U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-010/93006(DRS); 50-237/93030(DRS); 50-249/93030(DRS)

Docket Nos. 50-010; 50-237; 50-249 Licenses No. DPR-02; DPR-19; DPR-25

Licensee: Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 300
Downers Grove, IL 60515

Facility Name: Dresden Nuclear Power Station

Inspection Conducted At: Dresden Nuclear Power Station
Morris, IL

Inspection Conducted: October 20 through November 3, 1993

RIII Inspectors: Robert M. Lerch
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Approved By: Bruce L. Burgess 12/7/93
B. L. Burgess, Chief Date
Operational Programs Section

Inspection Summary

Inspection on October 20 through November 3, 1993 (Reports No. 50-010/93006(DRS); No. 50-237/93030(DRS); No. 50-249/93030(DRS))
Areas Inspected: Routine, unannounced inspection by Region III personnel of the quality control programs within plant organizations and the outage contractor organization, Fluor Constructors International Inc. (NRC Manual Chapter 35702).

Results: Quality control programs were in place and functioning well with some fairly recent improvements. A concern was raised regarding whether the management message on quality, received by construction staff and contractors, had appropriate balance. Two violations were identified in other areas. One violation was for inadequate calibration evaluations of lost or broken measuring and test equipment, and the second violation was for the lack of a corrective action process for observation reports. One unresolved item was identified regarding the licensee's commitments to quality standards. An inspection followup item was identified to track review of a motor operated valve failure.

DETAILS

1.0 Persons Contacted

Commonwealth Edison Company (CECo)

Herb Massin, Site Engineering and Construction (SEC) Manager
Richard A. Robey, Site Quality Verification (SQV) Director
Charles Tomashek, Integrated Analyst, SQV
Dave Wheeler, SEC, Construction Superintendent
George M. Kusnik, Quality Control (QC) Supervisor
Kirk Peterman, Outage Manager
JoAnn Shields, Regulatory Assurance Supervisor
Sara Reece-Koenig, Regulatory Performance Administrator
Dennis A. Lindsey, Bechtel QC Supervisor

Illinois Department of Nuclear Safety (IDNS)

Rick Zuffa
Alwyn C. Settles

The people listed above and others attended the exit held November 3, 1993. Other members of the licensee, Bechtel, and Fluor staffs were also contacted.

2.0 Introduction

The purpose of this inspection was to evaluate Quality Control (QC) oversight of station and contractor activities. The inspectors interviewed QC managers and staff, reviewed programs and procedures in use and proposed for the QC organization. The inspectors also reviewed corrective action documentation and work packages. Fluor Contractors International Inc. (Fluor), the outage contractor reviewed, was being replaced by Bechtel Construction.

Deficiency records were reviewed that were identified through several reporting processes. The review included a sample of discrepancy reports written by the plant staff, and a sample of corrective action reports, non-conformance reports, deficiency reports, and observation reports written by Fluor staff. The inspectors also reviewed the corrective actions taken on selected problem reports.

3.0 Inspection Program

Overall, with the exception of the weaknesses noted in specific areas, the QC inspection programs appeared to be functioning well and exceeded regulatory requirements for inspections and overview in some areas.

3.1 Staffing/Overtime

The use of overtime was discussed with workers and managers, and no excessive use was reported. A review of documentation for CECo QC staff identified rare occasions for approving overtime in excess of Generic Letter 82-12 guidelines. These approvals met procedural requirements. CECo's and Fluor's use of overtime was normally limited to a three shift schedule. Workers were aware that limitations existed on overtime and that management approval was required to exceed the limits.

3.2 Inspection Hold Points

The inspectors reviewed the licensee's program for applying inspection hold points. The application of hold points for modification and some maintenance activities was considered acceptable. However, the inspectors questioned the acceptability of random application of hold points for some types of work activities performed by the station. This issue is discussed further in Section 3.2.3 and will be tracked as an unresolved item.

3.2.1 Application of Hold Points Within Procedures

Most safety-related modifications were performed using corporate Nuclear Station Work Procedures (NSWPs). Since inspection hold points were already incorporated into NSWPs, the inspectors did not identify any concerns regarding hold points associated with work performed in accordance with NSWPs.

