

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
COMMONWEALTH EDISON COMPANY)
(Braidwood Station Units 1 and 2)

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Docket Nos. 50-456
50-457
OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

APPLICANT'S FIRST PARTIAL RESPONSE TO ROREM'S
SECOND SET OF QUALITY ASSURANCE INTERROGATORIES
AND REQUESTS TO PRODUCE

On October 21, 1985, Intervenors Rorem, et. al. ("Intervenors") filed their Second Set of Quality Assurance Interrogatories and Requests to Produce. This submission, which is Applicant's first partial response to Intervenors' discovery requests, provides a partial response to Specific Interrogatory 7. Investigation continues for responses to the remaining requests in Intervenors' Second Set.

With respect to Specific Interrogatory 7, this submission provides, with one exception, responses to the portion of the interrogatory which requests Applicant to "detail the purpose and objectives, organization, methodology, procedures, staffing, implementation, results, conclusions and evaluation of effectiveness" with respect to: "The 'Top Twenty' Corrective Action Programs," and "The 'On-Going' Corrective Action Programs" identified in subparts B and C of the interrogatory, respectively. The exception relates to the "Corroded Pipe" corrective action program referenced in the April 8, 1985 letter from David H. Smith to James G. Keppler identified in subpart B of the interrogatory. With respect to this corrective action program, Applicant

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is preparing a detailed report which will respond to the portion of the interrogatory identified above. That report will issue in the near future and will be furnished to Intervenor as a partial response to the interrogatory.

In addition, Applicant has prepared a detailed report with respect to the "Material Traceability Verification" corrective action program referenced in the letter of Mr. Smith identified in subpart B of the interrogatory. This report responds to the portion of the interrogatory identified above and it has already been furnished to Intervenor. The report is incorporated herein by reference as a part of this response.

With respect to BCAP, identified in subpart A of the interrogatory, Applicant is also preparing a detailed report that will respond to the portion of the interrogatory identified above. This report will issue in the near future and will be furnished to Intervenor.

Each document identified in the response provided herewith has been listed in a Reference List provided with this submission. Each of these documents will be numbered and a numbered index will be provided to intervenors in the near future. With respect to the documents identified in the "Material Traceability Verification" and "Corroded Pipe" reports, an index of numbered documents will also be provided in the near future. Finally, such an index will also be provided with respect to the BCAP report. Further investigation is proceeding with regard to any other documents that may reflect the responses provided herewith, as well as any which may reflect the "Material Traceability Verification", "Corroded

Pipe" and BCAP responses. An updated index will be provided to Intervenor when this process is completed.

A response will be provided in the near future to the portion of Specific Interrogatory 7 which requests, as to each of the identified programs, "its relationship to the items or subparts of the amended quality assurance contention including the extent, if any, to which it is relied upon as evidencing the absence of a significant breakdown in quality assurance or the ability of safety-related parts, components or system to meet regulatory requirements or perform their intended function in service." In addition, a response will be provided in the near future for other unanswered portions of Intervenor's Second Set of Quality Assurance Interrogatories and Requests to Produce.

SPECIFIC INTERROGATORY 7

Please describe in detail the following corrective actions, corrective action programs, or other actions with regard to quality assurance, construction or procedural deficiencies at Braidwood:

- A. Braidwood Construction Assessment Program (BCAP).
- B. The "top twenty" corrective action programs at Braidwood identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler.
- C. The "Ongoing Corrective Action Programs" identified in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.

As to each please identify its relationship to the items or subparts of the amended quality assurance contention including the extent, if any, to which it is relied upon as evidencing the absence of a significant breakdown in quality assurance or the ability of safety-related parts, components or systems to meet regulatory requirements or perform their intended function in service. As to each please detail the purpose and objectives, organization, methodology, procedures, staffing, implementation, results, conclusions and evaluation of effectiveness. Please identify any documents which reflect these answers, including program descriptions, procedures, organizational charts, data, observation, inspection or evaluation forms or documents, and interim or final reports.

RESPONSE

Applicant's response is provided in the descriptions of Corrective Action Programs attached hereto.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
ASME MATERIAL PROCUREMENT

A review of the records of site-procured ASME materials was performed by CECo Project Field Engineering personnel in August 1984. A problem with these records had been partially identified in 1981 but adequate measures were not established to control the materials and provide complete corrective action to the identified records. The result of the 1984 review indicated that approximately 50% of the records prior to 1981 did not explicitly indicate that the material was supplied in accordance with the ASME Material Manufacturer's and Material Suppliers Quality System Program requirements. Program statements or ASME Quality System Certificates are not always referenced on the records received with the material. This documentation is used as a basis for showing that the material is manufactured under an approved quality program as required by the ASME Code. This item was reported to the NRC on August 28, 1984 as 10 CFR 50.55(e) Report No. 84-16 and is included on Commonwealth Edison Co. Nonconformance Report No. 655. ASME piping materials, structural materials, and consumables are included under 84-16.

An initial review indicated that the following inadequacies had contributed to the problem:

1. Quality requirements not included on site procurement records.
2. Inadequate documentation reviews during receipt inspections.
3. Inadequate corrective action for ASME material suppliers removed from CECo Approved Bidder List.

4. Procurement of ASME material from vendors with only safety related Approved Programs.

Based on initial review of records, site-procured ASME materials received prior to October 27, 1981 which were still in stock were put on hold. Materials with questionable documentation received since October 27, 1981 were placed on hold until the documentation problems are resolved.

The purpose of the program is to review the records received with the site-procured ASME materials to identify Quality System Program or technical deficiencies and to provide corrective actions necessary to bring the materials into compliance with the requirements of the ASME Code. This review originally included site-procured ASME materials received prior to September 1984. Subsequently, to assure complete corrective action, the review was extended to confirm that ASME site material purchases since September 1984 are in compliance with the ASME Code.

In order to identify deficiencies in the documentation, a maximum of six Sargent and Lundy and one Phillips, Getschow Co. QC personnel under the direction of Project Field Engineering have reviewed the records in accordance with the following Project Field Engineering Procedures:

- PFE 100-1- On-Site Purchase Materials, Documentation Reverification Program.
- PFE 100-2- Procedure for Processing Materials in accordance with Code Case N-242-1.

Review of this documentation is now complete.

If the records did not meet the acceptance criteria of the applicable procedure, one or more of the following corrective actions are being performed.

- Obtain revised or additional documentation from the vendors to complete the documentation package.
- Acceptance of the materials in accordance with paragraph NX-2610 in the Winter 1975 Addendum of the ASME Code or Code Case N-242-1. These allow alternate provisions for accepting materials that may not have been procured in total compliance with the ASME Quality System requirements.
- Replacing the material.

After corrective actions are completed, the documentation packages' completeness is verified by Site Quality Assurance. Phillips, Getschow Co. performs a review of the package prior to releasing the material from hold.

Of the estimated total 4,300 heat/lot numbers, an estimated 2,200 required revised or additional documentation from the vendors or corrections to associated records. An estimated 375 of the total heat/lot numbers require additional corrective action to bring the documentation into conformance with ASME Section III requirements. Two heat/lot numbers require replacement in certain applications. The entire effort, which is not yet complete, has accepted over 99% of the materials. At the completion of the program in the near future, the materials will meet ASME Section III requirements or will be designated for replacement.

Furthermore, Phillips, Getschow Co. Procedure QCP-B4 and the CECo/PGCo Interface Agreement (BM 101) dealing with material receipt have been enhanced to provide an additional level of documentation review by experienced personnel for ASME site-purchased material. In addition, CECo Procedure PCD-07 has been revised to include added controls on vendors supplying ASME material and to define the quality requirements to be included on site purchases of ASME material. It is believed that these actions will prevent problems of this nature in future on-site ASME material procurements.

REFERENCES

1. Phillips-Getzchow NCR's 640, 645, 662, 670, 1691.
2. Licensing file on 50.55(e) report 84-16.
3. CEC Co NCR 655.
4. CEC Co Project Procedure PFE 100-1.
5. CEC Co Project Procedure PFE 100-2.
6. Phillips-Getzchow QCP-B4.
7. Phillips Getzchow/CEC Co Interface Agreement BM101.
8. CEC Co Project Procedure PCD-07.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
NAMEPLATE DOCUMENTATION RETRIEVAL PROGRAM (NDRP)

In July of 1984, it was determined that certain ASME NPT symbol nameplates were improperly removed from piping subassemblies by Phillips, Getschow Co., the mechanical contractor, without proper controls or documentation. As a result, nondestructive examinations of the nameplate removal areas, required by ASME Section III, were not subsequently performed. In addition, the removal of ASME NPT nameplates left installed spool pieces without ASME Code-required positive identification. This issue affects 2-1/2 inch and larger piping spools fabricated by Southwest Fabricating and Welding under Sargent & Lundy Specification L-2741.

This item was reviewed by Commonwealth Edison Company and was reported to the NRC as a potential reportable condition under 50.55e 84-12 on 7/24/84. CECO NCR 639 and Phillips, Getschow Co. NCR 1783 were written to identify this item and track its resolution. To resolved this item the Nameplate Documentation Retrieval Program (NDRP) was developed. The purpose of this program is to perform the following tasks:

1. Determine the total population of spool pieces for which the ASME NPT Symbol Nameplate have been removed without proper controls or documentation.
2. For each item in the above population, perform the following:
 - A. Verify the traceability of the spool piece
 - B. Locate the nameplate removal area

- C. Perform the required NDE or visual examination of the nameplate removal area.

The time frame of large bore piping installation work which had to be reviewed for possible inclusion into the scope of NDRP ranged from the start of large bolt piping installation work, late 1976 to 7/24/84 when more stringent controls on the removal of ASME Nameplates were enforced. Approximately 600 spool pieces are expected to be included in the scope of this program. Some of these spools that had missing ASME nameplates were also reported as part of the Material Traceability Verification Program.

Phillips, Getschow Company is implementing the NDRP in accordance with PGCo procedure PGCP-51, "Verification of Code Nameplate Data and Resolution of Discrepancies". This procedure provides for the following actions to take place:

1. Determine the total population of installed spool pieces that do not have nameplates attached.
2. Verify the identity of installed spool pieces using manufacturer's documentation.
3. Field check installed spool pieces without nameplates to locate nameplate removal areas.
4. Perform NDE required by ASME Section III on nameplate removal areas.
5. Measure pipe wall thickness at nameplate removal areas to insure that minimum wall thickness is maintained.
6. Any required repair to the nameplate removal area will be performed per established procedures.
7. With the concurrence of Commonwealth Edison Co. and the Authorized Nuclear Inspector, replacement identification plates will be attached to the installed spool pieces.

8. Resolve on a case by case basis, those spool pieces for which a nameplate or nameplate removal area can not be located.

Replacement identification plates being attached to the spool pieces are being generated and controlled in accordance with CECO Procedure PCD-39. Regular PGCo and CECO staffs are being employed to implement this program. PGCo QC and engineering office personnel are developing and reviewing NDRP packages. Field inspection is being performed by PGCo QC inspectors.

As of mid-November, 1985, a total of 568 spools have been identified as falling under the scope of NDRP (this number is not expected to increase significantly). Nameplate removal areas (or in some cases the nameplates themselves) have been located for 291 spool pieces. Positive identification has been established for 490 spool pieces. CECO is presently developing dispositions for situations where the nameplate removal area can not be physically located. It is expected that all spool pieces will be positively identified and that the disposition of all nameplate removal areas will be resolved at the completion of this program.

REFERENCES

1. 50.55E 84-12 Reports (interim reports)
2. CEC Co NCR 639
3. NDRP report 10/24-30/85 (PGCo Status Report)
4. PGCo Procedure PGCP-51
5. 7/27/84 memo by T. O'Connor (PGCo) on ASME Nameplate Removal

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
CEA INSPECTIONS

In September 1984, a review was undertaken by Commonwealth Edison (CECo) of the contractor programs for installation and inspection of Concrete Expansion Anchor (CEA's). The review was instituted as a result of what appeared to be a developing trend of CEA inspection rejections by Pittsburgh Testing Lab (PTL), the Quality Assurance Independent Inspection Agency. The review encompassed the four contractors performing safety-related CEA installations at Braidwood: Phillips Getschow Company (PGCo), L.K. Comstock Company (LKC), Pullman Sheet Metal (PSM) and Gust K. Newberg (GKN).

In order to conduct the review, Sargent & Lundy (S&L) provided CECo with a listing of those attributes it deemed significant to the quality of a CEA Installation. CECo then compared each of the affected contractor's programs to the listing provided by Sargent & Lundy to determine whether the contractor programs provided for either quality control inspection or production verification of these attributes. The review of the contractor's programs revealed that:

1. The amount and types of attributes Sargent & Lundy considered significant to the quality of a CEA installation were not being inspected at Braidwood by Quality Control personnel to the extent those attributes were being inspected at LaSalle County and Byron Stations.

In addition, no 100% final quality control inspection of all CEA installations was conducted at Braidwood, but such inspections had been conducted at LaSalle and at Byron. Despite the lack of 100% QC involvement in CEA installation verification, most of the CEA installation attributes were verified by contractor Production personnel at Braidwood.

2. A small number of attributes of those Sargent & Lundy considered significant to the quality of a CEA installation were not inspected or verified by either contractor Production or Quality Control personnel at Braidwood.
3. An apparent trend existed of CEA installation rejections by PTL for attributes they reviewed.

As a result of its review, CEC Co concluded that the affected contractor's programs for installation and inspection of CEA's did not appear to be as stringent as industry practices or the practices in use at other CEC Co Stations. CEC Co reported these findings to the NRC Region III office on October 10, 1984 as a potential deficiency under 10 CFR 50.55(e). In addition, CEC Co Nonconformance Report (NCR) numbers 658 (Unit 1) and 659 (Unit 2) were issued on October 9, 1984 to track and resolved this concern.

As an interim corrective action, CEC Co issued letters to each affected contractor on October 5, 1985, directing them to revise their existing procedures for the installation and inspection of CEA's. Revisions were to include a 100% Production and Quality Control verification of all attributes considered by Sargent & Lundy to be significant to the quality of a CEA installation. All revised contractor procedures were being implemented by October 29, 1984 and, on the basis of these revisions, CEC Co allowed safety-related CEA installation work to continue. At the same time, CEC Co undertook to develop a generic corrective action program applicable to all contractors performing safety-related CEA installations and inspections. The approach CEC Co developed for the program was two-fold; evaluations of past work and consistency of ongoing work.

In an effort to provide assurance that future CEA's would be installed, inspected and documented in a consistent manner, CECco developed a generic CEA installation and inspection Procedure, PCD-08, "On Site Contractor Installation and Inspection of Concrete Expansion Anchors," based on the requirements contained in Sargent & Lundy standard form BY/BR/CEA which governs the installation and inspection criteria for CEA's. This procedure incorporated on a generic basis the interim corrective actions required for CEA installation and inspection that had previously been implemented by each affected contractor on an individual basis. Upon approval of this procedure, it was transmitted to the four contractors performing safety-related CEA installations for incorporation into their existing CEA Installation Programs.

Procedure PCD-08 provides the contractors with a model installation/inspection procedure and traveler to ensure Site consistency for the installation, inspection and documentation of safety-related CEA's. In addition, the procedure also contains mechanisms for revising the developed model procedure and traveler and for transmitting such revisions to affected contractors in the event Sargent & Lundy standard form BY/BR/CEA is changed in the future. This assures that on-going contractor CEA installation and inspection activities will continue to be performed in the future in accordance with current requirements.

In an effort to ascertain the quality of past CEA work, CECco and S&L developed a generic program to determine if the lack of 100% Quality Control inspection of significant CEA installation attributes adversely

affected the quality of installed CEA hardware. This evaluation is being conducted under CECo Procedure PCD-30: "Evaluation of Concrete Expansion Anchor Installations." Procedure PCD-30 provides the affected contractors with a model procedure and checklist to be utilized to perform sample inspections and data collection of CEA installation work performed prior to the implementation of the interim corrective actions which resulted from CECo's initial identification of the problem. Under PCD-30, contractors were required to develop contractor-specific procedures and checklists in order to perform the required CEA sample inspections. PCD-30 also defines the actions to be taken by CECo and Sargent & Lundy personnel in evaluating the results of the CEA sample inspections undertaken by the affected contractors.

Specifically, the approach being utilized under Procedure PCD-30 is a 95% confidence/95% reliability statistical (95/95) sample plan and an inspection of all accessible CEA attributes considered significant to the quality of the CEA installation. The decision was made to require inspection of only accessible CEA installation attributes because Sargent & Lundy determined that data resulting from such inspections would be adequate to determine the acceptability of installed CEA hardware.

To develop the sample population, the affected contractors initially provided CECo/Sargent & Lundy with a listing of those CEA installations performed prior to the date of the implementation of their interim corrective actions. From this listing, a 95/95 sample CEA population was developed for each affected contractor. The resulting sample population

of 60 CEA assemblies each was then forwarded to each of the four contractors for quality control inspections of accessible significant attributes in accordance with the specific procedures and checklists developed by contractor Engineering personnel for this purpose. Contractor inspection activities were then performed by existing Quality Control Inspection personnel.

