U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-237; 50-249
License Nos:	DPR-19; DPR-25
Report No:	50-237-97008(DRS)
Report No:	50-249-97008(DRS)
Licensee:	Commonwealth Edison Company
Facility:	Dresden Generating Station, Units 2 and 3
Location:	6500 North Dresden Road Morris, IL 60450-9765
Dates:	March 31, 1997, through May 14, 1997, and June 16, 1997, through July 8, 1997
Inspectors:	Eric R. Duncan, Reactor Inspector James A. Gavula, Reactor Inspector George M. Hausman, Reactor Inspector
Approved by:	Ronald N. Gardner, Chief Engineering Specialists Branch 2 Division of Reactor Safety

EXECUTIVE SUMMARY

Dresden Generating Station, Units 2 and 3
NRC Inspection Report 50-237/97008(DRS); 50-249/97008(DRS)

This announced special inspection reviewed the licensee's performance with respect to the commitments and actions identified by Confirmatory Action Letter (CAL) No. RIII-96-016, dated November 21, 1996. The purpose of the inspection was to ensure that the CAL activities were completed and implemented in accordance with NRC requirements.

As a result of this inspection, two violations of NRC requirements were identified. One violation concerned the Dresden Engineering Assurance Group's (DEAG) failure to follow Desk Top Instruction (DTI) DTI-DE-15, "Roles and Responsibilities of the Dresden Engineering Assurance Group." The other violation concerned failure of the performance improvement process to ensure that problem identification forms (PIFs) were accounted for and contained within the PIF database to ensure prompt corrective actions were initiated.

- With the exception of the activities associated with the DEAG, the licensee's completed and on-going CAL activities satisfied the intent of the CAL (All).

- Numerous editorial errors (e.g., spelling, typographical problems, minor inaccuracies, etc.) were identified in most of the engineering documents reviewed by the inspectors (Sections E3.1.b, E4.1.b).

- The performance improvement process failed to provide PIF information for 13 approved PIFs as stated in the Verification Screening of Key Parameters for Twelve Risk Significant Systems Report. Subsequent licensee review identified the PIFs as lost or misplaced, which resulted in the PIFs having to be reissued (Section E4.2.b; VIO 50-237/249/97008-01(DRS)).

- No significant safety-related technical deficiencies were identified with the DEAG; however, during the period between November 18, 1996, through April 14, 1997, implementation of the DEAG oversight activities was not effective (Section E6.b; VIO 50-237/249/97008-02(DRS)).

- Gradual improvements in the DEAG activities and staffing level have been observed since late-April (Section E6.b).

- The CAL monthly meetings have been discontinued and replaced with quarterly meetings (Section E6.c).

- Numerous architect engineer (AE) deficiencies identified by recent Commonwealth Edison (ComEd) special audits were not observed during the Nuclear Utilities Procurement Issues Committee (NUPIC) audits of the same AE facilities. The results of the special audits performed by ComEd are not automatically provided to NUPIC members (Section E7).

Report Details

III. Engineering

E3 Engineering Procedures and Documentation

Confirmatory Action Letter (CAL) No. RIII-96-016, dated November 21, 1996, described two action items associated with nuclear engineering procedure (NEP) revisions and training. These action items were related to the identification of potential design-basis discrepancies and control of calculations as described in Sections E3.1 and E3.2.

E3.1 Identification of Potential Design-Basis Discrepancies

CAL Item (2) stated, "The Nuclear Engineering Procedures will be revised to provide specific direction on action to be taken whenever a potential design basis discrepancy is identified. The revisions and associated training are planned to be completed by January 31, 1997."

a. Inspection Scope (92703)

The inspectors reviewed the appropriate NEPs to verify that the procedures provided adequate direction for resolving potential design-basis discrepancies. The inspectors also reviewed the associated NEP training.

b. Observation and Findings

The inspectors reviewed NEP 10-03, "Disposition of Design Basis Discrepancies," Revision 0, issued January 20, 1997. The NEP was developed to meet the CAL requirement to provide specific direction on the actions to be taken whenever a potential design-basis discrepancy was identified. The licensee stated in the NEP that the purpose was to provide guidance regarding the disposition of discrepancies identified in each site's design information, design-basis, updated final safety analysis report (UFSAR), and physical operating configuration. The inspectors determined that NEP 10-03 provided three paths to follow when a design-basis discrepancy was identified following PIF initiation. The three paths were "Discrepancy Between the UFSAR and the Physical Plant," "Discrepancy Between Design Documents and the UFSAR" and "Design Document Discrepancy." Although, in some instances, the NEP did not provide specific direction regarding which applicable NEP or site specific procedure should be consulted for guidance (e.g., Steps 5.2.1.2, 5.4.2 and 5.4.3), the inspectors determined that the directions provided adequately addressed the intent of the CAL.

The inspectors reviewed the appropriate module/lesson plan (i.e., Module/Lesson Plan TS013196) and verified the topics addressed by NEP 10-03 were covered in the plan. Some minor problems were identified with the module/lesson plan concerning inattention to detail, such as, errors associated with the plan number (i.e., plan number was identified as TS013196; however, the correct plan number was TS013197), not using the CAL specified date when the Dresden Engineering Assurance Group (DEAG) was to be established and not using the CAL specified date when training was to be

completed. The inspectors reviewed personnel training information attendance sheets for NEP 10-03 and verified that personnel were trained within the CAL specified date.

c. Conclusions

The inspectors' review concluded that CAL Item (2) activities were completed by the licensee and met the intent of the CAL.

E3.2 Control of Calculations

CAL Item (3) stated, "The Nuclear Engineering Procedure on control of calculations will be revised to provide clearer guidance, expectations, and directions on the review, control, and reconstitution/verification of calculations for equipment or portions of systems affected by new modifications. The revisions and associated training are planned to be completed by December 2, 1996."

a. Inspection Scope (92703)

The inspectors reviewed control of calculation NEPs to verify that the appropriate NEPs were revised and to verify that associated NEP training had been completed.

b. Observation and Findings

The inspectors reviewed the following NEPs, which were revised to meet the CAL Item (3) requirements.

- 12-01, "Preparation, Review, and Approval of Design Input Requirements," Revision 2. This NEP revision was issued on November 25, 1996.

- 12-02, "Preparation, Review, and Approval of Calculations," Revision 4. This NEP revision was issued on November 25, 1996.

- 12-02DR, "Dresden Calculation Site Appendix," Revision 1. This NEP revision was issued on December 31, 1996.

The inspectors' review of NEP 12-01 identified that Revision 2 added guidance regarding situations where design input did not exist. Where design input was needed to support an on-going operation or a new modification, the revised NEP specifically stated that the necessary design input shall be generated. The inspectors' review of NEP 12-02 identified that Revision 4 provided clarification that the procedure also applied to the use of calculations; provided additional guidance for revising calculations and reviewing impact on the plant design-basis; and removed an incorrect note that stated calculations were not "configuration managed" documents and were not automatically updated when plant conditions, design-basis, or other conditions change. The inspectors' review of NEP 12-02DR identified that Revision 1 added the use of a database to allow preparers to build an electronic information index and to identify calculations which are used as design input for other associated calculations. The inspectors' review of the revised NEPs identified no concerns and determined that the additional directions provided adequately addressed the intent of the CAL.

