, no problems have been noted with the charging capabilities of the new equipment.

To resolve this item, OPPD load tested battery charger #3 during the 1987 refueling outage. The test was performed for at least one hour and verified proper operation. The test data included:

- Starting time of the test
- Initial float and equalizing voltages
- Voltage values recorded at regular intervals (e.g., every five minutes)
- Final float and equalizing voltages at the completion of the test
- Completion time of the test

The test and inspection procedure contained a description of the objectives; acceptance criteria to be used to evaluate the results; prerequisites for performing the test and inspections including any special conditions to be used to simulate normal or abnormal operating conditions; limiting conditions; and the test and inspection procedure. This procedure also specified any special equipment or calibrations required to conduct the test and inspection. Test and inspection results were documented and evaluated by qualified personnel to assure that test and inspection requirements were satisfied.

F.1b (Continued)

Where tests and inspections were to be witnessed, the procedure identified hold points in the testing sequence to permit witnessing. The procedure required appropriate approval for the work to continue beyond the designated hold point. The test and inspection procedure required recording the date, identification of persons performing the test or inspection, as-found condition, corrective actions performed, if any, and as-left condition.

F.1.c The test procedures included in MR 84-74A (fuse protection for limit switches) did not include adequate requirements for the testing of the fuse protection for the limit switches. (IR 50-285/85-29, D2.8-2)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

The test procedure originally prepared for this modification was considered adequate by the design engineer, the electrical department manager and the independent design reviewer. Design calculations in conjunction with an operability verification were considered to provide an adequate test of the system. This modification involved the installation of one additional fuse in certain valve control circuits. It would be difficult to simulate the actual conditions under which the protective fuses would operate. The normal wiring check plus the operability test would have detected any errors in the installation. Design calculations verified the ability of the fuse to clear the postulated ground.

After consultation with the NRC inspector, the design engineer agreed that a more detailed functional test would provide additional assurance that the modification would function as designed. This testing was completed prior to restart from the 1985 refueling outage. Results of the testing indicated that the modification was correctly installed, that the modified control circuits functioned as designed, and that the modification did not adversely affect the normal operation of the circuitry.

F.1d The installation procedure for MR 83-158 (addition of air accumulators) did not contain adequate instructions regarding tubing configuration and accumulator tank locations. (IR 285/85-29, D2.5-2)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

The installed tube spacing was evaluated by alternate calculations. These calculations have been completed and verified, and they have confirmed that the installed tubing is, in fact, adequately seismically supported.

OPPD has developed and given a special training session for the applicable design groups to enhance their knowledge of the design for instrument tubing and reemphasize the importance of using the specific Fort Calhoun criteria for routing and support of seismic instrument tubing. A very limited number of required personnel could not attend the initial training session. Their training has also been completed.

The use of the guidelines provides additional assurance that CQE tubing required for subsequent modifications is appropriately installed.

F.1e The installation instruction for MR 84-94A (fuse protection for limit switches) did not contain adequate detail to ensure that a 10% random inspection of splices was performed as required. This procedural problem was also noted in MR 85-009 and MR 84-179. (IR 50-285/85-29, D2.4-1)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

The cause of this finding is apparently a misinterpretation of the phrase "random inspection." At the time of the inspection, OPPD's cable splicing procedure, GSEE-0512, required Quality Control (QC) to inspect, "...a minimum random sample of 10% of the conductor splices..." for conformance to the procedures. During the preconstruction review of the installation procedures, QC did, in fact, randomly select a minimum of 10% of the specified splices and marked a QC holdpoint in the procedures to ensure that QC would be contacted to witness the procedure for those identified splices. The intent of this random selection was to assure that a representative sample was inspected.

Because of confusion resulting from the use of the term "random", GSEE-0512 has been revised to delete the use of this term and to clarify that QC inspections be performed in accordance with the procedure. QC will inspect at least the minimum number of splices specified in the procedure. Additional spot checks by QC may also be performed.

F.1.f The installation procedure for MR 84-61 (union installation of SIT relief valves) did not provide a caution statement or a hold point for verification of the protection of the valve O-rings during welding. (IR 50-285/85-29, D2.4-1)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

Standing Order G-21 requires preparation of detailed installation and testing procedures. However, ANSI N18.7-1976 states "skills normally possessed by qualified maintenance personnel may not require detailed step by step delineations in a written procedure." Procedures are written with the assumption that they will be installed by personnel who are qualified in their respective craft and knowledgeable of plant requirements delineated in the Standing Orders.

The procedures are reviewed by Quality Control personnel prior to PRC review. The modification to install the unions was performed because the previous practice was to cut and reweld the relief valves when they needed to be removed for testing. Therefore, craftsmen knowledgeable in the requirements to safely weld in the vicinity of the valve were available. It was decided that this would be sufficient to provide the necessary protection for the valve O-rings during welding.

The quality of the modification installation was assured by adequate nondestructive testing and performance testing.

OPPD has developed a qualification matrix that relates qualifications to identified tasks for each Fort Calhoun Station and Central Maintenance craft person. This matrix is updated on a weekly basis and will ensure that only qualified personnel are allowed to perform tasks.

F.1g The installation procedure for MR-84-105 (replacement of 4160/480 volt transformers) did not provide adequate inspection requirements and hold points for visual inspections of the base welds by QC. (IR 50-285/85-29, D2.4-1)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

The welds in question were inspected by QC. These inspections were properly documented on Form FC-145 and Attachment A to procedure GSEE-0517 as required by the documents. The welds were found to be satisfactory.

GSEE Procedure GSEE-0517 (new designation CTS-2) has been revised to more closely control and document welding performed on CQE and Limited CQE electrical equipment supports at Fort Calhoun Station. Planners and craftsmen involved with welding on supports for CQE and Limited CQE electrical equipment have been trained on the requirements of Procedure CTS-2, "Electrical Equipment Support Installation Specification".

The requirements of Standing Order G-12A have been incorporated into a standard CTS-2.

OPPD has developed a qualification matrix that relates qualifications to identified tasks for each Fort Calhoun Station and Central Maintenance craft person. This matrix is updated on a weekly basis and will ensure that only qualified personnel are allowed to perform tasks.

F.1h The installation procedure for MR 85-42 (replace valve MS-100) did not provide sufficient detailed instructions to assure adequate conduct of the safety-related maintenance activities. (IR 50-285/85-29, D2.4-1)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

Standing Order G-21 requires preparation of detailed installation and testing procedures. However, ANSI N18.7-1976 states "skills normally possessed by qualified maintenance personnel may not require detailed step by step delineations in a written procedure." Procedures were written with the assumption that they would be installed by personnel who are qualified in their respective craft and knowledgeable of plant requirements delineated in the Standing Orders.

The quality of the modification installation was assured by nondestructive testing and performance testing.

OPPD has developed a qualification matrix that relates qualifications to identified tasks for each Fort Calhoun Station and Central Maintenance craft person. This matrix is updated on a weekly basis and will ensure that only qualified personnel are allowed to perform tasks.

F.1i The installation procedure for MR 83-158 (addition of air accumulators) regarding safety-related seismic instrument tubing did not provide installation criteria for the tubing or seismic supports and did not reference the applicable Stone and Webster guideline for the installation of seismic tubing and supports. (IR 50-285/85-29, D2.4-1)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

The installed tube spacing was subsequently evaluated by alternate calculations. These calculations were completed and verified, and they confirmed that the installed tubing is seismically supported.

OPPD has developed and implemented a special training session for the applicable design groups which perform design of instrument tubing. The importance of using the Fort Calhoun Station criteria for routing and supporting of seismic instrument tubing was emphasized during the training. A very limited number of applicable engineers could not attend the initial training session. Their training has since been completed.

OPPD has developed a qualification matrix that relates qualifications to identified tasks for each Fort Calhoun Station and Central Maintenance craft person. This matrix is updated on a weekly basis and will ensure that only qualified personnel are allowed to perform tasks.

F.1j The installation procedure for MR 85-62 (replacement of CCW flow element) did not provide instructions or provide reference to another instruction for the proper makeup of a flanged joint which was found to be out of parallel by approximately .030" and was leaking. (IR 50-285/85-29, D2.4-1 and IR 50-285/85-29, D2.5-5)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

The leakage identified by the inspection team was apparently detectable at some time after craft signed off . The flange gasket was a Flexitallic Gasket, style CG. Flexitallic Bulletin 171 recommends 0.050" - 0.055" compression of the gasket with a tolerance of ± 0.010". The flange faces were visually determined to be parallel by the modification planner.

The ability to make such an installation properly was considered within the range of skills expected of a journeyman craftsman. Such skills are addressed in the pressure equipment apprenticeship program.

The planner prepared Maintenance Order No. 057887 to tighten the flange bolts. Completion of this M.O. corrected the leakage condition. Subsequently, measurements taken verified that the out of parallel condition was within the allowable ± 0.010" tolerance.

OPPD has developed a qualification matrix that relates qualifications to identified tasks for each Fort Calhoun Station and Central Maintenance craft person. This matrix is updated on a weekly basis and will ensure that only qualified personnel are allowed to perform tasks.

F.1k The installation instructions for MR 84-140 (delta T power process loops) were inadequate in that safety-related cables EC10483 and ED10484 were tie-wrapped to nonsafety-related cables in two electrical panels (AI-216 and A-217), contrary to USAR, Section 8.5.1.i. (IR 50-285/85-29, D2.5-6)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

OPPD does not interpret USAR Section 8.5.1 to address separation between safety related and non-safety related cables in panels. Section 8.5.1 addresses only cables in raceways. At the time of Fort Calhoun Station construction, no separation criteria existed beyond the general guidance criteria in IEEE 279-1968 and FSAR, Appendix G, Criterion 20, 22, and 25. Subsequently, OPPD has been selectively using IEEE 384-1981 for guidance to the extent practicable within the constraints of existing panels. The craftsmen responsible for this modification were not aware that more stringent separation criteria than that given in IEEE 279 would be applied to the new AI-216 and AI-217 panels. The subject cables were relocated prior to plant operation.

Design and construction packages prepared for the 1987 outage have addressed the separation issue in greater detail. Each modification involving CQE panel separation criteria was inspected per modification-specific separation criteria prior to System Acceptance Committee review.

F.11 The flow diagram for the Main Steam System (11405-M-252) was not correct or current with the as-installed arrangement in the plant. (IR 50-285/85-22, D2.1-8)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

Subsequent to the NRC finding, OPPD engineers walked down the area in question. The apparent cause of the drawing error was that the surrounding area is very congested. Due to this congestion, previous walkdowns had overlooked this line. The flow diagram has been revised.

F.1m The system descriptions for the Auxiliary Feedwater System (III-4), Compressed Air System (III-10), and Component Cooling Water System (I-7) were incorrect and not updated following completion of modifications as required by the Station Systems Acceptance format. (IR 50-285/85-22, D2.1-9)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been taken.

The System Descriptions are not maintained as a "controlled document"; however, they are, for the most part, a useful source of reference information. The decision to use information contained within the System Descriptions is left to the discretion of the engineer. Each engineer is cognizant that the System Descriptions are not "controlled" and that information gained via the System Descriptions should be used as reference material only.

System Descriptions did form the major design information which was available to the engineer. Also, the checks and balances which are built into the design review process are depended upon to provide adequate assurance that design inputs are appropriate and correct.

OPPD recognizes the need to update the System Descriptions. However, until the System Descriptions can be fully updated and document controls established, each set of System Descriptions has been clearly marked "Uncontrolled Document, for Information Only".

F.2 Instructions, procedures, or drawings were not followed regarding the following safety-related activities:

a. The seismic restraint for valve YCV-1045B was not completed in accordance with the specifications for MR-FC-81-127. (IR 50-285/85-22, D3.2-7)

OPPD admits the seismic restraint for valve YCV-1045 was not completed in accordance with the specifications for MR-FC-81-127.

The restraint in question (AFW-15) was one of those identified by Gilbert/Commonwealth as requiring a detailed thermal analysis prior to installation to determine if such a restraint would have a detrimental thermal impact. This thermal, deadweight, and seismic analysis was performed and the result indicated that a rigid restraint at AFW-15 was not required. The decision was then made to not install a new restraint at this point since the seismic loads without this new restraint are within allowable limits. Since the existing restraint offered no seismic advantage it was also decided to remove it from the analysis. Since the existence of this restraint had no adverse safety significance, it was then decided to not remove the restraint. It has been determined that the engineer responsible for the design did not fully understand the importance of the analysis exactly matching the as-built condition.

The rod restraint has been removed. The analysis and as-built condition are now consistent.

OPPD will continue to stress the importance of having analyses exactly match the as-built conditions. OPPD has implemented a training program for modeling techniques for piping analysis. OPPD has reviewed its computer analysis documentation to determine what actions must be instituted to improve accessibility of computer program analyses. A preliminary application procedure that includes specific responsibilities and update methodologies has been completed. The review has also underscored the need for control of data bases on a sectional level. This control has been documented and is presently being assimilated and formalized.

F.2b The installation procedure for MR 81-80 (seismic supports on masonry wall) was not followed in that work was allowed to proceed without the verification of material adequacy required by a QC hold point and the shift supervisor was not notified prior to proceeding with drilling holes through the battery room wall. (IR 50-285/85-29, D2.4-2)

OPPD admits that procedural requirements were not strictly followed with regard to material verification for MR 81-180, and that drilling of holes through the battery room wall was initiated prior to notification of the shift supervisor.

Receipt, inspection, storage and handling requirements for Critical Quality Element (CQE) and Limited CQE materials are specified by Standing Orders G-22, "Storage of CQE and Radioactive Material Packaging, Fire Protection Material and Limited CQE", G-24, "Receipt Control of CQE Material", and G-25, "Stores Control."

The procedural violation concerned a step in the installation procedure for the modification. The procedure step cited was for QA review of material certification. Material used in the modification work was QA receipt inspected and had green "QA Material Conformance" tags attached. The purchase order numbers were listed in the modification documents as the material was received and inspected. However, the procedure step was not signed off as completed because the material was being received in stages throughout the project. The procedure allowed for steps to be performed out of order to facilitate the work.

Because this project was performed in stages, material was received in stages. Clear guidance was not given in the installation procedure for handling the staged receipt of material. The previous response to Deficiency D2.4-2 as provided by Reference 5, said that the modification was reviewed by QA prior to System Acceptance. Because work was not completed, QA review was not obtained. The partially completed modificaton was "Not Accepted" by the System Acceptance Committee because at the time it was not totally installed. Personnel have been instructed to word installation procedures in such a manner to cover staged receipt of material. Generic guidelines for installation procedures are being prepared which will ensure that the instructions are incorporated in subsequent modifications and training for new personnel. The completion date is scheduled for March 1989.

For modifications where the material is received in stages during the course of the work, Quality Assurance inspectors are currently signing the step in the installation procedure with the first receipt. Subsequent receipts are entered and signed off in the "Remarks" section of the procedure.

The installation procedure contained a requirement to obtain the Shift Supervisor's signature prior to beginning each phase of the work. With regard to the battery room walls, the Shift Supervisor was verbally notified prior to start of drilling, however, a signature was not secured until the situation was identified. The elapsed time was approximately 30 minutes.

When the lack of a signature authorizing start of the work on the battery room walls was identified, the Shift Supervisor was immediately contacted and his signature secured while the NRC inspector was at hand and witnessed same. The personnel involved in this oversight were instructed in the requirements of the procedure and the reasons for them.

F.2c Station Procedures Standing Order G-21, "Station Modification Control," and Standing Order G-26A, "Quality Control Program," were not followed in that inspectors, who were not Level III certified, reviewed and approved procedures for adequacy of QC hold points. Also the engineers writing the procedures were not Level III certified. (IR 50-285/85-29, D2.4-2)

OPPD does not contest this violation. The intent of Standing Order G-26A was to have Level III certification for personnel reviewing and approving NDE and welding procedures and Level II certification for personnel reviewing and approving installation procedures subject to QC review.

The Standing Order, as written at the time, did not make this distinction. The review of installation procedures for adequacy of hold points is the responsibility of QC. A properly certified QC inspector specifies additional hold points which are deemed necessary to ensure quality of the installation.

In order to eliminate any possible confusion in this regard, a procedure change has been implemented to Standing Order G-26A to state the classification levels of QC personnel required to review and approve installation procedures. Standing Order G-26A now requires qualification Level III to review and approve NDE procedures and the Level II to review and approve other installation procedures. OPPD is in full compliance with the revised procedures in place.

Current OPPD commitments and procedures do not require certification for engineers preparing draft procedures that specify QC hold points.

F.2d The controlling procedure Standing Order O-20, "Equipment Tagging," was not followed in that the documented shift supervisor review was not provided for work in progress for tagging out breakers BKR CB-5 and CK4-33 during the performance of MR 84-119 (replacement of instrument inverters). (IR 50-285/85-29, D2.4-2)

OPPD admits that the tagging log sheet 85-1078 was not signed by the Shift Supervisor in accordance with Standing Order O-20. It has been subsequently reviewed, independently verified and signed by the Shift Supervisor present at the time of the tagging event.

All Shift Supervisors were made aware of the circumstances of this event, and the significance of procedural non-compliance.

No further corrective action is required. OPPD is presently in full compliance.

F.2e The maximum unsupported span requirement of 4 feet 6 inches specified in Section 4.2.2 of the Stone and Webster guideline for seismic tubing was violated in four instances in modification MR 83-158 (addition of air accumulators). (IR 50-285/85-29, D2.5-2)

This example is closed per Reference 7, based on the following information that documents corrective steps that have been or will be taken.

The as-built support spacing has been subsequently justified by alternate calculations. The calculations were completed and verified, and they confirmed that the installed tubing is seismically supported.

OPPD has developed and implemented a special training session for the applicable design groups to enhance their knowledge of the design of instrument tubing and to re-emphasize the importance of using the Fort Calhoun criteria for the routing and support of seismic instrument tubing. A very limited number of engineers could not attend the initial training session. Their training has since been completed.

F.2f The installation procedure for MR 84-61 (union installation on SIT relief valves) was not followed in that the unions were installed incorrectly. (IR 50-285/85-29, D2.4-2)

OPPD admits that the unions were installed in an orientation different than that shown on the drawings.

The unions on the Safety Injection Tank relief valves were in fact installed contrary to the procedure and drawings. The fitter installed the unions in a manner which he considered standard.

This departure from the design was discussed with the responsible engineer, was determined to be within the design basis of the modificaton, and a field change was issued to reflect the as-built configuration. The procedures and drawings were revised after-the-fact to agree with the as-built configuration.

In conjunction with the revisions to the welding program in 1986, the Quality Control inspection procedures for welded joints were also strengthened. A fitup inspection is now required for ASME or ANSI code welds. This inspection should preclude further events of this nature. In addition, Quality Control inspectors have been instructed to more closely monitor jobs of this type. This has been factored into the training program for contractor inspectors for the 1987 refueling outage.

Maintenance training has been informed of the circumstances of this violation. Measures are presently in place to ensure compliance.

F.2g The installation requirements for MR 84-61 (union installation on SIT relief valves) was not followed in that the installed relief valves on SI tank 6R were incorrectly identified. (IR 50-285/85-29, D2.5-4)

OPPD admits that valves SI-217 and SI-221 were interchanged and reinstalled on different safety injection tanks than they had been originally.

This violation was the result of a lack of attention to detail. The relief valves for all four safety injection tanks are functionally and materially identical and have the same setpoint. The valves are periodically removed and shop tested. At some point during the installation of MR-FC-84-61, valves SI-217 and SI-221 were interchanged. Since Valves SI-217 and SI-221 are identical, this installation error poses no safety significance.

Because of the differences in tail pipe length and union installation, the relief valves are unique to the tank on which they belong. Therefore, the valves will remain as installed and controlled documents (drawings) applicable to these valves show the as-built configuration.

Maintenance Training has been informed of the circumstances of this violation. Measures presently in place address the need for attention to details.

F.2h The Station Procedure Standing Order G-30, "Setpoint/Procedure Changes," requirements were not followed in that training associated with procedure change 13494 was not provided prior to implementing the change. The procedure change was dated on November 2, 1984, and the training sheets were not issued to operators until November 5, 1984. (IR 50-285/85-29, D2.3-4)

This example is closed per Reference 7, based on the following information that documents corrective actions that have been taken.

It should be noted that Procedure Change 13494 was not implemented until November 6, 1984. Therefore, even though there appears to be a discrepancy with the date recorded for the signature when training was completed, the training was accomplished prior to actually implementing this procedure change.

A review conducted in 1986 revealed no other known circumstances in which a procedure change which required pre-approval training was implemented prior to completing the training. Standing Order G-30 "Setpoint/Procedure Changes", has been reviewed and found adequate to control this portion of the procedure change process.

The specific condition cited was corrected by completing the training by issuing a "Hot Line" to operations personnel. Training department personnel who are authorized to document that training has been completed have been required to review Standing Order G-30.

OPPD has emphasized the importance of ensuring that necessary training is accomplished prior to implementing a procedure change in accordance with Standing Order G-30 with both Training department personnel and members of the Plant Review Committee (PRC).

F.2i The design verification review for MR-FC-85-158 (addition of air accumulators) was not provided for the installation of these items as required by GSE Design Procedure B-2. (IR 50-285/85-22, D2.1-6)

This example is closed per Reference 7, based on the following information that documents corrective actions that have been taken.

The Form "J" in Standing Order G-21 was revised to specifically require completion of third-party review of the design and construction prior to acceptance of a modification for operation by the System Acceptance Committee (SAC). GSE Procedure A-2 was revised to define in more detail for the engineer what would constitute an acceptable third-party review for the purposes of SAC. The subject third party reviews were completed in accordance with these procedures prior to system acceptance for operation.

OPPD recognizes the economic and schedular advantages of completing design verifications as soon possible in the life of a modification. It is not in OPPD's best interest to install a modification and then have to rework or remove it because of a design verification problem. However, it is also not efficient utilization of engineering resources to perform design reviews before all the information is available. The requirement in the procedures to complete third-party reviews prior to System Acceptance is adequate as far as plant safety is concerned. OPPD will continue to emphasize earliest reasonable completions of design verifications to reduce any potential pressures on reviewers or resource constraints near the completion of outages.

F.2j The verification or checking of the adequacy of the design inputs, such as load tables used and the reliance on earlier nonverified calculations, for MR-FC-84-119 (battery charger and inverter replacement) were not provided as required by OPPD Procedure GSE-B-11. (IR 50-285/85-22, D5.1-1)

This example is closed per Reference 7, based on the following information that documents corrective actions that have been taken.

Revised battery load profiles were developed, checked and independently reviewed prior to the end of the 1985 refueling outage. The battery sizing calculations have also been further revised to confirm the adequacy of the batteries under all operating conditions and total loss of AC power. Operating procedure changes and minor load redistributions were made to increase the battery design margins.

A battery load test was performed to determine the exact battery capacity after the two cells were removed. The completed battery load study is available as a design basis document to evaluate future DC system load changes.

