TENNESSEE VALLEY AUTHORITY

Nuclear Power

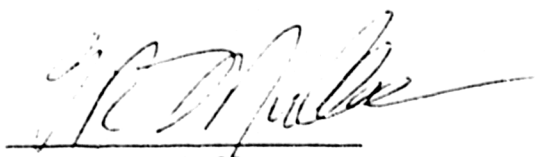
REVIEW OF THE INTEGRATION OF ENGINEERING ASSURANCE FUNCTIONS INTO NUCLEAR QUALITY ASSURANCE AND NUCLEAR ENGINEERING PART 3

Report No. R-90-04-NPS

November 1990

Prepared by

Nuclear Manager's Review Group (NMRG)



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PART 3

EXECUTIVE SUMMARY

This was the third 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 and NE. Parts 1 and 2 were conducted at intervals of three and six months following the EA-related reorganization in June 1989. Part 1 found that the functions previously performed by EA had been effectively integrated, however, personnel training and procedure revisions to reflect the new responsibilities were incomplete. Part 2 found that the NQA and NE oversight of engineering products was effective, but the methods of collecting Performance Indicator (PI) data did not ensure consistent and accurate results.

NMRG's overall assessment at the conclusion of the three part review was that the integration was effective. All of the functions previously performed by EA had been assumed by NQA or NE. The quantity, quality, and scope of engineering product oversight was continuing at or above that previously conducted by EA.

Part 3 of the review identified two findings and one observation which are summarized below.

Finding

<u>There were deficiencies in training records; corrective actions for previous findings were not effective.</u>

Training on the latest procedure revisions was not always documented on Individual Training Records (ITRs) or in some cases was not performed. For example, 243 of 247 site NE ITRs and 14 of 22 NQA ITRs sampled had one or more instances in which required reading had not been signed-off by the due date.

As discussed in the NMRG Part 1 report, deficiencies in NE training records has been a long standing problem. Several EA audits and NRC inspections identified training concerns similar to the NMRG findings since 1985. A comprehensive CAQR regarding these concerns was closed on April 6, 1990 with NQA verification that the training records were current. Subsequently, the problem recurred.

Finding

Performance indicators did not always provide consistent and accurate indication of engineering performance trends.

The data collected for the PIs were not a broad-based representation of NE performance. For example, the PI for NE deliverables in the second quarter NP Level 1 Trend Analysis Report reflected mostly BFN and WBN NE products. Only 2 of the 153 products submitted were for SQN, even though SQN generated approximately 40 percent of the products during this period.

The second quarter Level 1 PIs in the trend analysis report indicated a decrease in the quality of NE products. However, interviews with NE and NQA site and corporate management indicated that the Level 1 and Level 3 NE PIs were not an accurate representation of NE quality. Management stated they did not rely on the PIs to measure NE performance. They based their assessment of NE performance on NQA audits, monitors, and other external reviews, as well as the day-to-day interface between engineering and NQA. The management assessment was that NE product quality was at least as good as it was before the reorganization.

Noting the problems with the PIs discussed above, NMRG assessed the trend of NE products by reviewing the quantity and quality of oversight, as well as reviewing the results of other audits. This review found that NE oversight was continuing at a level at or above that conducted by EA. In addition, a review of six recent NQA audits and the last BFN and SQN Nuclear Regulatory Commission Systematic Assessment of Licensee Performance Reports indicated that engineering products were adequate and/or improving. Therefore, NMRG concluded that the assessment by NE and NQA management regarding the quality of engineering work was sound.

Observation

Although corrective actions had been implemented, CAQRs continued to exceed the 10-day limit for generic implication reviews.

NE had implemented the use of Tracking and Reporting of Open Items (TROI) and a "pending items list" to track the status of generic reviews. However, TROI data showed that 57 out of 84 CAQRs received by NE between March and August 1990, exceeded the 10-day limit for generic implication review. Increased management attention was being directed toward this problem, including weekly status reviews.

I. INTRODUCTION

A. Background

In a reorganization on June 16, 1989, the functions previously performed by Engineering Assurance (EA) were integrated into Nuclear Quality Assurance (NQA) and Nuclear Engineering (NE). To evaluate NE performance after the integration, three Performance Indicators (PI) were developed. These PIs were defined as (1) percent of unsatisfactory NE deliverables versus the total number of NE deliverables evaluated during NQA audits/monitors and NE off-line reviews, (2) number of field changes (i.e., FDCNs) per engineering modification package that were initiated because of inadequate design work, and (3) percent of 10 CFR 50.59 evaluations prepared by NE that were rejected by the Plant Operations Review Committee (PORC) because of inadequate engineering work.