The inspectors reviewed the appropriate lesson plan (i.e., Module/Lesson Plan TS112196) and verified the topics addressed by the NEPs were covered in the plan. No concerns were identified. The inspectors reviewed personnel training information attendance sheets for the associated NEPs and verified that most personnel were trained within the CAL specified date. However, because of end-of-year vacations and schedule conflicts, the licensee stated that some personnel were not trained within the CAL specified date. As a result, the licensee had issued a letter to the NRC dated December 6, 1996, which notified the NRC that all engineers affected would be trained by January 31, 1997. The inspectors determined that the required training was completed within the revised date.

c. Conclusions

The inspectors' review concluded that CAL Item (3) activities were completed by the licensee and met the intent of the CAL.

E4 Engineering Staff Knowledge and Performance

The CAL described four action items associated with Dresden's 12 most risk significant systems. These action items were related to key parameter screening and the on-going reconstitution or validation of the design-basis and/or calculations as described in Sections E4.1 and E4.2.

E4.1 Key Parameter Screening

CAL Item (4) stated, "An immediate screening of key parameters will be performed on the 12 systems most important from a risk perspective. The screening will include a review of key operating parameters against existing system calculations to verify that calculations support those parameters. The screening will be performed by a dedicated team of senior experienced engineering personnel from outside of Commonwealth Edison (ComEd). The screenings are planned to be completed by February 28, 1997."

a. Inspection Scope (37550/92703)

The inspectors reviewed (sampled) the results of the licensee's key parameter screening activities and verified the screening had been completed.

b. Observation and Findings

The licensee completed the 12 systems' key parameter screening and transmitted the results to the NRC by ComEd letter JSPLTR 97-0043, dated February 28, 1997. The activities described in the report, "Verification Screening of Key Parameters for Twelve Risk Significant Systems," were performed by a dedicated team of senior experienced engineering personnel brought from outside of ComEd and supported by appropriate licensee System and Design Engineering personnel. The key parameter screening identified/reviewed the key operating parameters and verified that system calculations existed to support those parameters. When discrepancies were identified, the licensee used the performance improvement process to generate and track corrective actions.

The 12 systems designated for key parameter screening were selected based upon the system risk achievement worth as determined by the Dresden Individual Plant Evaluation. The 12 systems most important from a risk perspective were identified as 1) safety-related 125/250 Vdc systems; 2) low pressure coolant injection (LPCI)/containment cooling service water systems; 3) feedwater/condensate system; 4) turbine building closed cooling water system; 5) main steam safety and relief valves; 6) service water system; 7) automatic depressurization system (ADS); 8) 4kV/480Vac safety-related auxiliary power systems; 9) isolation condenser (ISCO) system (including makeup water); 10) offsite power system; 11) emergency core cooling system initiation logic; and 12) high pressure coolant injection system.

The screening methodology determined the 12 systems' key parameters, their numerical values, and verified that a calculational basis existed to support those key parameters. The results of the licensee's screening process included:

- Identification of the system components that were important for system operation.
- Identification of the key operating modes, which included initiation points and system function for that mode.
- Identification of the key operating parameters for the systems and components.
- Determination of a numerical value for the key parameter.
- Identification of the reference which provided the numerical value for the key parameter. References included, but were not limited to, technical specifications (TSs), the UFSAR, and the Dresden Administrative Technical Requirements.
- Identification of available calculations which provided the basis for the numerical value for the key parameter and verification of the completeness of the design calculation scope, inputs, and analysis performed.
- Initiation of PIFs when differences between the UFSAR and TSs were identified.
- Initiation of PIFs for incomplete or missing calculations.
- Performance of operability evaluations when required.

The inspectors discussed the screening methodology with licensee personnel who indicated that although the system reviewers verified that calculations supporting the key parameter existed, a detailed review of the calculations was not performed. Rather, a cursory review was performed with the intent of verifying, for example, that applicable assumptions were used, that correct system diagrams and pump curves were used, that pages in the calculation were not missing, and that the calculation methodology was appropriate and did not contain any obvious errors. However, assumptions such as tank volumes and other system constants were not verified.

In addition, the calculations identified as a reference in the report were not necessarily key parameter design-basis calculations, as implied by the report methodology. For

example, setpoint error analysis calculations based on the key parameter or a verification that the key parameter was translated into appropriate acceptance criteria of supporting surveillances were used as "supporting calculations" in some cases. The inspectors discussed this issue with licensee personnel who stated that the intent of the review was to include a review of key parameters against existing system calculations to verify that calculations supported those parameters. Licensee personnel also stated that "support" as defined by the review process consisted of identifying calculations or some other reference which utilized the key parameter to establish a value used for operation of the plant. The inspectors concluded that although the screening methodology described in the report stated that the identified calculations were reviewed to ensure that calculations supported the values of the key parameters, the scope of that review was limited.

In most of the engineering documents reviewed by the inspectors (not only with the key parameter screening results), numerous editorial errors (e.g., spelling, typographical problems, minor inaccuracies, etc.) were identified. Many of these errors were the result of inattention to detail. Although no significant technical errors were identified, the errors raised concerns with the overall quality of the engineering products. The inspectors reviewed the licensee's key parameter screening results for ADS, ISCO and LPCI systems. The following discrepancies were noted:

- The licensee failed to process PIFs for problems identified during the screening review process (see Section E4.2).

- Key parameter values identified in the report were not always correct. For example, the inspectors determined that the values for key parameters such as high drywell pressure, ADS initiation time delay, LPCI pump pressure ADS permissive, and Core Spray pump pressure ADS permissive, were incorrectly listed in the report. Following additional review, the inspectors determined that these errors were due to poor attention to detail when the report was generated.

- The licensee neglected to address an ADS key parameter discrepancy between listed references. The inspectors identified that the TS reference value for ADS initiation time delay for low-low reactor water level without high drywell pressure ($\leq$10 minutes) was inconsistent with the value referenced in the UFSAR (8.5 minutes). The inspectors discussed this issue with licensee personnel who stated that a General Electric (GE) report required that the time delay be set at $\leq$10 minutes, and that 8.5 minutes was selected. The inspectors concluded that although this was technically acceptable, the TS and UFSAR differed since the TSs did not specifically state the UFSAR reference value.

- The licensee neglected to list the UFSAR value of 15 seconds for the ISCO initiation time delay in the report, although it differed from the TS value of 17 seconds. The inspectors discussed this issue with licensee personnel who stated that GE required the initiation time delay be >10 seconds to accommodate transients and that 15 seconds or 17 seconds were both reasonable. The inspectors concluded that although this was technically acceptable, the GE report, TSs and the UFSAR differed since the references did not specifically state the same reference value.

- The licensee did not always generate PIFs when warranted. For example, the licensee initiated a PIF to identify that the ISCO system key parameter value for heat removal capability did not have a supporting calculation. However, the licensee neglected to initiate a PIF for an issue discussed in the report regarding whether the heat removal key parameter value was accurate.