The affected contractors completed their initial inspection of the sample CEA assembly population during the summer of 1985. On the basis of these initial inspections, all assemblies identified as having discrepant attributes have been submitted to Sargent & Lundy, who is presently evaluating them for engineering significance. This evaluation includes, for each identified discrepant assembly, a determination of assembly capacity reduction and a comparison of that reduction to the design margin to ascertain the adequacy of the installation to fulfill its intended function. In some cases, Sargent & Lundy has required the contractors to provide additional inspection data in order to complete its engineering evaluation. Upon completion of the evaluation, a determination will be made as to the acceptance of work for each affected contractor or whether additional inspection or rework is required. Although the evaluation is presently incomplete, preliminary results indicate that no additional inspections will be required. Final determinations as to the need for additional inspections and the extent of rework, if any, will be made by December 1985.

Completion of the sample inspection program for past CEA installations in conjunction with the program enhancements for ongoing and future work will assure the adequacy of all safety-related CEA installations at Braidwood.

REFERENCES

1. Licensing file on 50.55(e) report 84-17.
2. Letter dated April 5, 1985 from S.L. Wahlert to W.E. Vahle.
3. Sargent & Lundy standard form BY/BR/CEA.
4. CEC Co NCR 658.
5. CEC Co NCR 659.
6. CEC Co Procedure PCD-08.
7. CEC Co Procedure PCD-30.
8. G.K. Newberg Procedures QCP-34, and QCP-34-1.
9. Pullman Sheet Metal Procedures B9.3.F, and B10.8.F.
10. L.K. Comstock Procedures 4.3.6, and 4.3.6.1.
11. Phillips-Getschow Procedures PGCP-10, and PGCP-10.2.
12. Letter dated October 5, 1984 from D.L. Shamblin to T. O'Connor.
13. Letter dated October 5, 1984 from D.L. Shamblin to D. Craven.
14. letter dated October 5, 1984 from D.L. Shamblin to F. Rolan.
15. Letter dated October 5, 1984 from D.L. Shamblin to R. Lawler.
16. Letter dated October 10, 1984 from D.L. Shamblin to T. O'Connor.
17. Letter dated May 6, 1985 from D.L. Shamblin to D. Lawler.
18. Letter dated May 6, 1985 from D.L. Shamblin to D. Craven.
19. letter dated May 6, 1985 from D.L. Shamblin to T. O'Connor.
20. Letter dated May 6, 1985 from D.L. Shamblin to F. Rolan.
21. Letter dated April 22, 1985 from D.L. Shamblin to D. Craven.
22. Letter dated April 24, 1985 from D.L. Shamblin to T. O'Connor.
23. Letter dated April 25, 1985 from D.L. Shamblin to F. Rolan.
24. Letter dated April 25, 1985 from D.L. Shamblin to D. Lawler.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
CONCRETE EXPANSION ANCHORS IN REPAIRED CONCRETE AREAS

Sargent & Lundy (S&L) Specification BY/BR/CEA, paragraph 3.1.9 specifies requirements for installation of Concrete Expansion anchors (CEAs) in surface repaired concrete areas where the repair extends beyond the reinforcing steel ("major patches"). The specification provides that the embedment length of the CEA be increased by a dimension equal to the thickness of the concrete cover plus the nominal diameters of the outside reinforcing steel. (Specification BY/BR/CEA, figure 38-5.) Commonwealth Edison (CECo) initiated NCR 634 when it became aware that CEAs in repaired concrete areas were not being installed in accordance with the specification. Therefore, some CEA installations have embedment lengths potentially less than the required minimum. On July 12, 1985, CECe revised its previous notification to the NCR of violations involving CEA's in finished floors (50.55e #84-07) to include CEA's in surface repaired concrete.

CECo instituted corrective action to resolve the identified concern with the NRC and to close NCR 634. On June 26, 1984, CECe and Gust K. Newberg (GKN), the contractor responsible for concrete work, took preliminary steps to establish an identification system to identify concrete patch repairs done by GKN in the past. GKN Procedure 12 requires that major patches be documented on NCR's. A review of these NCRs revealed the location of the patches which were then identified by physical demarcation in the field. For surface repairs that might be performed in the future, GKN prepared an instruction sheet directing that

repaired areas be similarly marked. On July 5, 1984, CECo issued a letter to all contractor management that install CEAs. The letter informed the contractors that major patches would be marked in a master set of drawings kept in the GKN office and that copies would be sent to the contractors. Such copies were sent on July 26, 1984. The letter also specified that as new patches were added revised drawings would be transmitted, and that in the future GKN, after making a concrete repair, would mark it with a cure date and physically demarcate the patch before the 28 day cure date expired.

Staffing of this aspect of the corrective action was furnished by GKN: approximately 3 engineering personnel, 2 QA/QC personnel and 2 production personnel. Physical demarcation of the patches was performed by the GKN production personnel and/or by 1 production person employed by Midway Industrial Painting contractors.

CECo and S&L also developed a program to determine the adequacy of CEAs already installed in surface repaired concrete. S&L performed a walkdown to determine the sizes of CEA's installed in these areas. It was found that 1/4" diameter anchors were installed in repaired concrete, which was not allowed by Specification BY/BR/CEA, in addition to embedment lengths not being increased for larger diameter anchors.

To resolve these concerns, S&L reviewed industry tests which show that 1/4" diameter anchors installed in repaired concrete perform similarly to those installed in parent concrete. At Braidwood 1/4"

diameter anchors have short embedment lengths (less than 8 times the anchor diameter) and the ultimate capacity is governed by a concrete cone type failure.

S&L also reviewed industry tests which show that embedded plates with headed studs installed in repaired concrete perform similarly to those installed in repaired concrete. Thus, the strength of the repaired concrete is as good as for the parent concrete.

For 3/8" diameter and larger anchors, whose embedment length is a minimum of 8 times the anchor diameter, the ultimate capacity is normally governed by slippage of the anchor in the hole. To determine if anchors installed in repair material have similar ultimate slip capacities as those installed in parent concrete, tests were performed at Braidwood on 3/8" diameter and larger anchors.

S&L developed a test program which was coordinated by CECO under PCD Procedure 38. The tests showed that the ultimate strength of CEA's installed in repair material is comparable to that for anchors installed in parent concrete.

Testing was performed and/or witnessed by approximately two GKN production personnel, one CECO PCD person, one CECO QA person, and one S&L person, one engineer from Hilti, Inc., the CEA supplier, and two Phillips, Getschow Company testing inspectors.

On October 14, 1985, S&L issued a letter summarizing the test results and concluding that CEA's already installed in surface repaired concrete were acceptable. In addition, S&L Specification BY/BR/CEA Rev. 23 was issued on September 23, 1985, to allow installation of 1/4" diameter anchors in repaired concrete. S&L also recommended that future work using 3/8" diameter and larger anchors conform to Specification BY/BR/CEA for increased embedment lengths. CECO has assured such conformance through the directive issued to contractors, as described above. On this basis, on October 23, 1985, CECO Project Construction Department recommended that NCR 634 be closed.

REFERENCES

1. G.K. Newberg Procedure QCP-12, Rev. 5,9.
2. Letter dated 07/05/84 from Dan Shamblin to all contractors concerning meeting requirements for CEA's.
3. Letter dated 06/26/84 from Robert L. Voss to Bruce Tanouye.
4. Figure 38-5 for S&L Specification BY/BR/CEA.
5. CEC Co NCR 634.
6. Licensing file on 50.55(e) 84-07.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
CEA's IN FINISHED SLABS

Sargent & Lundy (S&L) has specified that certain locations in the plant have separate finished concrete floors. These consist of a separate finished concrete slab poured on top of a rough concrete slab. S&L Specification BY/BR/CEA, Section 3.1.5 specifies how concrete expansion anchors (CEA's) are to be embedded in these floors. The specification provides that the required embedment be measured from the surface of the rough concrete slab, not from the top of the separate finished floor. Because of a misinterpretation of the specification, contractors were measuring the embedment from the top of the separate finished floors. When Commonwealth Edison Company (CECo) became aware of this, it initiated NCR 617 on May 10, 1984. On May 11, 1984, this item was reported to Mr. W. Forney of the NRC.

In order to ensure that the specification would be properly interpreted in the future, CECe took immediate steps. On May 7, 1984, CECe transmitted to the applicable contractors color coded drawings to aid in identifying the separate finished floor areas. On May 10, 1984, CECe directed all applicable contractors to have installation drawings reviewed by S&L for proper embedment length before installation. In addition, Specification BY/BR/CEA was revised to require that S&L review future CEA attachments in concrete finished floors before installation of the CEA assemblies (Specification BY/BR/CEA, Rev. 20, issued June 5, 1984, via ECN 22019).

Furthermore, CECO requested that S&L identify and evaluate existing installations in finished floors. In a letter dated May 2, 1985, S&L summarized the results of the evaluation. All 317 assemblies found in floor finish were acceptable. However, S&L identified 47 assemblies which should be revised or reworked to restore design margins.

Fifteen of these assemblies are for block wall column supports which are inaccessible. A G.K. Newberg document review showed that none of the 15 had CEA's embedded in the finish floor. Thus, the actual number of assemblies requiring revision or rework is 32. Revision usually requires adding braces to the assembly. Rework involves removing the installed CEA's in the assemblies and replacing them with new ones per the specification.

As of October of 1985, the rework or revisions are 81% complete. Phillips, Getschow Company was responsible for 22 of the 32 installations. Rework or revision on all of these installations is now complete. L.K. Comstock was responsible for 10 of the 32 assemblies. Six of these 10 are still undergoing rework or revision.

REFERENCES

1. CEC0 NCR 617.
2. Letter dated 5/2/85 from S.L. Wahlert to W. Vahle.
3. Sargent & Lundy ECN 22019.
4. Licensing file on 50.55(e) 84-07.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
WELDED AND BOLTED CONNECTIONS-BLOCK WALL COLUMNS

During a special Site Quality Assurance review conducted by Commonwealth Edison (CECo) in September 1982, it was discovered that inadequate provisions existed for the inspection of bolted and welded connections in Block Wall Columns and on miscellaneous structural steel installed by general structures contractor Gust K. Newberg (GKN). Given the existing scope of GKN's work at the time, CECe determined that the deficiency was limited to GKN's installation of Block Wall Columns and other miscellaneous structural steel in the Auxiliary Building and miscellaneous structural steel installation in the Unit 1 and Unit 2 Containments.

As a result of the identification of this deficiency, CECe instructed GKN to determine the extent of work which had been installed without welded or bolted connections being inspected or with inadequate welded or bolted connections inspection documentation. On November 5, 1982, GKN wrote two Nonconformance Reports (NCR's) to track the deficiency. GKN NCR 213-497 covered accessible bolted and welded connections in block wall columns and miscellaneous structural steel with missing inspection records. GKN NCR 213-498 covered bolted and welded connections in block wall columns and miscellaneous structural steel, that were now inaccessible due to concrete and/or block having been installed, with missing or inadequate inspection records.

GKN NCR 213-497 was dispositioned and resolved by CECO instructing GKN to develop an inspection program to reinspect those accessible bolted and welded connections identified on the NCR. GKN revised its existing Procedure QCP-31 "Erection and Inspection of Structural Steel" to encompass the scope of this inspection activity. Revised Procedure QCP-31 also instituted the use of a Structural Steel Installation Traveler (SSIT) for use in all future GKN structural steel installation to assure that bolted and welded connections would be properly inspected at the time of installation.

Under revised Procedure QCP-31, for past work, GKN requested Pittsburg Testing Laboratories, the Braidwood Site Quality Assurance independent testing agency, to perform Quality Control inspections on accessible bolted and welded connections identified on GKN NCR 213-497 as having missing inspection records. These connections were treated as not having been inspected. The identified population PTL was to inspect included bolted and/or welded connections in approximately 57 block wall columns or Tee's, and 121 bolted and/or welded connections for miscellaneous structural steel in the Auxiliary Building. In addition, the welded connections on the stiffeners and tie backs and the bolted connections on the tie backs, girders and rails of the Unit 1 Containment polar crane and the bolted connections on the tie backs, girders and rails of the Unit 2 Containment polar crane were inspected by PTL. CECO instructed GKN to repair or replace any defects found as a result of the PTL inspection.

Approximately 70% of the items inspected by PTL were identified for replacement or repair by GKN. All of the work identified on GKN NCR 213-497 was inspected and repaired, if necessary, in accordance with therevised Procedure QCP-31 and the NCR was closed on June 12, 1984. In addition, all new structural steel work performed by GKN after the identification of the deficiency is now required to be installed in accordance with revised Procedure QCP-31.

Upon receipt of GKN NCR 213-498 for inaccessible block wall columns or miscellaneous structural steel welded or bolted connections with missing or inadequate inspection records, CECo Project Construction Department (PCD) initiated CECo NCR 434 to track and disposition the deficiency. On November 19, 1982, CECo notified the Nuclear Regulatory Commission of the deficiency pursuant to the reporting requirements of 10 CFR 50.55(e) and designated the item as 50.55(e) Report 82-10.

CECo initially identified 640 inaccessible welded connections and 250 inaccessible bolted connections with inadequate inspection records. This included welded and bolted connections in block wall columns and Tee's and in miscellaneous structural steel platforms installed in the Auxiliary Building. This number was subsequently increased to include any inaccessible structural steel bolted or welded connections that had been installed by GKN prior to the implementation of revised GKN Procedure QCP-31. For some of the inaccessible items identified, bolting and/or welding inspection records were available, but documentation was inadequate as to type of material, location and/or size of steel

members. A total of 2436 inaccessible welded and bolted connections was identified.

At first, CECo decided to disposition NCR 434 by instituting a corrective action program to inspect a statistical sample of the identified inaccessible bolted and welded connections to determine if the work as installed was acceptable. Based on this approach, Sargent & Lundy instituted a 95% confidence/95% reliability statistical sample plan in which 180 connections were chosen at random to constitute the sample population. The sample inspection program began in May 1983. Under the program, block walls and other impediments were removed from around the sample population and the connections were inspected by PTL or GKN and evaluated for design significance by Sargent & Lundy. The types of discrepancies found during the sample inspection program included: (1) American Welding Society (AWS) weld quality deficiencies such as overlap, undercut, included slag, fit-up gaps and undersize welds; (2) incomplete welds; (3) bolting deficiencies such as bolt location in the slots and width of slots; (4) member and connections angle sizes changes; and (5) expansion anchor embedment lengths. However, Sargent and Lundy determined that none of the inspected connections had discrepancies with design significance (i.e, design margins remained within specified limits and code allowable stresses).

During the course of the sampling program, similar discrepancies were also identified in shop fabricated welds on the clip angles of block wall columns supplied by the American Bridge Division of United States of

Steel Corporation and others (Mid City Architechtural Iron Co. and Ramco Industries) and installed by GKN in the Auxiliary Building prior to the implementation of revised Procedure QCP-31. Sargent & Lundy also evaluated a statistical sample of the welds of each of these suppliers and determined that none of the identified discrepancies had design significance.

In October 1984, prior to completion of the sampling program, CECO decided to expand its identified corrective action program to reinspect and repair, if necessary, all of the inaccessible welded and bolted connections with inadequate inspection records identified on CECO NCR 434. This decision was based on the fact that while the Byron loads had been used by Sargent & Lundy for its design significance evaluation, it was thought that the actual Braidwood loads, once determined near the completion of construction, could in some cases be greater than the Byron loads. As a result, CECO determined that it would be more expedient to make modifications to restore design margins to these inaccessible connections during on-going construction rather than at fuel load when additional systems would have to be removed from service to perform such modifications. The expanded scope of the program also included the reinspection and repair, if necessary, of the American Bridge (and others previously mentioned) shop fabricated welds on block wall columns installed by GKN prior to implementation of revised Procedure QCP-31 in November 1982.

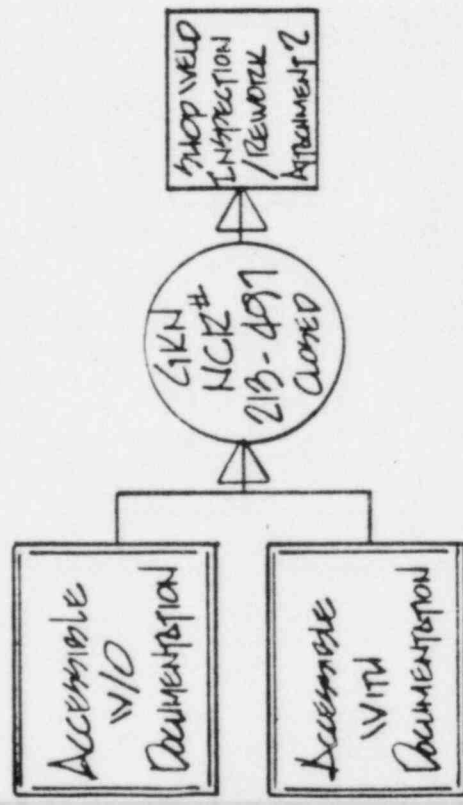
The reinspection and repair of identified inaccessible bolted and welded connections was conducted under GKN Procedure 57. This procedure was initially issued for this purpose on December 14, 1984 and was approved by Sargent & Lundy on January 8, 1985 and by CECO PCD on January 8, 1985. Under GKN Procedure 57, work was started in the lower levels of the Auxiliary Building and proceeded upward from those locations.