F.2k Changes to drawings 11405-M-1, "Containment Heating, Ventilation, and Cooling," and 11405-2, "Auxiliary Building Heating and Ventilation," were not adequately controlled in accordance with OPPD Procedure GSE-A-9 in that changes were made to the drawings contained in modification package MR-FC-82-178 based only on engineering sketches. (IR 50-285/85-22, D4.5-1)

This example is closed per Reference 7, based on the following information that documents corrective actions that have been taken.

The reason a sepia was not requested was because the modification was small in scope, uncomplicated, and did not have any significant impact on the P&ID. In the particular case of MR-FC-82-178, it was decided that no drawings were required to be revised during the preparation of the design package. Rather, sketches were utilized to construct the modification.

There are two reasons why sepias are issued for those drawings that must be changed for construction: 1) The sepia provides a document to show the proposed design change so it can be installed without modifying the document of record until the modification is installed. This ensures that the document of record is changed only after the modification is "as-built", and 2) The sepia tracking system informs all who utilize the document of record that a pending modification (or modifications) may affect it. Many times drawings that are not necessary to install a modification (and therefore not changed) but are affected by the modification. Thus, it is not necessary to make a sepia of those drawings. GSE Procedure A-9, Par. 3.2 states "when an existing drawing needs revision during the preparation of an MR, a request for a sepia of that drawing is made." The phrase "during the preparation of an MR," is intended to limit sepia production to only those drawings that need revision to install the modification, not all drawings that may eventually need to be revised.

F.21 Computer calculations associated with cable derating factors resulting from installing a fire wrapping system for modification MR-FC-85-25 were not verified in accordance with OPPD Procedure GSE-B-11. (IR 50-285/85-22, D5.2-1)

This example is closed per Reference 7, based on the following information that documents corrective actions that have been taken.

Separate calculations were performed by OPPD to determine the actual load currents on the motor control center feeder cables. Analysis of the cable derating effect of the fire wrap material was performed in accordance with GSE procedures for CQE calculations. These calculations were performed to provide the basis for further heat transfer calculations to determine the actual derating factors of the fire wrap, independent of 3M's computer calculations.

OPPD performed, checked and verified calculations to determine:

a. actual load currents on the MCC feeder cables,

b. actual derated ampacity of the fire wrapped cables.

These calculations and verifications were completed in accordance with GSE procedures B-2, B-9, and B-11. The results of these conventional heat-transfer calculations indicate, independently of the vendor supplied computer calculations, that the derating factors used as a result of the application of the fire wrap material did not adversely affect the power cables. In accordance with S.O. G-21, independent verification of these calculations was completed prior to system acceptance.

F.2m Weld inspections were not accomplished by QC as required by Section 5.22 of GSEE-0517 for the transformer base welds to embedments for modification MR 84-105 (replacement of 4160/480 volt transformers). (IR 50-285/85-29, D2.5-7)

This example is closed per Reference 7, based on the following information that documents corrective actions that have been taken.

The planner and craftsmen assigned to MR FC-84-105 were not fully cognizant of the QC inspection requirements for welding CQE seismic supports. These requirements were stated in Standing Order G-12 and GSEE-0517 at the time the procedure was issued, but were not specifically translated into the installation procedure.

The welds in question were inspected by QC. These inspections were properly documented on the required Form FC-145 and Attachment A to procedure GSEE-0517. The welds were found to be satisfactory.

Standing Order G12A has been implemented to control and document welding performed on CQE and Limited CQE equipment at Fort Calhoun Station.

Planners and craftsmen involved with welding on CQE and Limited CQE electrical equipment have been trained on the requirements of Standing Order G-12A. The requirements of Standing Order G-12A have been incorporated into Standard CTS-2, Electrical Equipment Support Installation Specification, (formerly GSEE-0517).

G.1 The control of construction drawings in the following construction packages was inadequate in that: (IR 50-285/85-29, D2.3-1)

a. MR 85-009 (replace penetration subassemblies) and MR 84-119 (replace inverters) contained construction drawings not on the drawing list.

b. MR 84-119 (replace inverters) contained drawings with incorrect revision numbers, a wrong number in the drawing list, and two drawings (same revision and date) with different information.

c. MR 83-158 (addition of accumulators) had no Piping and Installation Diagrams (P&IDs) in the construction package.

This example is closed per Reference 7, based on the following information that corrective steps have been or will be taken.

GSE procedures have been revised to clarify when "For Information" drawings should be part of the construction package and how they should be referenced on the drawing list. Requests for prints and drawings to be included in the construction package are prepared by the Engineering Services Department personnel. The stamped prints are double checked against the drawing list prepared by the design engineer.

G.2 Drawing file number 39881 for MR 84-105 (replacement of 4160/480 volt transformers) contained pen and ink markups and changes to indicate clarification to the weld symbolism and no field change number was entered and approved. (IR 50-285/85-29, D2.3-5)

This example is closed per Reference 7, based on the following information that corrective steps have been or will be taken.

The information added to the subject drawing was determined to be correct and no corrective action was required regarding the installation. The as-built condition was evaluated and determined to be adequate.

The Field Change and Procedure Change forms are required to document changes to modification control documents. Occasionally, additional informal comments or information were noted in the margins of procedures or on drawings. This practice was useful in transmitting information to craftsmen, planners, and QC inspectors on other shifts. Adequate controls exist during the modification acceptance process to assure that Field Changes and Procedure Changes are written where appropriate. These controls include review of the modification control documents by QC, QA for safety related design change orders and the System Acceptance Committee (SAC). A revision to Standing Order G-30 has strengthened the Field Change process. Training regarding Field Change requirements with emphasis on drawing changes has been provided to those planners and operations engineers involved in the 1987 outage.

G.3 Installation procedures for MR 84-96 (replace HFA relays), MR 84-51 (replace Dresser-Hancock valves), MR 83-158 (addition of air accumulators), and MR 84-61 (union installation on SIT relief valves) contained pen and ink changes and additions without approved field changes or procedure changes being provided in accordance with Standing Order G-30 (IR 50-285/85-29, D2.3-2)

This example is closed per Reference 7, based on the following information that corrective steps have been or will be taken.

The Modification Control Documents for MR-FC-84-96, MR-FC-84-51, MR-FC-83-158, and MR-FC-84-61 have been reviewed by Quality Control, Quality Assurance and the System Acceptance Committee for adherence to the requirements of standing orders including Standing Order G-30 and found to be satisfactory. The procedure changes and field changes prepared for the subject modifications have been reviewed and approved by the PRC. The use of an on-the-spot change for MR-FC-84-61 was found to be appropriate and the descriptions or markups provided with the field changes were found to be adequate.

Field Change and Procedure Change forms are required to document changes to modification control documents. Occasionally, additional comments or information were noted in the margins of procedures or on drawings. This practice was useful in transmitting information to craftsmen, planners, and QC inspectors on other shifts. OPPD believes that adequate controls existed during the modification acceptance process to assure that Field Changes and Procedure Changes were written where appropriate. These controls included review of the modification control documents by QC, QA for safety related design change orders, and the System Acceptance Committee (SAC). Standing Order G-30 was revised to strengthen the Field Change process. Training has been provided to the planners regarding Field Change requirements with emphasis on drawing changes.

A statement provided in the previous response to Deficiency D2.3-2 transmitted by Reference 5, was subject to misinterpretation. As discussed at the enforcement conference, a formal definition of "pen and ink changes" does not exist in any Standing Order. The use of pen and ink changes was administratively controlled and was understood by personnel involved in the modification process. The proposed revision of Standing Order G-21 does provide definition of allowed "pen and ink changes".

G.4 Loop calibration procedures for CP-X/905 and CP-X/902 associated with MR 85-009 (replacement of penetration subassemblies) contained seven procedure revisions without approved field changes being provided in accordance with Standing Order G-30. (IR 50-285/85-29, D2.3-6)

This example is closed per Reference 7, based on the following information that corrective steps have been or will be taken.

The records pertaining to the subject calibration procedures were reviewed, are now properly annotated, and are in conformance with Standing Order G-30.

Additional training has been given to technicians responsible for procedure changes emphasizing plant standing order and other relevant procedures and the importance of proper documentation for auditability.

Training on revisions to Standing Order G-30 has been performed.

H.1 The weld on SIT 6B relief valve unions (MR 84-061) contained an unacceptable crater pit in the lower pipe weld and had been previously accepted by QC. (IR 50-285/85-29, D2.6-1)

OPPD admits that the weld addressed by this violation contained a crater pit. OPPD QC inspected the weld and determined that the crater pit was not sufficient to reject the weld. The PT examinations supported the inspectors determination. In addition, the integrity of this weld was verified by hydrostatic testing.

During discussions at the enforcement conference, it was apparent that some miscommunication of desired actions had occurred. OPPD understood that the NRC Inspector requested an additional visual inspection of the weld in question. This visual inspection was performed. The SSOMI team believed they had requested another penetrant test be performed. To resolve this issue, a dye penetrant test of the weld in question was performed and documented during the 1987 refueling outage. The small crater pit was ground out and the dye penetrant test indicated that the weld was acceptable.

H.2 The safety-related nonisolable socket weld on MS-100 (MR 85-042) had been inspected and accepted by QC but was found to be unacceptable and had to be repaired. (IR 50-285/85-29, D2.5-1 and IR 50-285/85-29, D2.6-1)

OPPD admits that the original weld on MS-100 was unacceptable

Acceptance of the first weld on MS-100 was based on what was believed to be a successful dye penetrant (PT) examination. A subsequent inspection by an NRC inspector revealed the existence of a small crater pit on the back side of this weld. The crater pit did not show on the PT examination because the crater was filled with tightly adhered slag that was missed by both the welder and the QC inspector.

The QC inspector that missed the crater pit is a highly qualified contract inspector who has shown competence as a QC inspector during three different refueling outages at Fort Calhoun Station. The contract used to procure these inspectors specifies that inspectors must be experienced and fully qualified in applicable codes and procedures. All inspectors are certified. The certifications of the contract QC inspectors were reviewed by station management and OPPD QA prior to the outage. OPPD provides an indoctrination course for contract inspectors prior to beginning work. During the 1985 outage the contractor QC certifications were reviewed by OPPD QA.

After the NRC inspection, OPPD QC inspectors concluded that the weld was unacceptable and repair was required. The weld in question was a socket weld. Repair entailed grinding out the defective weld and replacing it with an acceptable weld. During the grinding process, the craftsman became overly aggressive when removing the defective weld. This resulted in a reduction of the wall thickness of the inlet pipe stub. This wall thinning was observed by both OPPD and NRC inspectors. The new weld was inspected by PT examination and found acceptable. The condition caused by grinding out the old weld and reducing the pipe thickness was evaluated by OPPD engineering and found to be acceptable for the design conditions. Inspectors were notified of this occurrence and instructed to exercise vigilance to ensure that similar conditions did not recur.

OPPD completed a review of the welding program and procedures for the Fort Calhoun Station in 1986. Changes were made to further strengthen the program. OPPD's nondestructive examination procedures have also been reviewed and revised to provide more detailed guidance for inspectors. Further upgrading of the welding program is in progress and will be completed by January 1988.

OPPD has an aggressive program for training permanent QC inspectors at Fort Calhoun Station. Applicable portions of the maintenance training program, instruction by plant specialists, outside corporations specializing in NDE, refresher courses from local colleges, and two weeks of intensive training and recertification by Combustion Engineering are examples of the training programs employed to ensure the qualifications of our QC inspectors. These programs will be continued.

Contract inspectors are given an indoctrination in OPPD QC procedures prior to being assigned to field inspection duties. This program has also been strengthened to reduce the possibility of future problems of this type.

H.2 (Continued)

OPPD is presently in compliance, but we are currently implementing program changes to increase the number of weld procedures and review the documentation requirements associated with the welding program.

H.3 Dye penetrant inspections for MR 85-062 (replacement of CCW flow element) were found to have been accomplished and accepted at surface temperatures below the minimum allowed by procedures. The inspections were redone and two of four welds examined were found to be unacceptable because of linear indications. (IR 50-285/ 85-29, D2.6-1)

OPPD admits that the original dye penetrant (PT) examination of the welds associated with the replacement of FE-498 was performed at a pipe temperature below the minimum allowed in the procedure.

This violation occurred because the inspection report form in use at the time did not specify temperature limits or recording of the actual temperature and the inspector involved did not realize that the piping was below the minimum allowable temperature.

The PT procedure specifies a minimum temperature of the parts being examined of 60°F. The actual temperature of the CCW supply header at the time the initial PT was performed between 47° to 51°F.

Despite the fact that the procedure is usable at temperatures below the specified minimum, the welds in question were retested. Two of the four welds had rejectable linear indications. Before the welds were reexamined, OPPD's QC inspector informed the NRC inspector that reexamination of the welds would probably result in discontinuities. The discontinuities were predicted on the basis that corrosion had formed on the weld material during the 1½ months which had elapsed since the welds were made. Experience has shown that cleaning would not be effective in removing the corrosion. Minor dressing of the welds with a file was sufficient to clean the welds so that reexamination was acceptable. The two welds were again re-examined and this time, exhibited no rejectable indications.

The PT procedure and inspection report form have been revised to clarify the requirements for acceptable test temperatures. The report form now specifies the acceptable temperature range (minimum - maximum) and requires recording of the actual surface temperature of the parts being tested.

Based on the corrective actions taken, OPPD is presently in full compliance.

H.4 A procedure for standard flat plate 90° fillet welds was used to accomplish skewed fillet welds, plug welds, pipe boss attachment welds, and seal welds for modification packages MR 84-162 (containment HVAC supports) and MR 85-62 (replacement of CCW flow element) installed during the 1985 outage. (IR 50-285/85-29, D2.6-2)

This example is closed per Reference 7 based on the following inforamtion that corrective steps have been completed.

MR 84-162 - The knee brace of containment ventilation duct support B was attached to the base plate using Weld Procedure No. 1-B. The principal axis of this support is not perpendicular to the wall on which it is mounted, rather it is skewed 15° counterclockwise from the perpendicular. Weld Procedure No. 1-B is designated as applicable to fillet welds in general, however, the term "90° Fillet" is used in the space on the form where other types of joints for which the procedure is applicable can be listed. This procedure did lack any instructions relative to proper end preparation for a skew T-joint.

A misdrilled hole in the base plate for the knee brace of support A was repaired using Weld Procedure No. 1-B. This work was done as Field Change F-6 and was designated on the field mark-up of Drawing No. A-4875, Sheet 2 of 3, as a plug weld on both sides. OPPD had no procedure specifically designated for plug welds.

MR 85-62 - The Welding and Test Control Record sheets show that all welds on this modification used Welding Procedures No. 1 and No. 6, not No. 1-B, which was implied by the statement of the deficiency. The only indication that 90° fillet welds might have been used is the statement in the notes on Drawing No. SK-FC-85-62. Weld procedures No. 1 and No. 6 apply to groove welds and were properly applied in this modification. A drawing revision notice has been prepared to correct the notes on Drawing No. SK-FC-85-62 to remove the reference to fillet welds.

OPPD has completed an engineering evaluation of the welds in question and has verified that the two supports, A and B, are satisfactory as installed.

Standing Order G-72A "Welding and Weld Control" has been incorporated into the Fort Calhoun Station operating manuals. It provides for more thorough documentation of welding operations and tighter control of weld materials; it also includes revised weld procedure specifications and the methods to be employed in qualifying welders and procedures. In conjunction with this, welder qualification records were reviewed and during July, 1986, and requalification testing was conducted for those welders requiring it. Further upgrading of the welding program in progress and will be completed by January 1988.

H.5 Welds completed during the outage on seismic conduit supports and installation of the conduit and supports for MR 84-140 (delta T power process loops) did not conform to the installation procedure design details. (IR 50-285/85-29, D2.5-6)

This example is closed per Reference 7 based on the following information that corrective steps have been completed.

A complete analysis and inspection of the seismic conduit supports installed during the outage was performed by OPPD prior to completion of the 1985 Outage. This information was included in the modification file. This inspection included verification of support details, support spacing and conduit configuration. The supports in question were found to be adequately designed and installed.

The previous response to Deficiency D2.5-6 transmitted by Reference 5 stated that OPPD has nearly completed the development of a separation criteria standard for safety related circuits. The development of this standard is scheduled to be completed by March, 1988. Modifications will be governed by interim criteria.

I.1 Level B safety-related material was stored in a Level C storage area for up to 19 months. (IR 50-285/85-29, D2.9-2)

OPPD admits the violation.

Prior to the SSOMI inspection OPPD had undertaken an extensive effort to improve, rearrange and reorganize the warehouse inventory in response to DR-FC1-85-013,"Stores CQE Hold Area Insufficient." This deficiency was written 3-21-85 and was closed 10-8-85. During this time the items identified by the inspection team were improperly stored.

OPPD has taken, and is continuing to take, corrective actions to resolve those CQE storage problems which do not require the construction of the new warehouse facility. The ANSI N45.2.2 level of storage has been defined for each permanent CQE storage area, and CQE storage and issuance discrepancies have been resolved. Standing Orders G-22 and G-24 are being revised. The use and documentation of material request forms is being improved. Shelf life reviews are also being addressed.

The corrective actions needed to resolve these concerns will be implemented. Continued surveillance by OPPD QA personnel will provide management a means to judge the effectiveness of the corrective actions performed. Safety related material storage areas are inspected quarterly by Quality Assurance. These inspections are conducted using Quality Assurance Surveillance Plan Q-1 "CQE Material Receipt/Storage/Issue" as a guideline. The surveillance plan is written to ensure that programmatic effectiveness is maintained.

Deficiencies found during the conduct of the Q-1 Surveillance Plan are reported to management on a monthly and quarterly basis.

Part of the solution to the overall storage problem will result from the addition of a new warehouse. OPPD is currently in the process of constructing the facility.

Management attention will be directed toward ensuring this problem area is addressed until the new warehouse and new procedures to be developed have proven effective in solving this problem.

I.2 Examples were found of safety-related material for which identification tags did not agree with material markings or other material documentation. (IR 50-285/85-29, D2.9-2)

OPPD admits the violation. As stated in the response to I.1, OPPD had undertaken an extensive effort to rearrange and reorganize the warehouse inventory. That equipment which could not be supported by necessary documentation to establish the CQE classification was reclassified as non CQE.

Corrective actions have been taken to resolve CQE storage and issuance discrepancies. Stores controls have been improved for CQE materials.

OPPD has implemented a project to verify CQE inventory for proper identification, certification records, tagging, and storage.

No further specific actions are required for this example of the violation. Continued surveillance by OPPD QA personnel will provide management a means to judge the effectiveness of the corrective actions performed. OPPD is currently in compliance.

I.3 Quality control surveillance of temporary safety-related storage areas were not accomplished on the required monthly basis. (IR 50-285/85-29, D2.9-3)

OPPD admits that surveillance inspections were not performed each 30 days.

This violation occurred because of the lack of an adequate tracking method to show when a temporary storage area had been activated and constituted an area which required surveillance. The log in use at the time of SSOMI did not document when a Temporary Storage area was activated or deactivated. Consequently, it appeared to an auditor that a lack of surveillance inspections had been performed for long periods of time when in fact the Temporary Storage area had been deactivated and did not exist. This condition was not identifiable through QC records.

Standing Order G-22 has been revised to provide tighter control of Temporary Storage Areas than had previously been required. The personnel responsible for assigning the CQE storage areas and those performing periodic inspections have developed a tracking mechanism. The new documentation will record the dates when a designated storage area is active and, therefore, require surveillance inspection.

Based on the corrective actions taken, OPPD is currently in compliance.

I.4 Damaged safety-related cable was stored in Temporary CQE Storage Area 4. (IR 50-285/85-29, D2.9-1)

I.5 Nonsafety related material was stored in safety-related temporary CQE Storage Area 17. (IR 50-285/85-29, D2.9.1)

I.6 Safety-related material was found in Temporary Storage Area 14 without the required quality assurance acceptance tags. (IR 50-285/85-29, D2.9.1)

These examples are closed per Reference 7 based on the following information that corrective steps have been taken.

Those items identified as being contrary to ANSI Standards and Standing Order G-22 were corrected by craft personnel.

OPPD has revised Standing Order G-22 to ensure that tighter controls are placed on CQE material placed in Temporary Storage areas. The upgrade includes more frequent surveillances during times of increased activity such as outages. The procedure has been expanded to include specific instructions relative to placement, control, and removal of material in Temporary CQE Storage areas.

J.1 The installation of lead shielding continued without adequate controls after inspections by INPO in 1982 and 1984 had identified difficulties in the program, and after an IE Information Notice had been issued in 1983 addressing installation of lead shielding. (IR 50-285/85-29, D2.10-1)

This example is closed per Reference 7 based on the following information that corrective actions have been completed.

Subsequent to the findings of this inspection, lead shielding that had been identified in the shielding log was removed except for three previously analyzed locations (see Violation D, example 1). Locations where lead shielding was installed and removed have had a safety evaluation performed for the current configuration. It was concluded that no damage to piping, supports, or equipment occurred.

A walkdown of plant areas was completed to verify that temporary lead shielding has been identified. Health Physics, Maintenance, and Plant Engineering personnel have been trained on the procedures to install temporary shielding.

Significant changes were made to Standing Order G-57, Installation of Temporary Lead Shielding, in March, 1986. The Standing Order has been rewritten using INPO Good Practice TS-411, Temporary Lead Shielding, as a guideline. The new procedure outlines specific types of analyses which should be considered before installing temporary shielding and requires a safety evaluation be performed and attached to the Temporary Shielding Request Form. The Plant Engineer or his alternate must sign the Temporary Shielding Request Form, giving his concurrence for the shielding to be installed after ensuring the required analysis and safety evaluations are performed and attached.

Procedures have also been enacted to ensure that lead shielding that is approved for installation in accordance with Standing Order G-57 will be properly secured and supported in accordance with seismic and structural design requirements.

J.2 No program existed for the resolution of discrepancies identified by the System Acceptance Committee for those plant modifications which were accepted for system operation by the committee with outstanding discrepancies. (IR 50-285/85-29, D2.10-2)

This example is closed per Reference 7 based on the following information that corrective actions have been completed.

OPPD instituted the System Acceptance Committee to help ensure that a modification was properly completed. Standing Order G-21 has been updated several times to expand the thoroughness of the acceptance criteria and the requirements to document that the criteria have been met. It was always assumed that the responsible personnel assigned in the course of the SAC review would promptly correct any deficiencies/discrepancies. Because of the lack of specific designations of who was responsible to clear the discrepancies/deficiencies and because of the lack of a priority being assigned to closing out installed modifications, a backlog of modifications that were accepted with deficiencies/discrepancies developed.

In order to further enhance the Station Modification Control Program, OPPD personnel have developed computer programs to track outstanding discrepancies identified by the SAC for modifications installed during the 1985 refueling outage. The computer programs track the outstanding discrepancies and the person(s) assigned to implement the corrective action. This action ensures a more timely response to reported discrepancies than has been observed in the past.