Work performed not using NSWPs was generally controlled using station procedures. However, most station procedures did not have appropriate hold points incorporated. Consequently, hold points were inserted into work request (WR) instructions when reviewed by Quality Control (QC) personnel. Attachment F, "Guidelines For Quality Control and Witness Points," to Dresden Administrative Procedure (DAP) 15-01, "Initiating and Processing a Work Request," dated November 4, 1991, outlined the requirements for specifying QC hold points in station WRs. More specific guidance in placement of hold points for QC work package reviewers was provided in Quality Control Instruction No. 10, "Quality Control Inspection Plan," dated January 7, 1993. These procedures specified mandatory hold points for some safety-related activities such as cleanliness inspections, grouting, coupling alignments, orientation of valves, environmentally qualified (EQ) splices, and motor operated valve (MOV) actuator motor connections. However, for many other safety-related activities, only random placement of hold points was required. The safety-related activities for which only random placements of hold points were specified included fastener torques, blue checks for valves, MOV operator work, non-EQ splices, and electrical terminations.

The inspectors also reviewed a sample of nonsafety-related work packages with respect to the application of hold points. Hold points were inserted into the work packages where prudent for nonsafety-related activities even though there is no requirement to do so.

3.2.2 Licensee Commitments Concerning Inspections

Quality Assurance Topical Report CE-1-A, Revision 64, dated August 17, 1993, commits the licensee to the following standards concerning inspections:

> ANSI/ASME NQA-1, "Quality Assurance Program Requirements for Nuclear Power Plants," 1989 (1a, 1b)
>
> ANSI/ASME NQA-2, "Quality Assurance Requirements for Nuclear Facility Applications," 1989
>
> Regulatory Guide 1.116, "Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems," Revision 0

By commitment to Regulatory Guide (RG) 1.116, the licensee is also committed to the following standard endorsed by RG 1.116:

> ANSI N45.2.8-1975, "Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants"

The inspectors noted that the NRC has not yet endorsed ANSI/ASME NQA-2 as being an acceptable method to fulfill the requirements of 10 CFR Part 50, Appendix B.

ANSI/ASME NQA-2, Part 2.8, Section 4.3, "Inspection," outlines the requirements for performing inspections of mechanical components. The section specifically states:

> Inspections of the work areas and the work in progress shall be performed to verify that the mechanical items are being located, installed, assembled, or connected in compliance with the latest approved-for-construction drawings, manufacturer's instructions, and procedures. Inspections performed shall include as appropriate, but not be limited to, the following:
>
> ... (d) clearances and tolerances
> (e) tightness of connections and fastenings...
> (g) absence of leakage...

Section 4.4, "Inspection," of ANSI N45.2.8 also specifies requirements similar to that of ANSI/ASME NQA-2 concerning inspection requirements.

ANSI/ASME NQA-1 Section 4.2, "Sampling," of Supplement 10S-1, "Supplementary Requirements for Inspection" states:

> Where a sample is used to verify acceptability of a group of items, the sampling procedure shall be based on recognized standard practices.

3.2.3 Concerns Regarding Licensee Application of Holdpoints

The inspectors identified two concerns with respect to the licensee's random application of hold points for safety-related work. Although the licensee considered the random application of hold points to constitute a sampling plan as permitted by ANSI/ASME NQA-1, the licensee did not have any documented methodology for the random application of hold points. Secondly, since hold points were specified on a random basis, some jobs received no inspections for certain activities, such as inspection of tightness of fasteners and connections, which the inspectors considered contrary to regulatory requirements. Resolution of this issue will be tracked as an unresolved item.

The licensee did not specify any sampling methodology for placement of QC hold points where inspections were to be performed on a random basis. QC Instruction No. 10 only specified that hold points were to be inserted on a random basis for certain activities. The instruction did not specify what fraction of the activities were to have hold points. Further, the instruction did not provide a sampling plan based on recognized standard practices.

Secondly, the licensee considered performing inspections of a sample of similar activities, such as fastener tightening, to constitute performing inspections on a sample basis. The licensee performed inspections of fastener tightening on a sampling basis because past history had not shown a problem in this area. However, the inspectors' interpretation differed in that they considered sampling to only be permitted within the same job for safety-related work. The inspectors considered ANSI/ASME NQA-1's reference to sampling methods to refer to the sample size to be inspected for a specific job based on past history, but not reduce the sample size to zero for a specific job. For example, the inspectors considered the licensee's practice of witnessing only portions of reactor head stud tensioning acceptable because portions of that specific job were inspected. However, contrary to the inspectors' expectations, the licensee did not inspect tightening of fasteners for some safety-related work activities. For example, for overhaul of the Unit 2 high pressure coolant injection (HPCI) turbine, WR D90331, no inspections were performed for tightening the turbine casing studs or the turbine stop valve flange bolting performed in February 1993.