After block was removed to expose individual bolted or welded connections and any paint was removed from welds, GKN Engineering reviewed the welded or bolted connections to determine if the individual connections which comprised a welded or bolted assembly were installed as originally designed. For those connections or assemblies with identified discrepancies GKN Engineering determined if the connection or assembly could be installed as originally designed. In situations where such installation was possible, an Inaccessible Steel Rework Traveler (ISRT) package was developed and sent to the field for GKN production personnel to repair or rework the connection or assembly to its original design. (It was at this point of the program that new clip angles were installed to replace the shop fabricated welds on block wall columns supplied by American Bridge and others.) If the connection or assembly could not be installed as originally designed, due to interference, etc., a field problem report was sent to Sargent & Lundy for evaluation and issuance of a design change (FCR, ECN) for the modification of the connection or assembly to a workable and acceptable condition.

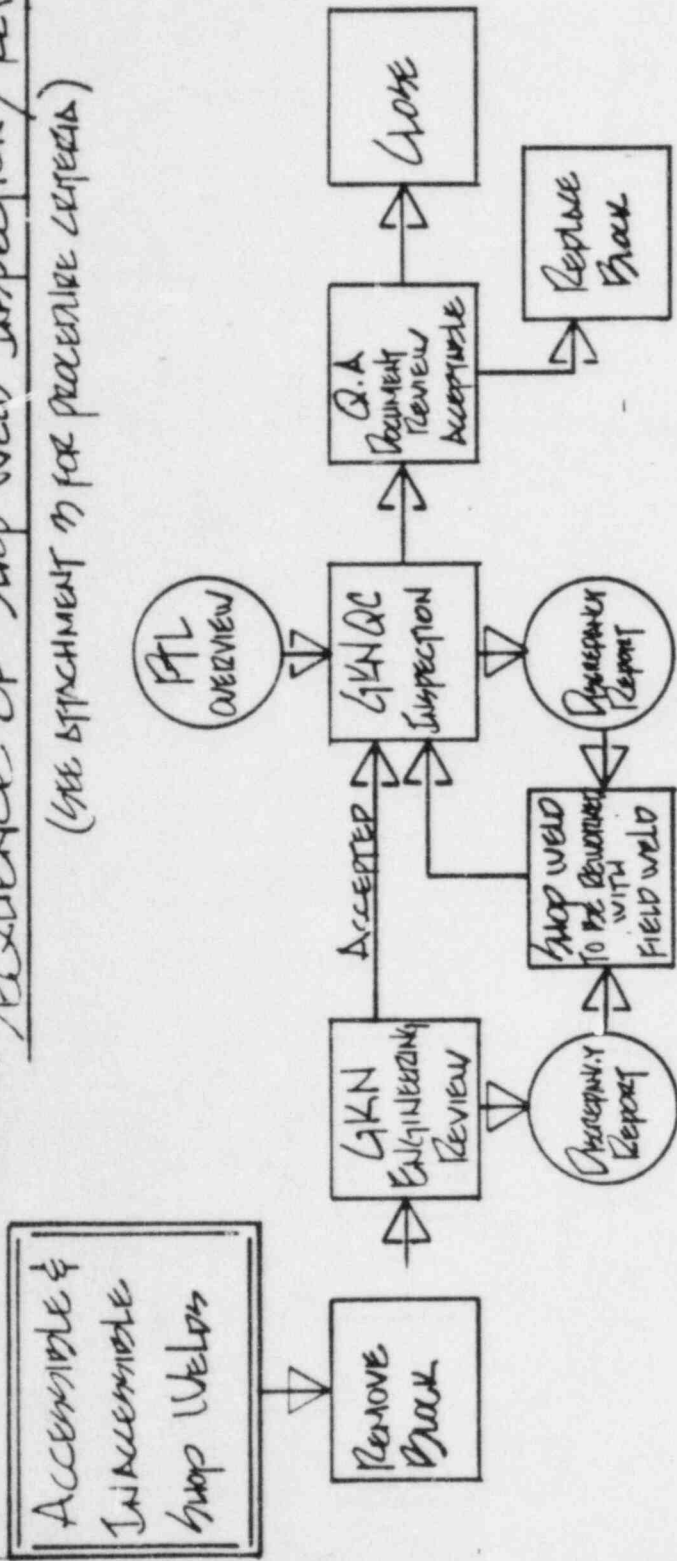
Once GKN Production personnel had completed required repairs or rework under Procedure 57, Quality Control personnel performed quality inspections and PTL performed overview inspections as directed by CECO Site Quality Assurance. If, as a result of these inspections, the repaired or reworked connections or assemblies were determined to be unacceptable, an NCR was generated and processed in accordance with GKN standard nonconformance resolution procedures. Once all inspections have been performed and are found acceptable, a final documentation review is performed by GKN in accordance with GKN Procedure QCP-29-1-2 "ISRT Document Review". Upon completion of the final document review, GKN instructs the masonry contractor to reblock the connections or assemblies in accordance with GKN Procedure 32 "Masonry Work".

As this program was originally developed under GKN Procedure 57, all inaccessible bolted and welded connections identified as falling within the program scope were to be repaired to meet original design. However, during the course of the inspection and repair work under Procedure 57, it was determined, based on Byron and Braidwood as-built drawings, that some connections in question were on columns embeded in block walls that had known actual loads which exceeded original design loads. In these cases, additional internal modifications were made to the welded and/or bolted connections to increase the load carrying capacity of the wall to account for these additional known loads. In some cases where the welded or bolted connections were on columns or Tee's embeded in concrete partition walls that had been installed in lieu of block walls, the decision was made not to repair the connections due to the difficulty of

(SEE ATTACHMENT 3 FOR PROCEDURE CRITERIA)



Sequence of Shop Weld Inspection / Review (Attachment 2) (SEE ATTACHMENT 3 FOR PROCEDURE DETAILS)



REFERENCES

1. G.K. Newberg Procedure 57, Rev. 4.
2. G.K. Newberg Procedure 32, Rev. 14.
3. G.K. Newberg Procedure 31, Rev. 13.
4. G.K. Newberg Procedure 29-1-2, Rev. 1 and Rev. 2.
5. CEC Co Audit QA-20-82-52.
6. G.K. Newberg NCR 213-497.
7. Letter dated 5/9/83 from T.J. Ryan to J.T. Westermeier.
8. CEC Co NCR 434.
9. Letter dated 4/12/84 from S.L. Wahlert to J.T. Westermeier.
10. Letter dated 2/27/84 from J.J. Hairston to T.R. Sommerfield.
11. 11/3/82 list of Tees installed but inaccessible.
12. List of columns installed but inaccessible.

BRAIDWOOD "TOP TWENTY" AND "ON-GOING" CORRECTIVE ACTION PROGRAM
HVAC INSTALLATION TOLERANCES

On September 13-21, 1982, a Commonwealth Edison (CECo) General Office Quality Assurance Audit was performed on Pullman Sheet Metal (PSM). The audit identified three hangers which failed to meet approved design tolerances. Based on the audit finding, PSM issued NCR BR31 on September 24, 1982 and CECO Project Construction Department (PCD) issued NCR 407 in September, 1982 to disposition the three hangers. The corrective action under the NCR's was for PSM to perform a 100% configuration inspection of all safety-related hangers it had installed at Braidwood prior to November, 1982 to assure installation to approved design tolerances. Prior to this time, PSM had been performing a 10% hanger configuration inspection. However, it should be noted that PSM had been performing a 100% visual weld inspection for these hangers.

As PSM began the reinspection program, further investigation revealed that a number of HVAC safety-related hangers, auxiliary steel, and bracing were not installed in accordance with dimensional tolerances and typical details as shown on the Sargent and Lundy design drawings. As a result, CECO notified the Nuclear Regulatory Commission Region III Office of a potential deficiency under the reporting requirements of 10 CFR 50.55(e) on January 26, 1983 and designated the item on 50.55(e) Report 83-01. In addition, CECO PCD issued NCR 460 on January 24-27, 1983 to track the dispositioning of this broader concern.

CECo elected to continue its established corrective action initially instituted under PSM NCR BR31 and CEC Co NCR 407 to address this broader concern. CEC Co continued to believe that a 100% reinspection program would assure that the installation of all PSM safety-related hangers conformed to approved design configuration.

To implement the required reinspection program and to assure the design adequacy of safety-related hanger installations in the future, PSM revised its existing Quality Control Procedure B10.3.F, Rev. 2, "Installation Inspections" on November 18, 1982 to require the 100% safety-related hanger configuration inspection. The methodologies under this procedure remained unchanged and just the scope of work was expanded from 10% to 100%. PSM also increased its on-site Quality Control personnel to meet its expanded inspection and reinspection commitments under revised Procedure B10.3.F. In addition, Sargent and Lundy clarified existing design tolerances and provided PSM with additional design tolerances on revised drawings in order to achieve proper configuration and perform the inspection/reinspection of installed safety-related HVAC hangers.

PSM initially commenced configuration reinspection activity in November 1982. After the issuance of CEC Co NCR 460, CEC Co requested that PSM identify the quantity of safety-related hangers, braces and auxiliary steel installed prior to the implementation of revised Procedure B10.3.F which required reinspection. PSM Production personnel conducted this identification by researching production drawings that had been colored

to indicate all areas where safety-related HVAC hangers had been installed. 1068 hangers, 688 auxiliary steel items and 163 braces were identified by this process as having been installed.

PSM Quality Control completed configuration reinspection for these 1919 (total) items on May 1, 1983. Pursuant to revised Procedure B.10.3.F, Rev. 2, Quality Control issued correction notices, identifying the nature of the problem found, for all items failing to meet design configuration. PSM Production personnel then determined whether it was feasible to rework a particular hanger configuration in the field to comply with approved design tolerances or whether the hanger had to be submitted to Sargent and Lundy for evaluation and dispositioning. Those hangers falling into this latter category were as-built and submitted to Sargent and Lundy on Field Change Requests (FCR's) for approval or rework instructions.

During its on-going rework and/or as-built submittal activities, PSM production personnel identified additional installed safety-related hangers in the field which had not been discovered during its review of production drawings for inclusion under CEC Co NCR 460 and which, subsequently, had not been reinspected under revised Procedure B10.3.F, Rev. 2. Upon Identification, these hangers were turned over to PSM Quality Control for reinspection to design and, if necessary, were reworked or accepted as-built.

In June 1984, at the recommendation of CEC Co Site Quality Assurance, PCD decided to revise NCR 460 to include the total list of safety-related

hangers installed by PSM prior to June 22, 1984 which were subject to the 100% reinspection program. Safety-related hangers installed after the implementation of revised Procedure B.10.3.F, Rev. 2, on November 18, 1982 up to June 22, 1984 were also included under the revised version of NCR 460 as they could not be singled out from those hangers installed prior to that time. (In actuality, CECO determined that due to the work stoppage at Braidwood in August 1983 not many new safety-related hangers had been installed during this time period). CECO NCR 460, Rev. 1, was issued on August 10, 1984 and covered a total population of safety-related population 1676 hangers, 908 auxiliary steel components and 228 braces. These items are being reinspected and dispositioned in accordance with procedures established for the population originally identified.

Reinspection and approval work has proceeded steadily since August 1984. To date, approximately 60% of the hangers and related items have been configuration reinspected and approved, i.e. reworked or as-built, to existing design tolerances. Completion of all reinspection and back fit work for Unit 1 is expected by fuel load and Unit 2 work is expected to be completed thereafter. Completion of the reinspection program, together with program enhancements under revised procedure B10.3.F, Rev. 2 will assure that all safety-related HVAC hangers will conform to approved design tolerances.

REFERENCES

1. CEC Co QA Surveillance 3625.
2. CEC Co NCR 407.
3. October 25, 1982 letter to Marcus enclosing Pullman's response to GO Audit of September 1982. Letter has PSM NCR BR-31 attached.
4. October 25, 1982 letter to Cosaro enclosing Pullman's response to GO Audit of September, 1982. Letter has PSM NCR BR-31 attached.
5. CEC Co CR 460 and Rev. 1.
6. Pullman Procedure B10.3.F, Rev. 1,2.
7. Licensing file on 50.55(e) report 83-01.

BRAIDWOOD "TOP TWENTY" AND "ON-GOING" CORRECTIVE ACTION PROGRAMS
NUCLEAR STEAM SUPPLY SYSTEM
COMPONENT SUPPORT VERIFICATION PROGRAM

The Nuclear Steam Supply System ("NSSS") Component Support Verification Program includes two of the "top twenty" corrective action programs at Braidwood identified in the April 8, 1985 correspondence from David H. Smith to J. Keppler. These programs were designated in the letter as "NSSS Supports" and "NSSS Support Steel". The scope of the Program developed as follows.

In 1982, Commonwealth Edison (CECo) recognized the need for an American Society of Mechanical Engineers (ASME) accredited contractor to reverify the installation of the NSSS Component Supports which had been previously installed by G. K. Newberg, a non ASME accredited structural steel contractor. Installation reverification was needed prior to the issuance of the required ASME Code Data Report (N-5 report) for the installation of the NSSS Supports. In October 1982, Nuclear Installation Services Inc. (NISCO), an ASME contractor, was chosen to perform the verifications required by the ASME Code. NISCO was chosen to perform the reverification because it was already on site performing work associated with Sargent & Lundy Specification L-2834 "Specification For Final Setting of Nuclear Steam Supply Equipment and Mechanical Equipment Erection". As NISCO was developing the procedure for its verification program, additional concerns were identified concerning the NSSS component supports that caused the program to be expanded.

During mid 1982, the Nuclear Regulatory Commission questioned the cold setting of the Steam Generator and Reactor Coolant Pump supports in the Unit 2 Containment. This concern was documented in Inspection Report 50-456/82-05

and 50-457/82-05 issued on February 7, 1983. Thereafter, as a result of its own review of the as-built locations of the Unit 1 and 2 Steam Generators Pressurizers and Reactor Coolant Pumps supports, CECo identified that the as-built locations of these supports were not within the design limits specified by Sargent & Lundy drawing S-1105. CECo issued NCR 489 on February 21, 1983 to track the resolution of this item and, after determining the item was reportable under 10 CFR 50.55(e), notified the NRC on March 9, 1983 and designated the item as 50.55(e) 83-03.

In December 1982, CECo identified another concern with the installation of the NSSS Component Supports by structural steel contractor G.K. Newberg. Specifically, CECo discovered that the support steel used in the NSSS Components had been installed by G.K. Newberg without all the required Quality Control inspections and that, as a result, the status of the support steel installation was considered to be indeterminate. CECo issued NCR 446 on December 3, 1982 to track the resolution of this item.

Since NISCO was already under contract to perform verifications associated with the NSSS Component Supports and was an ASME accredited contractor, NISCO's verification program responsibilities were increased to assist in the resolution of these two additional concerns. The purpose and objectives of the NSSS Component Support Verification Program therefore expanded from a program to verify previous work performed by G. K. Newberg and others and to complete the installation of the NSSS Component supports in order to issue an ASME N-5 report(s), to encompass the resolution of outstanding concerns identified on CECo NCR-446 and CECo NCR-489/50-55(e)

83-03. The expanded program is being carried out by NISCO's existing site organization (organizational chart attached).

NSSS Supports

The basic procedures employed by CECO to resolve CECO NCR-489 concerning the quality of the as-built locations of the NSSS Supports involved the interaction of G.K. Newberg, Sargent & Lundy the Project Architect Engineer, and NISCO. G.K. Newberg was first assigned to survey the as-built locations for the NSSS Component embedments and support columns. G.K. Newberg performed these surveying activities in accordance with its existing staffing and approved site procedures. Based on the survey information, Sargent & Lundy was assigned to evaluate the as-built location of each NSSS Component support to determine whether or not it met design requirements. Finally, NISCO was assigned to perform whatever actions were required by Sargent & Lundy to resolve identified concerns and to provide any pertinent results to Sargent and Lundy for further evaluation.

G.K. Newberg established the as-built locations of the NSSS Component supports and their associated embedments and forwarded this information to Sargent and Lundy for their evaluation with the transmittal NCR 489 in February 1983. Sargent & Lundy evaluated the as-built locations of the supports and embedments and revised drawing S-1105 and related drawings to incorporate tolerances derived from the functional requirements of the NSSS Component supports. Using the revised Sargent and Lundy drawings and tolerances, NISCO then began the process of verifying critical rotational dimensions associated with the Unit 1 and 2 Reactor Coolant Pumps and Steam

Generators support columns hinges and the alignment of the NSSS Component supports themselves to assure that they will be able to function properly given their existing installed locations. This verification program is presently on-going.

As the hinge rotational capability and alignment is determined for each NSSS Component support column, NISCO is providing the information to S & L for evaluation to assure that existing column hinge rotation is acceptable and that existing column base locations satisfy the functional requirements specified in Sargent and Lundy Drawing S-1105. Sargent & Lundy will then make final determinations with regard to whether each NSSS support is functionally acceptable as installed. Modifications to correct or improve the existing location or condition of the NSSS Component supports to satisfy functional requirements as determined by Sargent & Lundy will be implemented by NISCO. NISCO is expected to complete necessary modifications, if any, and to perform final verifications of all existing support locations by early 1986.