The backlog of completed modifications with outstanding discrepancies/deficiencies was addressed. By August 31, 1986 all but two modifications were accepted. The two modifications that were the exception required additional analysis and/or field verification. These two modifications were accepted in January 1987.

Several modifications did not have sufficient documentation of the as built condition and were reclassified as "under construction".

ATTACHMENT NO. 4

CORRECTIVE ACTION IMPLEMENTATION PLAN

CORRECTIVE ACTION IMPLEMENTATION PLAN
(Design Change and Modification Program Review Committee)

Table of Contents

# 1. INTRODUCTION

At the conclusion of the NRC's Safety Systems Outage Modification Inspection (SSOMI), OPPD formed a Design Change Modification Program Review Committee to review the inspection findings, determine the root cause of the findings, and to perform a comprehensive review of programs and procedures by which OPPD administers and controls design changes at Fort Calhoun Station. The purpose of the review was to improve quality of the design change process used at Fort Calhoun Station. The scope of the review was not limited to the SSOMI findings; additional areas which relate to the design change process but were not a subject of SSOMI were also included.

The review employed an objective appraisal of programmatic methodologies in place at OPPD. It served to facilitate complete understanding of the concerns expressed by SSOMI and to evaluate the status of our program for plant modification. Several programmatic weaknesses were identified during the review; root causes were identified; and recommended corrective actions were formulated. The deliberations of the Review Committee were documented in a formal report.

The Design Change Program Review Committee Report was presented to OPPD Senior Management. Senior Management endorsed the recommendations given in the report and directed that a corrective action program be implemented to enact the recommendations.

Recommendations which were developed by the Review Committee have been transformed into action items contained in the following Corrective Action Implementation Plan (CAIP). The CAIP is OPPD's internal corrective action plan. The CAIP will be maintained as a living document and will be revised as necessary to reflect program progress and any changes that are identified which will enhance implementation of the various corrective actions.

Responsibility for completing each of the action items has been assigned and reporting requirements established to track status. Preliminary scheduled completion dates have been established as milestones. Action items are being incorporated into the Integrated Living Schedule (ILS) which is under development (See section 7.16). Final schedule dates will be provided to the NRC.

## 2. PURPOSE

The purpose of the Corrective Action Implementation Plan (CAIP) is to implement the recommendations developed by the Design Change and Modification Review Committee. The CAIP provides a living document which provides OPPD a comprehensive record of activities which are necessary to improve the quality of the design change process used at Fort Calhoun Station.

3. SCOPE

The initial scope of the CAIP will address the four major areas of the design process which were evaluated by the Design Change and Modification Program Review Committee. Within the four major areas, eighteen topics were reviewed.

Inputs

1. Design Basis and Construction QA Records
2. Updated Safety Analysis Report (USAR)
3. Documentation of Design Assumptions, Design Inputs, and Engineering Judgements
4. Commitment Tracking

Process

5. Design Change Program
6. Procurement
7. Safety Evaluations
8. Reviews and Approvals
9. Quality Assurance Program
10. Quality Control
11. Post-Modification Testing
12. Installation Procedures and Field Changes
13. System Acceptance
14. Emergency Modifications
15. Minor Modifications

Planning

16. Pre-Outage Planning (including Integrated Living Schedule)

Training

17. Training
18. Systems Engineers

## 4. BACKGROUND

A Safety Systems Outage Modification Inspection (SSOMI) was performed by personnel from the NRC's Office of Inspection and Enforcement during the 1985 refueling outage at the Fort Calhoun Station. This inspection, which was conducted between August 19, 1985 and December 17, 1985, was part of a trial (pilot) NRC program being implemented to examine the adequacy of licensee management and control of modifications performed during major plant outages. OPPD's Fort Calhoun Station was chosen because of the nature of the work being performed during the outage and the timing of OPPD's refueling outage. The objectives of this outage inspection program were to verify, through review of the licensees' program and inspection of selected work packages, that:

- effective controls for conducting modification and repair activities during outages exist,
- activities are accomplished in accordance with the established procedures and commitments,
- completed repairs and modifications have been properly designed, installed, inspected and tested, and
- affected systems are ready for safe startup and operation of the plant following a design modification.

The inspection was divided into three (3) areas: Design, Equipment Vendors, and Installation and Test.

Design Inspection

The results and conclusions of the design portion of the SSOMI are documented in NRC letter 50-285/85-22, dated January 21, 1986 (Reference 2). The inspection team reviewed OPPD's staffing and procedures and interviewed personnel to determine the responsibilities of and the relationships among the entities involved in the design process. Primary emphasis was placed upon reviewing the adequacy of design details (or products) as a means of measuring how well the design process had functioned in the selected sampling area. In reviewing the design details, the team focused on the following items:

- Validity of design inputs and assumptions
- Validity of design specifications
- Validity of analyses
- Identification of system interface requirements
- Potential indirect effects of changes
- Proper component classification
- Revision control
- Application of design information transferred between organizations
- Design verification methods

The following generic weaknesses were perceived by the SSOMI inspection team in the design control process: (Ref. 2)

- original design basis information (including calculations and specifications) has not been maintained in a workable form to assure that the original design margins are not unintentionally abrogated.

Background (Continued)

- post-modification testing procedures were inadequate to confirm that the physical modifications fulfill the functional design requirements of the system or component.

- several deficient conditions were identified concerning the performance of safety evaluations pursuant to 10 CFR 50.59.

- improper design control associated with emergency modifications.

Vendor Inspections

As a portion of the overall SSOMI, six vendors were selected by the NRC for audit. The six vendors supplied equipment or services to OPPD for use in, or in support of, the 1985 outage. The results and conclusions of these vendor inspections are documented in six (6) NRC Vendor Inspection Reports.

The NRC vendor inspection reports identified certain weaknesses in the vendors' QA/QC Programs; however, these problems were not identified as an OPPD deficiency or problem.

Installation and Test Inspection

The results and conclusions of the installation and test portion of the SSOMI are documented in NRC letter 50-285/85-29 dated March 19, 1986 (Reference 3). The inspection, which centered around 18 modifications accomplished during the outage, was installation and test oriented. Particular attention was directed toward the adequacy of installation procedures, conformance of the modifications to requirements, adequacy of functional tests, material control, and safety-related maintenance activities. This assessment covered the following areas:

- Effectiveness of controls for conducting modification work activities during outages,

- Accomplishment of modification work activities in accordance with the established procedures and commitments,

- Proper inspection and testing of completed modifications, and

- Readiness of affected systems for safe startup and operation of the plant following the outage.

The NRC inspection team concluded that certain weaknesses exist in OPPD's program for accomplishing outage modification work activities. However, there were no significant safety concerns identified. The NRC documented their concerns in the Notice of Violations, Reference 6 of the cover letter.

## 5. OBJECTIVES

The objectives of the CAIP is to implement the recommendations which were developed by the Design Change and Modification Program Review Committee. Specifically, the objectives are as follows:

5.1 Detail the action items to be completed which are necessary to implement the recommendations developed by the Design Change and Modifications Program Review Committee.

5.2 To inform OPPD management and personnel of action items to be completed, scheduled completion dates, and status.

## 6. ORGANIZATION AND MANAGEMENT

The CAIP will be conducted under the management and supervision of the Design Change and Modification Review Committee. The CAIP will provide for implementation of corrective actions to improve the quality of the design program.

Organization

1. Executive Steering Committee

   Division Manager, Nuclear Production, Chairman

   Division Manager, Quality Assurance & Regulatory Affairs

   Division Manager, Engineering

   The Executive Steering Committee will provide Management oversight of the Corrective Actions Implementation Plan. They will coordinate the interface between the Committee and Senior Management to support implementation of the corrective actions.

2. Working Committee

   Supervisor, Nuclear Regulatory & Industry Affairs, Chairman

   Section Manager, Generating Station Engineering

   Supervisor, Technical - Fort Calhoun Station

   Section Manager, Technical Services

   The working committee will perform a continuing review of the design change process and formulate recommended corrective actions for any weaknesses identified. The Committee will monitor the progress of corrective actions taken to determine status, ensure adequacy, and ensure schedule compliance. They will be responsible for coordinating activities conducted by their respective organizations and liaison between the organizations and the Review Committee.

## 7. AREAS REVIEWED

The following areas were evaluated by the Design Change and Modification Program Review Committee. As a minimum, the following sections include purpose, scope discussion, and action items which were established to improve the quality of OPPD's design program. Preliminary completion dates have been established. These dates will be finalized by means of the Integrated Living Schedule (I.S).

## 7.1.0 DESIGN BASES AND CONSTRUCTION QA RECORDS

### 7.1.1 Purpose

The purpose of the review of design bases documentation and construction QA records was to evaluate the status of the record situation at OPPD, their impact on the modification process and to develop a plan to improve the program for retention and retrieval of records.

### 7.1.2 Scope

The Review Committee evaluated existing design bases documents to assess the current status. The effort consisted of investigation of Construction QA records and storage, review of retrievability of records, utilization of current programs, and an assessment of potential improvements to present practices.

### 7.1.3 Definitions:

7.1.3.1 Design Bases: The design bases of Fort Calhoun is that information which identifies:

1. The Specific Functions to be Performed by the structures, systems and components; and

2. The Specific Values or Ranges of Values Chosen for controlling parameters as referenced bounds for design. These values may be:

   - Restraints derived from generally accepted "state of the art" practices for achieving functional goals or

   - Requirements derived from analysis (based on calculations and/or experiments) and/or regulatory requirements of the effects of a postulated accident for which a structure, system, or component must meet its functional goals.

### 7.1.4 Discussion

One of the generic concerns of the SSOMI team was that the original design bases information (including calculations and specifications) had not been maintained in a workable form to assure that the original safety margins are not unintentionally abrogated.

The design bases for Fort Calhoun Station is contained in many controlled documents and historical records that support the as-built structures, systems, and components. Examples of controlled documents include the USAR, Technical Specifications, drawings, modification documentation, specifications and the Fort Calhoun Operating Manual.

Historical records include original construction records, original specifications, calculations, analyses prepared in support of licensing commitments, and results of safety evaluations prepared in support of modifications, tests, and experiments. These records also support the original design of the plant.

OPPD had previously consulted with outside organizations and had implemented a Records Management System (RMS). An extensive effort was undertaken to classify and organize historical documents. To resolve the finding of the SSOMI team will require continuation of the document collection and retrieval process.

At the present time, Fort Calhoun records fall into one of the following categories:

7.1.4.1 Historical Records available within OPPD

1. Records which have been identified as QA records. These have been microfilmed and are accessed via the RMS. These consist of Operating, QA, Purchasing, and design records.

2. Construction records for Fort Calhoun which have been reviewed and sorted by record type and located in a storage vault in the Bekins Warehouse. These consist mostly of records obtained from the A/E and some may be considered construction QA records.

3. Records which are not yet classified. These are records, stored at various locations at OPPD, which are in the process of being reviewed or sorted. They consist of a large number of record types and cover more than one facility.

7.1.4.2 Historical Records stored by Vendors

Fort Calhoun design predates ANSI N45.2.9 (first issued in 1974). Consequently, vendors were not obligated to maintain all design records generated prior to 1975 as QA records. Design records generated by Combustion Engineering (CE), the NSSS vendor, are located in several CE facilities. Some of these records are mixed with other CE plant records. At this point, it is OPPD's understanding that records which were required to be retained per ASME requirements are stored at various manufacturing facilities and are in good condition. Discussions are underway to initiate a CE owner's group effort to index all CE design records so that these are easily accessible to various plant owners.

Similar problems may exist with other vendors such as General Electric but considering their limited scope, these records are not considered as high priority.

7.1.4.3 As-Built/Current Records

In January 1982, the District began a program utilizing six dedicated engineers and engineering technicians and later expanded the program to include nine personnel. This Update Team reviewed approximately 1,053 Design Change Requests issued from 1973 through 1980 and also reviewed approximately 30,400 maintenance orders issued during that same period. Based on their review, 2,363 plant drawings were revised and approximately 265 new drawings were made.

Concurrent with the update effort, extensive revisions were made to the District's modification control procedure to ensure that plant documents and design documents accurately reflect hardware changes made as a result of modifications. At the same time the District instituted a program whereby the operations staff can initiate changes to design documents through a Request for Document Revision (RDR).

The District also has a very effective program in place to ensure that the Control Room and other selected areas throughout the plant receive updated drawings important to operations through a timely controlled issuance. These drawings receive the highest priority for updating and distribution.

Additionally, design bases and design records have been updated as a result of several other issues e.g., NRC IE Bulletins 79-02 and 79-14 effort; 10 CFR 50.49; TMI issues etc.

7.1.5. Conclusions

The Review Committee evaluated the status of design bases records and determined that improvements need to be made. Interim requirements on design bases need to be established to ensure that near term modifications and procedure changes adequately address design bases requirements. A long term program needs to be implemented to collect, compile, and index available design records and produce a set of system based design bases documents. The scope of this program must still be evaluated. However, based upon the experience of other utilities engaged in this process, it is estimated that 48 months will be needed to complete the collection and compilation of available data, prepare justifications for missing records, and to produce design bases descriptions for CQE and other select systems.

7.1.6 Action Items

7.1.6.1 Interim Requirements on Design bases

1. Interim requirements need to be established to ensure that activities such as modifications, procedure changes, and safety evaluations can be continued without creating a possibility of unintentional abrogation of safety margins.

   Fort Calhoun USAR forms the basis of our license and contains a summary of OPPD's design bases. USAR contains details in the area of design commitments and functional requirements. The USAR, however, does not provide reference to back up calculations and lacks information regarding design details and design margins. Some of this information is contained in design drawings. The information provided in USAR and design drawings is adequate to help support modifications and procedure change activities provided any pending changes to USAR are taken into consideration.

For safety evaluations in addition to the design bases information provided in the USAR, bases of various technical specifications needs to be considered. In some cases bases section in the technical specification is brief and will require a supplement in the form of a review of any NRC Safety Evaluation Reports which pertain to the technical specification section in question.

In view of the above, the following interim policy has been adopted.

Fort Calhoun USAR in conjunction with any pending changes to Fort Calhoun design drawings and Safety Evaluation Reports used for amendments to the technical specification shall be used for providing design bases for activities such as modifications, procedure changes, and safety evaluations. Additionally, if the design bases calculations are not available, the design changes shall be based upon the assumptions that no design margins are available unless justified otherwise based on conservative assumptions and/or actual field verification. Alternatively, whenever required, design calculations and design bases shall be recreated to ascertain design margins and ensure that the activity does not result in an unreviewed safety question and/or deviation from any regulatory commitments.

The above policy has been incorporated into Fort Calhoun Station Standing Order G-21.

2. In order to support proper implementation of item 1 above, the following actions will be or have been completed to improve retrievability of available records.

   a. OPPD's Licensing Department has compiled a listing of Safety Evaluation Reports issued amendments to Technical Specifications and prepared a subject index to make these easily retrievable for performing safety evaluations.

   b. GSE has developed and implemented an indexing system for calculations and analyses which are in support of modifications. These records have been evaluated and indexed. This item has been completed.

   c. Licensing has included a method to disseminate information with regard to "pending USAR changes" into the USAR upgrade project. This item will be completed concurrent with the USAR upgrade (July 1988).

7.1.6.2 Reconstitution of Design bases

Responsibility for reconstitution of design bases has been assigned to Generating Station Engineering Section of OPPD. A program plan has been developed to identify user needs, establish schedules, establish the scope of work and priority of systems, and propose technical approaches. This program has been finalized through user interviews and comments. A project team has been established to meet the following objectives:

1. To locate, sort, and computer index the Fort Calhoun Quality Assurance (QA) construction records to ensure that these records can be readily retrieved with appropriate keywording.

2. To locate and organize design bases records in such a way that a set of system oriented design bases documents (DBD) can be generated. In addition, plant level documents will also be developed to address such generic subjects as seismic and fire protection. These DBDs will be prepared to reflect the current design condition of the plant, combined with an historical perspective of the justification for the current plant configuration or generic subject area. The DBDs will be controlled documents to be updated as plant configuration or issues change. The primary purpose of these DBDs will be to evaluate the impact of modifications and changes in operating procedures, to support safety evaluations, and to determine the impact of new regulations or regulatory concerns.

A summary of the proposed technical approach and a tentative schedule is provided in Attachment A to this section.

7.1.6.3 Design Bases Verification

There have been various walkdowns in the past, and some are still ongoing to verify the as-built conditions. Examples of these are the walkdowns associated with the P&ID Update project, drawing updating project (see discussion in item 7.1.4.3), the Environmental Qualification program, and the recent Auxiliary Feedwater System review performed by OPPD. It is intended to use the results of these walkdowns to verify the contents of the System DBDs where applicable. Where circumstances warrant, a new walkdown may be performed.

Additionally, the following activities are under consideration to verify the design bases.

1. Procedure Check: On completion of the design bases project, OPPD will verify that Operating Procedures, Emergency Operating Procedures, Abnormal Operating Procedures and Technical Data Book, unless justified otherwise, are in conformance with the design bases.

2. Commitments Verification: On completion of the commitment tracking system, the District will verify compliance on an as needed bases.

3. Functionality Check: On completion of the design bases project, OPPD intends to verify that safety systems and other selected systems can perform their intended functions. This verification is intended to be done as follows:

   a. Normal Mode Functions - Review of operating experience to verify that systems can perform their intended normal operating functions.

   b. Post-Accident Mode Functions - Systems that are required to function in post accident mode will be reviewed to verify that their ability to perform their intended post accident functions was not compromised through the modification process. This review will be based upon:

      - Review of applicable modification packages to ensure that appropriate post modification functional testing was done.
      - Review of surveillance test procedures and in-service program.
      - Review of operating experience.

      Systems for which their ability to perform intended post accident functions cannot be verified through a combination of above actions will be retested unless justified otherwise.

4. Safety Evaluation Check: Concurrent with the reconstitution project OPPD will review modification packages (for safety related modifications and non-safety related modifications which have potential to impact safety systems) installed after issuance of the license to confirm the adequacy of safety evaluations.

   The above evaluation will be based on the information contained in the design packages and no new detailed packages will be created. This effort will be part of design bases reconstitution project.

5. Limited Scope SSFIs: Maintenance procedures, in-service inspection procedures, and training activities will be audited to confirm their adequacy and wherever necessary corrective actions will be taken.

ATTACHMENT A

TECHNICAL APPROACH TO RECONSTITUTION
OF THE DESIGN BASES

The following is an overview of the technical approach and tentative schedule included in the program plan. A preliminary program plan which will be utilized to achieve the project objectives has been developed to establish organizational responsibilities, define scope of work, establish priorities, develop technical approach, and establish schedule. This program plan will be finalized prior to start of detailed work through user interviews and comments. The schedules provided below are tentative and demonstrate the emphasis placed on as much concurrent work as possible to achieve timely implementation.

Phase I. Record Indexing and Compilation

This phase consists of the identification of possible locations where records relating to Fort Calhoun may be stored including vendor locations. Once these records are identified and compiled, they will be sorted and indexed as described in the following tasks: First priority is being given to indexing Bekins Building records and this task should be completed by January 1988. This will be followed by indexing all other OPPD records which will be completed by July 1988. The remaining tasks cover indexing of vendor records. OPPD is participating in Phase I of the CE owners group project which has been initiated to develop scope for the indexing project. CE is proposing to index all their records by 1990 subject to receipt of authorization from participating CE Owners members. The final schedule will depend upon the results of Phase I effort.

Phase II. Development of Plant Level Documents

Plant level documents will be produced to record criteria, methods, and analyses which can be treated most efficiently and conveniently in common documents. The information in plant level documents lends itself to common treatment because it either:

- Deals with the results of analyses of events which impact the integrity or function of multiple systems and/or structures or
- Deals with criteria and/or methods which are generally applicable to many systems and/or structures

The convenience and efficiency is realized by use of a single source for each certain types of information. This source can be used as a reference for system and component level information presented in design bases documents (DBD) thereby reducing the amount of complex and repetitive detail which is put into the DBD. In addition, treating common information in common documents tends to promote consistency in its use.

The following are examples of plant level documents which will be prepared/updated:

- Fire Hazard Analysis
- High Energy Line Break Evaluations
- Environmental Charts
- Security Evaluation
- Plant Transient Analysis

The purpose of each plant level DBD is to document: (1) how that topic was considered in the original design of the plant; (2) how that topic was considered in subsequent modifications or reevaluations, and (3) how that topic will be considered in future modifications. The scope of the document will be to document OPPD's position for each of the appropriate topics.

Scheduled completion date is January 1989.

Phase III. Development of System Design Bases Documents (DBDs)

At this time it is contemplated that each package will include the following information for each system:

1. Functional Requirements
2. Regulatory Commitments
3. Design Assumptions and Inputs
4. Design Limitation/Margins
5. References to Support Data to Justify Design - This includes calculations, specifications, analyses, modification records, etc.
6. System Interactions
7. Construction QA and QC Records to support quality of components and adequacy of installation.
8. Design bases documents on a system basis.

The following specific tasks will be accomplished in this phase.

Task 1 Selection and prioritization of candidate systems for DBD development.

The plant systems will be ranked as to importance for DBD development. This ranking will depend on such factors as frequency of modifications and safety significance of the system.

Scheduled completion date is January, 1988

Task 2 First draft of DBD requirements section.

The objective of this task is to generate a set of design bases requirements using the information contained in the FSAR, modification packages, Safety Evaluation Reports issued by the NRC since initial licensing, and the commitment tracking system. From these requirements it will be possible to determine the records which are necessary to support these requirements.

Scheduled completion date is January 1989

Task 3 Finalize DBD

The final DBD can be written based on Task 2 effort and supporting documents indexed as part of the Phase I effort. From the supporting documents, such as calculations, will come such additional input to the DBD as the design assumptions and limitations/margins.

Scheduled completion date is January 1990

Task 4 Design bases verification (See discussion in item 7.1.6.3)

Scheduled completion date is April 1990

Phase IV. Evaluation and Recreation (If Necessary) of Missing Records

As a result of the efforts of Phase II and III, the DBDs will be written and the requirements compared with the information necessary to fulfill these requirements. There may be missing records, for example, calculations to support statements in the DBD. These missing records, will be evaluated to determine their safety significance and the need to recreate the information.

In those cases where it is determined that it is essential to recreate missing information, various methods will be considered. Such methods are (1) use of testing results in lieu of calculations (2) further searching of the reference data base to ascertain if this data was overlooked, and 3) recreation of necessary data.

The scheduled completion date will depend upon the scope of this effort which will be identified in the first three phases of this project and will be determined by April 1990.

Phase V. Revisions to the Design Bases Documents

Based upon the results of Phase III, Task 4 and Phase IV efforts, the design bases documents prepared as a result of Phase III, Task 3 effort will be finalized in this phase. Additionally, since the DBD will be controlled documents, a means must be provided to make changes, not only to the document itself, but also to the reference base. This is particularly necessary since Phase IV will be an ongoing activity and the changes will have to be reflected in the DBD. A procedure for controlling the DBDs will be developed.