The Nuclear Manager's Review Group (NMRG) was directed to assess the effectiveness of the integration at intervals of three months, six months, and one year following the reorganization. The Part 1 assessment concluded that the functions performed by EA had been integrated into NQA and NE, but personnel training and procedure revisions to reflect the new responsibilities were incomplete. The Part 2 assessment concluded that the NQA and NE oversight of engineering products was effective and engineering products were technically adequate; however, the methods of collecting PI data did not ensure consistent and accurate results. It was also found that while progress had been made, instances were noted where training was not properly documented and that procedures were not up-to-date or being followed. The results of the Part 1 assessment are provided in NMRG Report No. R-89-04-NPS, Part 2 in NMRG Report No. R-90-01-NPS.

This report provides the results of the one-year assessment which identified two findings and one observation.

B. Team Structure

Seven personnel participated in this review. The team members were:

TEAM MEMBERS	POSITION/ORGANIZATION
J. E. Carignan	Manager, NMRG Reviews Department
B. M. Gore (Team Leader)	Principal Nuclear Evaluator, NMRG
M. A. Harrison	Principal Nuclear Evaluator, NMRG
V. D. McAdams	Principal Nuclear Evaluator, NMRG
R. E. McClure	Principal Nuclear Evaluator, NMRG
H. W. Mooncai	* Principal Electrical Engineer
R. F. Papken	* Senior Titled Engineer

* Outside subject matter experts.

C. Methodology

This assessment focused on two areas: (1) a check of actions taken to resolve concerns identified in Part 2 of the NMRG review, and (2) the level of oversight of engineering products conducted by NQA and NE since the last review.

NQA audits, surveys, and monitoring reports were reviewed to assess the level of engineering activity oversight. A review of NE and NQA procedures and training records was conducted to determine if they were being maintained up-to-date. PI data input sheets and the Level 1 PIs were evaluated for consistency and accuracy in indicating engineering performance trends. In addition, NE and NQA personnel, including management, were interviewed.

D. Schedule

The assessment was conducted between September 17 and October 19, 1990. The assessment was conducted at the corporate offices in Knoxville and Chattanooga, and at Browns Ferry Nuclear Plant (BFN), Sequoyah Nuclear Plant (SQN), and Watts Bar Nuclear Plant (WBN).

II. Review Results

A. Overall Assessment

NMRG's overall assessment at the conclusion of the three part review was that the integration of EA functions into NQA and NE was effective. All of the functions previously performed by EA had been assumed by NQA or NE. The quantity, quality, and scope of engineering product oversight was continuing at or above that previously conducted by EA.

Part 3 of the review identified two findings and one observation which are discussed below.

B. Findings

This section of the report discusses findings in the areas of training and PIs. 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. <u>There were deficiencies in training records; corrective actions for previous findings were not effective.</u>

- o Training on the latest procedure revisions was not always documented on the Individual Training Records (ITR). For example, 243 of 247 site NE ITRs sampled had at least one instance in which required reading had not been signed-off by the due date. In addition, the NE Training Manager reported he had identified 65 deficient ITRs for corporate engineers.

- o Seven of 15 site NQA ITRs and seven of seven corporate NQA ITRs for personnel performing engineering oversight had instances in which required reading had not been signed-off by the due date.

- o Required training was not always being performed.

  - BFN NE was not on distribution for Site Director Standard Practices which resulted in NE personnel not being notified of revisions to two procedures on their ITRs.

  - Due to a computer input error, SQN Civil NE personnel were not notified of seven procedure revisions that were on their ITRs.

II. B. Findings (continued)

- Some NE personnel interviewed indicated that the revised procedures were on their desk, but they had not read them due to higher priority work.

- NEP 1.2 "Training," required that training be "current and documented." However, "current" was not defined and some supervisors interviewed stated they had 30 days to update training while others stated they updated training quarterly. However, NP Standard 7.1.1 "Managing Training" states that training be complete "in advance of expiration dates" of procedures.

o Deficiencies in NE training records has been a long-standing problem. Several EA audits and NRC inspections identified training concerns similar to the NMRG findings since 1985. A comprehensive CAQR regarding these concerns was closed on April 6, 1990 with NQA verification that the training records were current. Subsequently, the problem recurred.