NSSS Support Steel

The procedures employed by NISCO under the remainder of the NSSS Component Support Verification Program comprise the majority of its responsibilities associated NSSS Component supports. These procedures include the final verification of the NSSS Component supports and the resolution of CECO NCR-446 regarding Quality Control inspections of installed NSSS Component support steel. In general, the scope of NISCO work under this part of the program includes the performance of receipt inspections on all NSSS Component

damage. Untraceable or nonconforming materials are being documented and tracked for resolution on individual NISCO NCR's. To date, approximately 20 such NCR's have been written. All untraceable or nonconforming NSSS support steel components or materials which are accessible, including A-490 bolting material associated with the NSSS Component supports are being replaced by NISCO. This aspect of NISCO's work is nearing completion with only those accessible, but untraceable, items located in the Unit 2 Containment still to be replaced. Completion of this Unit 2 replacement activity is expected by mid-1986. For all inaccessible NSSS support steel components or materials that can not be traced through available documentation, the individual NISCO NCR's written are being consolidated for evaluation and dispositioning by Sargent & Lundy or CECo Project Field Engineering on CECo NCR 768 which will be issued shortly. Approximately 6 such NISCO NCR's involving 35 NSSS Component support steel items or groups of items have been included on CECo NCR 768. Final evaluation and dispositioning of these items is expected by early 1986.

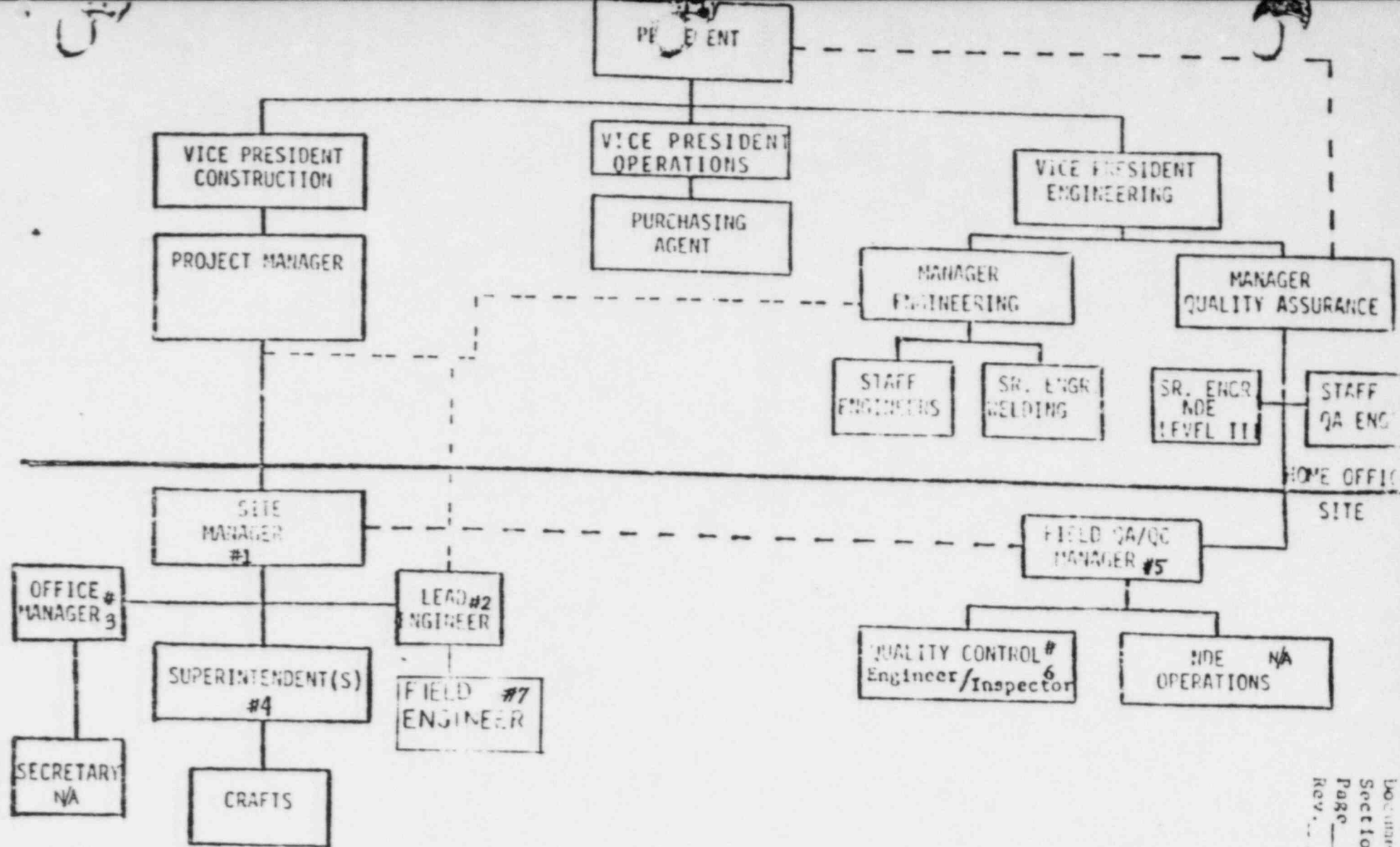
To complete the NSSS Component Support Verification Program. NISCO is performing critical dimensional checks associated with the NSSS support steel to assure proper assembly and installation. In addition, NISCO is completing installation of the Steam Generator Upper Lateral supports and will thereafter perform the cold and hot shimming of the NSSS Component supports. NISCO is also presently in the process of conducting its final document review and the preparation of the required N-5 report(s). The completion of these activities is anticipated by early 1986 for Unit 1 and by mid-1986 for Unit 2.

Completion of the program already in progress in conjunction with the NISCO ASME N-5 Documentation review will resolve all verification concerns regarding the installation of NSSS Component supports, including those identified on CEC's NCR's 489 and 446 and 768, and will assure that the Unit 1 and Unit 2 NSSS Component Supports are installed in accordance with the correct procedures, specifications and regulatory requirements.

supports installed to assure proper identification, traceability and freedom from damage; the removal, inspection, replacement and/or reinstallation of NSSS Component support bolting material installed by Newberg to assure traceability and proper installation; verification of the alignment of the critical NSSS Component dimensions; completion of all outstanding NSSS installation activities; and the issuance of the required ASME N-5 data report(s).

NISCO developed Engineering Specification 3009-CECo-1 in January 1983 to define and control these aspects of its NSSS Component Support verification work. ES 3009-CECo-1 references NISCO's QA Manual and subsidiary Quality Control procedures for the control of the activities associated with the program. To specifically address the prior lack of Quality Control inspections of NSSS support steel, ES 3009-CECo-1 requires inspections to verify the traceability of all NSSS support steel materials installed by G.K. Newberg or others and the critical design dimensions of such material. Implementation of the Procedure by NISCO will therefore resolve CECO NCR 446. NISCO has also developed or is in the process of developing engineering specifications for the hot shimming of the NSSS Component Supports and for performing the final document review required for the preparation and issuance of the ASME N-5 report(s).

In accordance with ES 3009-CECo-1, NISCO is currently engaged in performing inspections of all prior installed NSSS support steel at its installed locations to assure proper identification, traceability and certification of each NSSS item and that all items as installed are free from



#1 D. Niebaum	#6 G. Feldhake
#2 B. Allen	#7 C. Rucker
#3 K. Rodriguez	#6 J. Thomas
#4 A. Rodda	
#5 C. Novak	
#6 M. Geyer	

Figure 1

REFERENCES

1. NRC Inspection Report 50-456/82-05; 50-457/82-05 (pages A0001021-A0001060).
2. Licensing file on 50.55(e) 83-03.
3. CEC Co NCR 446.
4. CEC Co NCR 489.
5. CEC Co NCR 768.
6. NISCO Engineering Specification 3009-CEC Co-1 Revisions C, G, H, I.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
SOUTHWEST FAB RADIOGRAPHS

During an NRC Nondestructive Examination (NDE) Mobile Van Inspection conducted at the Braidwood Project in April, 1984, concerns relative to Southwest Fabrication supplied radiographs were identified. Southwest Fab has supplied prefabricated process piping to the Braidwood site. Shop welds on these items had been radiographed prior to being delivered on-site. At the time of the NRC's inspection, it was discovered that certain radiographs for ASME Code Section III piping shop welds had degraded and exhibited yellowing which might impair interpretation. Further analysis revealed that Southwest Fab had apparently processed its radiographs without adequate washing to remove all processing chemicals. This situation led to the gradual degradation of certain of the radiographs.

CECo Nonconformance Report (NCR) 606 was generated on April 19, 1984 to address this concern. Sargent and Lundy was then asked to determine what actions would be necessary to resolve the identified concern. The initial disposition of NCR 606 consisted of:

1. Review of film sample for visible yellowing.
2. Determination of potential for future deterioration by chemical testing.
3. Determination of necessary corrective action, including the possibility of rewashing, microfilming or xerox copying the film.

In an attempt to determine the magnitude of the problem, 553 Southwest Fab shop welds, consisting of 2500 radiographed views were

randomly selected and reviewed by PTL for visible yellowing. Preliminary results of this review indicated that five (5) views, each associated with a different weld, exhibited signs of visible yellowing. This represented two tenths of one percent (0.2%) of the total population of Southwest Fab supplied radiographs. The small percentage of yellowed film at issue was later confirmed by the NRC Construction Assessment Team (CAT) in December 1984/January 1985 when it reviewed randomly selected radiographs of approximately 160 Southwest Fab shop welds and discovered no visible film yellowing.

The initial review also indicated that the problem was confined to the radiographic record itself and the ability to interpret the film at a later date should it degrade, not with the quality of the associated welds which were the subject of the radiographs. In addition, despite the questionable quality of the film itself, the radiographic reader sheet and technique sheet which documented the quality of the weld at the time the film was shot and which are still available for each radiograph package indicates that no problem exists with the accuracy of the interpretations originally made. The accuracy of original interpretations was verified independently by radiograph reviews performed and documented prior to the start of film degradation by certified American Society of Nondestructive Testing (ASNT) reviewers representing Southwest Fab, the ASME Authorized Nuclear Inspector (ANI), S&L and, on a sample basis, CECO. Moreover, the radiographs at issue were not to be utilized to establish the In-Service-Inspection baseline required by ASME Code Section XI to monitor weld quality during the operational phase of the plant. Utilizing the results of this initial review, CECO determined

that a rewash and fix of Southwest Fab supplied radiographs would be performed. This activity was intended to remove any residual processing chemicals on the film and stop any further degradation.

After the rewash and fix of initial radiographic packages, further analysis was performed by consultants such as the Electric Power Research Institute (EPRI) and the Eastman Kodak Company to determine if the process was satisfactorily removing residual processing chemicals. The results of this analysis, comparing rewash/fixed film to existing film, while showing improvement, indicated that the yellowed Southwest Fab radiographs did not meet extended storage requirements. Based on this finding, a revision to CECo NCR 606 was generated on October 7, 1985 to track the final resolution of the concern. After a thorough review of alternatives and discussions with EPRI and Kodak, CECo determined that the Southwest Fab supplied radiographs would be dispositioned under NCR 606, Revision 1 in the following manner.

The entire population of Southwest Fab radiographic film will be reviewed and inventoried. The review will be performed by trained personnel from PTL, knowledgeable in the processing of radiographic film. These individuals will be directly supervised by a certified ASNT Level II radiographic interpreter, who will determine the status of suspect radiographs. Any concerns raised by the Level II radiographic interpreter with yellowing film will then be directed to a cognizant CECo Level III ASNT interpreter to determine whether the film is yellowed. When a difference of opinion occurs, CECo is committing to refer the

difference to a Sargent and Lundy Level III ASNT interpreter to arbitrate the difference of opinion and make a final decision whether the film is yellowed. Those radiographic packages determined to contain yellowed film will be separated from the non-yellowed radiographic film. In addition to the aforementioned activity, all Southwest Fab radiographic film will be reinterleaved using new interleaving paper and new storage envelopes. All identification contained on the radiographic packages will be transposed to the new radiographic packages and all documentation contained in the radiographic packages, including existing reader and technique sheets, will be transferred to the new radiographic packages. This activity will ensure that any processing chemicals which may have leached into the original interleaving paper will have been removed. Further sampling of non-yellowed film will also be performed by CECO Project Field Engineering to assure that it will meet extended archive storage requirements.

The review and repackaging of Southwest Fab supplied radiographs was begun in early November 1985. Results to date are inconclusive as to the number of radiographs which are not interpretable. Upon completion of this activity, the total population of yellowed film will be identified and segregated. Upon completion of all the actions outlined above, all Southwest Fab film will be dispositioned in accordance with CECO NCR #606 Rev. 1 and the problem will have been resolved. In the future, if any of the radiographic film identified to be yellowed would need to be viewed, EPRI personnel have developed a computerized technique which can be utilized to enhance the yellowed image, thereby allowing proper

interpretation. Moreover, because the radiographs themselves are not needed to meet ASME Section XI requirements for weld baseline inspections, film quality is not a safety concern. Should an interpretation of these radiographs ever be needed EPRI personnel have developed a computerized technique which can be used to enhance the image.

In addition, in order to assure that site produced radiographs were receiving proper processing, Pittsburgh Testing Laboratories (PTL), the Site Independent Testing Agency, began performing archive quality testing of film on a weekly sample basis in April 1984, shortly after the identification of the concern to assure acceptability for extended archive storage. In addition, the site radiograph turnover Procedure SQI-24 was revised in June 1984 to require a sample check for film yellowing due to inadequate fixer removal prior to radiograph turnover to the station. To date, no site produced radiographs have exhibited the yellowing condition involved with the Southwest Fab radiographs.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
PTL RADIOGRAPHIC DENSITY

Upon re-review in March, 1984 by the ASME Authorized Nuclear Inspection (ANI) of early site produced radiographs depicting pipe weldments for compliance to ASME Sections III and V, certain radiographs were found to contain densities greater than allowed by Code. As a result, CECo reported a potential 50.55(e) to the NRC on March 6, 1986 in 50.55(e) Report No. 84-04. Subsequently, CECo generated Nonconformance Report (NCR) #609 on April 30, 1984, as clarified on May 21, 1984, to track the dispositioning of this item. Because the radiographs in question were originally produced, reviewed and interpreted by Pittsburgh Testing Laboratories (PTL), the Site Independent Testing Agency, an internal PTL NCR #185 was also generated.

The initial discrepancy had been found in a limited number of field-shot, PTL site-produced and interpreted radiographs. Initial investigation by PTL seemed to indicate that one (1) interpreter was responsible for the questionable density concerns on radiographs taken prior to September, 1979, the date of construction shutdown. Reviews of production weld radiographs shot prior to September, 1979 also indicated the presence of some marginal interpretations of film indications for weld quality.

As a precaution, CECo expanded the PTL re-review of film to include both production welds and welder qualification radiographs through 1979

for all PTL film interpreters. In addition, all film interpreted by the suspect interpreter was reviewed through 1980, and a sample of film reviewed by other PTL interpreters was reviewed through 1980. The results of the expanded review indicated that the problem radiographs dated only from July 1976, the date of the first field produced radiograph, through September 1979. Based on these reviews, both CECo and PTL concluded that the questionable interpretations during this period were limited to the one (1) interpreter. Upon gaining confidence that the questionably interpreted radiographs were identified the re-review was discontinued .

The following tabulation identifies by contractor, the total population of radiographs interpreted by the suspect interpreter which required further analysis.

1. Phillips, Getschow (PGCo) Production Weld Radiograph Packages	974
2. Phillips, Getschow Welder Qualification Radiograph Packages	279
3. G.K. Newberg Welder Qualification Radiograph Packages	19
4. Power Systems Inc. Welder Qualification Radiograph Packages	84
5. Universal Power Piping Welder Qualification Radiograph Packages	<u>2</u>
TOTAL	1358

The analysis of the aforementioned radiographic packages, each representing a particular weld, was completed as of November 27, 1984 by

certified American Society of Nondestructive Testing (ASNT) Level II and/or III interpreters, yielding the following results:

1. Of the 965 PGCo production weld radiograph packages reviewed for both density and weld quality concerns, 104 packages were not accepted. Of the additional 9 production weld radiograph packages needed to account for all 974 PGCo radiographic packages, five could not be located and one weld was discovered to have been cut out. The remaining three radiograph were dispositioned on individual NCR's.
2. Of the 279 PGCo welder qualification radiograph packages, all have been reviewed for both density and weld quality concerns, with 62 packages identified by PTL as not acceptable.
3. Of the 19 G.K. Newberg welder qualification radiograph packages, each was reviewed by certified ASNT Level II and/or III interpreters and found acceptable.
4. Also included in the relevant period were 2 Universal Power Piping welder qualification radiograph packages to qualify welders for work at Dresden, Unit I. Because qualification was for work at Dresden Unit I, which is currently being decommissioned, no further action was required.
5. Also included in the relevant period, were 84 Power Systems welder qualification radiograph packages. Power Systems Inc. had completed the scope of its work related to the Braidwood Project and was no longer on site at the time the concern was identified. Consequently, Power Systems Inc. was contacted in an attempt to retrieve these packages. However, it was determined that the radiograph packages have been discarded.

Based on the results of re-review, CECo has made the following determinations with regard to dispositioning the density/weld quality of the radiograph packages covered under CECo NCR 609, Rev. 1.

Both the G.K. Newberg and Universal Power Piping welder qualification radiograph packages have been resolved and no further action is required.

With regard to the PGCo production weld radiograph packages, 79 of the 104 welds found unacceptable have been repaired and/or reradiographed. A balance of 25 welds/packages still remain which require attention. Nineteen of these 25 welds/packages are associated with the Unit II Containment Spray and will not be accessible until after January 2, 1986 when needed scaffolding is moved from Unit 1. The remaining 6 weld packages, are currently being dispositioned to determine whether any repair and re-radiography is needed. These corrective actions are currently underway. Of the 9 remaining production welds packages (one cut-out) needed to account for all PGCo production weld radiograph packages, the five packages which were not located have been reradiographed.