Scheduled completion date is April 1990.

## 7.2.0 UPDATED SAFETY ANALYSIS REPORT (USAR)

### 7.2.1 Purpose

The purpose of the review of the USAR was to determine improvements which can be made in the USAR as it relates to the Design Change/Modification program at OPPD.

### 7.2.2 Scope

The Committee's review of the USAR was conducted to:

1. Formulate OPPD's policy pertaining to the USAR.
2. Identify programmatic improvements which can be made in the USAR.
3. Perform appraisal of OPPD's procedures for review and revision of the USAR.
4. Prescribe a program to implement changes which will provide improvements identified by the above reviews.

### 7.2.3 Discussion

#### 7.2.3.1 Programmatic Review of the USAR

The methodology used to prepare the first update of the original FSAR was in accordance with regulatory requirements. Guiding procedures for the update included all of the elements required by 10 CFR 50.71(e). As permitted by 10 CFR 50.71(e) a decision was made that the update should not increase the content or degree of detail contained in the original FSAR. The first update concentrated on a review of modification packages and revisions of drawings and figures.

OPPD procedures used to implement the requirements of 10 CFR 50.71(e) were found to be administrative in nature. The procedures adequately address the review, approval, and submittal of annual updates to the USAR but more guidance regarding applicable regulatory requirements, responsibility, purpose, definitions, format, content or degree of detail to be included when preparing a revision, and how to determine if an update is required, would provide standardization and consistency of updates.

Programs within OPPD to address the training of individuals who are responsible for preparation of revisions to the USAR would improve the USAR. The Committee concluded that instructional programs which address regulatory requirements, purpose of the USAR, and content, and detail that is expected to be included in revisions should be implemented.

7.2.3.2 Policy for the USAR

The proposed scope of the USAR and the detail to be included, and the frequency of revisions were discussed by this Committee. The following specific policies for the USAR were identified:

a. Purpose of the USAR:

1. The USAR is the fundamental document which summarizes the technical basis of the license for Fort Calhoun Station. The USAR informs the NRC of the nature of the plant and plans for its use. The information contained in the USAR provides technical information and analyses to support the conclusion that the facility is constructed and can be operated without causing undue risk to the health and safety of the public.

2. The USAR documents a summary of the design bases, design evaluation, descriptions of components and systems, and safety analyses that verify that the use of the facility will not pose an undue risk to the health and safety of the public. The USAR provides a summary of supporting detail for the bases and limits provided in the Technical Specifications. The information contained in the USAR supports appropriate limits of plant operation that are incorporated in the Technical Specifications.

3. The USAR describes how OPPD has incorporated applicable design and operating commitments into the facility. The USAR describes how changes in commitments are reflected in design changes and the effect that these changes have on the safety of the structures, systems, components, and procedures that were modified.

4. The USAR serves as a reference for OPPD personnel when performing Safety Evaluations of proposed changes to structures, systems, components, and procedures. Information contained in the USAR is used to determine if a proposed change can be made to the facility or procedures without prior approval of the NRC.

b. Detail to be included in the USAR:

The combination of detail included in text, tables, drawings, and figures should be sufficient to describe the nature of the plant and its use without the need of other documentation. Detail should be more than brief descriptions and summary analyses. Detail should be sufficient to permit the determination that the facility is designed and operated without undue risk to the health and safety of the public. The information should support the applicable design bases, limits, and safety margins that are specified in the Technical Specifications.

The specific details included should be sufficient to clearly identify how the design meets commitments to codes, standards, and regulatory requirements. A USAR user should be able to determine from the detail provided in the USAR that proposed changes to the structures, systems, components, and procedures can be accomplished within the bounds of the safety analysis.

The information should identify the specific functions to be performed by a major component or system in terms of performance objectives together with specific values of range or limits for design. Such limits may be restraints derived from generally accepted "state of the art" practices for achieving functional goals (such as a "no-center melting" restriction placed upon fuel design) or requirements derived from calculating the effects of a situation representing an upper or lower limit which a component or system could reach under credible circumstances.

Design evaluations should present a study of the functional and physical features of the major plant systems and components to determine:

1. Whether the design can or has met performance objectives with an adequate margin of safety.

2. The identity of and susceptibility to failures, either in equipment or control of process variables, which could be initiating events for accidents.

Safety analyses should present a study of predicted responses of the reactor plant to postulated failures to determine, with reasonable assurance, whether the plant has the capacity for preventing accidents or mitigating their effects sufficiently to preclude undue risks to public health and safety.

c. Frequency of Revisions to the USAR:

10 CFR Part 50.71(e) requires that the USAR be updated at least annually. The update must include effects of changes made to the facility or procedures as described in the USAR; safety evaluations performed by the licensee either in support of requested license amendments or in support of conclusions that changes did not involve an unreviewed safety question; and analyses of new safety issues performed by or on behalf of the licensee at Commission request during the past year and must be submitted no later than six months after January 22 of each year. The Committee recommends that revisions should be finalized as soon as possible after a change has been completed in lieu of the present practice of preparing revisions annually.

For facility modifications, the sections of the USAR that require revision should be identified in the final design package. The final revision (with any drawing changes) should be forwarded to Licensing not later than 90 days after SAC acceptance of the

Modification. Licensing would finalize the changes, review, and distribute revisions. The USAR revision would then be submitted to the NRC as required by 10 CFR 50.71(e). The above process would apply equally to minor, normal, and emergency modifications.

7.2.4.3 Program to Improve the USAR

1. Procedures should be revised to improve guidance for the preparation of USAR revisions. The procedures should provide the following:

   a. Assign overall responsibility for the USAR.

   b. Establish specific responsibilities for all appropriate divisions.

   c. State OPPD's purpose for the USAR.

   d. Summarize the regulatory requirements that control the USAR.

   e. Prescribe the organization and content of the USAR.

   f. Define the terms used in the USAR.

   g. Define the degree of detail to be included in the USAR.

   h. Establish review of proposed changes for applicability and accuracy.

2. A training program should be developed to ensure that individuals responsible for preparing revisions are knowledgable of OPPD's procedures and other requirements relevant to the preparation of adequate USAR revisions. As a minimum the training should cover the following topics:

   a. Responsibilities to the overall licensing process for the plant.

   b. Regulatory requirements pertaining to the USAR including OPPD interpretations and objectives.

   c. OPPD's procedures for USAR revisions.

   d. Identification of USAR revisions.

3. Safety Evaluation Reports and the substantiating information that was provided to the NRC should be incorporated into appropriate sections of the USAR.

4. The frequency for preparing revisions should be changed to provide expedient updating of the USAR. Revisions should be prepared, reviewed, and approved in a manner that minimizes the time interval between completion of a change and finalization of the updated USAR.

7.2.4 Conclusions

Areas were identified where programmatic improvements can be made in the USAR. Information provided by the USAR should contain sufficient detail and content to completely respond to the purposes for which the document is planned to be utilized.

7.2.5 Action Items

The following action items have been initiated to improve the quality of the Fort Calhoun Station USAR and address the conclusions of the Committee

7.2.5.1 A comprehensive evaluation of the USAR has been completed.

7.2.5.2 Guidance for the purposes to be addressed by the USAR, and the detail to be included when preparing USAR revisions has been included in the document which establishes OPPD policy discussed in paragraph 7.2.5.4.

7.2.5.3 A program for listing Safety Evaluation Reports which are to be reviewed in conjunction with 10 CFR 50.59 reviews of the USAR has been completed.

7.2.5.4 An OPPD policy which establishes the standards to be maintained in the USAR has been developed and is presently undergoing review.

Scheduled completion date is January 1988.

7.2.5.5 Procedures to establish guidance for identifying and preparing revisions to the USAR have been prepared and are undergoing review.

Scheduled completion date is January 1988.

7.2.5.6 Develop a training program for individuals that are responsible for preparing revisions to the USAR.

Scheduled completion date is February 1988.

7.2.5.7 Initiate a program to incorporate information which has been submitted to the NRC but was not incorporated in the 1982 update of the USAR or subsequent annual revisions.

The Design Bases, Design Evaluation, and Safety Analysis sections will be revised to incorporate information developed as part of the corrective action related to Design Documentation.

Scheduled completion date is consistent with Design Bases Development, see Section 1.

7.2.5.8 A program to compare the Technical Specification with the USAR to ensure that the USAR supports the information provided in the Technical Specifications and that there is consistency between the two documents has been completed.

## 7.3.0 DOCUMENTATION OF DESIGN ASSUMPTIONS, DESIGN INPUTS, AND ENGINEERING JUDGEMENTS

### 7.3.1 Purpose

The Review Committee evaluated the SSOMI Reports to evaluate the cause of the problems and to propose corrective actions.

### 7.3.2 Scope

The review in this area encompassed engineering, operations, and quality assurance procedures related to the Design Change/Modification Control program for Fort Calhoun. This procedural review considered Quality Assurance procedures for control of plant design and modifications, GSE procedures for developing design packages and specifications, and Operations procedures on documentation.

In addition, OPPD personnel involved in the design change program were interviewed for input and perception of the current process. Furthermore, procedural guidance was assessed versus the need for formal training programs in this area. The Committee evaluated the availability of existing documentation and why assumptions were made versus the use of available data.

### 7.3.3 Discussion

At the present time, OPPD procedures can be broken down into six major categories that encompass the overall design change program at Fort Calhoun. These six categories cover:

1. Preparation of design packages
2. Checking and approvals of design packages
3. Installation and testing of design packages
4. Field changes to design packages
5. System Acceptance
6. Closeout

In general, these areas are covered by QA procedures 5.1, 5.2, Fort Calhoun Station Standing Order G-21 and GSE Procedures A-2, A-5, B-2, B-3, B-7, B-9, B-11, and B-14. A review of these procedures shows that QA procedures 5.1 and 5.2 suitably and adequately address NRC concerns and the necessity for documenting design inputs and assumptions is identified in the procedures. However, the existing procedures can be improved to provide better guidance. In addition, there appears that additional training would be useful in this area.

The second area of procedural guidance covers checking. Again, it appears that existing procedures identify the requirements, but GSE and Plant procedures would be enhanced by incorporation of greater detail. Training which covers what is required to verify or document design bases should be implemented.

The installation and testing portions of modification packages are encompassed by the previously mentioned procedures as well as QA procedures 7.1 through 7.4 and 8.1 through 8.4 inclusive. The testing portions of the review have been identified by the Committee as an area to be covered independently in Section 7.11 of this plan.

In the area of installation, the SSOMI findings primarily centered on concerns about documentation of the installations. This included items such as procedure changes, engineering analyses of safety analyses, etc. These findings and a procedure review indicate an enhancement of procedural guidance and training in this area would result in program improvement.

The fourth area, field changes to design packages, is an area where assumptions are frequently made for "on-the-spot changes". SSOMI findings in this area were concerned with documentation of safety analyses, unapproved changes, and field alterations without calculations to justify the assumptions. Reviews of existing procedures show that the area of procedural guidance and training can be strengthened.

The fifth and sixth areas, covering system acceptance and closeout, were cited by the SSOMI team for lack of corrective actions in resolving discrepancies identified by the System Acceptance Committee, and the untimely closeout of Emergency Modifications. Detailed discussions of these processes are contained in Sections 7.13 and 7.14.

In addition to procedural reviews of the above, the area of existing documentation was evaluated. The committee reviewed the accessibility of existing documentation and the availability of information required to allow engineering/operations personnel to exercise good engineering judgement in making assumptions. At the present time, some of these documents:

1. Are stored in file drawers at the Bekins storage vault.

2. Are partially indexed.

3. Are entered into OPPD's Records Management System but detail is lacking.

This requires that whenever a new component or structure is added to Fort Calhoun, the Design Engineer starts over with a new calculation or analysis. At times, these calculations and analyses might lead to a perception of incomplete documentation of engineering judgements because of the lack of original documentation.

Improving the availability of existing records would result in:

- Man-hour savings used for recreating original plant design documents.

- Increased accuracy in engineering assumptions.

- Savings in construction costs due to less need for conservatism in design since the actual design bases would be known.

This evaluation further supports the conclusions and action items given in Section 1, Design Bases.

7.3.4 Conclusions

The Review Committee has concluded that there are areas in which OPPD can improve present practices of documentation of design assumptions and design inputs. These are in the areas of procedural guidance, training, and improvements to information management systems. In the past, the emphasis has been on documentation which is required for internal reviews. Changes should be made to ensure adequate documentation for auditability of records.

7.3.5 Action Items

The following action items have been established to improve the quality of OPPD's design program.

7.3.5.1 Actions will be taken to develop a program outline, resulting in a plan and schedule for updating/ improving existing procedures. In addition, a training program will be implemented to emphasize the necessity for documentation.

Scheduled completion date is December 1987.

7.3.5.2 Update and revise procedures and prepare new guidance documents in accordance with the plan developed in 7.3.5.1. The procedures and guidance documents, when completed, will provide a program to support documentation of:

- Design Bases
- Design Inputs
- Design Assumptions (stated and implied)
- Safety Evaluations
- Specification Inputs and Assumptions
- Technical Evaluations and Checking

Scheduled completion date is March 1989.

7.3.5.3 Training will be implemented on a continuing basis regarding the necessity for documentation of any assumptions and inputs.

Scheduled completion date is January 1988.

7.3.5.4 Establish design bases documentation utilizing construction QA records, where available, supplemented by additional analysis as required. This is discussed in depth in Section 7.1

See Section 7.1 for scheduled completion dates.

## 7.4.0 COMMITMENT TRACKING

### 7.4.1 Purpose

This review was conducted to determine what improvements would be attained by implementation of a Commitment Tracking System.

### 7.4.2 Scope

The Licensing Department had previously completed a scoping plan in order to review the existing commitment tracking and review practices performed by the various OPPD departments. This review was completed to evaluate the adequacy of current practices and develop recommendations for continued program development. Interviews were conducted with various department heads to determine existing departmental work practices and systems utilized in the review, tracking, and implementation of requirements and commitments affecting OPPD. Recommendations were received from the various organizations on how the current system could be enhanced to provide a more useful and comprehensive tool for tracking and analysis of specific requirements and their impact. This commitment tracking program plan has been approved and implementation is in progress.

The group reviewed the prior work on Commitment Tracking with the purpose of identifying any additional recommendations or ways to improve the program plan. The following sections provide details on the program plan.

### 7.4.3 Discussion

The existing OPPD Commitment Tracking Program is controlled by Nuclear Production Procedures NPD-G-2, NPD-G-3, and NPD-G-15. These procedures control the receipt and review of NRC correspondence and identify departments and individuals responsible for the analysis of, and response to, commitment requirements in correspondence to and from the NRC. A bi-weekly report, the "Integrated Regulatory Requirement Log" (IRRL), is generated and transmitted to the various departments. This report indicates the origin, responsible organization and current status of the review of requirements received in various NRC documents and correspondence. A well-formatted report utilizing clear, concise descriptions and review responsibility categories, the IRRL provides a useful tool for the review and response status tracking of active commitment items, items currently under review for applicability and impact on Fort Calhoun. However, the current program, as originally conceived and developed, was not intended to provide a historical record of past commitments for use by the various review organizations. This lack of historical perspective creates the potential for duplication of review effort, conflicting compliance documentation, changing of prior commitments, and affects reviews which are based on historical data. This can be costly from a fiscal and manpower standpoint. Areas for potential program enhancement, as identified by the various user groups, included the following:

a. Detailed History Base

The historical base, consist of the memories of staff personnel, their personal files, and Licensing/Corporate files, against which new requirements/commitments received may be compared to indicate instances of duplication or conflict with previous obligations. This condition was identified as the most important among the various users.

b. Periodic Reports

Several items in the "Recurring Report" category which are generated in accordance with various departmental procedures do appear in the IRRL. However, the vast majority of these periodic reports do not appear. The inclusion of only a portion of these reports in the Action Log creates confusion in review priority for the various users.

c. Categorization

The broad basis used in priority categories creates difficulties in review prioritizing. An improved breakdown of categories to assist in review prioritization is currently underway.

d. Organizational Checks

A formal, integrated program for determining the relationship of items under active review and the potential impact they may have on various organizations and their operational procedures would improve assurances that all items are tracked.

e. Implementation Assurance

Once a response to a commitment is made, an established follow-up mechanism would ensure continued compliance and augment SARC review of items of specific interest and QA Audits.

f. Periodic Review

The internal mechanisms utilized to ensure continued compliance with prior commitments should be tracked in a formal manner or cross-referenced to either programs established by other departments or to related upper tier documents.

The intent of the Coordinated Commitment Tracking Program is to utilize the best available data and programmatic approaches to provide the most accurate, concise, and consistent information in a readily accessible, easily utilized format.

The program plan is designed to provide OPPD the following:

- A source of consistent data
- A source of detailed design commitments
- A source of detailed operational/administrative commitments
- A source of information for implementing actions/documents

Making this information available to the many user groups will provide benefits in:

- Reduction in redundant research
- Reduction in the potential for conflicting actions
- Reduction in the potential for inconsistent policies and actions
- Reduction in the potential for regulatory sanctions based on incorrect or incomplete actions

The ability to integrate or translate existing systems and their functions should be considered a growth requirement for any system implemented. This integration and translation not only provides cost savings benefits but utilizes the wealth of data that currently exists that should be available to all divergent user groups.

By incorporating existing programs, OPPD can ensure that any action planned or taken shall be consistent with current practice. An enhanced Coordinated Commitment Tracking Program can be used to eliminate data and action inconsistencies, as a trending tool, and as a means to ensure that any item or action under consideration is thoroughly reviewed for impact on aspects of plant operation.

The addition of a Commitment Tracking System philosophy and its importance in the General Employee Training Program provides each employee with a knowledge of the fiscal and physical plant benefits of all users having a common "language". Ongoing verification of data efforts, procedurally conducted, provides the user with confidence that adequate and accurate data exists to make decisions accurately and in a timely manner. With such a program, plant management and the various regulatory agencies to which they must respond, can have the confidence that the data exists and is as it should be.

7.4.4 Conclusions

The Design Change Review Committee concluded that

a. A Commitment Tracking System can be a very helpful tool in improving the quality of design packages issued by GSE by providing easy access to design bases requirements.

b. A Commitment Tracking System is necessary to ensure OPPD does not arbitrarily change a commitment without either notifying the NRC or seeking their approval.

c. Commitment Tracking System should be developed with the following objectives:

- Identification of all programmatic commitments made (e.g.: administrative programs, procedure development, etc.) to the NRC, INPO, and various other regulatory agencies.
- Comparison of commitments to current policies and procedures.
- Assist planning for the identification and elimination of deficiencies and excessive practices.
- Correlation of commitments and their implementing procedures.
- Integration into a computer system that allows on-line interaction with the commitment data for the various user groups.
- Ensuring continued compliance with design requirements.
- Development and maintenance chronology of standards and requirements.

d. A phased approach should be taken to implement the Commitment Tracking System.

7.4.5 Action Items

The following action items have been initiated to improve the quality and retrievability of commitments.

7.4.5.1 A program plan to implement Commitment Tracking has been developed.

7.4.5.2 Improve the existing tracking system to ensure that the commitments will be accessible from historical files by OPPD personnel. This effort requires a review of current and past correspondence to identify the following information:

- Unique identifier with type and category information
- Source document information, revision, date, and section (paragraph, page, etc.)
- Sub-tier source document information, as applicable, including revision, date, and section.
- Plant system or component designation, if applicable.
- Periodicity, milestone tie, priority, as applicable.
- Identification of documents which record corrective actions.
- Document title or brief description.
- Organization originating document and responsible for its maintenance.
- Section number(s) of document pertaining to the commitment.
- Indications of deficiencies or variances.
- Listing of implementing/affected documents (e.g., procedures, including number, date, revision/issue number, category).
- Listing of cross reference documents.

The historical data should be accessible by:

1. IE Bulletin #
2. IE Circular #
3. INPO Document #
4. Regulatory Guide #
5. IEEE Publication #
6. Other NRC/Industry Documents
7. Equipment Tag #
8. System Code
9. Vendor
10. Type of Equipment
11. Equipment "No-No" List
12. Vendor "No-No" List
13. Plant Documents (e.g., procedures, etc.)
14. IE Notice #

Scheduled completion date is July 1988.

7.4.5.3 OPPD initially planned to create Licensing Review Packages from available data and incorporate them into the data base utilizing IRRL I.D. numbers as identifiers for closed items not on the current IRRL. While these items would not be a "complete" review package, they were intended to provide a record of items reviewed in the past. This approach has been modified.

OPPD is in the process of reviewing regulatory correspondence for the years 1973 through 1986 as well as the USAR, ER, and FES, and significant progress has been made. This is a significantly larger and more comprehensive effort than required by the initial commitment as it includes identification of hundreds of previously untracked commitments in addition to those represented in past action logs. As a result, instead of upgrading previously closed RRD items as a separate effort, those commitments will be reidentified according to the new more complete definition of a commitment, and entered onto Commitment Identification Forms for inclusion in an expanded historic data base.

This approach is expected to yield a more coherent overall historic record than would be achieved by isolated review of existing RRL packages. The completion of the review of the specified correspondence, the USAR and the Environmental Report is address by 7.4.5.3, below. Because of the interrelationship of this task and the task discussed below, the scheduled completion date will correspond to the December 1988 date given for 7.4.5.4.

7.4.5.4 Utilizing a unique set of identifiers for Licensing Review Package I.D. numbers, create Packages based on commitments contained in various design-based and operational documents. Sources of commitments to be reviewed would include:

1. Updated Safety Analysis Report and Updates
2. Environmental Report
3. Emergency Plan; Site Security Plan
4. Code of Federal Regulations
5. NUREGs
6. NRC, INPO Correspondence - Incoming/Outgoing (Including Safety Evaluation Reports and Supplements, IE Bulletins, IE Circulars, IE Notices, Generic Letters, NRC Inspections, LERs)
7. Regulatory Guides
8. Industry Standards (e.g., IEEE, ANSI, ASTM, ASME)
9. Plant Technical Specifications
10. Operating Incident Reports

Items 5, 7, 8 will be done in conjunction with the Design Bases records effort.

Scheduled completion date for items 1, 2, and 6 is July 1988.
Scheduled completion date for items 3, 4, 9, and 10 is December 1988.

7.4.5.5 Utilizing a unique set of identifiers for Licensing Review Package I.D. numbers, create packages based on commitments contained in telephone conversations, meeting notes, or other forms of miscellaneous correspondence with the NRC since 1973. The intent of this review is to detail commitments made which may not be reflected in the various, more formal forms of regulatory correspondence.

Scheduled completion date is July 1988.

7.4.5.6 Once the database is established, a verification will be done of selected items to ensure that what we have committed to is, in fact, implemented.

For the purposes of accessing historical data, which is primarily of a correspondence nature, a system capable of Text Management is required. The ability to search for records, both current and archived, from both keyword and cross-referenced perspectives, is of paramount importance in the establishment of a commitment tracking program that is to be utilized as a data reference or trending analysis tool. In conjunction with the OPPD Records Management, Computer Operations, and other appropriate departments, OPPD will develop and/or procure an application software program with these capabilities.