Discussion:

Although there were a number of contributing factors to the training deficiencies, a key element was insufficient management attention at the first-line supervisory level. It was noted that the Knoxville Electrical Engineering Branch ITRs had no training deficiencies. This was mainly due to management involvement in ensuring that the training remained current.

During interviews, most engineers and NQA evaluators stated that because of the many procedure changes, they routinely referred to controlled copies of procedures while performing their duties.

2. <u>Performance indictors did not always provide consistent and accurate indication of engineering performance trends.</u>

o The data collected for the PIs were not always a broad-based representation of the quality of NE products.

- Level 1 quarterly trend analysis reports did not equally represent each sites' engineering effort. For example, the PI for NE deliverables in the second quarter NP Level 1 Trend Analysis Report reflected mostly BFN and WBN NE products. Only 2 of the 153 products submitted were for SQN, even though SQN generated approximately 40 percent of the products during this period.

- Level 1 quarterly trend analysis reports did not always represent the most recent NE work. For example, 105 of the 233 FDCNs used for the April BFN input to the PI for the number of FDCNs/DCN were from design changes more than two years old, with one dating back to 1980. This was noted in the second quarter Level 1 report as the cause of the adverse trend.

II. B. Findings (continued)

- Off-line review data for the NE deliverables PI had not been submitted from December 1989 until August 1990 because the off-line reviews were behind schedule.

- An NQA memorandum dated May 1990 (RIMS L19 900509 800), concluded that BFN engineering was not always effective in identifying all FDCNs which were the result of design errors.

- Guidance for collecting and processing PI data was not well understood. Some August 1990 PI data sheets did not have all attributes of a product completed as specified in an NQA guidance memorandum. Furthermore, during the first two quarters, numerous BFN PI data sheets for NE deliverables were rejected by NQA because they were for incomplete products. SQN PI data sheets continued to be submitted on incomplete products as recently as September 1990.

Discussion

NQA had recognized the need for improvement in the PIs. In a memorandum dated October 4, 1990 (RIMS L17 901004 801), NQA recommended to NE that two of the three PIs be replaced or modified, that more data be collected for the PI on NE deliverables, and that control limits be established.

The NE PIs in the second quarter Level 1 trend analysis report indicated a decrease in the quality of NE products. However, interviews with NE and NQA site and corporate management indicated that the PI trends for NE were not an accurate representation of NE quality. Management stated they did not rely on the PIs to measure NE performance. They based their assessment of NE performance on NQA audits, monitors, and other external reviews, as well as the day-to-day interface between engineering and NQA. Their assessment was that NE product quality was at least as good as it was before the reorganization.

Considering the problems with the PIs, as discussed above, NMRG assessed the trend of NE products by reviewing the quality and quantity of oversight as well as reviewing other internal and external audits.

During the Part 2 review, NMRG assessed 25 engineering products previously reviewed by NE and NQA in audits, monitors, and off-line reviews. That assessment did not identify any significant product deficiencies beyond those previously identified by NQA and NE.

II. P. Findings (continued)

Part 3 of the review showed that the oversight of engineering products was continuing at a level at or above that conducted by EA. EA had conducted approximately 10 surveillances and 17 audits per year. By contrast, in the six months following the Part 2 review, March - August 1990, there were approximately 170 monitors and 8 audits of engineering activities conducted by NQA (relatively uniformly among the three sites). These audits and monitors covered a broad scope of engineering activities and products and were of the quality observed during Parts 1 and 2 of this review.

A review of six recent NQA audits, NMRG reviews of engineering, and Nuclear Regulatory Commission Systematic Assessment of Licensee Performance reports for SQN and BFN indicated that engineering products and processes were adequate and/or improving.

Therefore, NMRG concluded that the assessment by NE and NQA management regarding the quality of engineering work was sound.

C. Observation

An observation is an area of concern of lesser significance than a finding which if not corrected, could impact the effectiveness of performance in the stated area.

1. Although corrective actions had been implemented, CAQRs continued to exceed the 10-day limit for generic implication reviews.

   - NE had implemented the use of Tracking and Reporting of Open Items (TROI) and a "pending items list" to track the status of generic reviews.

   - TROI data showed that in the six months from March through August 1990, 57 of 84 NE CAQRs exceeded the 10-day limit for generic implication review. Three overdue CAQRs were noted during the NMRG review on September 18, 1990.

   - Interviews indicated that the reviews were late due to higher priority activities.

   Discussion

   Increased management attention was directed toward this problem, including weekly status reviews.