The three remaining production weld packages which account for the total population of PGCo production weld radiograph packages, are being dispositioned per PGCo NCR's 5207, 5208 and 5209. The corrective action for NCR's 5207 and 5208 is to "accept as is", based on the fact that only film density and not weld quality is involved. This film can be properly interpreted using a high intensity radiographic viewer. In addition, the Magnetic Particle Nondestructive examinations required by the ASME code on the welds in question were found to be acceptable. As a result, NCR's 5207 and 5208 were closed, respectively, by PGCo on September 25, 1985, and November 12, 1985. The corrective action for PGCo NCR 5209 has been referred to Sargent and Lundy for analysis and disposition. This corrective action is scheduled to be completed by January 2, 1986.

With regard to the 62 welder qualification radiograph packages originally identified by PTL as suspect, 28 were subsequently jointly accepted by PTL and PGCo after certified ASNT Level III interpretation using, where necessary, a high intensity viewer. Thereafter, a multi-party meeting attended by representative of CECO, PGCo, PTL and the ANI was held at Braidwood on June 11, 1985 to disposition the remaining 34/62 suspect PGCo welder qualification radiograph packages. (This meeting also determined the course of action taken on the 3 PGCo production weld radiograph packages previously discussed.) During this meeting, 22 of 34 of the welder qualification packages were found acceptable based on qualified personnel viewing the film with a high intensity viewer and determining it was interpretable. The disposition for 7 of 34 additional welder qualification packages was to accept "as is" through ASNT Level III interpretations made jointly by PGCo and the ANI using, where necessary, the high intensity viewer. The decision on the remaining 5 welder qualification packages was to track and disposition on PGCo NCR 5302. The corrective action for this NCR was to accept 3 of 5 welder qualifications "as is" based on further joint interpretation by a PGCo ASNT Level III interpreter and the ANI interpreter, 1 of 5 welder qualification "as is" based on the acceptability of the first production weld made by the welder in question and 1 of 5 welder qualification "as is" based on the fact that the welder in question perform no ASME Code or other safety-related production welding at Braidwood. NCR 5302 was closed on October 29, 1985 and the PGCo welder qualification radiograph issue is now resolved.

The course of corrective actions necessary to disposition the 84 Power Systems is still being evaluated by CECO Field Engineering. When these actions are determined, implementation will follow. It should be noted, however, that the surface examinations required by the ASME Code revealed that the quality of the welds performed by Power Systems welders at Braidwood were acceptable.

In summary, the balance of corrective actions required to resolve the concern with radiograph density are:

1. Complete repair and/or re-radiography of the remaining 32 PGCo production weld radiograph packages.
2. Close-out of Phillip, Getschow NCR #5209.
3. Determine actions required to resolve Power System Inc. welder qualification radiograph packages and implement corrective actions.

Upon completion of these remaining activities, the concern with radiographic density will be resolved. The corrective actions are intended to be complete in early 1986.

In addition, on April 13, 1984, shortly after the density concern was identified, CECO Site Quality Assurance imposed a hold point on PTL to assure that radiograph interpretations and recording of densities was performed properly (Letter BRD 10,911). The hold point was removed on May 1, 1984 (Letter BRD 11,048), when confidence was reached that radiograph density recording and interpretation activities were being performed acceptably by PTL. This confidence was reached by actual

review and verification of work performed by PTL between April 13, 1984 and May 1, 1984. PTL's internal Quality Assurance organization along with Commonwealth Edison Site Quality Assurance continues to monitor radiographic activities through audit and surveillances to assure that density concerns do not reoccur. Finally it should be noted, that in recent NRC inspections where PTL radiographs were reviewed, the NRC raised no concerns regarding radiograph density or weld quality interpretations. This supports CECO's position that the concern with PTL radiographs is being addressed and resolved to prevent recurrence.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
ELECTRICAL CONDUCTOR EXTENSION BUTT SPLICES

AS a result of problems encountered at another nuclear facility, CECo QA performed a surveillance at Braidwood that revealed L.K. Comstock procedures did not include the manufacturer's (AMP Industries) installation instructions or inspection criteria for conductor extension butt splices. To determine the effect on the field installations, QA examined a small sample (29 total) of the installed butt splices and discovered that 38% (11 total) did not meet the acceptance criteria. Consequently, the quality of the butt splice installations in this application was deemed suspect. On March 27, 1984, CECo NCR #598 was initiated to document the deficiency and serve as a basis for engineering evaluation. Initial evaluation of this deficiency concluded that it was not reportable under 10 CFR 50.55(e). Subsequent reevaluation determined that the condition was potentially reportable and NRC was notified on August 1, 1984 under 50.55(e) 84-13. CECo Project Engineering dispositioned NCR #598 by developing acceptance criteria for butt splices which paralleled the manufacturer's criteria; by directing that LKC installation and inspection procedures be revised to incorporate those criteria to address future installations; and by directing that an inspection program be developed to verify that the installed splices are in accordance with the criteria.

A program was developed as a supplement to the disposition of NCR #598 to identify conductor extension butt splices utilized in safety related applications in Unit 1 and Unit 2 and assure documentation of

their replacement. L.K. Comstock termination procedure 4.3.9 and termination inspection procedure 4.8.9 were revised in April 1984 to incorporate the butt splice installation instructions and inspection criteria. The scope of the NCR #598 disposition supplement was consequently limited to those conductor extension butt splices installed prior to May 1, 1984. A computer printout of safety related cable terminations made prior to May 1, 1984 was utilized to identify the equipment that would require inspection for the suspect splices.

After the program was developed and the equipment that needed inspecting was identified, the personnel to be involved in the program received documented training. The program required that the craft personnel be qualified terminators, and the QC personnel be certified termination inspectors. A representative was designated from the CECo Project Construction Department (PCD), CECo Operations Analysis Department (OAD), and LKC Engineering Departments as primary contacts for the field teams to assure participation from each organization as required during the program implementation. A field team consisted of two (2) craftsman (at least one being a qualified termination journeyman) and a Level II certified termination inspector.

The field team was provided a form by PCD that had been developed specifically for this program as an attachment to the Disposition Supplement. The form's heading is completed by CECo PCD and provides the equipment number, location, and drawing. The team has the responsibility of inspecting the specified equipment, listing the safety related cables

terminated in that equipment, and completing the line entries after each cable documenting the presence or absence of extension butt splices. This assures inspection and documented results for safety related cables that may have utilized a conductor extension butt splice prior to May 1, 1984.

CECo PCD and OAD decided at the start of the program implementation that it would be more practical to take the prudent approach of replacing each of the suspect splices rather than try to uncover (each splice at Braidwood is covered with heat shrink or tape materials), inspect, and evaluate the previously installed splices. This was decided primarily based on the fact that due to the extensive Human Factor modifications and other rework in process in the control room panels, and other major electrical panels throughout the plant, the systems would require retesting. Consequently, the retesting required for the butt splice replacement circuits would have a minimal impact, as the majority, if not all, would have already been scheduled for retesting. This was the most prudent approach as in addition to the retesting consideration, replacing the suspect butt splices also eliminated any possible damage to the conductors while attempting to uncover the splices and eliminated any questions regarding the unrecreatable processes involved in the original installation. Also this was the most frugal approach as it would take less manhours (inspection, craft, and engineering) to replace the splice rather than inspect and evaluate the suspect one for use.

The field inspections and required rework were started in May 1985. There were 207 pieces of equipment in Unit 1 identified by PCD as requiring inspection. Simultaneously, another generic program was started in the Motor Operated Valves under the direction of CEC Co OAD. In an attempt to assure that the valves would not have to be reopened again OAD decided to incorporate any generic inspection programs into the valve inspections in process. Consequently, 111 valves were added to the original list bringing the total of Unit 1 equipment to 318. Because of the physical layout of the valves it would be impractical to extend a conductor, and consequently the valves were not originally in the scope of the program. However, the conservative approach of adding the valves to the program was decided on since the valves were being inspected in any case. There were no conductor extension butt splices identified in the 111 motor operated valves. In addition to the Unit 1 list of 318 pieces of equipment, there were 71 pieces of equipment in Unit 2 identified as having terminations performed prior to May 1, 1984.

During an NRC followup inspection of a sample of the panels and equipment on October 3, 1985, it was discovered that a cable in one of the panels had four (4) conductors extended that had not been identified during the inspection per CEC Co NCR 598. LKC NCR #4570 was initiated to document the failure of the LKC craftsman and inspector to comply with the criteria established by the inspection instructions delineated in NCR #598. In the interest of re-establishing the credibility of the inspection program, LKC NCR #4570 was dispositioned to reinspect the ninety (90) panels/equipment the involved LKC inspector had inspected during this program. The reinspection revealed nine (9) more conductors

extended with butt splices that had not been documented during the NCR #598 inspection program. The reinspection was performed and documented in accordance with the program established by NCR #598, and twelve (12) of the thirteen (13) butt splices will be, or have been, replaced as required by that program. The remaining one (1) butt splice had been installed since May 1, 1984 and inspection documentation was on file. The craftsman involved had voluntarily terminated prior to the NRC inspection and is no longer employed at Braidwood Station. The certification of the inspector involved has been suspended pending LKC management review of other inspections he has performed to determine the extent of the corrective action required to prevent recurrence in future work. Other panels/equipment inspected by the other LKC inspectors were selected by the NRC inspector and found to have no anomalies. LKC and CECO have determined that this is an isolated incident limited to one inspector and that no further corrective action is required.

As of October 31, 1985 the program is approximately 95% complete. There have been 229 conductor extension butt splices identified (226-Unit 1, 3-Unit 2) of which 176 have been replaced. The remaining 50 are being evaluated by CECO OAD for out of service availability and retest requirements. At the completion of the program the electrical equipment which had safety related cable terminations prior to May 1, 1984 will have been inspected, and all conductor extension butt splices installed in safety related applications prior to establishment of the acceptance criteria will have been replaced. No further corrective action or analysis will be required.

REFERENCES

1. CECo NCR 598.
2. Licensing file on 50.55(e) 84-13.
3. L.K. Comstock Procedure 4.3.9.
4. L.K. Comstock Procedure 4.8.9.
5. L.K. Comstock NCR 4570.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
STRUCTURAL STEEL INSTALLATION TRAVELER (SSIT)

During an overview performed by the CEC Co QA department of some Structural Steel Installation Traveler (SSIT) packages, various inconsistencies in the documentation of Structural Steel installed by Gust K. Newberg (GKN) were revealed. Basically, these inconsistencies included: heat numbers that have been changed on the fabrication tickets, recorded length of welds on weld inspection requests that have been changed, and use of alternate details that were not noted. These changes were lined out, initialed, dated, and there is no explanation as to why these changes were made.

Because of this, on March 23, 1984, Commonwealth Edison Company (CECo) notified Mr. Paul Pelke of the NRC of a deficiency potentially reportable pursuant to 10 CFR 50.55(e) regarding inconsistencies in the documentation of structural steel installed at Braidwood Station.

In order to resolve the document inconsistencies, CEC Co directed GKN to develop a final document review program consisting of a review of all SSIT packages under GKN procedures. The program consists of developing specific and generic procedures for documentation review. GKN developed generic procedures QCP Sections 29 and 29-1 for this purpose. These procedures define the methods, responsibilities and controls for the completion, receipt, review, filing, storage, maintenance, and retrieval of quality-related records. GKN developed specific Procedure 29-1-1 for the review of SSIT packages. This procedure provides specific checklists

that give a uniform basis for verifying the completeness and correctness of SSIT packages.

In reviewing the documentation deficiencies described above, GKN developed a number of generic resolutions under Procedure 29-1 for reconciling the observed inconsistencies. These initial generic resolutions were approved as part of the formal procedure review cycle. Procedure 29-1, including the initial generic resolutions, was approved on March 18, 1985 by CECO and Sargent & Lundy. GKN personnel were trained in Procedure 29-1 in mid-March 1985.

The GKN document review personnel who implemented these procedures are listed in the response to Interrogatory 7 entitled "Newberg Welding Program."

Many of the inconsistencies occur on required quality documentation forms filled in by GKN engineering or production personnel. The remaining inconsistencies occur in forms filled in by GKN QC personnel. The generic resolution for many of these consists of reviewing supporting QC documentation which indicates that the installation is acceptable. Such supporting QC documentation may come from GKN QC records and/or inspection records from an independent testing laboratory. For example, inconsistencies such as heat numbers changed on fabrication tickets or storage release requisitions are resolved through the generic resolutions developed under Procedure 29-1 by reviewing other supporting documents to verify that the change was acceptable. When the inconsistencies cannot

be resolved through reliance on supporting QC documentation, GKN utilizes QC personnel or inspection personnel to verify the quality of the installation.

For any inconsistencies which cannot be resolved through these procedures, a specific or generic NCR is generated by GKN. (A generic NCR covers multiple instances of the same problem). In addition, any inconsistencies which do not fall under one of the initial generic resolutions approved with Procedure 29-1 are listed on GKN NCR's. These NCR's are dispositioned and approved by CECO PCD, Quality Assurance and/or Engineering. These answers are then used to resolve similar situations until Procedure 29-1 can be revised to add the generic resolution.

The SSIT final document review has currently identified a total of approximately 7,800 SSIT Travelers which require review. The current status of the program is that 5023 of the SSIT Traveler packages have been reviewed. 2383 of these have been reviewed and accepted. The remaining 2640 are awaiting final review after approval of generic GKN NCRs. The current anticipated date for completion of the program is March 1986. To date, no hardware deficiencies have been identified as a result of the documentation inconsistencies described in this response. Once this review has been completed, there will be assurance that all documentation deficiencies concerning GKN SSIT Traveler packages have been identified and resolved.

REFERENCES

1. G.K. Newberg Procedure QCP-29, Rev. 5.
2. G.K. Newberg Procedure QCP-29-1, Rev. 0,1,2,3,4.
3. G.K. Newberg Procedure QCP-29-1-1, Rev. 0
4. Subsection D of CECo Audit QA-20-83-110.
5. CECo Audit QA-20-84-502.
6. CECo QA Surveillance 3658.
7. CECo Audit QA-20-84-543.
8. CECo Audit QA-20-85-D.
9. CECo Audit QA-20-85-539.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
NEWBERG WELDING PROGRAM

While conducting a routine NRC inspection, an NRC inspector identified several documentation discrepancies in Gust K. Newberg Company (GKN) Structural Steel Installation Travelers (SSIT). Commonwealth Edison Company (CECo) Project Construction Department (PCD), upon being made aware of the situation, instructed GKN to perform an initial documentation review. As a result of this review, PCD elected to report the identified discrepant conditions to the NRC pursuant to 10 CFR 50.55(e). The discrepancies were reported on August 10, 1984 and are currently being tracked by CECO in 50.55(e) report 84-15 and under CECO NCR 646 also issued on August 10, 1984.

Among the discrepancies identified in the 50.55(e) report were documentation problems relating to the welding of structural steel. These inconsistencies can be categorized as (1) GKN engineers specifying American Welding Society (AWS) Weld Process Specifications (WPS) that had not been incorporated into the GKN welding procedure for flux core welding, GKN engineers specifying improper WPS's or failing to specify WPS's for all joints; (2) GKN ironworkers welding to AWS pre-qualified details that were not approved by Sargent & Lundy for the flux core procedure or were not specified by the GKN Engineer; and (3) GKN ironworkers listing procedures on traveler packages as being used which they did not use or which did not list WPS's used.

In order to address the conditions identified in the 50.55(e) report, CECo initially elected to review the affected SSIT packages to determine scope of the problem. In addition, CECo attempted to evaluate whether the documentation deficiencies indicated the existence of underlying hardware problems. This CECo/GKN engineering evaluation reached the following conclusions:

1. The welders involved were qualified according to AWS to use all welding processes involved.
2. The weld joints detailed by engineering and installed in the field conformed to AWS pre-qualified details.
3. The welding processes used were pre-qualified by AWS and the type of electrodes used were limited, thereby limiting the variables available to the welder.
4. Electrode wire size, voltage, and amperage parameters are the same for all FCAW and SMAW welds regardless of joint detail or orientation.
5. All welds were visually inspected and, in some cases, Non-destructive Examinations (NDE) were conducted. No physical defects were identified.

On the basis of these conclusions, it was determined that the concerns were limited to documentation only.

Subsequently, to provide a more comprehensive review of the documentation deficiencies identified, CECo decided to have GKN perform a final document review program. The program consists of developing specific and generic procedures for documentation review. GKN developed generic procedures QCP Section 29 and 29-1 for this purpose. These procedures define the methods, responsibilities and controls for the completion, receipt, review, filing, storage, maintenance and retrieval

of quality-related records. GKN developed specific procedure 29-1-1 for the review of SSIT packages. This procedure provides specific checklists that give a uniform basis for verifying the completeness and correctness of SSIT packages.

Documentation deficiencies identified in the SSIT Traveler packages as a result of the checklist review under procedure 29-1-1 are, where possible, resolved under generic resolutions developed under Procedure 29-1. When the deficiency cannot be accommodated under an existing generic resolution, it is categorized under a generic GKN NCR. These NCRs are generically dispositioned and approved by CEC Co PCD, Quality Assurance and/or Engineering. As new generic resolutions are determined through the dispositioning of each GKN NCR, they are added to the list of existing generic SSIT documentation deficiency resolutions contained in Procedure 29-1 for resolution of similar discrepancies that may be identified in the future.