The tag numbers, system identifications, and other reference documents will be consistent with similar identifiers used in the Computerized History and Maintenance Program System (CHAMPS).

Scheduled completion date is July 1988.

## 7.5.0 DESIGN CHANGE PROGRAM

### 7.5.1 Purpose

The entire design change process was reviewed with an objective of streamlining the modification process to be more responsive to OPPD's needs.

### 7.5.2 Scope

The review evaluated Fort Calhoun Standing Order G-21 with the objectives of improving the quality of the modification process and developing a flow path that optimizes the time between initiation of a request for engineering assistance, evaluation, preparation of design, installation, testing, plant acceptance, and document updating. The division of responsibilities was reviewed for areas of duplication and overlap. In addition, appropriate INPO documents were considered in this review.

### 7.5.3 Discussion

#### 7.5.3.1 Description of the Design Change/Modification Process

The design change/modification process, even for a simple modification, involves many OPPD resources. To effectively execute a design change at Fort Calhoun Station, the numerous tasks and interfaces must be completed in a thorough and timely manner. A brief overview of the Design Change/Modification process is given below. This discussion is also included to assist in orienting the reader to the interrelation of the various elements considered by the Committee in the course of this review.

The requirement to execute a change (Engineering Evaluation and Assistance Request - EEAR) to the plant design is initiated by some "driver." This driver may be generated internally by a need identified to improve operation or it may be generated externally by generic safety improvement programs ordered by the NRC. Some examples of drivers that commonly initiate plant modifications are:

1. IE Notice
2. IE Bulletin
3. Facility License Change
4. Operation Incident Report/Licensee Event Report
5. Topical Report
6. Employee Request
7. Operations or Maintenance Enhancement
8. NRC Generic Letter

The EEARs are first evaluated by plant engineering before being forwarded to Technical Services through the Nuclear Production Division Manager. The EEAR is then reviewed by Technical Services to determine if a modification is required. The EEARs requiring modifications are

then routed to Generating Station Engineering for preparation of design packages. Modification Requests with an active status are assigned to Design Engineers for preparation of design packages per GSE Procedures. The design packages receive several layers of review prior to final acceptance.

Near completion of the Final Design Package a safety evaluation is performed to determine if the change can be made without prior approval of the NRC. This evaluation is performed in accordance with 10 CFR 50.59. The safety evaluation requires reference to the USAR and the Technical Specifications. If the safety evaluation indicates that the change does not create an unreviewed safety question (URSQ), the design modification can be completed under the provisions of 10 CFR 50.59. If the evaluation determines that the design modification would cause an unreviewed safety question, a request must be initiated and NRC approval must be obtained prior to installing the modification or the design must be altered such that an URSQ is not involved. The Final Design Package is then submitted to the Plant Review Committee for review and approval.

After approval of the Final Design Package by the PRC, the Construction Package is completed. The Construction Package includes all drawings, procedures, installation procedures, QC inspections, and test procedures required to install the modification. The completed Construction Package is submitted to the PRC for final review and approval prior to installation.

During installation, field changes are made to the Construction Package as necessary to resolve interferences and unforeseen circumstances. These field changes are processed according to governing procedures and are incorporated into the as-built design modification file.

Final revisions to plant documents are prepared and submitted to the PRC prior to System Acceptance. The System Acceptance Committee (SAC) either accepts the modification, accepts the modification with deficiencies, or rejects the modification. Any deficiencies noted by SAC must be corrected within 90 days.

As part of the modification close out, documentation and drawings are revised to show the as-built condition of the modification. The applicable Design Basis Documents are updated to reflect the effects of the modification.

7.5.3.2 As can be seen from the above description, the modification process requires several layers of reviews and approvals, both before and after an EEAR is classified as a Modification Request. It should be noted that not all EEARs become modification requests, however, it is important that the EEARs which do become modification requests be routed to Engineering as soon as possible.

7.5.3.3 The EEARs are first evaluated by plant engineering before being forwarded to Technical Services through the Nuclear Production Division Manager. The review committee believes that time savings can be realized by routing the EEARs which are considered obvious modification requests, directly to Generating Station Engineering for action. Technical Services will continue to be involved in the review of design packages and post modification testing, thus ensuring their input in the total process.

7.5.3.4 Four levels of priority classifications are discussed in Standing Order G-21. However, "Need dates" and schedules are determined at meetings between Fort Calhoun staff, GSE, and Technical Services. This ensures more responsiveness from GSE to the plant's needs.

7.5.3.5 Sections 7.8, 7.14, and 7.15 provide additional discussion on streamlining the emergency modifications, minor modifications, and design review process.

7.5.4 Conclusions

It was concluded that the flow path for routing of the EEARs and design packages can be streamlined by routing the EEARs which are determined to be modifications by plant engineering, directly to GSE.

7.5.6 Action Items

The following actions items have been established to improve the quality of the Design Change Program.

7.5.5.1 Fort Calhoun Standing Order G-21 has been revised to allow routing of EEARs requiring modifications as determined by plant engineering and approved by Plant Manager, directly to GSE without Technical Services' review and approval. This will help streamline the modification process.

7.5.5.2 Plant Standing Order G-21 will be reviewed and purged of design requirements type information. This and some of the other details more appropriately belong in other applicable implementing procedures. It is expected that these changes will streamline Standing Order G-21 and would more clearly define the requirements.

Scheduled completion date is June 1988.

## 7.6.0 PROCUREMENT

### 7.6.1 Purpose

The purpose of the review was to identify the root causes for a variety of findings identified by the NRC inspection team as procurement-related and to develop improvements.

### 7.6.2 Scope

The scope of the review was to evaluate the various steps leading up to and resulting in the successful acceptance of a product, component, or service by OPPD and temporary storage before installation. The following activities, as they relate to procurement, were investigated:

1. Specification Development
2. Vendor Selection and Controls
3. Receipt Inspection
4. Procurement and Dedication of Commercial Grade Equipment
5. Temporary Storage Prior to Installation

The above items were reviewed in order to:

- Identify improvements which can be made in the overall procurement process.
- Develop action items to implement the improvements which are identified.

The scope of the review included an assessment of existing procedures to determine their adequacy in the light of the SSOMI team findings. The team evaluated the following procedures:

| Title | Number | Division |
|---|---|---|
| a. Nuclear Procurement Control | NPP-1 | MM |
| b. Outside Engineering Services | A-4 | ENG |
| c. Procurement Material and Labor | A-5 | ENG |
| d. Production of Design Descriptions and Evaluation - Nuclear Modifications | B-2 | ENG |
| e. Design Verification | B-11 | ENG |
| f. Maintenance Orders | G-17 | NPD |
| g. Station Modification Control | G-21 | NPD |
| h. Temporary Storage of CQE Materials | G-22 | NPD |

### 7.6.3 Discussion

As reviewed by the SSOMI Team, "procurement" encompasses the entire range of activities leading up to obtaining a product or service. In addition, this process also included the identification of and requirements for any special analysis or procedures to install the component in the Fort Calhoun Station, or to obtain services relating to Fort Calhoun and temporary storage prior to installation.

7.6.3.1 Specification Development

a. Technical Requirements

As a fundamental portion of any procurement program, an analysis is required to determine the specific properties and functions of the components to be procured. For any facility, it is imperative that the operating characteristics of the equipment be identified and closely defined prior to any procurement activities. For a nuclear facility, the engineering aspects of procurement should also take into account any special requirements such as seismic analysis and qualification, operability in harsh environments, fire protection criteria, failure modes, and the material type to be used, to name only a few.

Furthermore, for a nuclear facility, the process of defining these parameters must be well documented and retrievable.

OPPD's procedures and checklists specifically call for reviews of such inputs and parameters required for components. Additional training of personnel to ensure that the proper requirements are analyzed and included in procurement documents would enhance the procurement process. In addition, procedural guidance should be developed to assist in identifying applicable criteria.

Further development of procedural guidance should be pursued to result in a set of standard criteria documents identifying and specifying generic parameters associated with any component. These standard criteria could then be included with procurement documents to provide guidance to vendors and to ensure uniform specifications throughout OPPD.

b. Services

Frequently, various groups require assistance from outside firms; this may be due to a lack of resources in-house or the need for special expertise.

OPPD's procedures and checking requirements for issue of purchase orders for this type of service can be improved to more explicitly define requirements for outside firms. In addition, training should be conducted to familiarize OPPD personnel with the necessary prerequisites to procuring outside services.

c. Specification Development

At the present time OPPD utilizes two methods for identifying specific component requirements for Fort Calhoun. These consist of engineering analysis and preparation of a technical specification, or an engineering analysis which leads to selecting a specific component by catalog number. The SSOMI team observed that improvements could be made in this area to ensure compatibility of equipment with plant requirements, and to ensure adequate documentation for design verification.

The Review Committee evaluated this area and has identified improvements to existing procedures and further procedural guidance in specification preparation. In addition, Quality Assurance would be more effective if the technical areas requiring inspection are clearly identified. Development of standard criteria and specifications as discussed previously will also simplify future work in this area.

7.6.3.2 Vendor Selection and Controls

The Committee reviewed OPPD's methods of selecting vendors and verifying that the services supplied are controlled and meet the Quality Assurance requirements of 10CFR50, Appendix B.

It was noted by the NRC that of the vendors audited, all had some observations/findings relative to their internal QA/QC programs. Future QA audits should reflect this awareness and appropriate auditing steps should be taken.

7.6.3.3 Receipt and Procurement Inspections

Discussions with QA indicate that additional guidance from Engineering would be valuable in developing requirements for receipt inspection and/or shop inspections of modification-procured materials. The procurement process was reviewed to determine the organization within OPPD that is best suited for the identification of receipt inspection requirements. It was concluded that further work will be required by Engineering and Quality Assurance to develop guidance in this area.

7.6.3.4 Procurement and Dedication of Commercial Grade Equipment

Commercial grade equipment (e.g. nonengineered items) are simple, complete, functional products with a standard design, manufacturing, and fabrication process. They are identified in specifications and drawings involving erection work by reference to a manufacturer's catalog or part number (e.g., ASTM A36 bolt, ½" x 3" hex head). Procurement requirements are included in specifications, data sheets, and/or purchase orders. A corporate procedure to guide/govern the procurement and application of this type of equipment would improve the procurement process.

7.6.3.5 Temporary Storage Prior to Installation

Several comments were provided by the SSOMI team in the area of temporary storage of CQE materials. Standing Order G-22 should be reviewed to ensure that these areas are addressed. Receipt and control of modification-related materials, needs to be studied and a plan developed to ensure that such materials are properly stored and tracked.

7.6.4 Conclusions

It is the conclusion of the Review Committee that improvements can be made to the procurement process, through training and procedure revisions, which will ensure that OPPD meets, and will continue to meet in the future, all NRC requirements for procurement of equipment and services. In addition, the Committee has identified a specific need for further training to be provided and for the development of specification criteria and standardized specifications.

7.6.5 Action Items

The following action items have been established to improve the quality of OPPD's procurement activities.

7.6.5.1 Specification Development

Procedures that define OPPD methods for specifying equipment and vendors have been reviewed. Goals were to identify specific training and guidance requirements and to provide a guide for the development of new procedures. As a result, Engineering Standard GEG-2, "Guideline for Preparation of Procurement Specifications" has been prepared and implemented. The document is basic and self-explanatory so that specialized training is not required.

The above evaluation also provided a plan for the development of standard specification criteria and the development of standard specifications. Schedule completion date is May 1989.

7.6.5.2 Receipt Inspection

An interface document, QADP-12, "Material Acceptance and Receipt Inspection", has been developed to identify the areas in which OPPD needs to specify receipt inspection criteria. Operations QA is responsible for approving specific checklists for receipt inspection activities. Specific guidance criteria along with specific check lists have been developed for receipt inspections and are currently in use.

7.6.5.3 Procurement and Dedication of Commercial Grade Equipment

A corporate guidance document will be prepared to provide guidance in this area. Scheduled completion date is January 1988.

7.6.5.4 Temporary Storage

A plan for the the receipt, temporary storage and tracking of materials procured for modifications has been developed and implemented. The requirements and locations for temporary CQE storage areas have been defined prior to the start of the 1987 outage by QC and this effort was part of pre-outage planning work.

7.6.5.5 Specification Development Implementation

- Revise existing and develop new procedures if required.

  A new procedure GEG-2, "Guidelines for Preparation of Procurement Specificatons" has been implemented and addresses the implementation of specification development.

- Develop standard technical criteria and specification documents.

Scheduled completion date is May 1989

7.6.5.6 Specific guidance criteria for receipt inspection procedures, QADP-12 "Material Acceptance and Receipt Inspection", to be used in conjunction with specific checklists has been developed to expedite the receipt inspection process. QADP-12 established a standard set of criteria for Quality Assurance and will also eliminate the time consuming process of developing a new receipt inspection checklist each time a piece of equipment is purchased.

7.6.5.7 A tracking program has been implemented to monitor the progress of each procurement document to ensure that receipt inspection packages are available to QA prior to delivery of the equipment.

7.6.5.8 Training on procurement and dedication of commercial grade equipment will be provided.

Scheduled completion date is March 1988.

7.6.5.9 A separate temporary area will be reserved for storage of CQE materials in the new warehouse.

Scheduled completion date is December 1988.

7.6.5.10 Implement the results of the study plan developed for the receipt, temporary storage and tracking of materials for modifications in 7.6.5.4 above.

Scheduled completion date is March 1988. The temporary storage and tracking of materials will be further improved upon completion of the new warehouse (August 1988). Its completion will eliminate the need for the temporary storage of a great number of modification materials.

## 7.7.0 SAFETY EVALUATIONS

### 7.7.1 Purpose

The purpose of the review was to evaluate the conduct of safety evaluations, identify methods to improve the quality of safety evaluations, and to establish a unified approach in the application of requirements to perform safety evaluations.

### 7.7.2 Scope

The scope of the review relating to safety evaluations included the following:

- Identify the various sources which require that safety evaluations be performed.
- Review current OPPD procedures which address the preparation of safety evaluations.
- Establish draft definitions of key words and phrases pertaining to the safety evaluation process.
- Prescribe action items to implement identified improvements.

### 7.7.3 Discussion

The Committee recognizes that the main purpose of a comprehensive safety evaluation is to determine whether an activity will have or has had an adverse effect on plant systems, equipment or safety analyses. Further, the objective of the safety evaluation is not to justify that there will be no potential safety impact, but to fully analyze the situation and clearly/fully document the bases for the determination.

The necessity of performing safety evaluations results from either of two categories of sources (1) proposed changes (before-the-fact activities) and (2) resultant events (after-the-fact activities; events that occur during or as-the-result of operation). Examples of proposed changes (before-the-fact activities) include:

- Procedure change for any procedure, including those in the Operation Manual and Special Procedures or Maintenance Procedures.
- Installation procedures for modifications.
- Proposed changes to the Technical Specifications.
- New procedures and/or proposed tests and experiments.
- Modifications (design changes) to plant structures, systems, and components.
- Changes to safety analyses.

Examples of resultant events (after-the-fact activities) include:

- Violations of Technical Specifications.
- Identification of deviations pursuant to 10 CFR 21.
- Justifications for Continued Operation.
- Operations Incidents and Licensee Events.
- Responses to NRC Bulletins and Notices.

The above examples of activities which require safety evaluations are not meant to be inclusive; however, the listing does establish that the sources which require safety evaluations are several and that attempts to prepare precise listings of activities should not be pursued. Rather, safety evaluations should be performed to determine whether the proposed change/resultant event may have or has had an adverse impact on the health and safety of the public or degrade the design/operation of plant structures, systems, and components.

The Review Committee determined that OPPD departments have adopted their own procedures for performing safety evaluations and, although the procedures are similar in scope, they are different in interpretation and application of the requirements. It was noted by the Review Committee that progress has been achieved in 10 CFR 21 reporting of defects and noncompliances in that a single OPPD procedure has been adopted by the corporation. This single procedure provides a consistent format for reporting and establishes a unified application of the requirements.

Specific training in the performance of safety evaluations was identified by the Committee as being necessary in order to improve consistency and completeness in safety evaluations.

Assignment of specific personnel to review safety evaluations was discussed in order to determine the method or methods which would both enhance the quality of safety evaluations and be cost effective. The Review Committee believes there is merit in assigning a few engineers within the various departments to have primary responsibility for the review of safety evaluations. These individuals will require frequent training in order to ensure they are current in all aspects of the safety evaluation process.

A draft procedure for the preparation of safety evaluations was reviewed by the Committee. The draft procedure provides definitions of key words/phrases, assigns responsibilities, establishes training requirements, and outlines the proposed procedure for preparing and documenting safety evaluations. The purpose of the procedure is to provide practical and systematic guidelines for the preparation of

safety evaluations. The guidelines specify that a simple statement of conclusion by itself would not be sufficient. Further, the proposed guidance is not prescriptive in the sense that it provides detail for every conceivable situation but it does incorporate a checklist format designed to stimulate the evaluator to think, to be creative, and to ask questions.

7.7.4 Conclusions

The Review Committee concluded the following with regard to its assessment of the conduct of safety evaluations for activities relating to the operation, maintenance, and modification of Fort Calhoun Station:

- Improvements in the safety evaluation process would enhance quality and establish a unified approach in the application of requirements to perform safety evaluations.
- Definitions of key words and phrases pertaining to safety evaluations are considered basic to the safety evaluation process.
- A single OPPD procedure for the preparation of safety evaluations would provide a consistent format, promote a unified application of the requirements to perform safety evaluations, establish safety evaluation applicability criteria, and provide a means for documenting results and determining whether or not changes to the Technical Specifications and/or USAR are required.
- Performance-based training in the preparation of safety evaluations would provide consistency and uniformity in safety evaluations as well as enhance the quality of the evaluations.
- Qualified personnel dedicated to the review of safety evaluations would serve to improve quality.

7.7.5 Action Items

The following actions have been established to improve the preparation of safety evaluations and establish a unified approach in the application of requirements to conduct safety evaluations.

7.7.5.1 An outside consultant specialized in training programs has given training to selected OPPD personnel on the 10 CFR 50.59 process. This "awareness" training was non-plant specific, but addressed why 10 CFR 50.59 was developed, what changes need to be addressed by 50.59, and the necessary management review of safety evaluations.

7.7.5.2 Definitions of key words and phrases pertaining to the conduct of safety evaluations have been established.

7.7.5.3 Revised OPPD procedures for the preparation of safety evaluations have been developed and implemented.

7.7.5.4 A training program for personnel assigned the responsibility to review safety evaluations has been developed and training conducted. Training included familiarization with the following:

- Fort Calhoun Station Updated Safety Analysis Report.
- Safety Evaluation Reports
- Fort Calhoun Station Technical Specifications
- Industry codes and standards
- NRC regulatory requirements
- Design Basis
- Plant operations

7.7.5.5 Review and evaluate the effectiveness of the procedure developed for the preparation of safety evaluations and the impact on personnel requirements the implementation of the procedure might create.

Scheduled completion date is July 1988.

7.7.5.6 Consider further the assignment of qualified personnel who are dedicated to review of the safety evaluations within each group.

Scheduled completion date is July 1988.

7.8.0 REVIEWS & APPROVALS

7.8.1 Purpose

The intent of this evaluation was to identify areas where SSOMI team findings could have been resolved via the internal review process. In addition, the committee evaluated the review sequence to determine if improvements could be made to expedite/improve the overall modification process.

7.8.2 Scope

The Review Committee evaluated the applicable GSE and plant procedures for the preparation and review of Design and Construction Packages to determine if the improvements could be made while complying with the Technical Specification requirements and OPPD's regulatory commitments contained in USAR. The following types of reviews were considered and evaluated:

- Reviews within GSE (checking, approval, and independent reviews).
- PRC reviews (Final Design Package review, Construction Package reviews).
- Technical Services' Reviews (Special Processes, In Service Inspection, Transient Analysis, Computer Hardware/Software, etc.).
- QA review (Codes and Standards, compliance to procedures).

7.8.3 Discussion

a. Technical Specification Requirements:

In accordance with Technical Specification Section 5.5.1.6(d), all proposed changes or modifications to plant systems or equipment that affect nuclear safety are required to be reviewed by the PRC. The PRC is also required to review the following per Sections 5.5.1.6(a), (b) and (f).

- All procedures required by section 5.8 of the Technical Specifications and changes there to, and any other proposed procedures or changes thereto as determined by the Manager - Fort Calhoun Station to affect nuclear safety.
- All proposed tests and experiments that affect nuclear safety.
- Facility operations to detect potential safety hazards.

b. USAR requirements:

In accordance with Appendix A of the USAR, the District is committed to ANSI N45.2.11 and Reg. Guide 1.64. Paragraph 6.1 of this ANSI Standard requires that measures shall be applied to verify the adequacy of design and establishes independent review

requirements for safety related modifications. Section C-2 of Reg. Guide 1.64, Rev. 2, further modifies the independent review requirements and does not recommend the independent review by the immediate supervisor.

c. Present Practice:

In accordance with GSE procedures, the following type of reviews are required:

- All design packages are required to undergo checking and approval per GSE Procedure B-2.
- All design packages are required to be sent to Technical Services for their review.
- All safety related design packages are required to be independently reviewed per GSE Procedures B-2 and B-11.
- GSE Procedure A-2 requires that final designs for modifications involving CQE, Limited CQE, fire protection, and radioactive waste packaging be sent to QA for review.
- Preliminary and final design and Construction Package require PRC review.

The committee believes that the intent of the Technical Specification requirements discussed above is to ensure that the modifications to plant systems are reviewed for safety aspects. Additionally, the plant staff is also responsible for the operability and maintainability reviews. Therefore, the primary responsibility for the design reviews should rest with GSE, and the plant staff's review should be limited to safety, operability, and maintainability aspects.

To help facilitate the review process, the packages sent to the plant staff should be presented in a concise manner and details such as calculations, etc. should be excluded to allow proper reviews for operability, maintainability, and safety aspects.

The present GSE independent review procedure checklist has several questions relating to QA requirements, however, little guidance is provided for technical requirements. INPO document TS-415 provides a detailed checklist to perform a multi-discipline technical review which may improve the quality of review. Although ANSI N.45.2-11 and Reg. Guide 1.64 do not specifically require that the independent reviews be conducted prior to start of construction, this is considered to be a good practice.

Generally, limited time is allowed for review of Construction Package by the plant staff. In order to accomplish this in a timely manner, GSE should have the packages ready for plant staff at least 60 days prior to scheduled start of construction. The plant, Technical Services, QC, QA, and the group responsible for installation should assign dedicated personnel to conduct an orderly review.

7.8.4 Conclusions

The evaluation concluded that improvements can be made in the review process both in effectiveness and timeliness through procedural changes.

