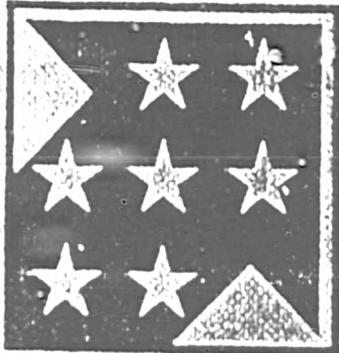


9004300351 900428
FDR ADOCK 05000252
PDC

Tennessee Valley Authority
Nuclear Power

NMRG



TVA NUCLEAR

Review of the Integration
of Engineering Assurance
Functions into Nuclear
Quality Assurance and
Nuclear Engineering

Report No. R-90-01-NPS

Part 2 - February 1990

Nuclear Manager's
Review Group

TENNESSEE VALLEY AUTHORITY

Nuclear Power

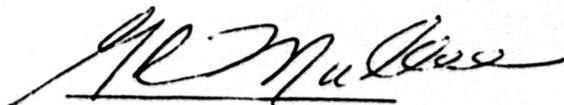
**REVIEW OF THE INTEGRATION OF ENGINEERING ASSURANCE
FUNCTIONS INTO NUCLEAR QUALITY ASSURANCE
AND NUCLEAR ENGINEERING
PART 2**

Report No. R-90-01-NPS

February 1990

Prepared by

Nuclear Manager's Review Group (NMRG)



**G. R. Mullee
Manager, NMRG**

CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	1
I. INTRODUCTION	2
A. Background	2
B. Team Structure	2
C. Methodology	2
D. Schedule	3
II. REVIEW RESULTS	4
A. Overall Assessment	4
B. Findings	4
C. Observations	7

REVIEW OF THE INTEGRATION OF ENGINEERING ASSURANCE (EA)
FUNCTIONS INTO NUCLEAR QUALITY ASSURANCE (NQA)
AND NUCLEAR ENGINEERING (NE)
PART 2

EXECUTIVE SUMMARY

This was the second review in a series of three assessments by the Nuclear Manager's Review Group (NMRG) of the effectiveness of the integration of EA functions into NQA, NE, and Nuclear Licensing and Regulatory Affairs (NLRA). The overall review is being performed at intervals of three months, six months, and one year following the EA-related reorganization. Part 1 assessed the integration of the functions previously performed by EA and new initiatives to monitor the performance of engineering work. Part 1 found that the functions previously performed by EA had been integrated and that personnel training and procedure revisions to reflect the new responsibilities were incomplete.

Part 2 focused on the oversight of engineering products and the quality of data being provided for the Performance Indicators (PIs) which monitor the quality of engineering work. In addition, follow-up was conducted on the resolution of concerns identified in Part 1 of the NMRG review. This assessment did not include evaluation of NLRA since the only EA function transferred to NLRA - the generic implications review of Conditions Adverse to Quality Reports (CAQRs) - had been reassigned to NE.

This report provides the six-month assessment as summarized below by subject areas.

Effectiveness of NQA and NE Oversight of Engineering Products

The NQA and NE oversight of engineering products was effective. In assessing the effectiveness, NMRG conducted technical evaluations of 25 engineering products previously reviewed by NE and NQA in audits, monitors, and off-line reviews. This assessment did not identify any significant product deficiencies beyond those previously identified by NQA and NE. NMRG observations and interviews indicated that the review of engineering products was enhanced through effective NQA monitoring and NE management involvement.

Quality of Data Provided for the PIs

The methods of collecting PI data did not ensure consistent and accurate results. For example, several inputs were used in establishing the PI relating to the percent of unsatisfactory NE deliverables. One of these, the off-line review input, submitted 32 data sheets, when in fact only 23 products were reviewed.

Follow-up of Concerns From Part 1 of the NMRG Review

A spot check of NE and NQA training records and procedures determined that progress had been made in resolving these concerns. However, instances were observed where training and qualifications were not properly documented. Some procedures were not up to date and referenced EA organizational responsibilities. Procedural requirements were not always being followed.

I. INTRODUCTION

A. Background

In a reorganization on June 16, 1989, the functions previously performed by EA were integrated into NQA, NE, and NLRA. To assess the effectiveness of the integration, NMRG was directed to conduct reviews at three months, six months, and one year following the reorganization. The part 1 assessment was conducted in September and October 1989, and the results are identified in NMRG Report No. R-89-04-NPS.

This report provides the results of the six month assessment. This assessment did not include evaluation of NLRA since the only EA function transferred to NLRA - the generic implications review of CAQRs - had been reassigned to NE.