The GKN document review personnel implementing Procedures 29-1 and 29-1-1 are comprised of seven (7) qualified reviewers, three (3) certified Level II document review personnel and one (1) certified Level III inspector. The seven qualified reviewers are trained and qualified in accordance with GKN proceduralized guideline QC-G-1. The remaining four personnel are qualified and certified in accordance with the American National Standards Institute (ANSI) standard N45-2.6 1978 for their respective level of capability.

During its initial review, GKN primarily identified documentation deficiencies in particular SSIT Traveler packages involving the parameters in the Weld Process Specifications (WPS), pre-qualified vs. qualified joint configurations and welder qualifications. However, investigations indicated that problems are confined to cover plate installations in Unit 1 and Unit 2 Containments, and box beam connection modifications in Unit 1 Containment. Based on applicable SSIT's reviewed to date, documentation problems have been found to occur in varying combinations, in approximately 82% of the Flux Core Arc Welding (FCAW) SSIT's and in 18% of the Shielded Metal Arc Welding (SMAW) SSIT's. A total of approximately 7800 SSIT Traveler packages have been identified to date as being involved. The documentation deficiencies consist in general of missing entires, erroneous entries, such as the listing of an improper AWS procedure for the particular weld joint indicated; and conflicts with other entries within the same SSIT package, such as the listing of both FCAW and SMAW weld procedures when the documented weld filler material used to install the weld indicates that only one of the two procedures should have been listed in the traveler package as used for the particular weld. Because the determination was made that these documentation deficiencies did not affect acceptability, traceability or identification of hardware, Procedure 29-1, Generic Resolution 4 provides for acceptance of these SSIT traveler package attributes based on correction of the indicated documentation error.

The SSIT Final Document Review has currently identified a total population of approximately (7800) SSIT Travelers which require review because of documentation deficiencies being tracked in 50.55(e) report

84-15 and under CEC0 NCR 646. The current status of the document review program is that 5023 of the SSIT Traveler packages have been reviewed. 2383 of these have been reviewed and accepted. The remaining 2640 of 5023 are awaiting final review after approval of generic GKN NCR's. The current anticipated date for completion of the program is March, 1986. Once review has been completed, there will be assurance that all documentation deficiencies concerning GKN SSIT Traveler packages have been identified and resolved.

REFERENCES

1. CEC Co NCR 646.
2. Licensing file on 50.55(e) report 84-15 (pages A0014075-14102).
3. NRC Inspection Report 50-456/84-17, 50-457/84-17 (pages A0002303-A0002324).
4. G.K. Newberg Procedure QCP-29.
5. G.K. Newberg Procedure QCP-29-1.
6. G.K. Newberg Procedure QCP-29-1-1.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
HVAC HOUSINGS AND AIR RISERS

In June 1984, based on an expressed quality concern, Commonwealth Edison (CECo) Project Construction Department (PCD) determined that the quarter-inch liner plates for the Auxiliary Building Ventilation (VA System) Exhaust Filter Housings and the Unit 1 and 2 Reactor Containment (VP System) Fan Cooler Housings, and associated eighty-four inch Return Air Risers were not installed by Pullman Sheet Metal (PSM) in accordance with appropriate drawings and specifications. The scope of the identified problem included welding configurations which did not match drawings in some cases, and weld quality inspections which were incomplete in other cases.

After indentifying this problem, CECe notified the Nuclear Regulatory Commission (NRC) Region III Office on June 5, 1984, of a potential deficiency under 10 CFR 50.55(e) and designated the concern on 50.55(e) Report 84-08. In addition, CECe PCD issued Nonconformance Report (NCR) 632 on June 18, 1984 to track the disposition and resolution of this concern.

To institute corrective action to verify weld configurations and perform all necessary configuration/weld quality inspections, CECe first instructed PSM to review and organize its existing documentation to derive a list of available in-process weld inspection records and to ascertain areas where weld quality inspections were not performed or

where weld quality inspection records were missing. Concurrently, CECo requested Sargent & Lundy (S&L), the project architect engineer, to transmit existing Byron HVAC weld configuration drawings to PSM for use in performing any required inspections. These drawings indicated minimum weld inspection criteria. S&L transmitted these drawings for use by PSM and CECo PCD on August 22, 1984. Thereafter, PSM and CECo PCD determined that the drawings could not be used to conduct necessary weld and configuration verifications/inspections because they failed to document HVAC weld design configurations actually installed at Braidwood. As a result of this determination, CECo decided that S&L should perform field verification and evaluation of the as-built condition of the PSM housings and risers in question to determine the design adequacy of existing configurations and welds.

S&L began its field verification activities in January 1985. This field verification is being conducted in accordance with S&L's standard procedures for design/as-built work. Once it completed its evaluation of existing as-built configurations for design adequacy, S&L then proceeded to develop design drawings for PSM's use in conducting and documenting all necessary weld quality/configuration inspections and completing all unfinished work. In cases where its evaluation results indicated that as-built configurations were inadequate, S&L incorporated required rework or other hardware fixes into the as-built drawings and released them to PSM Production personnel for completion prior to the conduct of weld configuration/quality inspections by PSM Quality Control personnel. S&L issued all drawings required for Unit 1 inspection activities to PSM by June 1985. At this time, S&L does not intend to issue Unit 2 drawings

to PSM for the conduct of inspection activities until directed by CECo in accordance with its existing construction schedule .

Shortly before the release of Unit 1 drawings to PSM for commencement of identified inspection activities, CECo PCD decided to expand PSM's inspection program to recreate all inspection records for the Auxiliary Building (VA System) Exhaust Filter Housings and the Reactor Containment (VP System) Fan Cooler Housings and associated return Air Risers. The expanded program encompasses a 100% reinspection effort for configuration and weld quality.

PSM Quality Control personnel began expanded inspection activities for Unit 1 in August 1985. On-going inspections are being performed in accordance with existing PSM Procedures QCP-B10.2.F "Installation Inspection" and B10.3.F "Visual Weld Inspections." In addition, PSM Production is currently interacting with S&L to incorporate any further design changes determined to be necessary on to the as-built drawings. PSM Production personnel are also using the drawings to complete any unfinished Unit 1 work. All required changes and completed work is then forwarded to PSM Quality Control for inspection.

To date, PSM Production and Quality Control have completed approximately 15% of the configuration/weld quality inspections for the Auxiliary Building (VA System) Exhaust Filter Housings and approximately 15% of the inspections for the Unit 1 (VP System) Reactor Containment Fan Cooler Housings and associated Return Air Riser. Unit 1 inspection work is expected to be concluded by fuel load, with Unit 2 inspection work to

be completed thereafter. Upon conclusion of the above described corrective actions, all welds and as-built configurations for these housings and air risers will have been corrected and Quality Control verified in accordance with existing approved Braidwood design drawings.

BRAIDWOOD "TOP TWENTY" AND "ON-GOING" CORRECTIVE ACTION PROGRAM
HVAC DUCT FITTINGS

On June 15-21, 1983, Site Quality Assurance Audit QA20-83-31 was performed on HVAC contractor Pullman Sheet Metal (PSM). The audit identified that PSM was not performing safety-related HVAC duct and hanger inspections in a timely manner. Further investigation by Commonwealth Edison (CECo) Project Construction (PCD) and PSM as a result of this audit finding indicated that stiffener configurations for safety-related HVAC duct fittings, such as Y-branches, nested elbows and square-to-rounds had been shop fabricated by PSM without Sargent and Lundy (S&L) approved design documents.

CECo PCD issued NCR 540 to track and disposition this deficiency on June 30, 1983. CECo also issued a stop-work order to PSM covering the installation of all HVAC duct and fittings on June 30, 1983. Thereafter, CECo reported this deficiency to the Nuclear Regulatory Commission (NRC) Region III Office pursuant to the requirements of 10 CFR 50.55(e) and designated the item on 50.55(e) Report 83-08. In order to resolve the deficiency and assure that all safety-related HVAC fittings conformed to design, CECo undertook the following corrective actions.

In its June 30, 1983 stop work order, CECo instructed PSM to revise the drawings contained in its duct brochure to indicate the generic shop fabrication details of the duct fittings at issue. PSM submitted the revised drawings contained in its duct brochure to S&L on September 20, 1983. S&L performed an engineering review and issued its

formal approval of the revised PSM duct brochure on October 6, 1983. At this point, CECo lifted its stop work order and safety-related HVAC duct fitting installation was allowed to proceed. For all previous work, CECo instructed PSM to conduct a field verification to determine which installed or on-site shop fabricated safety-related duct fittings failed to comply with the approved design drawings contained in the revised duct brochure. Shop fabricated fittings not in conformance with approved design were to be as-built and submitted on Field Change Requests (FCR's) to S&L for evaluation and approval.

PSM Engineering personnel began the field verification and submittal of FCR as-built drawings to S&L in October 1983. Standard PSM Procedures for submitting design changes were used to perform this work. Based on the FCR's reviewed through August 1984, S&L determined that it was feasible to issue to PSM, through the generation of a Engineering Change Notice (ECN), maximum design tolerances and additional details with respect to the duct fittings in question. These maximum tolerances and additional details, once incorporated into S&L approved design drawings and referenced in a further revision to the PSM duct brochure, could then be used by PSM to evaluate, without resort to S&L in each instance, whether particular fittings complied with design.

S&L issued ECN-23287 incorporating the maximum design tolerances and additional details on October 17, 1984. Based on the issuance of the ECN, PSM began a new review of all shop fabricated safety-related HVAC duct fittings. PSM Corporate Engineering and Quality Control personnel first conducted a review of shop fabricated fittings tickets to identify

the total population of fittings involved and to determine which fittings could be verified to be in compliance with the approved design indicated on the ECN. Items requiring further field review for design verification were then examined by PSM Field Engineering personnel. As of February 21, 1985, PSM has reviewed all identified fittings for compliance with the revised duct brochure and/or S&L approved design drawings. A total population of 2,823 fittings were reviewed, of which PSM determined 1852 fittings complied with S&L approved design.

Because PSM Engineering personnel, and not S&L, made the determination that a total of 1852 safety-related HVAC duct fittings had been shop fabricated in accordance with S&L approved design configurations, CECo felt that an additional verification was necessary to assure the accuracy of the PSM Field Engineering determination. Accordingly, a random sample review program was formulated. Under this program, S&L selected a statistically random sample of 60 fittings to be Q.C. inspected by PSM Quality Control personnel. PSM Q.C. personnel performed this special inspection using its standard safety-related duct fittings inspection procedures and existing design documentation for each fitting included in the random sample. Inspections were completed by May 31, 1985 and results, including any documented discrepancies, were submitted to S&L for engineering evaluation. The results of the sample were found to be design acceptable by S&L on June 22, 1985. Based on the acceptability of the sample overinspection population, S&L concluded that the entire population of 1852 fittings complied with approved design.

Of the remaining 971 fittings PSM Field Engineering identified as not in conformance with design, approximately 620 fittings have been as-built and documented by PSM and submitted on FCR's to S&L for evaluation and resolution. S&L completed this as-built review in April 1985, identifying approximately 70 fittings which require repair or rework. Rework was begun pursuant to S&L identified fixes in April 1985. Appropriate fixes on all 70 fittings were identified by summer 1985. The additional approximately 351 fittings identified as non-conforming were not as-built or submitted to S&L for evaluation. Instead, CECO instructed PSM that they would simply be reworked per PCD instruction to achieve design conformance.

To date, approximately 40% of the 421 (351 + 70) fittings requiring rework have been completed. Once all rework is achieved, the entire population of 971 fittings originally identified as not meeting design will be Q.C. inspected by PSM Quality Control personnel in accordance with standard procedures for performing field inspections of safety-related HVAC duct fittings. The program is currently expected to be completed for Unit 1 fittings by March 1986 and for Unit 2 fittings thereafter. Program completion will assure that all shop fabricated safety-related HVAC duct fittings conform to approved design configurations.

REFERENCES

1. CECo Audit QA-20-83-31.
2. Letter dated July 13, 1983 from Grant to Sommerfield.
3. CECo NCR 540.
4. Sargent and Lundy ECN 23287.
5. Letter dated April 8, 1985 from Ward to Dierbeck.
6. Letter dated May 3, 1985 from Dierbeck to Lawler.
7. Letter dated June 4, 1985 from Dierbeck to Gallaher/Fus.
8. Letter dated July 8, 1985 from Hitzeman to Vahle.
9. Letter dated July 22, 1985 from Dierbeck to Lawler.
10. Licensing file on 50.55(e) 83-08.

BPAIDWOOD "TOP TWENTY" AND "ON-GOING" CORRECTIVE ACTION PROGRAM
L.K. COMSTOCK DOCUMENT REVIEW

The L. K. Comstock Document Review Program establishes prescribed guidelines for the review of L. K. Comstock quality control inspection records. The program encompasses a review of all L.K. Comstock quality control inspection records to ensure that each inspection record is identifiable, complete and comprehensive and that all identified documentation deficiencies are reconciled. The history of the program developed as follows:

As early as March, 1982, Commonwealth Edison Company (CECo) Quality Assurance audits and the Technical Support Group Evaluation of September 1982, identified deficiencies indicating the need to improve the L.K. Comstock documentation/filing system. As a result of identified deficiencies, Commonwealth Edison Company felt that improvements could be made in the areas of:

1. Timeliness of records retrievability.
2. Better accountability of the production records which support the status of installation.
3. Reconciliation of outdated forms.

In October, 1982, it was determined that progress was poor in the document review. In November of 1982, a new L. K. Comstock Quality Control Manager was hired and charged with improving the organization and retrievability of quality documentation. However, poor progress in the document review continued. In March and April 1983, CECo Project Construction Department (PCD) held meetings with L.K. Comstock Corporate personnel, including the

Corporate Quality Assurance Manager, to discuss the poor progress being made on the document review. As a result, L.K. Comstock committed to provide four inspectors to complete the document review and provide a plan for completion. A plan to complete the review was submitted to CECO for concurrence on March 9, 1983. The plan's scope and depth was to reconcile audit deficiencies of document retrievability, as well as assuring record completeness and correctness.

In June, 1983, CECO PCD and Quality Assurance met with L.K. Comstock to discuss the status of the document review. It was determined that L.K. Comstock was not proceeding as scheduled to meet their stated September, 1983, completion date. As a result of the June meeting, CECO again obtained replacement of the L.K. Comstock Q.C. Manager to more adequately organize and complete the document review under a new completion date of February 1, 1984.

Corrective measures taken at this time to prevent incomplete or unacceptable documents from being filed included the use of a computerized document tracking system to document the status of installation and inspections and assure record retrievability. In addition, L.K. Comstock Procedure 4.13.1 "Quality Control Documentation Requirements of Quality Related Records," was, implemented during this time frame to establish the criteria for records retrievability and review.

On January 31, 1984, CECO notified the Nuclear Regulatory Commission Region III Office of the history and status of the L.K. Comstock Document

Review Program under 10 CFR 50.55(e) and designated this item on 50.55(e) Report 84-01.

L. K. Comstock was considered 100% complete with its review of all documents on file by March 1984 and by January 1985 reconciliation of identified deficiencies was nearing completion. No deficiencies had been identified which required extensive rework and only limited field work had been required. At that time, PCD and BCAP concerns arose regarding the thoroughness of the reconciliation effort and the completeness of the initial document review. As a result, CECO PCD placed the Document Review Program on administrative hold. In order to lift the administrative hold, L.K. Comstock was directed to revise its existing document review program in its entirety.

On March 29, 1985, L.K. Comstock, with approval of PCD, Sargent and Lundy and Site Quality Assurance, issued Procedure 4.13.1.1 "Turnover Document Review" to govern its revised Document Review Program. Under this Procedure, L.K. Comstock is performing a 100% review of all Quality Control inspection records. This review includes all past and future records generated. Implementation of Procedure 4.13.1.1 in connection with the continuing implementation of Procedure 4.13.1 resulted in CECO lifting its administrative hold on April 17, 1985.

Procedure 4.13.1.1 contains (1) the training and testing requirements for L.K. Comstock document review personnel to conduct initial document review; (2) the methodology used to resolved inspection records determined to be unsatisfactory; and (3) specific checklists to

review each type of Quality Control record generated. The checklists contain the criteria used to determine the satisfactory or unsatisfactory condition of the particular type of inspection record being reviewed. Particular document review personnel are trained under one or more of the specific checklists in order to provide greater expertise in the review of documents covered by that checklist.

As document review personnel are appropriately trained and tested under Procedure 4.13.1.1, they are assigned to the L.K. Comstock Records Vault to begin their review of the records for which they have been qualified. Records are filed in the Vault alphanumerically by design drawing and they are reviewed in the same order as they are filed. After each record has been reviewed it is stamped per L.K. Comstock Procedure 4.13.1.1 as evidence of having been reviewed. Satisfactory records are replaced in the file, unsatisfactory records are logged on the document review log required by the procedure and segregated in a file awaiting corrective action as appropriate. All corrective action under the program is performed by a Level II Quality Control Inspector certified per L.K. Comstock Procedure 4.1.3, "Qualification Classification and Training of QC Personnel", in the discipline appropriate to the record being reviewed. Once unsatisfactory records are resolved by a Level II inspector a review of the resolution is performed by an independent Level II inspector prior to the record being replaced in the file.

L.K. Comstock hired a Document Control Supervisor in March 1985 to oversee the program. The supervisor currently has 9 document reviewers

working in the L.K. Comstock Vault reviewing records in accordance with Procedure 4.13.1.1 (see attached organization chart).