During discussions held between F. A. Maura, NRC Region III, and with D. Brown, of the licensee's corporate quality assurance staff on November 16, 17, 29, and 30, 1993, the licensee agreed to seek an official interpretation concerning sampling from the ASME Committee on Nuclear Quality Assurance. Specifically, the licensee agreed to request clarification as to whether sampling could be applied to the inspections specified by ANSI/ASME NQA-2. In addition, further clarification will be requested as to whether the sample population had to be limited to a specific job (consistent with the inspectors' interpretation), or whether the sample population could include similar operations on similar components (consistent with the licensee's interpretation).

The inspectors requested that within 30 days of receiving an interpretation from the ASME committee, the licensee provide the NRC with a copy of the interpretation. In addition, the licensee was also requested to provide their position on how they meet their regulatory commitments for performing inspections for those areas in which inspections are performed on a random or sampling basis. Resolution of the issue concerning inspection commitments is an unresolved item pending receipt of the licensee's response and further NRC review (237; 249/93030-01(DRS)).

3.3 Initiatives

The QC manager presented several changes implemented in the QC program. The use of field inspection reports had been initiated to document inspector activities and observations in the plant. A summary analysis was compiled from this information showing the areas and types of problems being found. This information was then provided to the managers responsible for those areas. This information could also be used to indicate work where additional inspection was needed. The information gathering and analysis had been started in January 1993 and was still being evaluated. From the initial results, it appeared that the program would provide valuable feedback to managers.

The licensee also discussed a plan for work analysts to insert inspection points during the initial package preparation eliminating one cycle of QC review of initial work packages. As described, this change was being approached in a deliberate and cautious manner with appropriate QC oversite of the trial program.

One unresolved item was identified in this area.

4.0 Reviews of Problem Reports

The inspectors reviewed a sample of work documents involving QC such as work packages and deviation reports. Several issues received additional review to resolve inspector concerns. As discussed below and in Section 5, some significant issues were identified through these reviews, including two violations.

4.1 Measurement and Test Equipment (M&TE)

4.1.1 Evaluations of Lost or Broken M&TE

The inspectors' review of discrepancy records (DR) written for lost or broken M&TE found that the evaluations, the evaluation documentation, and the procedure were inadequate. Two DRs were selected as examples of the weaknesses identified. One, DR 93-188, written for a lost micrometer, was evaluated by licensee staff members as satisfactory because the three motor operator valves (MOV) operators it was used on were operating within specifications. However, the use of this instrument for the three MOVs did not assure that the micrometer was in tolerance. Also, the evaluation did not address whether the micrometer had been used on additional critical equipment or dimensions. The second example, DR 93-171, had documentation to show that only a review of the usage log was performed and that no work verification was necessary. The information in the usage log computer printout was not sufficient by itself to verify the usage of the micrometer. The licensee stated that another computer list from the total job management (TJM) system was normally used with the usage log to review tool usage. However, there was no TJM listing attached to DR 93-171. Consequently, the documentation was insufficient to show that an appropriate calibration reverification or evaluation was performed.

The inspector reviewed Dresden Administrative Procedure (DAP) 11-22, Revision 4, "Control of Measuring and Test Equipment." This procedure included a "Checklist A" for the out-of-tolerance evaluations of portable measuring and test equipment. The licensee indicated that Revision 4 of the procedure, dated July 29, 1993, added the use of Checklist A for lost M&TE. This was considered an improvement; however, the inspectors noted other procedural weaknesses. The procedure, including Step 8.d, was not specific in what constituted an acceptable reverification of M&TE. Documentation requirements on Checklist A for the reverification steps taken which stated "Describe in sufficient detail any retest or reverification performed" did not indicate what sufficient detail was. Signatures by the preparer, a reviewer, an operating engineer or assistant superintendent for operations, QC (approval), and the Office of Quality Verification (OQV) were required on Checklist A. However, DR 93-188 was signed off and the space for Technical Specification violations was marked "N/A" with an inadequate evaluation. The purpose of the various approval signatures was not clear and was not specified by the procedure. Use of the TJM system in the evaluation process was also not discussed in the procedure. The evaluation is to establish that, for M&TE that is lost, broken, or is out-of-tolerance at the time of recalibration, the M&TE equipment was still in calibration when it was last used, was not used in a way that affected safety, or additional corrective action was necessary.