B. Team Structure

Seven personnel participated in all or part of this review. The team members were:

<u>TEAM MEMBER</u>	<u>POSITION/ORGANIZATION</u>
J. E. Carignan	Manager, NMRG Reviews Department
B. M. Gore (Team Leader)	Principal Nuclear Evaluator, NMRG
R. D. Greer	Principal Nuclear Evaluator, NMRG
V. D. McAdams	Principal Nuclear Evaluator, NMRG

Part-time

A. M. Grady	* Mechanical Engineer
A. Lew	* Principal Electrical Engineer
S. A. Ali	* Senior Engineering Mechanics Engineer

* Outside subject matter experts.

C. Methodology

This assessment focused in three areas: (1) The oversight of engineering products conducted since the reorganization, (2) the quality of data being provided for the PIs which monitor the quality of engineering work, and (3) a spot check of actions taken to resolve concerns identified in Part 1 of the NMRG review.

NMRG performed technical evaluations of a sample of engineering products previously reviewed by NE and NQA. NMRG results were then compared with the NE and NQA results. In addition, observations were conducted of a survey and on-going monitors. To determine the quality of the data for the PIs, the PI trend data input sheets were collected from the sites and reviewed for consistency. One PI was independently evaluated in-depth and the results compared to the published PI. NE and NQA training records and procedures were sampled to determine if they were up to date. In addition, key personnel in both NE and NQA were interviewed.

D. Schedule

The assessment was conducted between January 8 and February 9, 1990. The assessment was conducted at the corporate offices in Knoxville and Chattanooga, as well as Browns Ferry Nuclear Plant (BFN), Sequoyah Nuclear Plant (SQN), and Watts Bar Nuclear Plant (WBN).

II. REVIEW RESULTS

A. Overall Assessment

The NQA and NE oversight of engineering products was effective. In assessing the effectiveness, NMRG conducted technical evaluations of 25 engineering products previously reviewed by NE and NQA in audits, monitors, and off-line reviews. This assessment did not identify any significant product deficiencies beyond those previously identified by NQA and NE.

- The NMRG technical evaluations of seven previously monitored engineering products did not reveal any significant deficiencies not already identified by the monitors. Additionally, observations of five monitors concluded that they were being conducted in sufficient depth.
- A NMRG technical evaluation was conducted on an Engineering Change Notice (ECN) previously audited by NQA. This evaluation found that the audit was conducted in-depth and contained only minor documentation deficiencies not previously identified by the NQA audit team.
- A detailed technical evaluation of 17 of the 23 engineering change packages selected from off-line reviews showed that the packages were technically adequate. Two concerns not noted by the off-line review team were brought to management attention and are described in observation C.1, page 7.
- NMRG observations and interviews indicated that the review of engineering products was enhanced through effective NQA monitoring and NE management involvement.

B. Findings

This section of the report discusses findings in the areas of PIs, training, and procedures. These findings are areas of concern which, if not corrected, could have an adverse impact on the overall effectiveness of performance in the stated area.

1. The methods of collecting PI data did not ensure consistent and accurate results.

As a result of the integration of EA into NE and NQA, three PIs were developed for evaluating NE performance. Listed below is each PI with supporting information concerning the inconsistencies of data collection.

- a. Percent (%) of unsatisfactory NE deliverables versus the total number of NE deliverables evaluated during NE audits/surveillances and NE off-line technical reviews.
- Off-line review input data sheets did not consistently reflect the number of products reviewed, e.g., BFN off-line review personnel submitted 32 input sheets for 23 products reviewed.
 - There was inconsistency in the use of the checklist to monitor the quality of NE products in that applicable checklist attributes were not always evaluated. For example, in some cases the Unreviewed Safety Question Determinations (USQDs) was the only attribute evaluated for a Design Change Notice (DCN); although other attributes such as input requirements and calculations needed evaluation to ensure the adequacy of the product.
 - Data sheets used for PI input were sometimes duplicated resulting in inaccurate PI output. For example, some of the data sheets from audit BFA89003 were counted more than once.
- b. Number of field changes (i.e., FDCNs) per engineering modification package issued after July 1, 1989, that are initiated because of inadequate design work.

Inconsistent criteria were used in the selection of data at all three sites resulting in inaccurate comparisons of actual NE performance. For example, BFN results which were based on "closed DCNs" would have changed if they had used the WBN criteria which was "field completed" (i.e., 0.3 FDCN/DCN would have changed to 0.4 FDCN/DCN). Procedure Method (PM) 89-06 (NE), "Project Engineers' Evaluation of Discipline Performance," specifies the selection criteria as the number of design changes that have been field completed.