- Tracking of some issues identified during the screening review was a weakness. For example, the inspectors reviewed the nuclear tracking system (NTS) item related to the ISCO system PIFs and determined that the description section of the NTS items merely stated that the issue should be included as part of the 2-3 year design review. No description of the specific issues were contained in the NTS item description. In addition, the PIFs referenced by the NTS items neglected to reference the 12 key parameter system report for additional information. As a result, the inspectors were concerned that there was a potential that issues identified in the report, but only briefly discussed in the PIF and NTS system, may not receive a proper review in the future. The inspectors discussed this concern with licensee personnel who agreed that a reference to the 12 key parameter system report would have provided beneficial information to a future reviewer to ensure that the issues would be thoroughly reviewed.

c. Conclusions

The inspectors' review concluded that CAL Item (4) activities were completed by the licensee and met the intent of the CAL; however, numerous errors were noted in engineering documents developed during the screening process (i.e., numerous editorial errors or omissions were made).

E4.2 On-Going Reconstitution or Validation of Design-Basis

CAL Item (5) stated, "On an on-going basis, reconstitution or validation of the design basis and/or calculations will be performed on equipment and portions of the 12 systems most important from a risk perspective which are affected by design modifications."

The CAL also described the following short term activities:

- The results of the screening performed on the 12 systems selected from a risk perspective will be provided to the NRC on a monthly basis through a meeting and docketed correspondence.

- The NRC will be immediately informed if critical parameters on any of the 12 systems selected for screening are discovered to be outside of normal acceptance values.

a. Inspection Scope (92703)

The inspectors reviewed all level II and III (sampled level IV) PIFs generated since the CAL on the 12 most risk significant systems. The inspectors also verified that those PIFs discovered to be outside of the normal acceptance values were appropriately dispositioned and that actions required for the reconstitution or validation of the design-basis documents and/or calculations were planned.

b. Observation and Findings

During initial inspector requests for PIF information concerning the 12 most risk significant systems, the inspector observed that the licensee failed to process PIFs for problems identified during the key parameter screening. The performance improvement process (PIF database) failed to retrieve PIF information concerning 13 approved PIFs identified during the 12 most risk significant systems screening. The inspectors observed in the key parameter screening report that the "12 System Discrepancy Disposition" section stated for 13 approved PIFs that "The PIF addressing this discrepancy is being processed." Inspector follow up revealed that the 13 approved PIFs were not contained within the PIF database.

For example, ISCO system discrepancies #9 and #12 identified a number of electrical and mechanical key parameter supporting calculations that could not be identified or retrieved from the PIF database. The licensee's key parameter selection and screening verification process stated that a PIF would be generated when incomplete or missing calculations were identified. The licensee, it appeared, had failed to generate PIFs to identify the discrepancies. Similarly, a PIF could not be identified or retrieved which addressed discrepancy #11 that concerned ISCO initiation pressure switch settings.

The inspectors provided this information to licensee personnel who later determined that although the PIFs had been written, they had been inadvertently lost until questioned by the inspectors. Subsequently, these PIFs were re-identified and processed. The inspectors determined that failure of the performance improvement process to ensure that following PIF initiation, approved PIFs were accounted for and contained within the PIF database constituted a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action." (VIO 50-237/249/97008-01(DRS))

Out of 56 discrepancies identified by the key parameter screening, a total of 47 PIFs were generated. No significance level 2 PIFs were identified, one significance level 3 PIF was identified on the LPCI system and all other key parameter PIFs were identified with a significance level of 4 (Note: PIF significance levels were rated from 1-4 with 1 being the most significant). The LPCI system PIF #97-12703 identified the LPCI loop select logic reactor pressure permissive 900 psig setpoint was set non-conservatively. As a result, an emergency notification system call (ENS #31857) was made at 2051 hours on February 26, 1997, and Units 2 and 3 entered a 7 day limiting conditions for operations (LER 97-007). The inspectors verified that the PIFs were appropriately dispositioned.

Since the CAL, the licensee and the NRC have held monthly CAL meetings to discuss the status of the CAL activities. During the CAL Meeting on May 12, 1997, the license designated 6 risk significant system design-basis documents and calculations that were to be validated during 1997. During this review, the inspectors questioned the licensee if changes to the validation/verification commitments had occurred due to the recent decreases in contractor support. The licensee stated that this was an on-going effort and any changes to previously identified NRC commitments would be submitted on the docket. The last monthly CAL meeting was held on June 27, 1997, and the overhead slides from that meeting are included as an attachment to this inspection report.

c. Conclusions

The inspectors' review concluded that CAL Item (5) and the short term activity related to critical parameters outside of normal acceptance values, although not complete, met the intent of the CAL. The short term activity related to providing key parameter screening results through monthly meetings and docketed correspondence has been completed by the licensee and met the intent of the CAL. The inspectors identified a violation involving failure of the performance improvement process to ensure that following PIF initiation, approved PIFs were accounted for and contained within the PIF database.

E6 Engineering Organization and Administration

The CAL described three action items associated with the formation of an engineering assurance group. These action items were related to the DEAG and DEAG on-going activities.

CAL Item (1) stated, "An Engineering Assurance Group (EAG) consisting of senior ComEd engineering personnel and experienced outside experts was established and in place on November 18. The EAG will function to provide oversight of key engineering activities until normal engineering functions have improved to the point where these reviews are no longer necessary."

The CAL also described two short term DEAG activities that would be completed as follows:

- "A document detailing the membership and background of EAG members, charter of the EAG, responsibility, and EAG implementing procedures will be provided to the NRC by December 6, 1996."

- "The results and actions in response to these on-going EAG activities will be provided directly to the NRC on a monthly basis through a meeting and docketed correspondence until such time that we have fully assessed the effectiveness of oversight activities."

a. Inspection Scope (92703)

The inspectors reviewed the DEAG membership and background, EAG charter and responsibilities, EAG implementing procedures and monitored the on-going DEAG oversight activities to assess the DEAG's effectiveness.

b. Observation and Findings

The document detailing the membership and background of the DEAG members, charter of the DEAG, responsibility, and DEAG implementing procedures was transmitted to the NRC by ComEd letter JSPLTR: 96-0230, dated December 6, 1996.

The inspectors' review and monitoring of the on-going DEAG activities identified the following:

- From February through July 1997, the DEAG was not fully staffed (i.e., four full time and 3 part-time senior engineers as stated per JSPLTR: 96-0230) due to the reassignment of a DEAG member in February 1997 and the resignation of the DEAG Lead in March 1997.

- The DEAG did not include structural engineering expertise from November 1996 through June 1997.

- From November 1996 through February 1997, the DEAG functioned as an in-line engineering and mentoring organization.

- Although most engineering operability evaluations and all engineering safety evaluations were reviewed by the DEAG, the selection of a representative sample of modifications, calculations and setpoint changes for review were not based upon a known selection methodology (i.e., based upon a known type and number of documents generated by engineering).

- The DEAG did not generate PIFs when engineering/design-basis discrepancies were discovered until late February 1997.

- The DEAG had not been made aware of or was not involved with some significant design-basis calculation activities, which were required by the DEAG Charter/Desk Top Instruction (DTI), such as, the Unit 3 Core Flow Calibration Mismatch.

