UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

# SEQUOYAH NUCLEAR POWER PLANT, UNITS 1 AND 2

# SAFETY EVALUATION REPORT FOR EMPLOYEE CONCERN ELEMENT REPORT 204.6(B), "ECN PROCESS AND SCOPE OF ENGINEERING "REQUIRED FOR MODIFICATIONS"

## I. SUBJECT

Category: Engineering (20000)
Subcategory: Organization or Operating Procedures (20400)
Element: Engineering Change Notice (ECN) Process and Scope of Engineering Required for Modifications (20406)

The basis for Element Report 204.6(B), revision 1, dated June 10, 1987 is employee concerns PH-85-038-001, WI-85-100-041, WI-85-100-055, XX-85-070-003, I-85-128-NPS, ECTG-2 and IN-85-929-001 which state:

PH-85-038-001:

"Office of Engineering's Procedure OEP-11 'Changes to Plant' was revised. The revision eliminated the front page of the ECN form which identified the documents/other areas of plant the ECN could affect. The old ECN front page had as an example, 'FSAR affected: Yes/No' and 'Appendix R affected: Yes/No', which required some positive action by requiring the 'yes' or 'no' block to be checked. The new revision to OEP-11 has an Attachment 2 which is only a list of possible areas which might be affected and requires no check off. Therefore no one is using it. CI has no aditional information. Anonymous concern."

WI-85-100-041:

"Lack of adequate tracking for EN DES commitments and design changes. CI has no further information. Anonymous concern via letter."

WI-85-100-055:

"Untimely closeout of ECNs, due to a lack of knowledge of status of ECNs or designs affected. CI has no further information. Anonymous concern via letter."

XX-85-070-003:

"Sequoyah: Work plans contain inaccurate data. Majority of the Design Change Requests (DCR) taken care of, but not documented right and drawings do not reflect the as-built condition. Details withhheld to maintain confidentiality. Nuc power concern. CI has no further information."

I-85-128-NPS:

"An individual from Bellefonte Nuclear Plant wrote NSRS expressing his concern that the control and quality of OE's design effort is inadequate. The CI sent several pages detailing and summarizing his evaluations and conclusions concerning three major areas: design calculations, nonconformance reports (NCR) and management policies."

ECTG-2:

"Lack of coordination of effects of upcoming (near or long-term) design changes with all disciplines and site construction. Inadequate evaluation of impacts (not under configuration control)."

IN-85-929-001:

"The excessive number of ECNs hinders the quality of work at Watts Bar Nuclear Plant by bogging down the mechanisms of normal construction activities and causing rework. CI has no further information."

## II. SUMMARY OF ISSUES

Six issues were defined by the licensee as applicable to this evaluation:

1. ECNs are closed out in an untimely manner, without proper status of ECN and affected design being known. There is a lack of adequate tracking for EN DES design changes.

2. Procedure OEP-11 revision eliminated space on the front cover page for identification of other documents and plant areas affected by ECNs. Elimination of this "checklist", which required consideration and positive action by the ECN preparer and reviewer, may result in an affected document or plant area being overlooked.

3. The majority of design change requests (DCR) are not documented properly.

4. The engineering scope and design activities required for modifications are not adequately identified.

5. TVA does not coordinate the effects of upcoming (near or long-term) design changes with all disciplines and site construction. This results in an inadequate evaluation of the impact of design changes.

6. An excessive number of ECNs hinders the quality of work by delaying construction activities and causing rework.

These concerns also generated issues which are addressed in other Sequoyah Element Reports:

201.5 There is inadequate tracking of EN DES commitments.

201.6 Basic design input, design requirements, and the basis of determination of design requirements are not readily available.

205.1 Basic design calculations are not prepared or documented.

205.2 There are no procedures to control and keep calculations current.

206.1 Configuration control does not exist. Drawings do not reflect the as-built conditions.

307.4 Work plans contain inaccurate data. Majority of the DCRs have been implemented by documentation had not been prepared correctly.

III. EVALUATION

The licensee reviewed their engineering procedures and practices relative to the ECN and DCR systems, corporate and Sequoyah nuclear performance plans, program audits, available transcripts of NRC investigative interviews and an initial NRC response to the Sequoyah Design Baseline and Verification Program (DBVP). In the Sequoyah Nuclear Performance Plan, the licensee acknowledged past problems with design change control. The licensee attributed these weaknesses to inadequate evaluations, poor coordination, poor followup on paperwork, poor control by using a two-drawing system and the wide scope of individual ECNs.

The NRC staff evaluated the licensee's element report and inspected (50-327/86-62 and 50-328/86-62) and audited the licensee's corrective actions. NSRS Report No. I-85-637-SQN "Work Plan Processing" examined employee concern XX-85-070-003 and was also reviewed. This evaluation included an audit of the licensee's interim design control procedures and ECN packages:

SQEP-13, Revision 6 dated August 3, 1987, "Procedure for Transitional Design Change Control"

SQEP-60, Revision 1 dated August 14, 1987, "Handling of Modifications Using Design Change Notices"

ISSUE ONE - ECN CLOSEOUTS

The element report indicated that the licensee formerly had procedures where engineering change notices could be considered complete when all of the engineering work was completed, regardless of the status of the implementation of the changes. However, Sequoyah Nuclear Plant (SQNP) required a written notification that field implementation was completed before closing the ECNs and the concern about premature closeout is not substantiated. The licensee admitted untimely closeouts of ECNs and established an ECN closeout group. The NRC found (50-327/86-62) at one time that only 145 of 1,400 safety-related ECNs had been closed.