7.8.5 Action Items

The following action items have been established to improve the quality of the review and approval process:

7.8.5.1. Independent reviews are now accomplished prior to PRC acceptance of the Construction Package unless otherwise justified by GSE and approved by the Plant Manager. Independent reviews of field changes are accomplished prior to SAC.

7.8.5.2 GSE has implemented multi-disciplinary independent reviews to improve the quality of the reviews.

7.8.5.3 GSE checking and approval process is considered adequate; however, additional improvements have been made through training and assigning experienced personnel for checking.

7.8.5.4 Plant reviews are now conducted in two parts, i.e., Technical reviews and Procedural reviews. To help facilitate the Technical review, GSE has issued preliminary design packages for modifications, unless justified otherwise based on simplicity of the modification or prior discussion with the plant staff. The objective has been to not overwhelm the PRC with design details, but to provide adequate information to allow thorough reviews from aspects such as:

- Operability
- Statement of problem
- Human factors
- Impact on plant security system
- Impact on fire protection/detection system
- Impact on plant Technical Specification
- Design inputs provided by plant
- Maintainability
- Equipment selection (spare parts and operability experience)
- Any special training/manpower needs
- Safety evaluation

To allow "procedural review" by the plant staff, the Final Design Package has included work instructions or installation procedures (depending on the complexity of the job). This has allowed the plant staff to review the package for constructability aspects such as:

- Plant conditions during installation
- System tag out/outage requirements
- Impact on plant operations
- Walkdown if required, as determined by Plant Manager
- Availability of spare parts
- Impact on plant resources
- Impact on Technical Specifications

This action is complete.

7.8.5.5. Review subcommittees (including the operations engineer) are normally assigned within 30 days of the job being assigned an "Active Status" as determined by the Plant Manager. The design engineer(s) will closely coordinate the design with the operations engineer. In addition, for complex jobs the following are considered:

- Meetings with the subcommittee or operations during various stages of design.

- System walkdown with one or more subcommittee members if deemed necessary.

7.8.5.6 GSE will continue to send packages to Technical Services. However the reviewers will be asked to participate (invited or assigned to subcommittees) in the plant subcommittee discussions and their comments should be consolidated into one letter from the PRC Subcommittee to GSE.

7.8.5.7 The Corporate QA Department has reviewed their checklist for review of design packages to ensure that the checklist is consistent with the applicable QA review requirements.

7.8.5.8 The Plant QC group has reviewed both Final Design and Construction Packages and will be assigned to the PRC Subcommittee responsible for review of modifications.

## 7.9.0 QUALITY ASSURANCE PROGRAM

### 7.9.1 Purpose

The District's modification process was reviewed to identify improvements which can be made in the application of OPPD's Quality Assurance program to the OPPD modification process. In addition, the Committee sought to determine how the existing QA program could be applied to concerns identified by the SSOMI team.

### 7.9.2 Scope

The review consisted of an evaluation of the Quality Assurance process as it is applied in the following areas:

- Identification of Technical Requirements
- Specification Development
- Final Design and Construction Packages
- Vendor Selection and Controls
- Procedures
- Receipt Inspection
- Surveillances and Audits

Selected implementation procedures were also reviewed against the Quality Assurance Plan to determine their adequacy.

### 7.9.3 Discussion

The Review Committee held several meetings and conducted interviews with Quality Assurance seeking ways to improve the modification process. A primary consideration of the committee was the degree, application, and amount of Quality Assurance involvement in the overall modification process.

### 7.9.4 Conclusions

While the District's present QA program is adequate to meet the requirements of 10CFR50 and other regulatory requirements, measures can be taken to achieve improvements in the QA program at OPPD. The Committee identified several areas where development of further procedural guidance, implementation of training or improved quality of audits would improve the District's overall program:

1. Procedural guidance for QA reviews of Final Design and Construction Packages should be strengthened.

2. Procedures governing design reviews should address the resolution of QA review comments.

3. Procurement Quality Assurance can be strengthened in four areas:

   - Identification of Technical Requirements
   - Determination of QA Requirements
   - Specification Development
   - Receipt Inspection Requirements

4. The scope and depth of QA audits on design and modification activities should be increased.

5. Positive auditing, with the aim of preventing problems and providing guidance would aid in improving overall performance.

6. Implementing procedures should be reviewed against the commitments contained in Appendix A of the USAR and QA Plan.

7.9.5 Action Items

The following action items were established to improve the quality of OPPD's Quality Assurance Program.

7.9.5.1 Additional specific procedural guidance for QA reviews of Final Design and Construction Packages has been developed.

7.9.5.2 Design review procedures have been revised to include the resolution of QA review comments.

7.9.5.3 Audits to verify that commitments made to the NRC in the SSOMI team responses are in progress.

Scheduled completion date is December 1989.

7.9.5.4 A review of the following will be conducted. Appropriate guidance from these standards and associated regulatory guides will be incorporated into the Quality Assurance Plan.

- N45.2.4-1972, "Installation, Inspection and Testing Requirements for Instrumentation and Electrical Equipment During the Construction of Nuclear Power Generating Stations."

- ANSI N45.2.5-1974, "Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants."

- ANSI N45.2.8-1975, "Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants."

- ANSI N45.2.11-1974, "Quality Assurance Requirements for the Design of Nuclear Power Plants."

- ANSI N18.7-1976, "Administrative Controls and Quality Assurance for the Operations Phase of Nuclear Power Plants."

- BTP 9.5.1, "Fire Protection Requirements."
- ANSI N101.4, "Quality Assurance for Protective Coatings Applied to Nuclear Facilities"

Scheduled completion date is December 1988.

7.9.5.5 A review plan based on the lessons learned from the SOMI team findings was prepared. A review has been performed on 1987 outage modifications.

7.9.5.6 Use of technical experts to assist with QA audits on design activities has been increased.

7.9.5.7 QA surveillances will be expanded to cover the various types of modifications (Civil, Electrical, Mechanical and Nuclear).

This program will be implemented by December 1988.

7.9.5.8 Implementing procedures have been reviewed against the commitments contained in Appendix A of the USAR and QA Plan.

## 7.10.0 QUALITY CONTROL

### 7.10.1 Purpose

The purpose of the review was to determine the effectiveness of Quality Control involvement in the modification process at the Fort Calhoun Station and to develop recommendations for improvements, as appropriate.

### 7.10.2 Scope

The scope of the review included Standing Orders G-21 and G-26A, and the current practices which implement them. The Quality Control related concerns of the SSOMI team were also considered during the course of this review.

### 7.10.3 Discussion

The purpose of Quality Control involvement in the modification process is to ensure that the work is performed to the highest possible standards. This is done by performing the following actions:

1. Review installation procedures for adequacy, and specification of hold points where detailed inspection activities are to take place.

2. Surveillance of work in progress and performance of nondestructive examinations (NDE), as specified in the installation procedures.

3. Control issuance of CQE weld rod and CQE tools, such as torque wrenches and mechanical gauging equipment.

4. Verify that modification activities are performed by qualified personnel.

5. Control tool/equipment accountability for any work in the reactor cavity or in CQE pressure vessels.

The certification requirements for Quality Control inspectors are addressed in Standing Order G-26A. OPPD and contractor inspectors must be certified Level I, II, or III in the various NDE disciplines in accordance with SNT-TC-1A. A senior inspector must be certified Level III in at least three NDE disciplines and meet experience requirements. The contractor inspectors were required to be certified to at least Level II in multiple disciplines. Their certifications were reviewed and accepted by Quality Assurance.

Quality Control involvement in modifications is addressed in Section 5.0 of Standing Order G-21. Standing Order G-26A is appropriately referenced in G-21. The Review Team has concluded that quality control considerations in the modification process are adequately addressed.

The Quality Control group at the Fort Calhoun Station has implemented actions to help prevent recurrence of the types of Quality Control concerns that arose during the 1985/86 refueling outage. OPPD's inspectors have recently completed a triennial recertification/ upgrade program to meet ANSI SNT-TC-1A requirements. An ongoing QC training program has been implemented as a replacement for the triennial certification program.

The Quality Control group's NDE procedures are written as appendices to Standing Order G-26A, "Quality Control Program". These procedures have been recently reviewed and revisions were made to include documentation of test conditions.

The welding program at the Fort Calhoun Station has been revised to improve the methods for documentation of weld design, installation, and QC inspection. The actual weld procedures used at the Fort Calhoun Station have been revised and expanded.

OPPD is committed to having a top quality welding program for the Fort Calhoun Station. We have determined that additional improvements, beyond those which have already been made, are desirable to improve the overall program. At the present time, the welding program is receiving a detailed technical review. This review includes the assistance of both consultants and an Authorized Nuclear Inspector. The program, as a result of the review, will increase the number of weld procedures, will help ensure the adequacy of the documentation requirements associated with the welding program and will be completed by January 1988.

Contractor inspectors are provided training on station policies and procedures prior to becoming field inspections. This program was strengthened prior to the 1987 refueling outage. This will enhance the effectiveness of the contractor inspectors and will reduce the likelihood of the types of inspection problems which occurred during the 1985 refueling outage. Closer supervision of contractor inspectors by OPPD inspectors has been achieved by expanding the permanent inspector staff to six persons.

7.10.4 Conclusions

The Quality Control group provides an adequate level of support for modification activities at the Fort Calhoun Station. Nondestructive examinations are being accomplished in a competent manner. The problems raised by the NRC SSOMI team were judged to be isolated instances and could have been avoided. Such problems should be reduced by better indoctrination of contractor inspectors and by revising procedures to include documentation of required test conditions. Improved craft training is also essential to eliminate the workmanship problems which were identified during the 1985/86 refueling outage.

7.10.5 Action Items

The following action items have been established to improve the quality of the Quality Control Program.

7.10.5.1 The dye penetrant (PT) NDE procedure has been qualified to a lower temperature. Other NDE procedures have been reviewed for the appropriateness of the conditions under which the procedures are performed.

7.10.5.2 The PT report form has been revised to document the temperature at which the procedure was performed. Other NDE procedures will be reviewed to determine if similar and necessary changes are made.

7.10.5.3 A revised welding program has been implemented. Scheduled completion date for additional upgrade is January 1988.

7.10.5.4 A documented set of criteria has been developed for the indoctrination of contractor inspectors to ensure that they are aware of the requirements of the District's NDE procedure.

7.10.5.5 Improved training programs for craft personnel are being implemented and the procedural requirements regarding the assignment of qualified personnel to critical tasks have been strengthened.

Scheduled completion date is March 1989.

## 7.11.0 POST-MODIFICATION TESTING

### 7.11.1 Purpose

The purpose of the review was to determine the adequacy of the post-modification testing program at the Fort Calhoun Station, to prepare recommendations for enhancing its effectiveness, and to determine and resolve the root cause for SSOMI team findings related to inadequate post-modification testing.

### 7.11.2 Scope

The scope of the review included:

- Fort Calhoun USAR, Appendix A, "Quality Assurance Program."
- ANSI Standards:
- Regulatory Guides:
- Standing Orders (Including implementing practices) to identify areas where post-modification testing can be improved.

### 7.11.3 Discussion

The purpose of post-modification testing is to provide a high level of assurance that the modified system will perform in accordance with the design basis under expected operating conditions and that the performance of the modification has not created any new failure modes or system interface problems. Test procedures provide a means for planning and coordinating the testing and for documenting the results.

It is important that the testing be conducted for postulated operating and accident conditions, to the extent possible, in order to provide the maximum level of assurance that the system will perform as designed. If this is not possible, the testing should be as complete as possible and an engineering evaluation of the inability to test to the worst case operating conditions must be prepared.

Testing of safety-related systems at the Fort Calhoun Station is performed in conformance with the requirements of Standing Order G-19, "Test Control." This standing order, in turn, embodies the requirements of the referenced ANSI Standards and USNRC Regulatory Guides committed to in USAR, Appendix A.

These ANSI Standards, in turn, are responsive to Criterion XI of 10 CFR 50, Appendix B. In general, these standards require the following:

1. Testing must be a planned activity and must be controlled by procedures reviewed by the Plant Review Committee and approved by the Fort Calhoun Station Manager. The procedures must include step-by-step instructions for the activities to be performed.

2. Testing activities (including procedure preparation and review) must be performed by knowledgeable and qualified personnel.

3. All test equipment must be calibrated and documented.

4. Hold points must provide for independent verification of critical activities.

5. Test results must be documented and reviewed to verify that they are within satisfactory tolerance range and demonstrate compliance with the design basis.

6. Any necessary corrective action must be documented, and dispositioned; and retesting must be performed, as necessary.

7. Test procedures must include acceptance criteria.

Post-modification testing is addressed in Standing Order G-21, "Station Modification Control." The key statement is: "The test will be designed to demonstrate that newly installed structures, systems and components will perform satisfactorily in service."

Establishment of a group within Nuclear Production Division which would have the responsibility of post-maintenance and post-modification functional testing of existing plant systems will be helpful in improving overall quality of the testing. This will allow an independent check of the design and will develop expertise in one group for functional testing. This is a long term action and requires careful planning and evaluation. The personnel assigned would have the lead responsibility for testing.

The committee also recognizes the obvious advantages of the design engineer's involvement in the modification testing process and recommends that development of test procedures should continue to be a joint effort between the design organization and Nuclear Production Division. The final test results and deviations should be reviewed by the design organization.

7.11.4 Conclusions

Post-modification testing is especially critical to ensure that operation of systems have not been adversely affected by the modification. Standing Order G-21 contains rudiments of post-modification testing requirements. Standing Order G-19 contains a basic framework in which to perform testing. These procedures can be improved to enhance the post-modification testing program.

7.11.5 Action Items

The following action items have been established to improve the quality of post-modification Testing.

7.11.5.1 Revise Standing Order G-21, "Station Modification Control" has been revised to include:

- Delineation of the types of design changes that require special test procedures from those which are more simple.

- Reference to Standing Order G-19 for testing requirements.
- Definition of the requirement for stating the post-modification system performance requirements for preparing, performing and evaluating the testing.
- Definition of the responsible person for evaluating modification-related test results.
- Assurance that systems are tested and test results approved prior to returning systems to service following modifications.

7.11.5.2 Revise Standing Order G-19, "Test Control" to include:

- Definition of tests which are included in the Standing Order and Special Test Procedures.
- Definition of a recommended standard test procedure format.
- Definition of responsibilities for review and approval of test results depending on the group responsible for the test.
- Statement of disposition requirements for out of tolerance results.
- Statement of requirements for engineering analysis if testing cannot be performed under certain postulated normal and abnormal operating conditions and contingencies for alternate testing if appropriate.
- Statement of the test personnel qualifications for writing, approving, and performing tests and evaluating results.
- Address references from USAR, Quality Assurance Plan, Standards, and Regulatory Guides.
- Clear definition of responsibilities for tests, inspections, and examinations.
- Expanded testing to include any station tests whether on CQE systems or not since the only proof that the test does not affect a CQE component is by preparing the actual test procedure, evaluating its impact on the plant (10 CFR 50.59), performing the procedures as approved, and evaluating the course of the testing and results.
- A 10 CFR 50.59 analysis for each test procedure.
- Referring the test procedure results back to the G-21 required performance criteria for evaluation.

Scheduled completion date is January 1988.

7.11.5.3 Establish a group within the Nuclear Production Division which would have responsibility for post-maintenance and post-modification function testing of existing plant systems.

Scheduled completion date is March 1988.

7.11.5.4 Establish a program for evaluating and qualifying test personnel and state required records for qualification documentation and status.

Scheduled completion date is March 1989.

## 7.12.0 INSTALLATION PROCEDURES & FIELD CHANGES

### 7.12.1 Purpose

The purpose of this review was to evaluate comments regarding installation procedures and field changes made by GSE, the plant staff, and contained in the SSOMI Installation and Testing Report, and to develop action items which would improve the quality of the program.

### 7.12.2 Scope

The GSE and plant requirements governing installation procedures and field changes were reviewed. These include:

Technical Specifications - 5.5.1.6 and 5.8
Standing Order G-30
Standing Order G-21
GSE Procedure B-2
GSE Procedure B-11

In addition, the following documents were reviewed for recommendations regarding installation procedures and field changes:

ANSI N18.7-1976
ANSI/ANS - 3.2 - 1982
INPO Good Practice TS-402

### 7.12.3 Discussion

#### 7.12.3.1 Installation Procedures

ANSI N18.7 requires that modification activities be performed in accordance with "written procedure, documented instructions, or drawings appropriate to the circumstances . . .". INPO Good Practices TS-402 recommends the following types of documents for modification control:

1. Installation Procedures
2. Work Instructions
3. Installation Test Procedures
4. Functional Test Procedures
5. Design Drawings

#### 7.12.3.2 Field Changes

The field change process for modification control documents is necessary to assure appropriate review of changes to previously approved documents. The field change procedure adopted prior to the 1985/86 outage recognized that modification control documents actually consist not only of installation procedures but also other documents such as drawings, work instructions, and test procedures. This type of treatment is consistent with the recommendations of INPO Good Practice TS-402 and ANSI N18.7.

Prior to the introduction of revised G-30, Part II, Design Change Orders (DCOs) were required to be reviewed by the PRC but approval was not necessary. This practice is considered consistent with the Technical Specification requirements and should be restored to reduce work load on PRC. All field changes in DCOs will continue to be documented and reviewed by the design engineer and will require an additional GSE Department Manager review prior to SAC.

INPO recommends that changes to the installation documents be made by a Field Change Request (FCR). The FCR is approved by a Systems Engineer (Planner/OPS Engineer) and the Project Engineer (Design Engineer). It is also recommended that changes to procedures be approved by the normal procedure change process after approval by the System Engineer and Project Engineer.

7.12.4 Conclusions

The preparation and review of modification control documents should continue in accordance with present practice. Installation documents should be prepared in sufficient detail to assure adequate control of plant conditions, provide craft instructions, and assure QA/QC requirements are met. The work instructions or installation specifications should also provide acceptance criteria for workmanship and installation practices. The field change process should be strengthened to assure proper documentation of all changes and review by appropriate cognizant personnel. An effort should be undertaken to simplify and strengthen the modification installation process wherever possible.

7.12.5 Action Items

The following action items have been established to improve the quality of Installation Procedures and Field Changes:

7.12.5.1 A formal numbering system has been developed for field changes. This will help eliminate concerns regarding tracking of the field changes.

7.12.5.2 A GSE person has been designated to track field changes. This will facilitate review within 14 days of implementation.

7.12.5.3 A field change summary form has been developed. QC and QA will review the summary sheet to assure proper approvals have been received and that field changes are well documented.

7.12.5.4 The FC-1033 Form has been revised to require GSE-Department Manager approval prior to SAC. The GSE-Department Manager will assure that changes which affect the design basis or safety evaluation are correctly reviewed and incorporated into the appropriate design documents.

7.12.5.5 Training has been provided to all modification Design Engineers, Operation Engineers, and Planners to assure correctness and consistency in preparation of field changes.

7.12.5.6 The requirement for PRC review of field changes to DCOs which were not originally PRC approved has been dropped.

7.12.5.7 A revised Standing Order which will govern field changes to modification design drawings has been prepared.

7.12.5.8 Prepare future installation packages such that work instructions are separate documents from installation procedures and test procedures if possible.

Scheduled completion date is March 1989.

7.12.5.9 A computerized system for the tracking of field changes has been implemented.

7.12.5.10 Develop standard specifications and detailed work instructions for repetitive type installation work (e.g. Installation of conduit cables, piping, tubing, seismic supports, Hilti anchors, etc.).

Scheduled completion date is March 1989.

## 7.13.0 SYSTEM ACCEPTANCE

### 7.13.1 Purpose

The purpose of the review was to determine the effectiveness of the system acceptance process for modifications installed at the Fort Calhoun Station and to develop recommendations for improvements, as appropriate.

### 7.13.2 Scope

The scope of the review included Standing Order G-21 and associated implementing practices. The comments of the SSOMI team were also considered during the course of this review.

### 7.13.3 Discussion

The objectives of a system acceptance program are the following:

1. To confirm that installation has been completed and that a successful post-modification test has been performed.

2. To confirm that training in the operation of the modified system has been completed, or scheduled, as appropriate.

3. To confirm that independent reviews of all design aspects, including field changes, have been completed (as required).

4. To confirm that all affected documents (OIs, USAR, etc.) and data bases (CHAMPS, spare parts, etc.) have been updated.

Standing Order G-21 should specify a time frame for close out of modifications and a tracking system should be developed.

It is sometimes desirable, from an operations standpoint, to place a modified system into trial operation before criteria for minimum acceptance with deficiencies are satisfied. An example of this would be a sampling system modification where a trial operation period would be beneficial to determine trends related to equipment function. Standing Order G-21 should provide guidance as to how this can be accomplished. Also, Standing Order G-21 should provide guidance for any acceptance review prior to performance of a post-modification test.

When the SAC reviews a modification for acceptance, the Planner is required to confirm that procedure changes associated with the modification have been approved by the PRC and that all field changes have been reviewed by the PRC.

The Review Committee considered the aspects of a modification which must be completed to permit acceptance with deficiencies. It was concluded that the present items required for this level of acceptance are adequate. These criteria may be relaxed in order to allow acceptance for testing/trial operation.

7.13.4 Conclusions

The system acceptance process provides assurance that a modification has been completed and tested and that affected documents and data bases have been updated. The present process is fundamentally sound, but it can be improved by providing for acceptance of a modified system for trial operation, placing reasonable controls on the time allowed to closeout a modification after initial acceptance with deficiencies, and better documenting review and/or approval of procedures and field changes.

7.13.5 Action Items

The following action items have been established to improve the quality of System Acceptance.

7.13.5.1 Standing Order G-21 has been revised to include guidance/requirements on the final closeout of modifications which are accepted with deficiencies.

7.13.5.2 An acceptance category for testing/trial operation has been added to Standing Order G-21. SAC review prior to testing is not needed in all cases, but it could be beneficial in the case of complex modifications. Such review could be performed at the discretion of the SAC and/or PRC subcommittee. SAC review will be required for any modifications which are to be placed in partial or trial operation prior to final completion. These reviews must include consideration of the status of construction, training, procedures, etc. prior to acceptance at this level. This will provide an increased control over modifications in the last stage of their completion.

7.13.5.3 A field change summary sheet has been developed as part of the Modification Control Documents. This sheet includes documentation of completion of independent reviews, completion of installation, acceptance of any resulting field changes, etc. This action will improve the documentation of modification field changes.

7.13.5.4 A tracking system has been developed for tracking progress on deficiencies with reports on exceptions routed to Section Manager - GSE, Department Managers - GSE, Plant Manager, various department heads at FCS, and applicable Technical Services Managers.

## 7.14.0 EMERGENCY MODIFICATIONS

### 7.14.1 Purpose

This review was conducted to evaluate the Emergency Modification process, including such items as timely after-the-fact design package preparation, timely independent reviews, and timely SAC acceptance. The primary goal is to provide additional assurance that plant safety is maintained when emergency modifications are required. Secondary goals are to streamline the system if possible, and eliminate the long time to closeout and resulting backlog of emergency EEARs.