CECo Site Quality Assurance conducted Audit 20-85-522 and follow-up Surveillance No. 4735 of the L.K. Comstock Document Review Program in April 1985 and August 1985, respectively. As a result of minor concerns raised by Quality Assurance concerning consistent implementation of the Document Review Program, L.K. Comstock has revised certain reference lists used in its program to reflect current practices and procedures and, where necessary, reviewed again certain records. In addition, on August 5, 1985, L.K. Comstock Procedure 4.13.1.1 was also revised to address concerns expressed in Audit 20-85-522 and follow-up surveillance No. 4735.

The review of records associated with Unit 1 and common areas is scheduled for completion in December 1985 and the review of records associated with Unit 2 is expected to be complete in March 1986. As of October 30, 1985, the status of the program is as follows:

TOTAL RECORDS WITHIN THE SCOPE OF THIS PROGRAM	114,106
TOTAL RECORDS REVIEWED TO DATE	83,960 (73%)
TOTAL RECORDS REMAINING TO REVIEW	30,146 (27%)
TOTAL RECORDS FOUND SATISFACTORY TO DATE	67,097 (80%)
TOTAL RECORDS FOUND UNSATISFACTORY TO DATE	16,863 (20%)

Of the 16863 records deemed unsatisfactory, 7821 have been reconciled by Level II Inspectors. Of the 7821 reconciled, 145 required field inspection, 7676 office correction. The majority of discrepancies noted

to date have been primarily of an administrative and clerical nature requiring minimal reinspection of the hardware in the plant.

Once the L.K. Comstock Document Review Program is concluded, assurance will exist that all L.K. Comstock inspection records are identifiable, complete, comprehensive and retrievable.

COMSTOCK ENGINEERING, INC.
ORGANIZATION CHART
BRAIDWOOD STATION

TOTAL: 130

Revised 10/25/85
QC MANAGER DATE

Legend:

* - Lead
** - Disability

C: T. Passerba
D. Shamblin
F. Rolan
J. Klena
L. McGregor
QC Supervisors
QC Mgr File
QC File

*R. Whitehead - Medical Disability

SUPERVISOR
R. Tuite

RACEWAY/CABLE PULL
*M. Lechner K. Conner
M. Schiltz A. Parulekar
R. Hamilton K. Willoughby

TERMINATIONS/RWR
*D. Schirmer C. Fipia R. Louis
D. Graham J. Hosier
R. Marks C. Johns
F. Rolan J. Hutson

QCIPR
*M. Klechko D. Miller
G. Chinery P. Schultz
B. Schreiner E. Pishney
R. Geier B. Aho

SUPERVISOR
J. Hill

RECEIPT/CALIBRATION
*R. Nemeth R. Snyder
L. Phillips

CEA
*K. Figlik J. Bullock
R. Gallick D. Marachner
L. Wolf

EQUIPMENT
*T. Lych R. Gonzales
A. Cote P. Blackburn
R. Neu

UNIT CONCEPT/PTL OVERVIEW
*T. Bowman

DIRECT
SUPERVISOR

TEMP. ASST.
SUPERVISOR
T. Dunbar

DOCUMENT CONTROL
SUPERVISOR
R. Bower

STATUS CLERKS
C. Giacometti
J. Gutzman
J. Joyce

RECORDS VAULT
*T. Siebarth
A. Barton
P. Fricke
S. Jensen
P. Sichling
S. Wiekert
R. Castelli
H. Hanson-2nd
Shift

TURNOVER
*K. Ganoe
H. Himes
W. Bissett
D. Coxa
R. Martin

DOC. REVIEW
W. Abromitis
C. Arellano
L. Gunderson
K. Koehling
L. Larocca
J. Pantke
T. Schell
M. Swartz
L. Noble

REVIEWERS

Responsible for
overall program

These people perform initial review

QC MANAGER
I. DeWald

QC SECRETARY
S. Memenga

QA MANAGER/LICENSING
COORDINATOR
R. Seltmann

QA SUPERVISOR
R. Simms

QA ENGINEERS
R. Cartier
D. Gutman
D. Ferrara
D. Cordy

QA SECRETARY
L. Forneris

TRAINING SUPV.
R. Brown

TRAINING COORD.
B. Barrick
T. King

GENERAL SUPERVISOR
A. Simile

SUPERVISOR
D. Landers

UPPER/LOWER AUX.
*M. Mustered D. Pint
D. Gubelman A. Frew
D. Holley W. Wicks
G. Richards P. Hunter
M. Hintz

REACTORS
*D. Parrish R. Shields
R. Frisby J. Miner
L. Perryman R. Daniels

C/P WALKDOWN/REV. A REVIEW
*M. Blake D. Krizka
D. Peterson M. Gerrish
D. Assussen V. Yearout

DOC. REVIEW/AVO REVIEW
*B. Murphy L. Bossong
J. Anderson T. Gorman
T. Ruskiewics V. Whitcomb
D. Danielson

LEVEL II inspectors
they correct documents
found unsatisfactory

SUPERVISOR
SECOND SHIFT
J. Walters

RACEWAY/CABLE PULL
*C. Umbaugh J. Thomas
D. Loos S. Dooley
J. Dominique W. Finkle
J. Kidd K. Williams

WELDING/REV. A/AVO
*J. Aclero G. Nemeth
C. Noble

TRAINING
B. Hearn
R. Fanlon
R. Bores

REFERENCES

1. Licensing file on 50.55(e) report 84-01.
2. CEC Co Audit QA-20-82-35.
3. CEC Co Audit QA-20-82-21.
4. CEC Co Audit QA-20-82-31.
5. L.K. Comstock Procedure 4.13.1.1, Rev. A, Rev. B.
6. L.K. Comstock Procedure 4.13.1, Rev. D.
7. L.K. Comstock procedure 4.1.3, Rev. D.
8. Letter dated 2/6/85 from D.L. Shamblin to F. Rolan.
9. CEC Co Audit QA-20-85-522.
10. CEC Co Surveillance Report 4688.
11. CEC Co Surveillance Report 4735, Rev. 1.
12. L.K. Comstock response to CEC Co Audit QA-20-85-522.
13. L.K. Comstock response to CEC Co Surveillance 4735, Rev. 1.

BRAIDWOOD "TOP TWENTY" CORRECTIVE ACTION PROGRAM
SYSTEMS CONTROL - CONTROL BOARD WELDING

During a 1980 NRC Inspection documented in Inspection Report No. 50-456/80-06, 50-457/80-06 the adequacy of welds on the Main Control Board Panels supplied by Systems Control was questioned. Inspections were conducted and it was found that welding on the structural members of some of the panels did not meet applicable criteria. Weld defects included overlap, undercut, insufficient length, lack of fusion, and improper configuration. Commonwealth Edison (CECo) issued NCR 235 in July, 1980 to document the unacceptable welds and track the resolution of this concern.

The corrective actions implemented for the dispositioning and resolution of CECo NCR 235 were performed in three steps. At the direction of CECo, Sargent and Lundy (S&L), project Architect-Engineer, conducted inspections of all safety-related Systems Control Main Control Board Panels. From these inspections, S&L prepared as-built weld maps depicting the status of existing welding. Finally, S&L performed an engineering evaluation to determine whether the welds, as-built, required repair. This evaluation indicated that certain existing welds on the safety-related control board panels required repair and/or rework and, in some cases, additional welds needed to be added to the panels.

Based on the information, L.K. Comstock (LKC) production personnel made the required weld repairs/weld additions in accordance with existing LKC Procedure 4.3.16, "Revision/Work Request of Class 1E Safety Related Equipment". After necessary work was completed, LKC Quality Control

personnel performed required Quality Control inspections on all repaired or new welds in accordance with this existing Procedure 4.8.16

"Inspection of Revision to Installed Electrical Equipment." An overview inspection was also performed by Pittsburgh Testing Laboratories (PTL) the Site Independent Testing Agency. At the conclusion of this activity, Sargent and Lundy determined that the Systems Control safety-related Main Control Board Panels had been repaired and over-welded by adding an additional 150-200% weld material to assure the adequacy of the panels. (Letter dated May 24, 1983 from F.A. Kosik, Sargent and Lundy Senior Quality Control Coordinator to J.T. Westermier, CECo Project Engineering).

Subsequent to the original identification of the concern, the NRC upgraded the issue of Systems Control Main Control Board Welding to an item of non-compliance as documented in Inspection Report No. 50-456/80-11-02, 50-457/80-11-02. The NRC closed this item on December 10, 1982 in Inspection Report No. 50-456/82-06, 50-457/82-06. Closure was based upon the NRC's review and acceptance of repaired/new welds, the method of repair and the LKC Quality Control reinspection of the welds for the Unit 1 safety related Main Control Board Panels.

Even though the concern was closed by the NRC and repair work was acceptably completed, CECo NCR 235 still remains open. In an effort to obtain closure of the NCR, CECo Site Quality Assurance conducted Surveillance No. 3563 in June 1984. Audit 20-84-545 in September 1984, subsequently elevated the concerns in Surveillance 3563 to an audit finding. This finding is currently being tracked on Surveillance No. 4116, Rev. 2 in July 1985. These surveillances identified documentation

and filing practice concerns with the repair and/or inspection activities undertaken by LKC under the control board panel corrective action program. These concerns are currently being dispositioned on individual LKC NCR's. To date, LKC has issued NCR's 3539, 4424, 4425, 4620 and 4621 to resolve this documentation concern. In addition, CECo Project Field Engineering is currently in the process of evaluating whether any weld repair is required on the four (4) Systems Control non-safety related Main Control Board Panels as indicated on NCR 235. An evaluation is also being performed for three (3) of the panels which PTL inspected and found minor weld deficiencies. (Letter to W. Vahle, CECo Field Engineering, from D.L. Shamblin, CECo PCD, dated July 26, 1985). Preliminary results indicate that no further weld repairs will be required. Final closure of CECo NCR 235 is currently expected by December 1985.

Further, Westinghouse Electric Corporation, Water Reactor Division, has recently completed an as-built evaluation of the electric Main Control Board Panels at Braidwood for seismic qualification and structural integrity. The Westinghouse evaluation determined, with regard to the as-built weld condition of these panels, that the internal structural welds were sufficient to maintain the structural integrity of the panels. (Letter to J.D. Deress, Braidwood Project Engineering Supervisor, from J.L. Train, Westinghouse Manager for Commonwealth Edison Projects, dated October 7, 1985).

REFERENCES

1. NRC Inspection Report 50-456/80-06; 50-457/80-06 (pages A0000633-A0000639).
2. NRC Inspection Report 50-456/80-11; 50-457/80-11 (pages A0000699-A0000703).
3. NRC Inspection Report 50-456/82-06; 50-457/82-06 (pages A0001111-A0001126).
4. CEC Co NCR 235.
5. L.K. Comstock Procedure 4.3.16 and 4.8.16.
6. CEC Co Surveillance 3563.
7. CEC Co Audit 20-84-545.
8. CEC Co Surveillance 4116, Revisions 1 and 2.
9. L.K. Comstock NCR's 3539, 4424, 4425, 4620, 4621.
10. Letter dated May 24, 1983 from F.A. Kosik to J.T. Westermier.
11. Letter dated October 7, 1985 from J.L. Train to J.D. Deress.
12. Letter dated July 26, 1985 from D.L. Shamblin to W. Vahle.

BRAIDWOOD "ON-GOING" CORRECTIVE ACTION PROGRAM
REINSPECTION OF SAFETY RELATED MECHANICAL EQUIPMENT

A routine NRC safety inspection was conducted during the period April 19 through July 20, 1982, and a special inspection was conducted on September 8-10, 1982, of activities at the Braidwood Station, Units 1 and 2. The results of the inspections were discussed during an enforcement conference conducted at the NRC Region III Office on August 31, 1982, and at the Commonwealth Edison Company (CECo) corporate offices in Chicago, Illinois on November 19, 1982. During these meetings, CECo committed to placing a stop work on all safety related mechanical (SRM) equipment installations being performed at Braidwood by mechanical contractor Phillips, Getschow Company (PGCo). The stop work order was issued to PGCo on September 2, 1982 (letter BRD 7041). The reports setting forth the results of the NRC's inspections and the enforcement conferences are documented in Inspection Report No. 50-456/82-05; 50-457/82-05. The subject report stated that prior to July 16, 1980, no procedures existed with respect to the installation and inspection by PGCO of SRM equipment. The report further stated that the procedures developed for such installations subsequent to July 16, 1980 were not consistently implemented.

As part of its corrective action commitment to the NRC, CECo also initiated a complete retrofit inspection of all SRM equipment installed by PGCO prior to September 1, 1982 using the requirements of PGCo Procedure QCP-B22, Rev. 0 "Mechanical Equipment Installation" which was being

drafted at the time. This retrofit inspection was to be completed before PGCO proceeded with the completion of existing SRM equipment. Installation of new SRM equipment was to proceed under new procedure QCP-B22 after the lifting of the stop work order.

A total of 216 pieces of equipment were involved in this reinspection program. The purpose of the program was to assure that the SRM equipment installed by PGCo prior to September 1, 1982 had been properly installed and to provide a current status of the installation activities on each piece of existing SRM equipment. The program was also designed to establish conformance with the requirements of ANSI N45.2.8, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants".

The retrofit program under QCP-B22, Rev. 0, began on September 9, 1982 after CECo lifted its stop work order with respect to equipment installed prior to September 1, 1982. (Letter BRD 7091). CECo continued the stop work order on installation work on new SRM equipment received on-site after September 1, 1982. PGCO personnel involved in the installation of SRM equipment were subsequently trained in the requirement of QCP-B22.

In accordance with QCP-B22, Rev. 0, PGCo Engineering personnel reviewed existing installation drawings for each piece of equipment, along with Sargent and Lundy (S&L) Mechanical Specification L-2739 and

the applicable vendor equipment manuals. After completing this review, PGCO prepared an Equipment Installation Record (EIR) form, QCP-B22-1, for conducting the retrofit inspection on each piece of SRM equipment. The EIR form detailed steps necessary for installation and inspection of a specific piece of equipment. Those installation steps which had previously been completed, and therefore required reinspection, were highlighted on the form. Prior to the issuance of the EIR form to the field, each form was reviewed by PGCo Quality Control and CECo Site Quality Assurance for assignment of hold points at various stages of required field reinspection. Reinspection work was performed by PGCo Quality Control personnel and, where necessary production personnel to verify compliance with the requirements of ANSI N45-2.8 and to verify other necessary, attributes identified by PGCo Engineering on each EIR form. Additional rework or evaluations were performed, if necessary, as a result of the reinspection process. Implementation of the retrofit program under QCP-B22, Rev. 0, was completed on December 31, 1982, provided the status of the installation of all SRM equipment up to that time and resulted in the generation of a documented record of installation and Quality Control inspection for this equipment.

Revision 1 to QCP-B22 was issued in January, 1983 to proceduralize the clarification of reinspection activities which had occurred during the Revision 0 program review of the 216 pieces of SRM equipment. New equipment installation activities occurring after the approval of Revision 1 were performed in accordance with the provisions of QCP-B22, Rev. 1. Revision 2 to QCP-B22 was issued on April 16, 1983 to incorporate minor changes in the Procedure.

SRM equipment installation was allowed to continue during 1983, based on the lifting of the stop work order by CEC Co Site Quality Assurance on January 11, 1983. (Letter BRD #7912). However, during September 1983, PGCo management at Braidwood, on its own initiative, informally reviewed the documented results of the SRM equipment retrofit performed under QCP-B22, Revision 0, 1 and 2. Based on this review, PGCo deemed it necessary to perform a complete review of all documentation created under the program during reinspection and rework activities performed prior to December 31, 1982. The purpose of this review was to reformat existing documentation in a clear and auditable fashion. However, during the process of reformatting existing documentation, it became apparent to PGCo that further inspection and engineering activities were required to assure that the installation of SRM equipment was in accordance with all design requirements. Procedure QCP-B22 was then reviewed and revised several times by PGCo. This effort resulted in Revision 5 of the Procedure (Revision 3 and 4 not issued), which became effective in May 1984.

QCP-B22, Revision 5, was instituted to clarify the established administrative controls on equipment installation and provide a basis for review of existing documentation and processes performed under earlier Revisions of the Procedure relative to final preparations for system completion, preparation of the required ASME Code Data Report (N-5 review) and ultimate system turnover to the plant operating staff. In addition, QCP-B22, Revision 5 added new inspection attributes to be included in the reinspection of SRM equipment and, in some cases,

expanded existing inspection attributes previously developed under Revision 0, 1 and 2. QCP-B22, Rev. 5 also provided a method to reformat inspection information contained on existing inspection documentation.

Subsequent to the approval of Revision 5, PGCo initiated a program to correlate and review all previous SRM equipment documentation completed prior to December 31, 1982 and to perform the required field reinspections to encompass the newly added and expanded inspection attributes. In cases where inspection documentation created during reinspection activities under Procedure Revisions 0, 1 and 2 could not be properly reformatted due to unclear documentation, field reinspections were also performed to cover those Revision 0, 1 and 2 inspection attributes with unclear documentation. Corrective actions under QCP-B22, Rev. 5 proceeded temporarily on a low priority basis due to other project activities until July of 1985.