The procedure did not provide appropriate qualitative or quantitative criteria for performing a satisfactory evaluation as identified by the deviation reports reviewed by inspectors. This is a violation of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings (50-237; 249/93030-02(DRS)).

Inspectors visited the maintenance shop tool rooms and reviewed the documentation for post usage calibrations of a sample of torque wrenches. The tool rooms were well kept and organized. Documentation for torque wrenches was also good. The torque wrench calibration checks sampled by the inspectors were completed and adequately within tolerances.

4.1.2 Quality Assurance Audit of M&TE Programs

The efforts of the Quality Verification organization were limited but had some good findings. Recent audits of M&TE control programs were noted, however QC activities had only been reviewed through field observations. The M&TE audit had significant findings in the program and was performance-based in looking at the control of tools in the field. The audits were overly restrictive in that they did not review the quality of the M&TE evaluations as identified in paragraph 4.1.1 above and did not audit the work by Fluor, the outage contractor and a large user of M&TE. A review of Fluor discrepancy reports by inspectors identified that Fluor had issued a corrective action report a year earlier regarding uncontrolled use of torque wrenches in the field.

4.2 Observation Reports

In the review of Fluor processes for reporting discrepancies, the inspectors examined observations reports. These were generated by Fluor QC inspectors for identified problems or potential problems which were not related to a work package. Fluor observation reports were forwarded to CECo Site Engineering and Construction (SEC), previously Engineering and Nuclear Construction (ENC). Although traceable through Fluor, the resolution of these observation reports was not tracked by SEC. The inspectors reviewed fourteen observation reports written in 1993. The reports included a discrepancy on a low pressure coolant injection pipe support, damage to unidentified instrument lines, miswired annunciators, and questionable electrical connections on fire protection wiring. The licensee committed to writing Problem Identification Forms (PIFs) on the untracked observation reports as appropriate. The failure to track resolution of these discrepancies is a violation of 10 CFR Part 50, Appendix B, Criterion XVI. Corrective action which requires that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected (50-237/93030-03(DRS)).

4.3 Condensate and Waste Sample Tank Welds

During the 1993 Unit 2 refueling outage, the licensee experienced considerable difficulty in welding patches on condensate and waste sample tanks. The difficulty experienced was primarily due to poor weld

joint design which required square corner welds. The inspectors reviewed the documentation associated with the welds and concluded that licensee acceptance of the welds was acceptable.

The licensee experienced the most difficulty performing welds for the "B" Waste Sample Tank (WST) associated with WR D12161-02. Although considerable repair welding had been performed, the licensee was not able to eliminate a crack in a newly constructed weld and accepted the crack based on an engineering evaluation. Although acceptance of such a crack would not be allowed for safety-related or code related work, the usual code requirements which apply to nuclear work were not applicable because the WST is a nonsafety-related tank and no code commitments were applicable. The inspectors noted that engineering involvement was appropriate and did not identify any technical concerns associated with acceptance of the crack.

The inspectors identified concerns with respect to documentation of the engineering methods and assumptions used for acceptance of the crack. The inspectors reviewed the licensee calculation, NED-M-MSD-52, dated April 13, 1993, for the WST weld crack. The WST is approximately 17.7 feet in diameter and 19 feet high, 3/16" thick, and made of Type 5154-O aluminum alloy. The crack was found to be sub-surface and approximately 3/8" long by radiographic testing (RT) in April 1993. Subsequent to the RT, grinding had been performed in the area of the crack and the crack had become visible from the surface. Based on review of the calculations and discussions with the licensee's corporate engineering staff, the inspectors concluded that the crack will not result in a catastrophical tank fracture. At worst, a leak could develop, but the crack opening would be expected to be slow. Daily operator rounds which check for leakage would be able to detect and report the deficiency for resolution. While there was no apparent safety concern, the inspectors pointed out a number of shortcomings within the calculation. The requirements, the methods, and the acceptance criteria were not clearly delineated up front. The justification for not taking into consideration the weld residual stress and thermal cyclic stress was not documented, and the basis for selecting the formulas used was not discussed.