- Several DEAG commitments were made by a ComEd Memorandum (Hosmer to Netzel/Salva; Subject: Corrective Action Request AE-96-17-07) dated February 4, 1997, which were not communicated to the DEAG. As a result, the commitments were not incorporated into the DEAG's DTI-DE-15, "Roles and Responsibilities of the Dresden Engineering Assurance Group," Revision 1, as required. The following commitments were identified in the memorandum:

  1) DEAG Charter will be developed by March 1, 1997, and will include AE design output reviews.

  2) DEAG to monitor effectiveness of the changes to NEP 12-02 relative to handing the affect of cumulative impacts on calculations.

- The inspectors observed from November 18, 1996, through April 14, 1997, for items 1 through 3, and from February 25, 1997, through April 14, 1997, for item 4, that the DEAG failed to accomplish the following prescribed activities affecting quality in accordance with DTI-DE-15, "Roles and Responsibilities of the Dresden Engineering Assurance Group:"

  1) perform surveillance trending to identify potentially degraded equipment as required by Section 2.6 (Revision 0).

  2) perform oversight of the Performance Improvement Report Process as it relates to the identification of potential operability issues as required by Section 2.8 (Revision 0).

3) follow DEAG reporting requirements as required by Section 5.3 (Revision 0)/Section 5.4 (Revision 1).

4) appropriately grade all activities reviewed on the DEAG Review Sheets as required by Sections 5.2 and 5.3 (Revision 1).

The failure to accomplished the above prescribed activities affecting quality in accordance with DEAG Instruction DTI-DE-15 is a violation of 10 CFR 50, Appendix B, Criterion V (VIO 50-237/249/97008-02(DRS)).

The licensee stated that DEAG activities associated with DTI-DE-15, Sections 2.6 and 2.8 were also accomplished by other organizations within ComEd (i.e., Offsite Review and Site Quality Verification (SQV)). As a result, higher priority DEAG activities took precedence and the DTI activities were not performed. The activities associated with the reporting requirements identified in Section 5.3 (Revision 0)/Section 5.4 (Revision 1) were not performed due to inadvertent administrative organizational constraints and loss of DEAG personnel. The activities associated with appropriately grading all activities reviewed on the DEAG Review Sheets identified in Sections 5.2 and 5.3 were not performed because of inconsistencies within the DEAG administrative process and DEAG member interpretations.

To address these concerns, the licensee reevaluated the DTI and DEAG activities. DTI-DE-15, Revision 2, dated June 18, 1997, deleted Section 2.6 since this activity was more of an in-line function, deleted Section 2.8 since the SQV organization was already performing this function and revised the DTI DEAG Review Sheet grading methodology to conform to the grading methodology adopted by the engineering assurance peer group. The licensee appointed an acting DEAG Lead and the DEAG documentation was reorganized, which resulted in the first DEAG monthly report to be issued on June 26, 1997.

- Although no significant safety-related technical deficiencies were observed with the DEAG, the inspectors concluded that during the period between November 18, 1996, through April 14, 1997, implementation of the DEAG oversight activities was not effective.

- Gradual improvements in the DEAG activities and staffing level have been observed since late-April, such as,

  1) ComEd established an all station engineering assurance peer group (charter approved March 19, 1997)

  2) initiation of weekly DEAG meetings (started mid-April)

  3) improvements to the DEAG desktop procedure and review sheets

  4) the DEAG's identification of the quantity of documents developed by engineering (e.g., calculations, setpoint changes, etc.), such that, an adequate sampling methodology can be determined

5) an increase in the quantity of DEAG PIFs generated

6) the addition of personnel to restore the DEAG staffing level back to the original commitment (a structural engineer was added in June and a permanent lead was selected to start in July)

7) the issuance of the first DEAG Monthly Report on June 26, 1997

c. Conclusions

The inspectors' review concluded that CAL Item (1) activities were completed by the licensee, but the implementation of the DEAG oversight activities was not effective from November 18, 1996, through April 14, 1997, and did not meet the intent of the CAL. Although improvements have been observed within the DEAG, until demonstrated and sustained performance has been observed, the CAL will remain open to monitor and reevaluate the DEAG's effectiveness. The short term activity related to providing the information contained in JSPLTR: 96-0230 has been completed and met the intent of the CAL. The short term activity related to providing results and actions in response to on-going DEAG activities directly to the NRC through monthly meetings and docketed correspondence has been completed by the licensee and meets the intent of the CAL. However, until such time that the NRC has fully assessed the effectiveness of DEAG oversight activities, quarterly meetings will commence on October 15, 1997, at the Region III Offices to discuss the status and findings of the DEAG activities, the effectiveness of recommended corrective actions and overall engineering performance improvement. The inspectors identified a violation of procedure adherence requirement.

E7 Quality Assurance in Engineering Activities

CAL Item (6) stated, "Audits of the Nuclear Steam Supply System (NSSS) supplier and selected AEs will be performed by Site Quality Assurance and ComEd Chief Engineers to determine quality of design control and calculation quality. The initial audit of Sargent and Lundy was started in November 1996."

The CAL also described the following short term activity:

- "The schedule, results, and proposed actions relative to your NSSS and AE audits will be provided to the NRC until such time that we have fully assessed the effectiveness of the audits. The results will be provided on a monthly basis through a meeting and docketed correspondence."

a. Inspection Scope (92703)

The inspectors reviewed the licensee's Supplier Evaluation Services (SES) Special Audit No. AE-96-17, dated December 16, 1996, and Dresden's SQV Audit QAA 12-97-16, dated April 15, 1997, to assess the quality and proposed actions.

b. Observation and Findings

The licensee's corporate organization, SES, performed the special audit of Sargent & Lundy's (S&L's) Quality Assurance (QA) Program during the period November 12-19, 1996. The special audit team was composed of personnel from other ComEd sites and independent consultants (technical specialists). The purpose of the special audit was to assess the adequacy, implementation and effectiveness of S&L's QA Program with respect to the NRC Independent Safety Inspection Report issues and 10 CFR 50, Appendix B, design control requirements with specific emphasis on Dresden safety-related calculations. Other areas assessed were design errors/deficiencies, software QA, document control, internal audits, non-conforming items, corrective actions, QA Records (retrieval/control), previous deficiencies and NRC Notices, Bulletins and NUREG-0040 problems.

The Dresden SQV organization performed an audit of work activities associated with design control during the period March 10-27, 1997. The audit team was composed of personnel from other ComEd sites and independent consultants (technical specialists). The purpose of the audit was to assess the adequacy and effectiveness of work activities and programs associated with design control. The SQV design control audit team's conclusions are summarized below:

- Corrective actions performed in response to previously identified concerns with calculation quality have not been effective.

- Numerous deficiencies and weaknesses with documentation of assumptions and administrative errors were identified with calculations; however, no calculations were determined invalid or technically incorrect and no operability issues were identified.

- Corrective actions performed for configuration management (plant design change procedure/program impacts and testing) have been ineffective.

- DEAG effectiveness could not be determined.

The inspectors' review of both licensee audits concluded that the composition of the audit teams was appropriate. The addition of the technical specialists contributed to the overall effectiveness of the audit teams. The focus areas selected and the depth of reviews were appropriate. The type of audit findings and conclusions reached by the audit teams were relevant. The type, depth and conclusions of the audit findings indicated that progress has been made within the quality verification organizations and that the licensee's effort to improve the Dresden SQV organization has been firmly established.