The ECN closeout group is continuing to examine and close old ECNs. The licensee has implemented a transitional design change control (SQEP-13) to process all ECNs written since 1986. SQEP-13 states that the Project Administrative Section (4.1.36) "receives notification from Modification that all work relating to the ECN has been implemented and verified to the requirements of the ECN package and all workplans are field complete," (4.1.40) "notifies Modifications in writing that the ECN package is design

complete including Field Change Requests (FCR)," and (4.1.41) "receives notification from Modifications in writing that all workplans for the ECN package are closed."

SQEP-13 describes the design change document tracking system. SEQP-60 describes the design change notice (DCN) logging and tracking system. The primary purpose of a DCN is to approve design status changes to ECN pacakges controlled by SQEP-13. DCN coordinators are on-site personnel who are assigned to perform, coordinate and track each DCN. Administrative Instruction AI-19, Part IV commits the licensee to a timely closeout of all DCNs and 7000 series ECNs within six months after the final work plan for the modification is complete.

ISSUE TWO - ECN COVER SHEET CHECKLIST

This concern is not substantiated. The nine question checklist was removed from the cover sheet in OEP-11 and expanded into a 28 question checklist in Attachment 2 of OEP-11. SQEP-13 contains an engineering change notice cover sheet which requires signatures from the ECN preparers, engineering groups whether or not they provide data sheets, safety questions reviewers, engineering groups and project engineer for final approval and the RIMS accession number.

ISSUE THREE - DCR DOCUMENTATION

The concern about DCR documentation contained a large number of examples of deficiencies in drawings and vendor manuals. Examples are failure to update drawings or manuals, lost work plans, and modifying only one or the two Watts Bar plants. Most of these deficiencies were in nonsafety-related systems. The licensee did not respond directly to the issues of lack of tracking of design changes, lack of knowledge of affected designs, or lack of documentation of changes, but all modifications to plant safety systems which were initiated after the operating license was issued will be reviewed by the licensee prior to restart. When discovered, problems with earlier ECNs and DCRs will be resolved by the design baseline and verification program. SQEP-13 and SQEP-60 describe the documentation system which is used for current projects.

ISSUE FOUR - ENGINEERING SCOPE AND DESIGN ACTIVITIES FOR MODIFICATION WORK

The concern about inadequate identification of activities required for modifications is substantiated by licensee's statements in the element report. SQEP-60 describes the activities and process used to accomplish a modification.

ISSUE FIVE - INTERDISCIPLINE DESIGN CHANGE COORDINATION

The licensee has acknowledged in the Nuclear Performance Plan problems with the control of design changes and plant modifications. The licensee acknowledged the use of design and modification control methods that did not provide the coordination among groups required to ensure accurate documentation of plant configuration and performance of effective safety evaluations. In addition, each group was releasing its drawings to Modifications at different times and it was difficult to resolve design conflicts between groups before part of the modification was under

construction. There was lack of coordination between disciplines and between engineering and site construction and the resulting inadequate evaluation of the impact of design changes.

In the transitional program, all design activity will be completed prior to release of an ECN. The Change Control Board has been established to provide overall management control during the transition period. The Nuclear Engineering Branch reviews the proposed modifications to assess the potential for an unreviewed safety question. A review of other employee concerns shows frequent meeting between field engineers and construction employees to discuss the extent of the modifications.

ISSUE SIX - EXCESSIVE NUMBER OF ECNS

The licensee stated in the Nuclear Performance Plan that the large volume of modifications work at Sequoyah presented a significant challenge. The large scope of individual engineering change notices and the number of work plans has been a problem. Since then, the Change Control Board has been established to provide overall management during the transition period. Work scopes have been limited in size and must be able to be accomplished in one cycle.

LICENSEE COMMITMENTS

Control room primary drawings, which include approximately 900 drawings maintained in the plant control room, will be converted into configuration control drawings by the end of fuel cycle 4 outage (the second outage after restart). Changes will be red-lined on the control room drawings before a system can be operated. The licensee has established a target of 15 days from the completion of a field modification to updating of these primary drawings. Secondary safety-related drawings will also be maintained as-configured and are to be updated within 90 days of receipt by DNE of completed workplans and drawings from the Modifications group. Non-safety-related drawings required to support plant maintenance are also to be up-dated wihin 90 days of work completion. All other drawings, such as structure location drawings, isometrics, load tables and bills of material, will no be as-configured, but are to be updated and maintained as designed.

DISCUSSION OF LICENSEE CONCLUSIONS

The licensee acknowledges that the Sequoyah design change control and documentation program have not been adequate and issues one, four and five are valid. The concern in issue two about the cover sheet checklist is not substantiated. The licensee's statement that issue three about DCR documentation was regarded as the responsibility of the originating organization and therefore, not an engineering problem is contradictory to findings at Watts Bar. The licensee will be reviewing all modifications to plant safety systems which were initiated after the operating licensee was issued. The licensee's statement that issue six about an excessive number of ECNs is not a valid engineering concern because ECNs are generated in response to other design change documents whose quantity is not controlled by Engineering is contrary to the licensee's responsibility to control his work. The licensee has implemented a mechanism for apportioning work in the CCB based on available resources through procedure SQEB-13.

## IV. NRC CONCLUSIONS

The NRC staff believes that the licensee's investigation of the concerns was adequate, and their resolution of the concerns as described in TVA Employee Concerns Special Program Report Number 204.6(B) Revision 1 dated June 10, 1987, "ECN Process and Scope of Engineering Required for Modifications" is acceptable. TVA has committed to updating the control room drawings and issuing revised drawings within specific time limits. The NRC will be monitoring the adequacy of the improvements through inspections and audits.