4.4 Indentations in Unit 1 Service Water Radiation Monitor Piping

Fluor Constructors International, Inc. (FCII) requested a CECo evaluation of acceptability of slight indentations in nonsafety-related service water piping on March 18, 1992, associated with WR D82619-81. Three days later, CECo responded that the indentations were acceptable; however, no technical basis for the acceptability was provided. The inspectors noted that CECo later requested their architect/engineer, Sargent & Lundy (S&L), to evaluate the tubing indentations. S&L evaluated the indentations and provided a technical justification April 1, 1992. During this inspection, the inspectors performed a walkdown of the piping with the S&L engineer who performed the April 1992 evaluation. Insulation was removed from two line bends for further examination. In addition, the S&L engineer stated that he had examined

all of the piping when it had not yet been insulated in 1992. Based on interviews with the S&L engineer and inspection of the piping, the inspectors concluded that the S&L technical justification was acceptable. Although undulations were present in some of the tubing, the inspectors noted that the undulations were minor, and there was no evidence of buckling, cracks, or tears. Furthermore, the tubing was well within NSWP specifications for ovalness and line bends appeared to be within specifications for minimum radii. Except for the adequacy of the original CECo evaluation of this issue, the inspectors did not identify any concerns.

4.5 HPCI Containment Isolation Valve Failure to Open

During a review of a work package for a troubleshooting repair, the inspectors noted that the licensee had not evaluated why the limit switch for a HPCI containment isolation valve, valve MO2-2301-5, had been miswired in April 1993. The miswiring consisted of one wire being landed on an incorrect terminal and another wire being lifted. The inspectors did not have any operability concerns because the miswiring had taken place during an outage and was corrected prior to start up. However, the valve was found to be miswired after QC inspections of the wiring and valve diagnostic testing had been performed. Modification M12-2-88-063 (WR 93139) changed the limit switch from a two rotor to a four rotor design with the work activities and QC inspection completed on March 29, 1993. Modification M12-2-92-001 (WR 08998) also affected the limit switch wiring and work was completed on March 29, 1993, with QC signoffs performed on April 6 and 7, 1993. Diagnostic testing for the valve was successfully performed on April 6, 1993. However, WR 18287 was initiated by the system engineer on May 2, 1993, because the valve would not open. During troubleshooting, it was determined that the limit switch had not been wired correctly and the wiring was corrected. No corrective action document, such as a PIF, had been initiated at that time to determine why the limit switch had been miswired. During this inspection, the licensee agreed to write a PIF (Management Tracking System number 237-200-93-14400) to evaluate the issue. This issue will be tracked by an inspection followup item pending resolution of the PIF (237/93030-04(DRP)).

Two violations and one open item were identified in this area.

5.0 Summary Concern Regarding Management Message

In the course of the inspection, it appeared that, during the last outage, some workers received a message that schedule was paramount to quality.

Several manifestations of this were observed: (1) In discussions with staff the inspectors received remarks which referred to SEC as "the owner" and the implication that as "the owner", SEC project engineers called all the shots. SEC was not the final authority on quality control; by procedure, the station QC department was. However, reviews identified that station QC was not a visible presence in the field with

contractors and SEC engineers. Also SEC engineers routinely determined whether work met procedural or drawing requirements. (2) A memo, dated April 2, 1993, issued by the Fluor QC manager prominently directed inspectors to closely follow the scope of work and not to go on "witch hunts." Although the memo goes on to clarify that problems should be documented, an interpretation not to find problems could be made by QC inspectors. (3) The inspectors found notes in nonsafety-related work packages which provided work requirement interpretations without justification and appeared to be a rationalization for possible procedural shortcuts. (4) The resolutions to problems identified by Fluor QC inspector's observation reports were not fed back to the inspectors leaving a disconnection in the licensee's commitment to quality.

Although no evidence of a compromise to safety was identified, the potential shortcuts based on interpretation of procedures and statements to not identify problems were indicative of a poor quality environment. The last outage occurred at a time when continued operation of the plant was being questioned for financial reasons, and layoffs were being pursued in union bargaining. It appeared that management expectations were not clearly communicated in words and actions to show that short cuts were not being authorized and that the decisions on quality had the appropriate procedural or engineering basis.

No violations, deviations, or inspector followup issues were identified in this area.

6.0 Inspection Followup Items

Inspection followup items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. An open item disclosed during the inspection is discussed in Section 4.5 of this report.

7.0 Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations or deviations. An unresolved item disclosed during the inspection is discussed in Section 3.2.3 of this report.

8.0 Exit Meeting

The inspectors conducted an exit meeting on November 3, 1993, with licensee representatives (denoted in Section 1) at the Dresden Nuclear Power Station to discuss the inspection results and the inspectors observations. The inspectors summarized the scope and findings of the inspection activities. The licensee acknowledged the inspection findings. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such document/processes as proprietary.