The numerous AE deficiencies identified by the licensee's SES special audit were not observed during performance of the Nuclear Utilities Procurement Issues Committee (NUPIC) audits at the same AE facilities. As a result, the inspectors questioned the effectiveness of the NUPIC audits. The inspectors were concerned that the NUPIC audit process did not appear to be very comprehensive and appeared to produce questionable results. NUPIC audits, which are available to NUPIC members, are utilized by the utility industry to minimize the impact of required QA audits on suppliers by individual NUPIC members.

The inspectors' review of the licensee's corporate SES audit process identified the following concerns:

- The Dresden Management Review Board was unaware that the special audit was performed and had not been provided or informed of the audit results until notified by the NRC.

- The mechanisms used to feedback the special audit results were not formalized and were not automatically provided to NUPIC members. As a result, the inspectors were concerned that feedback of the special audit results may or may not be provided to other NUPIC members.

c. Conclusions

The inspectors' review concluded that CAL Item (6) and the short term activity related to providing the schedule, results, and proposed actions relative to the NSSS and AE audits, although not complete but on-going, met the intent of the CAL.

V. Management Meetings

X1 Exit Meeting Summary

At the conclusion of the inspection on July 8, 1997, the inspector met with licensee representatives identified herein and summarized the scope/findings of the inspection activities. The inspector questioned licensee personnel as to the potential for proprietary information being included or retained in the inspection report material as discussed at the exit. No proprietary information was identified.

Attachment: Dresden Station Presentation

PARTIAL LIST OF PERSONNEL CONTACTED

Licensee

J. Almon	Lead, Plant Testing Unit/Systems Engineering
D. Ambler	Executive Assistant, Regulatory Assurance
E. Carroll	NRC Coordinator, Regulatory Assurance
J. Dawn	Supervisor, DEAG
R. Freeman	Manager, Site Engineering
M. Heffley	Station Manager, Dresden
K. Ihnen	Auditor, Audit/Quality & Safety Assessment
R. Johnson	Analyst, Probability Safety Assessment/Systems Engineering; Member, DEAG
L. Jordan	Supervisor, Tech Services Training
J. Lewand	Compliance Engineer, Corporate Licensing
P. Murray	Staff, Corrective Action Process/Quality & Safety Assessment
E. Netzel	Director, Supplier Evaluation Services/Nuclear Oversight
J. Perry	Site Vice President, Dresden
K. Peterman	Supervisor, Project Controls/Design Engineering; Member, DEAG
C. Richards	Supervisor, Audit/Quality & Safety Assessment
T. Riley	Supervisor, Regulatory Assurance
B. Scott	Supervisor, Independent Safety Engineering Group/Quality & Safety Assessment
D. Spencer	Lead, Electrical System & Components/Systems Engineering
C. Tzomes	Assessor, Staff/Site Vice President
L. Weir	Superintendent, Design Engineering
R. Williams	Assistant Coordinator, Configuration Management
D. Winchester	Director, Quality & Safety Assessment

ComEd (Contractors)

J. Basak	Member, DEAG (Yankee Atomic)
C. Beck	Member, DEAG (Kiran Consultants, Inc.)
H. Campbell	Member, DEAG (Titan)
G. Shah	Member, DEAG (Bechtel)
A. Singh	Lead, Key Parameter Screening Team (S&L)

INSPECTION PROCEDURES USED

IP 37550: Engineering
IP 92703: Followup of Confirmatory Action Letters

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-237/249/97008-01(DRS) VIO PIF Corrective Action Process Failed
50-237/249/97008-02(DRS) VIO DEAG Failed to Follow DTI-DE-15 Requirements

Closed
50-237/249/97008-02(DRS) VIO DEAG Failed to Follow DTI-DE-15 Requirements

LIST OF ACRONYMS USED

ADS	Automatic Depressurization System
AE	Architect Engineer
ATTN	Attention
BWR	Boiling Water Reactor
CAL	Confirmatory Action Letter
CAR	Corrective Action Request
CCSW	Containment Cooling Service Water
CFR	Code of Federal Regulations
ComEd	Commonwealth Edison
DAP	Dresden Administrative Procedure
DBDs	Design-Basis Documents
DEAG	Dresden Engineering Assurance Group
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
DTI	Desk Top Instruction
EAG	Engineering Assurance Group
ECCS	Emergency Core Cooling System
GE	General Electric
HPCI	High Pressure Coolant Injection
IPE	Individual Plant Evaluation
IRP	Integrated Reporting Process
ISCO	Isolation Condenser
ISEG	Independent Safety Engineering Group
ISI	Independent Safety Inspection
JSPLTR	ComEd (J.S. Perry) Letter
LOCA	Loss of Coolant Accident
LPCI	Low Pressure Coolant Injection
LPM	Licensing Project Manager
NEP	Nuclear Engineering Procedure
NOC-BOD	Nuclear Operating Committee-Board of Directors
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NSSS	Nuclear Steam Supply System
NTS	Nuclear Tracking System
NUPIC	Nuclear Utilities Procurement Issues Committee
PDR	Public Document Room
PIF	Problem Identification Form
PSA	Probability Safety Assessment
QA	Quality Assurance
S&L	Sargent & Lundy
SES	Supplier Evaluation Services
SQV	Site Quality Verification
SRI	Senior Resident Inspector
SW	Service Water
TBCCW	Turbine Building Closed Cooling Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VIO	Violation

PARTIAL LIST OF DOCUMENTS REVIEWED

DOCUMENT NUMBER	DOCUMENT DESCRIPTION	REVISION OR DATE ISSUED
CAL No. RIII-96-016	Confirmatory Action Letter	November 21, 1996
DAP 02-27	The Integrated Reporting Process (IRP)	Revision 7
DTI-DE-15	Roles and Responsibilities of the Dresden Engineering Assurance Group	Revisions 0, 1, 2
EMF-89-065	Dresden Units 2 and 3 Principal LOCA Analysis Parameters (PROPRIETARY INFORMATION NOT FOR PUBLIC DISCLOSURE)	Revision 3
EMF-93-176	Updated Principal LOCA Analysis Parameters for Dresden Units 2 and 3 (PROPRIETARY INFORMATION NOT FOR PUBLIC DISCLOSURE)	Revision 5
JSPLTR: 96-0125	Basis for Confidence in Current Design & Operability with Plans for Further Verification of Design and Ensuring Sufficiency of Engineering Activities	November 8, 1996
JSPLTR: 96-0230	DEAG Membership and Background, Charter, Implementing Procedure	December 6, 1996
JSPLTR: 96-0251	CAL Action Item Update Report following first monthly status meeting held December 19, 1996	December 30, 1996
JSPLTR: 97-0005	ComEd Interim Response to NRC Independent Safety Inspection Report	January 13, 1997
JSPLTR: 97-0025	CAL Action Item Update Report following second monthly status meeting held January 31, 1997	February 7, 1997
JSPLTR: 97-0041	ComEd Response to NRC Independent Safety Inspection Report	February 26, 1997
JSPLTR: 97-0043	Verification Screening of Key Parameters for Twelve Risk Significant Systems	Revision 0
JSPLTR: 97-0050	CAL Action Item Update Report following third monthly status meeting held February 28, 1997	March 7, 1997
JSPLTR: 97-0082	CAL Action Item Update Report following fourth monthly status meeting held April 14, 1997	April 24, 1997
JSPLTR: 97-0100	CAL Action Item Update Report following fifth monthly status meeting held May 12, 1997	May 30, 1997
NEP 10-03	Disposition of Design Basis Discrepancies	Revision 0