### 7.14.2 Scope

The scope of the review considered the present format controls, in the context of improvements to the existing systems, and a review to see if a different approach is warranted with emphasis on plant safety.

### 7.14.3 Discussion

#### 7.14.3.1 Emergency Modification Definition

Emergency modifications were defined in Standing Order G-21, Station Modification Control, as:

> "Emergency Modification - Modifications required to avert or correct situations which could lead to the imminent possibility of loss of operating capability or equipment damage or imminent danger affecting the health and safety of employees or the public. Also included under this classification are modifications that must be expedited in order to take advantage of existing plant conditions, such as a refueling outage."

In addition to this definition, G-21 and related information in the GSE Manual establish the requirements for analysis, reviews, and documentation to ensure the modification addresses the operational and design basis nuclear safety aspects of a job, is responsive to the QA Plan (10 CFR 50 Appendix B), and still maintains timely action consistent with the emergency connotation. To accomplish this, G-21 Section 2.2 required as a minimum:

1. Form A and B with Technical Services and GSE telephone approval.
2. Operations and Design Engineer assigned.
3. 10 CFR 50.59 analysis addressing installation.
4. 10 CFR 50.59 analysis addressing design basis impact.
5. ALARA coordinator review.

6. G-21 forms as required.

7. After-the-fact modification package.

8. Independent review for safety-related MRs complete before SAC.

The definition as quoted from G-21 in the introductory section can be divided into two sections: 1) The MRs needed to respond to a true emergency situation or safety situation, and 2) Those needed to take advantage of some plant conditions in which expeditious action is required.

7.14.3.2 Emergency Modification Documentation and Review Level

A review of the minimum documentation and design review level for an emergency modification was completed.

Using the normal modification procedure as a document responsive to N-45.2.11 and the QA Manual, a minimum set of requirements and sequence was developed as follows:

1. Identify the need for the emergency MR and obtain management approval.

2. Prepare Design/Construction Package

3. Perform a Design Basis Impact Safety Analysis

4. Perform a Construction Safety Analysis (Operations Impact)

5. Perform an Independent Review

6. Obtain PRC approval

7. Construction

8. SAC, (or, possibly accepted with deficiencies) for operation of the plant

9. Release equipment for operation

10. Update drawings (modification completion)

These steps give assurance that the plant safety margin is correctly considered. This is the general form followed for outage packages when plant safety systems are affected.

7.14.4 Conclusion

In making the comparison of a normal modification sequence to the emergency modification sequence, areas were identified where improvement could be made in the existing system.

7.14.5 Action Items

The following action items have been established to improve the quality of Emergency Modifications.

7.14.5.1 The Minimum Requirements for an Emergency Modification Design Package have been established to provide the same level of assurance as a normal modification.

7.14.5.2 It is now required that the assigned GSE Engineer be called out to work with the Operations Engineer in preparing the design of emergency modifications.

7.14.5.3 Approvals and reviews obtained by telephone require full independent review prior to system operation and complete SAC within 14 days. This was assured throughout the 1987 refueling outage by administrative controls.

7.14.5.4 Implement a more responsive maintenance request system to reduce the number of emergency modifications.

Scheduled completion date is March 1988.

7.14.5.5 Establish a new Standing Order G-21 form for Emergency Modifications to meet the guidelines of item 1, above, by:

- Establish an Emergency Modification Form which defines the minimum design analysis and requirements for review. This form, when completed, will be a stand alone document and will be responsive to ANSI N45.2.11 for documentation of design description, design analysis, safety evaluations, etc.

- When the DCO or SRDCO is completed, enough design effort must have been completed to allow SAC to approve the modification.

Scheduled completion date is January 1988.

## 7.15.0 MINOR MODIFICATIONS

### 7.15.1 Purpose

The purpose of this review was to insure that the Minor Modification process has adequate controls to insure: 1. the process remains responsive to the QA Manual and ANSI N.45.2-11, and 2. A minor modification does not lead to degradation of the Design Basis of the plant.

### 7.15.2 Scope

The scope of this review was limited to the Minor Modification process as described in G-21 and the GSE Manual.

### 7.15.3 Discussion

Minor modifications are defined in Standing Order G-21, Station Modification Control, as:

> "Minor Modification - Modifications for which little or no engineering is required and which do not change the design bases. Minor modifications shall not involve Critical Quality Elements (CQE)."

G-21 requires that GSE review the minor modification for technical, economic, and cost accounting prior to installation. For a Minor Modification, the Nuclear Production Division supplies the Design Engineer/Planner.

#### 7.15.3.1 Preconstruction Review

The preconstruction review as defined in Section 2.3 of G-21 requires sufficient information to be transmitted in the EEAR to "identify the details of the modification which is proposed." Technical Services classifies the modification; GSE then performs a review to ensure it should be classified as a minor modification.

#### 5.3.2 Other Ways of Obtaining Minor Classification

Occasionally, Technical Services or GSE may recommend a modification be reclassified as minor.

#### 7.15.3.3 Normal Modification Requirements

As a minimum, a normal modification requires a Design Basis, Technical Description, and Design Evaluation, along with a review to determine if a Plant Design Basis Safety Analysis is required. These requirements, however, are not currently applied to minor modifications.

#### 7.15.3.4 Modification Classification System

Modifications have occasionally been classified as minor to expedite the work. This practice can sometimes lead to improper reviews and

documentation. The definition of a minor modification should be revised to limit use of this classification to truly minor modifications only. This will also require a more responsive normal modification system to ensure that the plant's needs are met in a timely manner.

7.15.4 Conclusion

There could be cases where inadequate description of a proposed minor modification could lead to improper classification and a potential reduction in the plant safety (e.g., lack of seismic installation over a plant safe shutdown component).

A more responsive normal modification process could virtually eliminate the need for minor modifications.

7.15.5 Action Items

The following action items have been established to improve the quality of Minor Modifications.

7.15.5.1 The definition of "Minor Modification" has been revised to limit the use of this classification to "truly" minor modifications only.

7.15.5.2 The following has been included in the Form B for a minor modification:

- Modification Design Basis
- Technical Evaluation
- Design Evaluation
- Plant Design Basis Safety Analysis

7.16.0 PRE-OUTAGE PLANNING (Integrated Living Schedule - ILS)

7.16.1 Purpose

Although no specific problems were identified by the Safety System Outage Modification Inspection (SSOMI) team, the Review Committee believes a root cause of some of the SSOMI concerns was too much work for the available resources due to ineffective planning and resource management. The committee reviewed this area to develop recommendations to correct this root cause.

7.16.2 Scope

The review evaluated past priorities relating to prioritization scheduling and installation of modifications. The ILS concept was reviewed as a method to correct the deficiencies in pre-outage planning. Standing Order G-21, "Station Modification Control" was reviewed to determine scheduling commitments in the modification process.

7.16.3 Discussion

Many activities are initiated to improve the effectiveness of Fort Calhoun operations and to satisfy NRC requirements. Due to the many modifications required there is a need to wisely allocate our resources so that both OPPD desired modifications and NRC mandated modifications can be appropriately scheduled and installed as planned. Many utilities are using the concept of Integrated Living Schedule (ILS) to effectively manage this tremendous workload. A general definition of the ILS is as follows:

Recognizing the needs and limited resources of both the NRC and the utility operating a nuclear power plant, the Integrated Living Schedule program is a continuing process of selecting, integrating, prioritizing, and scheduling plant betterment activities on the basis of safety, regulatory, reliability, operability, and economic factors in order to optimize the allocation of resources.

7.16.3.1 Current OPPD Scheduling Requirements

Individual modifications are requested, prioritized, and tentatively scheduled through the Engineering Evaluation and Assistance Request (EEAR) form. The form includes a required date for resolution of an identified problem, commitments to be met, and priority of the work. Preparation of a modification in response to the EEAR then involves the preparation of a preliminary design schedule by the design engineer, documentation of benefits by Technical Services, establishing priority by Nuclear Production and Engineering Divisions, and assignment of a scheduled commencement date by the GSE Department Manager in charge of the Design work.

In the past, the priority system has been of limited value because of too many "high priority" jobs. In the past year, schedules have been determined through meetings among GSE, Tech Services, and plant staff.

Additionally, prior to a Construction Package being accepted by the Plant Review Committee, independent reviews must have been completed within the schedule.

However, if the plant requirements dictate that a modification be installed on a "rush" basis, adjustments to schedules should be allowed per agreement between GSE and plant staff pending careful review. It must be recognized that a large number of the concerns by the SSOMI team stemmed from the "rush" nature of certain activities. It should also be recognized that in order to accommodate any new request from plant staff, schedules for other modifications may require changes. Also, requirements for material availability 30 days prior to start of construction should be applied to critical major items as a goal. Typically, the materials should be available and receipt inspected prior to start of construction.

7.16.3.2 Integrated Living Schedule

Members of the nuclear utility industry are actively pursuing the idea of an Integrated Living Schedule and some utilities have already adopted the concept. The NRC has encouraged nuclear utilities to implement ILS to meet commitments. The NRC is more flexible in accepting mandated modification schedules when they see that the utility has a definite prioritization system and overall modification schedule. Prioritization by cost/benefit is also a primary component of the NRC backfit rule. After adoption of ILS, utilities have incorporated the program into their operating license to assure NRC concurrence.

The ILS allows use of the Project/2 Scheduling System, but expands the use to integrate major work for all departments into one schedule. The reporting system enables management to monitor cost, manpower requirements, and completion dates for planned work. Software currently exists which can be used with Project/2 to establish ILS at OPPD.

The ILS is based upon a scheduling technique intended to provide personnel from the supervisory level to upper management, a tool whereby they are better informed on present and future work plans and requirements. It is a system that combines major projects and modifications into a coordinated schedule and reporting system enabling management to monitor future cost, manpower requirements, and completion dates for planned work. The system permits the determination of impact on resources and schedule resulting from proposed or actual changes to the plant imposed by outside agencies or utility management. The system enables the projection of long range scheduling requirements consistent with past, current, and anticipated information.

Objectives

The objectives of an ILS program include:

- To minimize crisis work planning
- To provide an aid for effective management of financial and human resources.
- To coordinate utility modifications.

The ILS program has the potential for reducing project costs through more effective management of resources. Detailed planning and scheduling of activities minimizes costly last minute changes. The program utilizes information from many sources to arrive at an overall "big picture" of the current status and future project activities. It requires project, engineering, operations, and licensing/permit schedules and budget information.

Program Initiation

There are three major tasks associated with initiating and maintaining the ILS system. They involve the gathering of all initial data, setting up the computer system, and providing the update information.

The data requirements will depend upon the objectives and scope of the program. The data required includes:

- Identification of all work items
- Equipment costs and man-hour estimates for all work items
- Identification of ILS completion dates already established
- Priority assignments
- Identification of work items requiring plant downtime

7.16.4 Conclusions

In order to allow for proper pre-outage planning and prevent recurrence of the SSOMI findings related to scheduling of modifications and timely implementation, an ILS concept must be established. Project/2 is probably appropriate to run the ILS. A new PC program will be needed to prioritize, and a group must be established, comprised of members of various departments, to input priority information.

7.16.5 Action Items

The following corrective actions have been established to improve the quality of Pre-outage Planning.

7.16.5.1 The District will continue to be involved in the industry activities in ILS. The District will investigate the various systems available to implement ILS and decide on the best system for OPPD. Licensing will continue efforts regarding ILS in the development of an overall program plan.

This action item has been implemented and is ongoing.

7.16.5.2 The practice of planning for one outage at a time has been changed to planning for at least two outages and 24 months of on-line work.

7.16.5.3 The modification installation staff will have access to the modification package ahead of the scheduled outage and start to scope out the work and help with pre-outage job planning. In addition, the installers will complete pre-fabrication and installation of certain portions of modifications not requiring an outage.

7.16.5.4 OPPD will purchase, if necessary, software and implement an ILS for modifications at Fort Calhoun.

Scheduled completion date is June 1988.

7.17.0 TRAINING

7.17.1. Purpose

This review was conducted to address SSOMI concerns and outline the most realistic approach to addressing the broad area of training and qualification of personnel involved in the modification and safety-related maintenance process.

7.17.2 Scope

In addition to reviewing existing training and qualification practices and procedures of Generation Station Engineering, Nuclear Production Division, Production Operations-Central Maintenance, and Employee Relations Division, appropriate INPO and NUMARC documents and programs were considered. Also, planned or anticipated actions were reviewed and discussed by the Review Committee.

7.17.3 Discussion

A common factor to all phases of the SSOMI concerns is that people are always involved. The NRC staff conducting the SSOMI recognized this fact and grouped the results of their installation and testing review of the Qualification and Training of Personnel into Installation & Test Report Section 2.12 and the subsequent observation 02.12-1:

- The experience level of the design engineers appeared limited with little substantial plant or nuclear systems training provided. They were largely responsible for complete design of all modifications at the station with little previous nuclear experience or training. The lack of nuclear experience and training was evident by the mistakes and inadequacies identified in several of the modifications that were evaluated in detail in this inspection. Examples included: not understanding total system operation or interactions with other systems; relying heavily on craft expertise; not providing sufficient detailed written installation instructions, and not considering all facets of testing and test requirements.

- There was no nuclear craft qualification or training program to certify craft personnel as a "nuclear craft." The only training was through the ranks to a standard journeyman craft level. Many of the problems identified under maintenance control and installation control point to inadequacies in the qualification standards of craft performing safety-related maintenance activities.

The NRC SSOMI concerns on training coincide with OPPD, INPO, NUMARC, and other industry-wide emphasis on the importance and needs to develop training and retraining programs. All recognize the need to improve an individuals level of understanding and experience to effectively and safely perform their work assignments. The need equally applies to an operator, craftsman, technician, engineer, or manager.

1. Existing and Developing Programs

Within OPPD and the many divisions which service the Fort Calhoun Station, there currently exists a multitude of training programs. This demonstrates an obvious management commitment in support of these training and development opportunities. This management support is evident by the existence of programs offered by OPPD through Employee Relations Division and outlined in the "Management Development Guide;" these programs include reimbursement for course work leading to college degrees and job related skills development. The Performance 100% Program and individual annual performance appraisals are founded on development and maximum utilization of the individuals strengths and skills. Specific nuclear training and qualification programs supported by OPPD Management include:

A. INPO accredited training of nuclear personnel. This includes the following job categories:

1. Senior Reactor Operator/Shift Supervisor
2. Licensed Operator
3. Non-Licensed Operator
4. Chemistry
5. Radiation Protection
6. I&C
7. Technical Staff
8. Electrical Maintenance
9. Mechanical Maintenance
10. Shift Technical Advisor

These programs have been developed in accordance with the instructional system design (ISD) process. The programs are performance-based and incorporate analysis, design, development, implementation and evaluation. Specifications governing each training program are presented in a Training Program Master Plan.

B. NUMARC - Human Resource Management System (HRMS)

Identification and development of individuals and possible career paths will assure a planned succession sequence and will increase the level of experience.

NUMARC commitments to the NRC have initiated OPPD's HRMS. This program ensures that positions are filled with highly qualified individuals through an organized and systematic process which evaluates 1) a position's skills and requirements, 2) the incumbent's abilities in management and technical skills, 3) identifies candidates and their areas of needed improvements, and 4) initiates development through several processes ranging from formal training to rotation through selected positions.

Currently, Employee Relations, the program manager, is collecting data in several Divisions to identify training needs and develop appropriate training skills curriculum. Policies to further implement the program are in development.

Specific nuclear related training and qualification programs and policies within the divisions which support the Fort Calhoun Station include:

Production Operations Division:
- Craftsmen and Journeymen Training
- Employee Orientation and Safe Work Practices

Engineering Division:
Generating Station Engineering
- GSE Manual/Training Procedure
- Proposed GSE Training Program

Nuclear Production Division:
- NPD Policies
- TAM (Training Administrative Manual)
- TPMP (Training Program Master Plan for each INPO accredited Training Program.)
- Policies and Procedures Manual, Section C, Training and Qualifications.

FCS Standing Orders:
- G-27 Standing Orders and the FCS Training Manual
- G-53 Personnel Certification

Technical Services:
- Administrative Procedure - N-TSAP-11

Quality Assurance and Regulatory Affairs Division:
- Division Training Program

The above programs and policies are being provided significant OPPD resources and support. However, the availability of individuals to fully utilize the training is a concern.

Although training is a corporate concern, and OPPD has made resources available to address needs that are identified, the responsibility for adequate training and qualifications rests clearly with the individual's supervisor. Priorities of assignments and work load too frequently conflict with their mutual desires to develop a specific expertise or complete planned training. Advanced planning and utilization of internal and external resources to complete work assignments and training may be necessary and appropriate.

2. Programmatic Relationships to SSOMI Concerns

Of particular importance to the SSOMI team is the NPD development of the Maintenance Training program being prepared for accreditation by INPO. Key personnel, previously in FCS maintenance supervision and foreman responsibilities, have been permanently transferred to the Training Department. Specific training and qualification programs are being developed for FCS and contractor maintenance personnel. Training materials were first implemented in training classes during July 1986. The number of maintenance training classes was steadily increased during 1986 and training classes in the various maintenance disciplines were being or had been taught by January 1987. Certification for Fort Calhoun Station maintenance personnel has been established. These certified personnel may serve as overseers for unrated individuals.

3. Additional GSE Corrective Action

GSE has developed and implemented a training program for design engineers using the guidance provided in INPO document, "Technical Development programs for Technical Staff and Managers - 1982". However, due to lack of manpower, this program has not yet been fully implemented. GSE will continue the practice of "technology transfer" by utilizing experienced help from outside to help train the permanent staff.

Generally, modifications are assigned to individuals who have previous experience commensurate with the experience requirements of the modification request. If in-house expertise is not available, help is requested from outside. Further, the inexperienced individuals receive closer supervision from experienced staff.

7.17.4 Conclusions

Training and qualification programs and policies are currently supported by management. Resources to develop and implement these programs are in place or planned. Resources required to support implementation of this training by the maintenance crafts are currently identified. Availability of individuals to fully utilize the training is a concern. When fully implemented, these programs and their results will address the SSOMI concerns in the craft areas. Other programs and corrective actions have and will continue to address the designer experience concern.

Utilization, by managers and supervisors, of the available programs will require an increased level of commitment by each individual and will require more frequent use of planning and possibly outside services to assure an appropriate training level is maintained.

For craft personnel responsible for installation of modifications, training needs should be identified by the planner on the PRC Subcommittee on a modification/job package basis and if required assigned craft personnel will provide supplemental training and certification prior to start of work.

Maintenance of a high level of experienced nuclear technical and design personnel would have prevented several SSOMI concerns. Programs for advancement of personnel through a parallel technical ladder are utilized by many firms to encourage development of senior technical staff with experience. Rotation of personnel for cross training and broadening of an individual's experience through the Human Resources Management System may also provide a change in job content and assist in this regard.

7.17.5 Action Items

The following corrective actions have been established to improve the quality of OPPD's Training Program.

7.17.5.1 Nuclear Production Division Managers are to work with their supervisors to identify training and qualification needs of the supervisor's work group and responsibility. Until implementation of 7.17.5.4 below, managers are to work with their supervisors to establish and maintain programs for training and qualification which meet their identified needs.

This is a continuing activity.

7.17.5.2 Specific programs identified in 7.17.5.1 will utilize established NPD Training Department materials and resources whenever possible or other resources as appropriate. Managers are to identify the resources required to support these programs, identify these needs to NPD Training Departments and if the NPD Training Departments cannot satisfy these needs, the managers will provide necessary resources.

This is a continuing activity.

7.17.5.3 Generating Station Engineering (GSE) will finalize and implement a specific training program based upon INPO Guidance and regulatory requirements. This implementation will be completed by June 1988. In the interim, GSE Engineers will continue to be trained in accordance with the existing training program.

7.17.5.4 Expansion of the performance based INPO accredited training programs, particularly Technical Staff and QA/QC program, utilizing the ISD process are being considered for longer term development training programs in 7.17.5.1 above. Emphasis will be placed on development of common courses for personnel involved in the modification and safety related maintenance processes to effectively address SSOMI concerns. Consideration is also being given to expand

other training programs utilizing the ISD process with emphasis for personnel involved in modification and safety related maintenance processes.

Expansion of the Technical Staff program is continuing and will be completed December 1988. INPO has decided not to accredit QC training at this time. Therefore, a decision will be made by July 1988 whether or not to expand the performance based training to QC training. The QA department is expanding performance based training to the QA program. Several training modules are on hand to begin training in January 1988. The purchase of new modules will continue until April 1989. QA will conduct this training on a continuous basis beginning January 1988.

Identification of any other programs to be expanded using the TSD process will be completed by July 31, 1988.

7.17.5.5 Plant training is administered by the Fort Calhoun Station Training staff. One individual in each section or major work group outside the plant has been assigned the responsibility for administering the training program for the group.

7.18.0 SYSTEMS ENGINEERS

7.18.1 Purpose

Use of Systems Engineers was evaluated as a concept which could prevent or correct the findings of the SSOMI report. The review was conducted to assess the effectiveness of System Engineers, whose emphasis on operational needs, procedural requirements, and plant familiarity could have avoided specific concerns in the areas of Operation and Test Control, Maintenance Control, and Construction Controls.

7.18.2 Scope

This review evaluated the existing OPPD utilization of Plant, Technical Services, and GSE engineers as they relate to the modification process and the modification aspects of the INPO Good Practice for System Engineers. This review included the NRC's reports of the SSOMI and the relationship of the existing OPPD practices and the INPO practice to the SSOMI findings.

7.18.3 Discussion

A System Engineer is an individual with an engineering degree or a strong demonstrable technical background who is assigned the responsibility of maintaining expertise in a designated plant system(s) and/or area(s)*. The purpose of the position is to improve overall plant performance and reliability.

Current OPPD Utilization of Engineers for Modification.

Plant Engineering:

Fort Calhoun Station Plant Engineers are an integral part of the modification process in the phases of initiation, evaluation, design review, installation, testing, operation, and maintenance/ trouble shooting of new equipment. Each of the 12 engineers in Plant Engineering is assigned responsibility for coordinating modifications as well as engineering support to operations and maintenance of four systems or areas.

This practice is consistent with the INPO Good Practice; however, additional responsibilities may reduce the individuals' ability to concentrate on purely operational concerns and reduce the individuals "ownership" and "responsibility" for his system's reliability.

In addition to these system assignments, these engineers are called upon to respond to operational problems, NRC questions, and many other concerns originating from within the Plant, OPPD, and INPO. These engineers are in daily contact with

*INPO Good Practice TS-413, September 1985

plant operations and serve as OPPD's primary agents to support daily operations and interface the plant systems with modifications, regulatory, and maintenance processes. When special needs arise beyond the capabilities of this group, assistance is sought from OPPD offsite or outside service firms.

None of the SSOMI concerns are directly attributed to ineffective performance of this group. Increased emphasis on operational concerns and a greater depth of understanding in system characteristics and design basis would further enhance Plant Engineering's performance in the modification process.