- c. Percent (%) of 10 CFR 50.59 evaluations prepared by NE after July 1, 1989, that are rejected by the Plant Operations Review Committee (PORC) because of inadequate engineering work.

Inconsistent criteria were used for the population of USQDs reviewed by PORC (i.e., BFN PORC reviews 100 percent of USQDs while SQN PORC reviews 10 percent). For example, during the period September through December 1989, BFN reviewed 181 USQDs and rejected 4, while SQN reviewed 9 USQDs and rejected none.

Discussion:

NE and NQA personnel interviewed indicated that there was little guidance provided on when a trending input sheet was to be submitted for PIs or the depth to which engineering products were to be evaluated. Additionally, interviews noted that some NE supervisors use their own methods to measure the quality of their products and do not use the PIs.

2. Deficiencies were identified in training and procedures.

It was observed that progress had been made in the updating of procedures and training records. However, a sample of NE and NQA training records and procedures noted deficiencies similar in nature to those found in part 1 of the NMRG review. (A NQA audit that was in progress during this review also identified similar training concerns.)

a. Deficiencies were noted in the maintenance of individual training records. These deficiencies were administrative in nature. Observations and interviews indicated that these personnel were properly qualified. Examples of deficiencies identified include:

- Four of five NE specialists performing off-line reviews did not have documented training to PM 89-04 (NE), "Off-line Technical Review and Performance Indicators."
- Matrices for NE electrical and civil (except WBN site) branches did not require training to the procedures manual methods as required by Nuclear Engineering Procedure 1.2, R2, "Training."
- A BFN Quality Engineering reviewer performing ECN/DCN reviews did not have documented qualification to perform these reviews per Quality Method's Instruction (QMI) 602.2.1, "Quality Engineering Training/Qualification Program."
- The NQA training records for the corporate quality analysts were not current in that the required reading had not been documented for two of three quality analysts.

b. Some NE personnel were not aware of the procedural requirements for placing procedure PM 89-05 (NE), "Control of Task Performance Contractors," into task scoping documents or for submitting written monthly reports of contractors' performance.

c. Some procedures, such as those listed below, were not up to date to reflect the new organization and still referenced EA.

- Browns Ferry Engineering Project PI 88-04, R4, "Change Document Closure"
- Electrical Engineering Branch CI-1, R1, "Preparation, Review, and Approval of Instructions and Standards" (The EA Functions Transition Completion Plan did not include actions to revise the NE Branch Instructions.)
- QMI 327, R4, "CAQR Preparation, Processing, and Responses."

d. The requirements of procedures were not always followed.

- A NQA supplier survey was conducted without documented acceptance criteria or a checklist as required by QMI-403, "Preparation, Performance, and Reporting of Supplier Surveys for Approved Supplier List Placement."
- The six criteria of PM 89-04 (NE), "Off-line Technical Review and Performance Indicators," for selection of review packages were not always considered, and the selection was not always made by the chief discipline engineer as required by the procedure.
- Corrections were made to a QA record by a NQA auditor without single lining, initialing, and dating as required by Standard 5.9.80, "Quality Assurance Records."

C. Observations

This section of the report discusses two observations. These observations are areas of concern of lesser significance than findings which if not corrected, could impact the effectiveness of performance in the stated area.

1. The off-line review process could be enhanced through more comprehensive use of the available checklists.

- The checklists used to review DCN packages did not contain the same level of detail as the checklists used for specific products such as drawings and calculations. These specific product checklists were seldom used in the off-line reviews. In addition, interviews with lead engineering personnel indicated that the off-line reviews could be more technical in nature.
- Two deficiencies were identified by the NMRG technical review which were not identified by the off-line review OLR-BFEP-8901. A civil calculation for a duct support had to be revised to correct the use of an improper formula. The outcome of the calculation was not affected due to conservatism used in the calculation. Problem Reporting Document BFP900032 was written to document and track this concern. An electrical calculation had to be revised to document the use of a relay as an isolation device. The device was determined to be adequate for its application but appropriate documentation was lacking.

2. Continued attention was needed to ensure timely processing for generic implication reviews of NE CAQRs.

It was observed that the number of NE CAQRs not receiving a generic implication review within the 10-day timeframe, had increased from 0 to 24. This time requirement is contained in the Nuclear Quality Assurance Manual. In accordance with discussions with Engineering Operations personnel, action was taken and the backlog was reduced to 10 as of February 2, 1990.