NEP 12-01	Preparation, Review, and Approval of Design Input Requirements	Revision 2
NEP 12-02	Preparation, Review, and Approval of Calculations	Revision 4
NEP 12-02DR	Dresden Calculation Site Appendix	Revision 1
NSWP-A-15	ComEd Nuclear Division Integrated Reporting Program	Revision 0
QAA 12-97-16	Dresden SQV Design Control Audit	April 15, 1997
Special Audit No. AE-96-17	ComEd Audit of Sargent & Lundy LLC Quality Assurance Program (CONFIDENTIAL COMMERCIAL INFORMATION NOT FOR PUBLIC DISCLOSURE)	December 16, 1996
T.J. Maiman (ComEd) to A.B. Beach (NRC) Letter	Programs to Improve the Quality, Maintenance, and Accessibility of the Design Bases at ComEd Nuclear Stations	November 12, 1996
T.J. Maiman (ComEd) to A.B. Beach (NRC) Letter	ComEd Plan for Upgrading the Quality and Access to Design Information at all Six Nuclear Stations	January 30, 1997
_____	Nuclear Engineering Services 1997-1998 Operational Plan	Revision 1
_____	Dresden Engineering Assurance Group Activities for May, 1997 (1st DEAG Monthly Report)	June 26, 1997
50-237/249-96-201	Independent Safety Inspection Report of Dresden Nuclear Power Station	December 24, 1996

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Dresden Station Presentation To NRC on Status of CAL Action Items

June 27, 1997

ComEd

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AGENDA

Russell Freeman	-	Introduction / Opening Remarks
Meeting	-	Resolution of Open Items from Last
	-	DEAG Recent Activity
	-	DEAG Activity Summary
	-	DEAG Future Plans
Dennis Winchester	-	Summary of Audit Activity
	-	Future Internal and Vendor Audits
Russell Freeman	-	CAL Closure
All	-	Open Discussion

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Engineering

R. D. Freeman

Site Engineering Manager

ComEd

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Action Items

Action Items from May 12, 1997

- DEAG Staffing
- DEAG Review of 10CFR50.59 Screenings
- DEAG Calculation Sampling

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Action Items (Continued)

DEAG Staffing

- Currently at 5 FT / 2 PT vs. original 4 FT / 3 PT
- Added full-time ComEd as DEAG Lead
- Added experienced structural engineer
- Structural, Mechanical, Electrical, and I&C Disciplines

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Action Items (Continued)

Review of 10 CFR 50.59 Screenings

- Performing reviews of 10CFR50.59 screenings in conjunction with review of other products such as DCP's, Procedures, etc.
- No inappropriate screenings to date

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Action Items (Continued)

DEAG Calculation Sampling

- Monitoring calculation log for new issues
- Random sampling, not statistical
- Reviewing calculation samples from each discipline including vendor calculations

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Looking Back - ISI Findings

- **Weakness in control of design basis**
  - Action: EAG Reviews, Training
- **Retrievability of design basis information**
  - Action: Calc retrieval program
- **System Impact of Mods not identified**
  - Action: EAG Reviews, Training
- **Discrepancies between design documents**
  - Design Basis Program

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Looking Back

Key CAL Actions

- Implement EAG
- Revise NEPs regarding Design Basis Discrepancies
- Perform 12 System Parameter Review
- Reconstitute Design as part of Mods for Key Safety System
- Conduct A/E Audits

Open Item is EAG Effectiveness

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DEAG Effectiveness

- DEAG established to provide additional assurance that the design basis is preserved
- Effectiveness demonstrated by high rework %
- Ultimate goal is to eliminate the need for the EAG
- Must improve first line supervisor skills, and worker standards

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DEAG Effectiveness Issues

- Staffing
- Sampling of Engineering Products
- Trending of Review Results
- SQV Unresolved Item
- Processing of DEAG Initiated PIF's

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DEAG Effectiveness (Continued)

- Organization returned to original size
- Increased cognizance of Engineering Products
- Improved Sampling
- Revised Desk Top Instruction
  - Common Scope at six sites
  - Common grading classification at six sites
- Performance Indicators show improving trends in rework required

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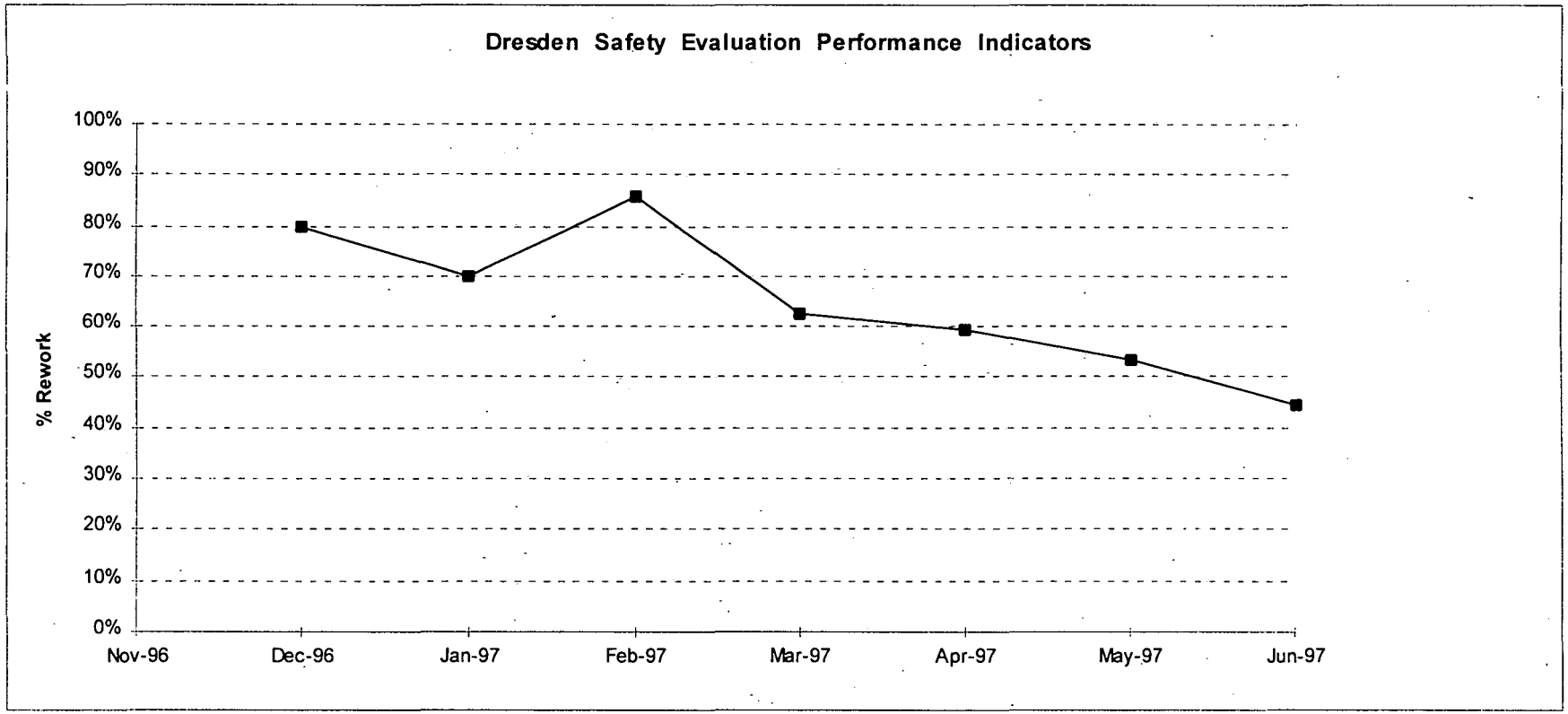
Safety Evaluation Trends