Generation Station Engineering:

GSE Engineers are principally responsible for all phases of the design, design review, procurement, installation, and testing of modifications. In addition, they are frequently called upon to provide a) operational and maintenance support to the modifications during operation and b) special expertise for technical areas to support operations, e.g., seismic and shielding analysis. Engineers within GSE are assigned modifications related to specific systems. Through these specific system assignments, special expertise and system understanding is developed and maintained.

This practice is highly appropriate and consistent with good engineering practice and the INPO Good Practice for Plant Modification Control (TS-402) in its discussion of the Project Engineer. It would be an appropriate parallel to the System Engineer Good Practice, TS-413, to call these individuals "System Design Engineers" for the specialization approach is the same.

SSOMI concerns related to the performance of this group are addressed in other sections of this report and in OPPD's responses to the NRC. It should be noted that the SSOMI identified the Design Engineers' involvement in the installation and testing phase as a strength for OPPD's program. Continued use and development of "System Design Engineers" is important in addressing these concerns and improving the design process.

Technical Services - Technical Support Engineers:

Technical Support Engineers are minimally involved in the modification process. Evaluation of EEARs and development of the Modification Request for NPD has continually reduced in scope as Plant Engineers more thoroughly and appropriately screen potential modifications before forwarding EEARs to Technical Services. Feasibility studies are given minimal development by Technical Services except where alternatives are available which eliminate or enhance the plants request. Technical Services performs Design reviews on approximately 10% of all modifications.

The "System Engineers" concept is formally utilized in Technical Support Services in such "special project" areas as Steam Generators, Inservice Inspection, and previously EEQ. These "special project" areas constitute the bulk of Technical Support Engineers workload. These "special projects" or the feasibility studies are not given guidance by INPO Good Practices related to System Experts or Modifications.

SSOMI concerns related to Technical Service activities were related to document control and purchasing guidelines. These concerns are peripheral to the modification process and would be unaffected by further OPPD development of the "Systems Engineer" process however, it should be anticipated that these engineers would also serve as System Engineers.

7.18.5 Conclusions

As already stated, enhancement or improvement of the "System Engineer" concept is not necessary to respond to the concerns of the SSOMI. There are, however, other operational and managerial benefits to expanding the basic program currently practiced in Plant Engineering to more closely follow the INPO Good Practice.

7.18.5 Action Items

The following action items have been established to improve the quality of the Design Process.

7.18.5.1 NPD management should further explore the concept to more specifically quantify resource requirements, relocation of engineers, and advantages derived.

Scheduled completion date is March 1989.

7.18.5.2 The current practices within OPPD will be continued and individuals with current specialty assignments will be given added training in their system or speciality and responsibility to perform effectively.

Scheduled completion date is March 1989.

REFERENCES


1. Docket No. 50-285

2. Letter dated January 21, 1986, from NRC (J. M. Taylor) to OPPD (B. W. Reznicek) - Safety System Outage Modification Inspection (Design) 50-285/85-22

3. Letter dated March 19, 1986, from NRC (J. M. Taylor) to OPPD (B. W. Reznicek) - Safety System Outage Modification Inspection (Installation & Test) 50-285/85-29

4. Letter dated April 15, 1986, from OPPD (B. W. Reznicek) to NRC (J. M. Taylor) - Safety Systems Outage Modification Inspection (Design) 50-285/85-22

5. Letter dated May 22, 1986, from OPPD (R. L. Andrews) to NRC (R. D. Martin) - Safety Systems Outage Modification Inspection (Installation and Testing) 50-285/85-29

6. Letter dated January 26, 1987, from NRC (R. D. Martin) to OPPD (R. L. Andrews) - Notice of Violation and Proposed Imposition of Civil Penalty (NRC Inspection Reports No. 50-285/85-22 and No. 50-285/85-29)

7. Letter dated February 12, 1987, from NRC (J. E. Gagliardo) to OPPD (R. L. Andrews) - July 10, 1986 Enforcement Conference; August 7, 1986 Working Meeting

8. Letter dated February 20, 1987, from OPPD (R. L. Andrews) to NRC (J. E. Gagliardo) - Request for Extension of Time to Respond to Enforcement Action

9. Letter dated March 16, 1987, from NRC (J. E. Gagliardo) to OPPD (R. L. Andrews) - Approval of Request for Extension of Time to Respond to Enforcement Action

10. Letter dated April 10, 1987, from OPPD (R. L. Andrews) to NRC (J. M. Taylor) Response to Violation and Proposed Civil Penalty

ATTACHMENT NO. 5

CLARIFICATIONS/CORRECTIONS TO

INFORMATION PREVIOUSLY PROVIDED

BY REFERENCES 4 & 5

ATTACHMENT NO. 5

Clarifications/Corrections to Information
Previously Provided by References 4 & 5

By References 4 and 5, OPPD informed the NRC of the required responses to the deficiencies and unresolved items and of several programmatic actions which were to be implemented to address generic concerns of SSOMI. An Executive Order was issued by OPPD management which addressed interim measures to be taken until a program to implement programmatic solutions could be formulated. The Design Change and Modification Program Review Committee was established to conduct an in-depth review of OPPD's design change process and develop recommendations to enhance the quality of the overall program. One result of these two actions has been several modifications of the information previously provided to the NRC. These changes have been made to strengthen the program and improve manageability of interim positions or actions. Clarification of the status of actions either complete or in progress are given below.

1. The Design Change and Modification Program Review Committee consisted of licensing, Fort Calhoun Station technical staff, design engineering, quality assurance, and technical support engineering personnel. The scope of the Committee's review was expanded from that previously provided to the NRC. The report (issued June 30, 1986) addressed the following:

   Design Basis and Construction QA Records
   Updated Safety Analysis Report (USAR)
   Documentation of Design Assumptions, Design Inputs, and Engineering Judgments
   Commitment Tracking
   Design Change Program
   Procurement
   Safety Evaluations
   Reviews and Approvals
   Quality Assurance Program
   Quality Control
   Post-Modification Testing
   Installation Procedures and Field Changes
   System Acceptance
   Emergency Modifications
   Minor Modifications
   Pre-Outage Planning (Integrated Living Schedule)
   Training
   System Engineers

2. In Reference 5, delays or exceptions to the Executive Order were required to be approved by the Executive Steering Committee. As indicated in the Design Change and Modification Program Review Committee recommendations, pre-planning was an area of needed improvement. This need to pre-plan was evidenced by the number of exceptions required to the Executive Order.

3. In Reference 5, Item 1, the requirement to correct deficiencies or discrepancies within 90 days of the initial Safety Acceptance Committee (SAC) acceptance of the modification has been successfully implemented for modifications completed after June 1, 1986.

4. Item 2, Reference 5 required that the independent design verification review required by the QA Plan for all final designs involving CQE and Limited CQE structures, systems, and components would be completed prior to the construction package being accepted by the Plant Review Committee (PRC). Because of the time limitations, the PRC is reviewing the construction packages as they are transmitted.

5. In Item 3, Reference 5, three actions were required to be completed by August 31, 1986. The status of these three items are as follows:

   a. The modifications that had been completely installed and had outstanding SAC deficiencies were reviewed and accepted by the SAC by August 31, 1986, with the exception of two. These two modifications required additional effort and were approved January 1987. Several modifications were found to still require additional construction activities.

   b. All emergency modifications that had been completely installed were accepted by the SAC prior to August 31, 1986 except two that were accepted in January 1987.

   c. The existing backlog of EEARs/MRs will be viewed with the intention of significantly reducing the backlog. The EEARs/MRs prior to 1981 have been reviewed. The review of the EEARs/MRs from approximately 1981 to June 1, 1986 will be completed by September, 1987.

6. Item 4 of Reference 5 directed schedule milestone dates for implementing normal modifications. Milestones for which lead times where given were: define outage modifications, procure materials and submit construction packages. These schedule requirements have not been rigorously met as discussed in Item 2 of this attachment.

7. The Working Group issued the Design Change and Modification Program Review Committee Report on June 30, 1986. The topics that were addressed are those discussed in Attachment 4, Corrective Action Implementation Plan.

9. The modification to replace the component cooling water flow (CCW) element was used as an example of several violations. The following corrected information is being provided:

   The loss of the existing CCW flow element in the fall of 1984, was not part of the modification, but it was known to the design engineer because it was stated in the Form A written in March of 1985. It was assumed that a safety concern did not exist because of the situation. The need to improve documentation of safety evaluation is discussed in Attachment 4.

OPPD said that a review would be performed of installation procedures used to install flanges to develop better instruction to craft personnel. No standardized installation procedures have been developed. It is expected that flange installation will be one of the skills covered in the craft training program that will comply with INPO standards.

Documentation has been reviewed for the determination of CCW system pressure at the time the procedure was signed off for verification of non-leakage. The flanged connection was being hydrotested at 1.25 times the design pressure at the time of the signoff.

9. The previous response to Deficiency D2.5-6 transmitted by Reference 5 stated that OPPD has nearly completed the development of a separation criteria standard for safety-related circuits. The development of this standard will require additional time. Modifications will be governed by interim criteria.

10. Additional corrections or clarifications are provided when necessary in Attachment 3.

ATTACHMENT NO. 6

REQUEST FOR REEVALUATION OF

THE VIOLATION'S SEVERITY LEVEL AND REMISSION

OF THE CIVIL PENALTY PURSUANT

TO 10 CFR 2.205

ATTACHMENT NO. 6

Request for Reevaluation of the Violation's Severity Level and Remission of the Civil Penalty Pursuant to 10 CFR 2.205

A. Failure to Meet Requirements of 10 CFR 50.59

Part 1 of the violation stated "the licensee failed to meet the requirements of 10 CFR § 50.59 in that a change was made to the facility as described in the USAR without conducting and documenting a review to determine that the change did not involve an unreviewed safety question."

Part 2 of the violation stated "On January 15, 1985 the licensee improperly analyzed the change to its facility as described above and concluded that an unreviewed safety question did not exist when, in fact, an unreviewed safety question did exist." As a result of this finding, OPPD has rigorously reevaluated the modification as installed between 1980 and 1985 and clearly demonstrated, as detailed in the following discussion, that an unreviewed safety question did not exist. An evaluation to determine if the changes of MR-FC-78-43 could be made under the provisions of 10 CFR 50.59 was performed and documented on April 20, 1979. This unreviewed safety question evaluation for MR-FC-78-43 was reviewed by the NRC team as part of the package of material attached to the Safety Related Design Change Order (SRDCO-79-9). This safety evaluation stated:

"This change will result in safer plant operation. The valve, YCV-1045, is now a fail closed valve. This change will make the valve fail open. In the event of loss of air, the valve will fail open and thus enable the steam driven feedwater pump to operate".

SRDCO-79-9 was initiated in response to concerns of improving auxiliary feedwater (AFW) system reliability following the TMI accident and issuance of NRC IE Bulletin 79-06B. In its previous "fail closed" configuration, the steam driven AFW pump (FW-10) would have no motive power source for operation under the conditions of a loss of offsite power (which results in the load shedding of the instrument air compressor motors). Thus, only the electric driven AFW pump would be available for start with power supplied by diesel generator D-1. The change in the failure position of YCV-1045 successfully fulfilled the requirements of NRC IE Bulletin 79-06B and as determined by a recent reliability analysis verified an improvement in the AFWS reliability from $10^{-3}$ to $10^{-5}$.

OPPD acknowledges that the quoted original evaluation and a second evaluation completed November 8, 1983, during the closeout of the modification package, were not sufficiently comprehensive. However, had a comprehensive 10 CFR 50.59 evaluation been conducted at those times, it should have been concluded that an unreviewed safety question did not exist as discussed in paragraph B. below.

B. Existence of an Unreviewed Safety Question

Part 1 of the violation stated "The inability to close the "fail open" steam supply valves upon the loss of non-safety-related instrument air would result in an additional fission product release path, not analyzed in the USAR, for a steam generator tube rupture incident. Consequently, the change involved an unreviewed safety question because the consequences of an accident previously evaluated in the USAR may have been increased."

As a result of this statement, OPPD has thoroughly reevaluated the Steam Generator Tube Rupture (SGTR) incident and the AFW system configuration as installed between March 1980 and October 1985 to determine whether or not an unreviewed safety question did exist during this time interval. Our determination that an unreviewed safety question did not exist is summarized as follows:

1. Was the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis increased?

   The change of YCV-1045 operator from "fail closed" to "fail open" was initiated to enhance one design function; e.g., to increase the reliability of AFW under a true demand per the requirements of NRC IE Bulletin 79-06B. As indicated in FSAR Table 5.9-1, YCV-1045 should fail closed and be isolated by SIAS. It should be noted that this table is based on a configuration shown in FSAR Figure 10.2-1 (Rev. 7, 8-18-69), in which FW-10 received steam through only one line which was downstream of the Main Steam Isolation Valves (MSIV's). This figure was consistent with the system configuration as designed in 1972 when the FSAR was submitted. As per Appendix M of the FSAR, added in June 1973, a modification was installed (prior to receipt of the initial operating license) which added a line from each steam generator upstream of the MSIV's, each with a "fail open" isolation valve (i.e., YCV-1045A/B) and removed the AFW steam supply line downstream of the MSIV's. These steam supply lines were junctioned upstream of YCV-1045 which remained a "fail closed" valve. At that time, the non-safety grade actuation system for the air operated actuator on YCV-1045 would have opened YCV-1045 upon demand following a loss of offsite power because adequate air pressure would remain in the system. However, it would have eventually gone closed as instrument air pressure was lost if no operator action was to be taken. Conservatively, the FSAR analysis assumes release independent of any flow path for up to 30 minutes into the event. Although there was a conflict regarding FSAR Table 5.9-1, the modification was intended to enhance the system function in accordance with the system's primary design function.

   In evaluating the safety significance of the changed failure mode, a review of the analyzed accidents in the FSAR/USAR was conducted to determine if the probability of occurrence or consequences of these events could be increased. Of the accidents analyzed, only three events were potentially impacted by the change. For the loss of

feedwater flow event, normally caused by loss of offsite power, the modification reduced the probability of occurrence and lessened the consequences for a total loss of all feedwater in that it improved AFW reliability. A steam line break downstream of YCV-1045A/B did not add a new path of a non-isolatable main steam leak since YCV-1045A/B were already "fail open" valves. Thus, this situation was bounded by the FSAR/USAR 14.12 main steamline break analysis which assumes a non-isolatable double-ended pipe break of the main steam line. The assumption of the largest possible break size results in the most severe primary system cooldown and, in the presence of a negative moderator temperature coefficient, also results in the most rapid positive reactivity insertion.

For a SGTR with a concurrent loss of offsite AC power (which results in the load shedding of the instrument air compressor motors), the steam release through FW-10 was not specifically identified as a discharge path for release of activity. Since the time the initial operating license was granted, the air operated actuator on YCV-1045 would have opened upon demand following a loss of offsite power because air pressure would have remained in the system. The release path through YCV-1045 should have always existed and a release path, inconsistent with the original design, was not created when the MR-FC-78-43 modification (of changing YCV-1045 from "fail closed" to "fail open") was made.

In order to better determine the potential for increased SGTR consequences, two separate analyses were performed in February 1987 and are described in Section C. One was a reanalysis of the SGTR event with a loss of offsite AC power for two cases; one with no flow through FW-10 and the second with flow. The intent of this analysis was to determine, using current Combustion Engineering (CE) methodology accepted by the NRC for facilities with CE Nuclear Steam Supply Systems, if the addition of FW-10 as a leak path resulted in an increased steam release to atmosphere. The second analysis used the information from the first analysis to evaluate the difference in offsite radiological consequences for the two cases. The two analyses demonstrate that although the increase is small, the SGTR case with YCV-1045 open does, in fact, result in a small increase in radiological consequences over the case where YCV-1045 is shut. However, for both positions of YCV-1045, the SGTR analysis in Section 14.14.5 of the FSAR was bounding. Thus, neither the probability of occurrence or the consequences of an analyzed accident were increased.

2. Was the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report created?

The FSAR analysis assumed a release to the atmosphere of 10 percent of the iodine and 100 percent of the noble gases transferred from the primary to secondary system during the first 30 minutes of a SGTR event without regard to the release pathway. The consequences of an 8 hour release are bounded by the data contained in the FSAR.

3. Was the margin of safety as defined in the basis for any Technical Specification (T.S.) reduced?

The basis for Technical Specification 2.5 Steam and Feedwater Systems, states: "core decay heat can be dissipated via the steam bypass to the condenser as long as feedwater to the steam generator is available". MR-EC-78-43 improved the reliability of the AFW system from $10^{-3}$ to $10^{-5}$, thus improving the margin of safety as defined by Technical Specification 2.5. Although Criterion 53, Appendix G of the FSAR required automatic closure of valves associated with a system closed to containment, the Technical Specification containment integrity definition requires valves "not required to be open during the accident conditions" to be closed. YCV-1045 is required to be open during certain accident conditions, thus the margin of safety for containment integrity is unaffected.

C. Reevaluation of Radiological Consequences

In order to assess the radiological consequences of YCV-1045 failing open during a SGTR incident with the loss of offsite power, the AFW system configuration as installed between March 1980 and October 1985 was analyzed in February 1987. The purpose of this section is to present the results of that evaluation and provide comparisons to consequences presented in the FSAR. This comparison concludes that the release path through FW-10 did not result in exceeding the FSAR quantity of radionuclides released due to methods and assumptions used in the previous analyses. Further, assuming identical initial radionuclide concentrations and meteorological conditions, the radiological consequences, if recalculated assuming YCV-1045 failed open, would be bounded by the FSAR.

1. February 1987 Analysis Summary

A reevaluation of a SGTR incident was completed in February 1987 using the NRC approved computer code CESEC-III, methodology currently used by Combustion Engineering (e.g., see analyses performed by Combustion Engineering under Docket 50-318 for Calvert Cliffs Unit 2 for Cycle 5 or Docket No. 50-335 for St. Lucie Unit 1 for Cycle 4), and inputs consistent with those of the FSAR and associated 1971 methodology. The original input assumptions of the FSAR were used in the February 1987 evaluation of the SGTR event using the CESEC-III code. The FSAR analysis used the then current SASSY code which has been superseded by CESEC.

Two cases were analyzed. The first case assumed YCV-1045 closed. The results from this analysis determined the primary to secondary leak rate through the ruptured tube and mass release through the main steam safety valves. The "YCV-1045 open" case was then modeled and the case rerun to establish the increase (or decrease) in the leakage or mass release values. The 1800-second results were then extrapolated to obtain a conservative eight-hour release value. These results are presented in Table I.

As anticipated, the total mass release value is greater with YCV-1045 open as opposed to closed; however, the total mass releases from both cases were bounded by the values contained in the FSAR. Consequently, the radiological consequences remain bounded by the FSAR.

2. USAR Analysis Summary

The SGTR incident analysis presented in USAR Section 14.14.4 was performed and submitted in conjunction with OPPD's application made in 1979 to increase reactor power from 1420 $MW_{th}$ to 1500 $MW_{th}$. The SGTR event was not reanalyzed specifically for Fort Calhoun but instead used conservative input values from Millstone Unit 2 (2700 MW vs. 1500 MW) in lieu of specific Fort Calhoun plant values. The analysis was accomplished using conservative methods and the CESEC computer code (previous version to the CESEC-III code currently in use). The USAR analysis assumes no loss of offsite power for the primary and secondary system responses, but uses a loss of offsite power as the basis for the radiological consequences. It assumes releases are made directly to the atmosphere and not through the condenser off-gas. The three assumptions describe an event which results in a mass release which exceeds the mass releases presented in the FSAR analysis and the February 1987 reanalysis.

A review of the SER in response to OPPD's 1500 MW stretch power submittal, shows that the NRC did not review OPPD's SGTR analysis for stretch power but based their 1500 MW approval on the original SGTR FSAR analysis. The February 1987 analyses and methodology described here will be submitted to the NRC for review. After receipt of a Safety Evaluation Report, the results of the analyses and original FSAR data will be included in the required USAR update.

TABLE I

STEAM GENERATOR TUBE RUPTURE WITH LOSS OF OFFSITE POWER

Fluid and Steam Release Comparisons
($lb_m$)

| | FSAR | YCV-1045 CLOSED | YCV-1045 OPEN |
|---|---|---|---|
| Primary to Secondary Leakage (0-30 min.) | 50,000 | 48,950 | 49,043 |
| Total Release (0-8 hr.) | 332,000 | 101,909 | 102,179 |

3. FSAR Analysis Summary

The SGTR incident analysis presented in FSAR Section 14.14.5 was performed in February 1971 by the NSSS vendor, Combustion Engineering, Inc., to support initial (i.e., Cycle 1) plant operation at 1500 $MW_{th}$. Although the Fort Calhoun Station was operated at a reduced rated power level of 1420 $MW_{th}$ until Cycle 6, this analysis was valid and bounded operation of the reduced rated power level. The FSAR analysis was performed using the then "state-of-the-art" SASSY computer code and the results of the thermal/hydraulic response analysis used as input to the radiological consequences evaluation. The radiological consequences calculations assumed a loss of offsite power which maximizes the site boundary dose rates due to direct atmospheric releases rather than releases through the condenser off-gas, which would occur if offsite power were available.

The FSAR, as opposed to the USAR, most correctly reflects the basis upon which the Fort Calhoun Station is licensed to operate, because this analysis received specific regulatory approval.

4. Conclusion

From a comparison of the results of the FSAR and the 1987 reanalysis, it is concluded that the mass of steam and radionuclides released to the environment, for either position of YCV-1045, are less than (i.e., bounded by) the releases presented in the FSAR.

Please refer to Table II for a comparison of radiological consequences.

TABLE II

DOSE COMPARISONS (REM) - EXCLUSION AREA BOUNDARY

| | 10 CFR 100 (2 HOUR DOSE) | FSAR (8 HOUR DOES) | YCV-1045 CLOSED (8 HOUR DOSE) | YCV-1045 OPEN (8 HOUR DOSE) |
|---|---|---|---|---|
| Whole Body Dose | 25 | 0.45 | 0.1687 | 0.1690 |
| Thyroid Dose | 300 | 13.7 | 2.20 | 2.27 |

D. Conclusions

10 CFR 2, Appendix C, Supplement 1, C.6, states that a Severity Level III can be issued for violations involving, for example, "Failure to meet the requirements of 10 CFR 50.59 such that a required license amendment was not sought;"

As discussed in Sections A, B, and C of this attachment, OPPD has provided sufficient information to support the conclusion that an unreviewed safety question did not exist and, therefore, a license amendment was not required.

However, OPPD does admit that in accordance with 10 CFR 2, Appendix C, Supplement 1, D.2, the violation involved an example of a "failure to meet the requirements of 10 CFR 50.59 that does not result in a Severity Level I, II, or III violation;"

Based on information provided, OPPD respectfully requests a reduction in the Severity Level of the Violation and remission of the Civil Penalty.