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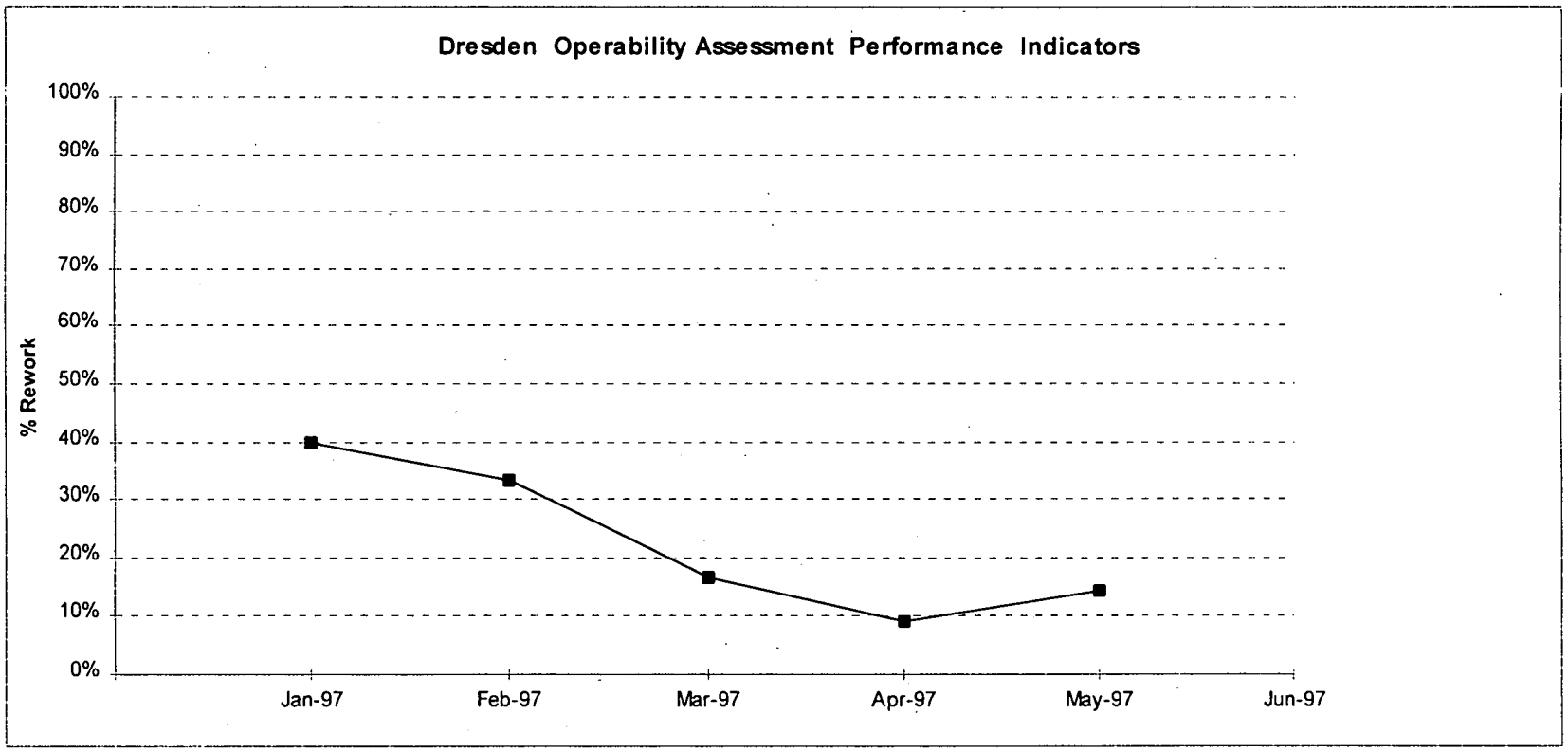
Operability Eval Trends



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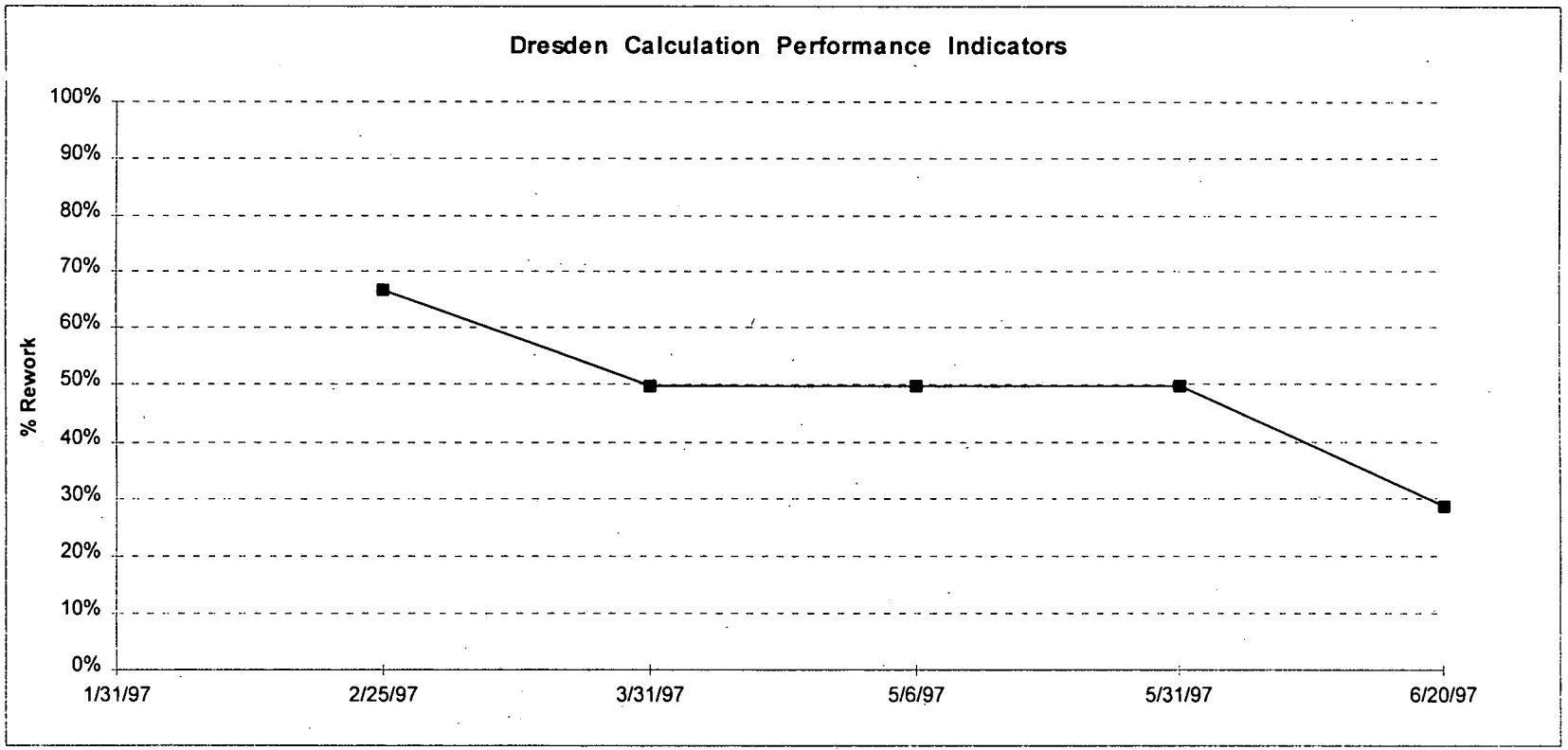
Calculation Trends



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Summary of DEAG Activity

	Reviewed	Rework	PIF's
Safety Evaluations	89	49	7
Operability Assessments	50	14	-
Design Changes	46	14	3
Calculations	20	9	5
Special Procedures	8	3	--
LER's	6	3	--
Engineering Evaluations	23	--	--
Other	22	9	--
Total	**264**	**101**	**15**

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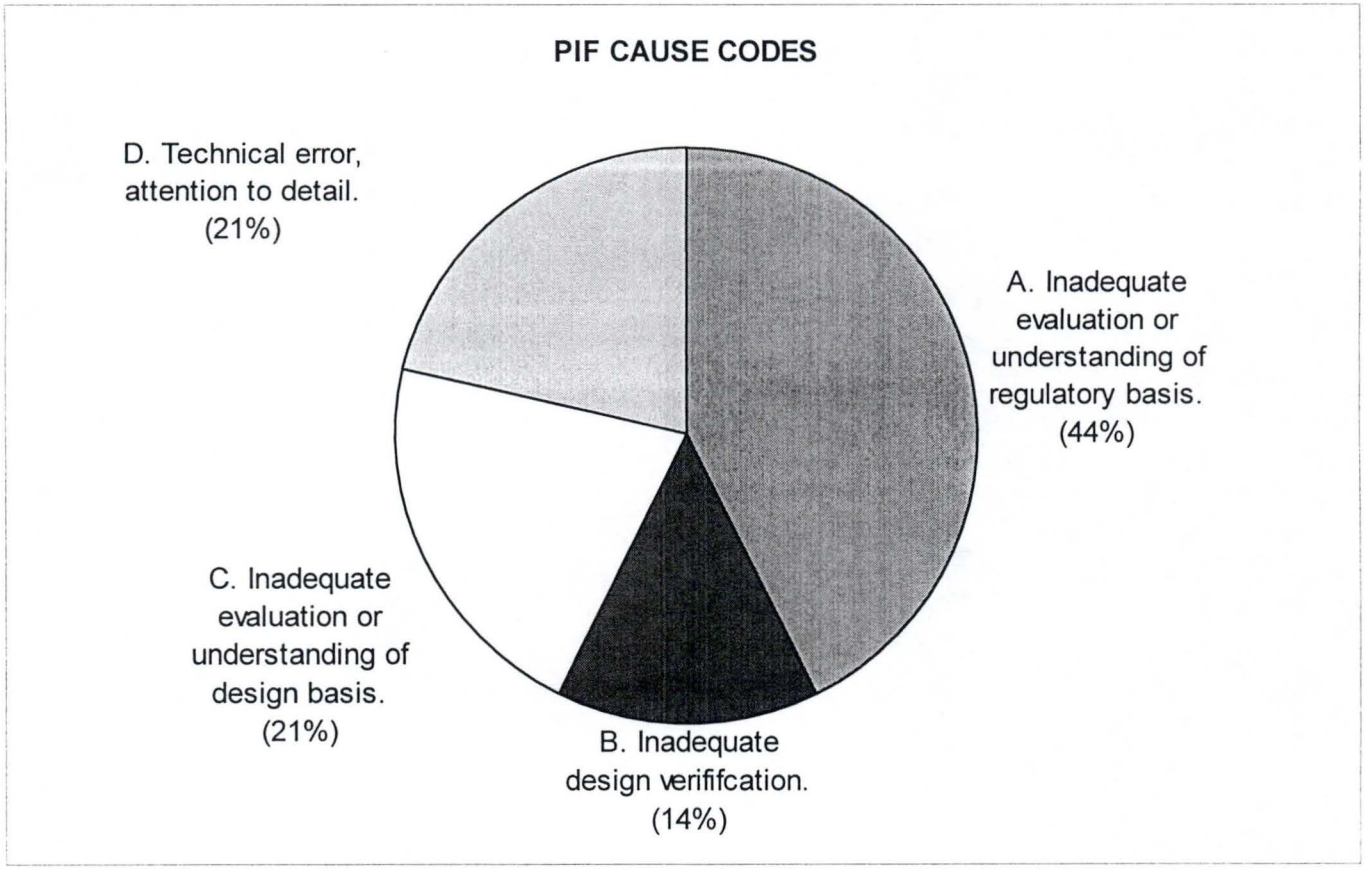
PIF Trends



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EAG Effectiveness

- Curves show we have made improvements
- We are not ready to disband EAG
- Areas which require further focus
  - Improve the preparer's understanding of Plant Licensing Basis
  - Insure that reviewers spend the time necessary to do a quality review

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DEAG Effectiveness (Continued)

<u>What we've done about issues</u>

- ESPT Training by DEAG
  - 50.59's in March
  - 50.59, calcs, design changes in June / July
- ESPT Training by Design Engineering Supt.
  - Calcs in June / July
- Immediate feedback to Preparer and First Line Supervisor by DEAG

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DEAG Effectiveness (Continued)

Problems We've had

- Initial Focus on mentoring and supporting rather than monitoring and reporting
- PIFs not getting through First Line Supervisors - set Expectations
- Tracking system not established early on

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DEAG Effectiveness (Continued)

How To Improve?

- Additional training on licensing / design basis
- Reduce the number of qualified reviewers and require them to attend advanced training

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Conclusions

- DEAG is effective at identifying problems
- Engineering Management is listening and using direct feedback and training to improve line performance
- It's time to close the CAL

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Future Action

- Provide written update of status in December
- Report on station plan for future DEAG activities
- Incorporate DEAG function into organization

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SQV

Dennis Winchester

SQV Manager

ComEd

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SQV Coverage

- Significant Portion of the Commitments are Complete

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SQV Coverage

- Audit Results
  - ComEd and Vendor Standards Raised
    - Design Control (Calculations)
    - Engineering Interface
    - 50.59 Evals
    - Procedures
    - Audits
  - Corrective Action Monitoring

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SQV Coverage

- Station Integrated Design Control Audits
- Initial Audit of primary AE's
- Initial Audit of Fuel Suppliers
- Audit Schedule Approved for Continued Coverage