In March 1985, PGCo issued QCP-B22, Revision 7, which incorporated minor procedural enhancements and clarifications. Thereafter, Revision 8 to QCP-B22 was issued to again add minor procedural enhancements and clarifications. The heightened reinspection activities which began in July 1985 were performed under these Procedure Revisions. However, the basic program methodology that was implemented at this time was that originally developed in March 1984 under Procedure Revision 5. The scope of work continued to be the new and repeat reinspections that were identified in March 1984 to be necessary for SRM equipment installed prior to September 1, 1982. Reinspection activities under this phase of the program are implemented through a four-step process described below.

Initially an office review of previous existing inspection documentation was conducted by PGCo Engineering. The review encompasses a comparison of the existing records for each piece of equipment with current installation requirements detailed on Procedure checklists (PG/QA-5-36A for rotating equipment and PG/QA-5-36B for non-rotating equipment). The checklists, which were developed under the procedural enhancements of QCP-B22, Rev. 5, provide detailed information for installation and inspection of the SRM equipment in accordance with the Revision 5 enhancements. In addition, all vendor manuals, vendor drawings and A.E. design location and mounting drawings were reviewed as part of this effort. During the course of this review, all clear and auditable information obtained from existing inspection documentation and other relevant information obtained through the aforementioned reviews was transferred onto procedural form PG/QA-5-38 in accordance with Section 18.1.2 of QCP-B22.

The PGCo files were also searched to gather copies of relevant documents for each piece of SRM equipment. Standard categories of documents encompassed by this search include:

1. All copies of superseded installation records and/or installation drawings
2. Non-Conformance reports
3. Monitoring reports
4. Field change orders
5. A.E. Design documents (ECN's, FCR's, etc.)
6. Weld and bolt-up documentation.

Throughout this engineering review/research effort, the pertinent historical data/documents utilized were accumulated into a history/reference package kept on file by PGC Co Engineering. The history reference package provides for timely response for further research that might be required on a piece of equipment and facilitates the response to questions that might arise regarding the ongoing review.

This history/reference package together with the procedural form PG/QA-5-38 comprise the equipment installation record (EIR) data package on each piece of equipment covered in the reinspection program. In addition, any on-going work for an existing piece of equipment covered by the program, i.e., work that is not retrofit related, is also detailed on form PG/QA-5-38 and is included in the EIR data package. The EIR data packages are revised as necessary to incorporate additional documentation which is issued on each particular piece of SRM equipment.

After the EIR data package is developed, the packages are checked by PGC Co Engineering personnel other than those who prepared them, sent through a quality review sequence for review by PGC Co Quality Control, CEC Co Site Quality Assurance and the ASME Authorized Nuclear Inspector (ANI), and then returned to PGC Co Engineering for issuance to the field. The field verification activities are commenced at this point under the second step of the reinspection program.

Field verification activities include all required work and/or inspections indicated on form PG/QA-5-38 as not previously completed. PGC Co field production and field Quality Control personnel are responsible

for completing the work and inspection steps as detailed on form PG/QA-5-38. The successful completion of these steps is documented on pages 0 thru 5 of the form. As each step of the required retrofit work and/or inspection activity is completed, field sign-offs are obtained from PGCo field production and/or Quality Control personnel. Once all required sign-offs are obtained, the particular piece of equipment is designated "Field Retro-Review Complete". The PG/QA-5-38 form for that piece of equipment is then routed to the PGCo office Quality Control Department for review and acceptance.

Under step three of the program, the PGCo office Quality Control Department reviews the "Field Retro-Review Complete" form PG/QA-5-38 for each piece of equipment in conjunction with the accumulated documents contained in the EIR data package which make up the history/reference package. This review assures that all procedural requirements of QCP-B22 and other related procedures have been met and that the resultant installation/inspection documentation is adequate, complete and understandable. At this point, the EIR data package is designated "Retro-Review Complete". The EIR data package is then placed in the PGCo Q.A. Records Vault until it is required for the completion of new work which has not yet been completed, i.e., non-retrofit installation/inspection work, for each particular piece of SRM equipment. This new work is performed under step four of the program. The steps for completing any new work are also setout and controlled on form PG/QA-5-38. A final package review is then performed by PGCo Quality Control and upon approval package closure is accomplished.

After an EIR package has attained "Retro-Review Completed" status, it is a readily auditable document which verifies that the subject piece of SRM equipment has been installed/inspected in accordance with all current procedural and specification requirements. The EIR document package contains the history of a specific piece of SRM equipment from its date of receipt at the site to its present condition. This indexed package identifies all work performed, documented inspections, discrepancy and nonconformance reports associated with the piece of equipment and their final disposition or current status. Identified within the package are all field change orders (FCO's) which will reflect any work performed on the piece of equipment during its construction cycle. The documents that are identified as part of the EIR package also track the sequence of work activities which have been and will be performed. The EIR package allows the contractor, and other organizations, to identify and track the status of installation of a piece of SRM equipment through proper completion.

To date, EIR data packages for all 216 pieces of equipment involved in the SRM reinspection program have been completed through initial engineering review and the packages have been issued to PGCo field production and field Quality Control personnel. Field work and inspections have been completed on 183 of the EIR data packages. 153 of the EIR data packages have been further reviewed and accepted by PGCo office Quality Control Department and have been designated "Retrofit-Review Complete". A total of 125 PGCo, CECo and S&L employees have been involved at various stages in the reinspection program which is currently expected to be completed, for all SRM equipment installed prior

to September 1, 1982, by December, 1985. Once this activity is completed, work will be expanded to include reinspections on SRM equipment installed between January 11, 1983 (the date of the lifting of the stop work order on new equipment installations) to May 1984 when Revision 5 was issued (Letter BR/PCD 85-612).

REFERENCES

1. NRC Inspection Report 50-456/82-05; 50-457/82-05 (pages A0001005-A0001018).
2. T.R. Tramm letter to J.G. Keppler dated October 8, 1982 transmitting Commonwealth Edison's Report for 10 CFR 50.55(e) 82-07 (pages *A0003558-A0003564).
3. Cordell Reed letter to J.G. Keppler dated April 4, 1983 transmitting Commonwealth Edison response to Inspection Report 82-05 (pages A0001063-A0001084).
4. Phillips, Getschow Procedure QCP-B22, "Equipment Installation Record", Revisions 0, 1, 2, 5, 7 and 8 (pages K0015128-15387).
5. "Historical Account of Safety Related Mechanical Equipment Installation at Braidwood Station" - Draft report (pages A0014008-14053).
6. ANSI N45.2.8 "Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants."
7. Letter dated September 10, 1982 from R. Cosaro to R. Meyers.
8. Letter dated September 8, 1982 from T.R. Sommerfield to R. Cosaro.
9. Letter dated January 11, 1983 from T.R. Sommerfield to R. Cosaro.
10. Letter dated July 11, 1985 from D.L. Shamblin to T. O'Connor.
11. Letter dated September 2, 1982 from R. Cosaro and T.R. Sommerfield to R. Meyers.

BRAIDWOOD "ON-GOING" CORRECTIVE ACTION PROGRAM
QUALITY CONTROL INSPECTOR REINSPECTION PROGRAM

As a prudent effort, Commonwealth Edison Company (CECo) instituted the Quality Control Inspector Reinspection Program (QCIRP) to provide additional confidence in the adequacy of the inspector certification methods used by the on-site contractors performing safety related construction activities at Braidwood. The QCIRP is designed to test whether original inspection results for safety related construction activities can be repeated by currently certified inspectors. These original inspections occurred prior to the upgrading of contractor Inspector Certification Procedures pursuant to the requirements established at CECo's Byron Station and transmitted to Braidwood site contractors in a letter dated May 12, 1982. The original QCIRP was put on hold in March 1984 pending the implementation of the QCIRP program at CECo's Byron Station at the conclusion of the Byron licensing hearings.

The completion of the QCIRP is now being tracked under CECo Noncomformance Report (NCR) 688. This NCR was written in December of 1984 to identify and resolve potential unsatisfactory conditions in the site Quality Control inspector certification process. The NCR states, in part, that past inspector certifications performed in accordance with ANSI N45.2.6-1978 require evaluation to assure conformance to the upgraded acceptance requirements per agreement between the NRC and CECo at Byron. In order to address this issue, CECo decided to perform the QCIRP.

Supplement one (1) to NCR 688 outlines the scope of the QCIRP. The program provides for the following:

1. Determination of the contractors to be included in and excluded from QCIRP;
2. Determination of the applicable time period for the program;
3. Defining the areas of certification used by contractors;
4. Defining the sampling process to be used for the selection of Inspection Reports/Inspection Elements for reinspection;
5. Describing the reinspection process;
6. Defining the acceptance criteria;
7. Defining the methods to be used for counting and tabulating the results;
8. Providing a method for sample expansion of the program, if required.

It should be noted that the QCIRP is only directed towards verifying inspector certifications, not verifying, or otherwise establishing, the quality of plant hardware at Braidwood. Other corrective programs have been implemented by CECO, as deemed appropriate, for this purpose.

Attachment A to Supplement One (1) of NCR 688 provides a listing of justifications for including/excluding contractors in the QCIRP. At the present time, the contractors included in QCIRP are the mechanical contractor Phillips Getschow Company (PGCo), the electrical contractor L.K. Comstock Company (LKC), and Pittsburgh Testing Laboratories (PTL) the Site Independent Testing Agency. The basis for inclusion in QCIRP is that the contractor's inspectors were certified to ANSI N45.2.6-1978 and

the contractors performed safety related work that is currently accessible or recreatable, i.e. has not been reworked, deleted or reinspected. The applicable time period for each contractor's inclusion in the program is governed by the date each contractor started work at the Braidwood site, up to the program cut-off date. The program cut-off date is the date when each respective contractor received approval from CECo for the revision of its Inspector Certification Procedure to the requirements of the CECo letter dated May 12, 1982. These dates are February 8, 1983 for PGCo, December 17, 1982 for LKC and November 19, 1982 for PTL. In some cases, reinspections performed during the QCIRP may extend past the designated contractor cut-off date for individual inspector. This is in order to conduct reinspections for a particular inspector's work performed up to the date that individual inspector was actually recertified to his contractor's revised Inspection Certification Procedure.

Attachment B to Supplement One (1) of NCR 688 lists the areas in which the included contractors certified inspectors. These "certification areas" are grouped into two categories. The Type A certification area is inspectors certified to perform subjective inspections, i.e. visual weld inspections. The Type B certification areas include inspectors certified to perform objective inspections, and therefore encompasses all areas other than weld inspections. If an objective inspection element involves welding, it is for weld presence only. Attachment C to Supplement One (1) of NCR 688 provides justification for the certification areas which are excluded from the QCIRP. In general, those certification areas which encompass

non-recreatable or in-process inspections or inspections which are currently being reworked, deleted or reinspected at Braidwood are excluded from the QCIRP.

The sampling process used to select items for reinspection under QCIRP is primarily based on the inspections performed by each individual inspector covered by the program during his initial 90-day period after certification in which he actually performed recreatable inspections that can now be reverified. In some cases where the inspector performed no recreatable inspections during the 90 day period after certification, the 90-day period was adjusted to start with his first recreatable inspection. In other cases, due to administrative delay, inspectors began performing inspections prior to the final paper work being issued for their certification. In such instances, inspections performed by these inspectors during the initial 90-day period in which they performed recreatable inspections is included in the sample of inspections to be used in the program. If available, a minimum quantity of five inspection reports, containing 50 inspection elements, are being randomly selected and reinspected for each inspector included in the QCIRP. For subjective inspections, an element is defined as an individual weld and for objective inspections an element is defined as each recreatable line item the inspector verified on the original inspection checklist. This sample is expanded chronologically beyond the 90-day period, if necessary, to obtain the required number of inspection elements to be included in the sample for each inspector under the program.

The reinspection program basically provides for a currently certified inspector, other than the original inspector, to verify the inspections performed by the original inspector. The reinspection uses the criteria that was in effect at the time the original inspection was performed. Additional inspection criteria to clarify and interpret original inspection requirements are provided in Procedure PM-11 "Quality Control Inspector Reinspection" developed specifically to implement the program.

Once reinspections are completed for an inspector, results are compared to an established acceptance criteria. For the type A inspections, 90% agreement with the original inspection results for each inspector being reinspected is considered acceptable. For the type B inspections, 95% agreement with the original inspection results for each original inspector being reinspected is considered acceptable. Reinspections are performed for both Type A and Type B inspections by a currently certified (in the particular type of inspection being evaluated) Level II inspector. For those Type A inspections identified by a Level II as not-acceptable, a currently certifiable Level III inspector, independent from the contractors, reviews the discrepancies to assure uniformity of results among the contractors.

Once all the reinspections for an individual inspector are performed, a tally is made for Type A and for Type B inspections to determine if the acceptance levels have been maintained and that the original inspector's work is considered acceptable. For those inspectors

whose reinspections fall outside the acceptance levels, the program defines established steps for the expansion of the reinspections on an individual inspector basis. Expansions may be extended to include a 100% reinspection of the original inspector's work until the time he was recertified to his contractor's revised Inspector Certification Procedures (or when he left the site). An engineering evaluation will be performed to evaluate the design significance of discrepancies identified for a particular inspector.

As previously noted, Braidwood Project Management developed Procedure PM-11, to implement the QCIRP as defined by Supplement One (1) to NCR 688. PM-11 provides the means for conducting the program on a day-to-day basis. It contains program definitions, policies, procedures, forms for recording inspection discrepancies and clarification requests to aid current reinspectors in interpreting the standards in effect at the time of the originally performed inspections. A CECO Task Force (CTF) was established to administer PM-11. The CTF consists of CECO personnel, including a Site Quality Assurance representative, and representative from the Architect/Engineer Sargent and Lundy and independent consultants. A CTF chairman has been designated by the CECO Project Construction Department (PCD) Superintendent to oversee day-to-day implementation of the QCIRP. The CTF chairman is responsible for program implementation, contractor interface, coordinating reinspection activities and training, statusing results and the overall completion of the program.

The CTF does not contain personnel from the site contractors that are included in the QCIRP. However, each of the contractors included in QCIRP is required by Procedure PM-11 to have an interfacing procedure. These interfacing procedures provide the necessary guidance for contractor inspection personnel to implement the PM-11 requirements on a contractor-specific basis. Contractor personnel assigned to QCIRP activities are trained to their respective interfacing procedures. Contractor management, in turn, interface with the CTF. The contractors currently in QCIRP have designated the following interface procedures:

1. PGCo - Procedure PGWI-35, "Inspector Reinspection Program";
2. LKC - Procedure 4.1.3.02, "Quality Control Inspector Reinspection Program";
3. PTL - Procedure IS-BRD-36-IRP, "Instruction Sheet for the Inspector Reinspection Program (ANSI N45.2.6)".

Field reinspections for each contractor in QCIRP began during September 1985. Completion of field reinspections is currently scheduled for January 1986. To date, no final conclusions have been made. Upon conclusion of the QCIRP, a statement will be able to be made regarding the adequacy of the included contractors' inspector certification programs prior to fall 1982/winter 1983 when revised and improved Inspector Certification Procedures were instituted by these contractors.

REFERENCES

1. Commonwealth Edison Nonconformance Report #688 dated 12/10/84 including Supplement 1 Revision 2 dated 7/29/85.
2. ANSI/ASME N45.2.6 - 1978, Qualifications of Inspection, Examination, and Testing Personnel for Nuclear Power Plants.
3. Regulatory Guide 1.58 Revision 1 September 1980 - Qualification of Nuclear Power Plants Inspection, Examination, and Testing Personnel.
4. Byron/Braidwood Final Safety Analysis Report page A1.58-1 Amendment 33 October 1981 - Regulatory Guide 1.58.
5. Braidwood Nuclear Station Project Procedure PM-11 Revision 1 dated 8/9/85 - Quality Control Inspector Reinspection.
6. Phillips, Getschow Company Work Instruction No. PGWI-35 Revision 1 dated 8/21/85.
7. L.K. Comstock Work Instruction WI-4.1.3-02 Revision B dated 10/12/85 - QC Inspector - Reinspection Program.
8. Pittsburg Testing Laboratory Instruction IS-BRD-36-IRP Instruction Sheet for the Inspector Reinspection Program (ANSI N-45.2.6).

BRAIDWOOD "ON-GOING" CORRECTIVE ACTION PROGRAM
QUALITY CONTROL STRUCTURAL STEEL REVIEW (QCSSR)

Commonwealth Edison Company implemented the Quality Control Structural Steel Review (QCSSR) Program in 1982 in response to experiences concerning the erection of structural steel at other nuclear plant construction sites. The program was undertaken to provide, on a sampling basis, as-built information regarding essential design attributes so that the Architect/Engineer (A/E) could analyze any difference between the design and the as-constructed condition.

The A/E developed the sampling plan used in the QCSSR Program. The sample sizes and accept/reject criteria were based upon MIL-STD-105D, Sampling Procedures and Table for Inspection by Attributes, using General Inspection Level III and multiple sampling to establish a 95% confidence level that at least a 95% acceptance was achieved. Inspection samples were selected from safety-related structural steel erected by Napoleon Steel Contractors, American Bridge Division of U.S. Steel Corporation, and Mid-City Architectural Iron Company.

The inspections of the samples selected were performed by three Gust K. Newberg (GKN) Construction Company QC inspectors, with two Pittsburgh Testing Laboratory (PTL) inspectors performing the inspections on the welding attributes. GKN developed Quality Control Procedure Section 31-1, "Special In-Place Structural Steel Inspection", to perform these inspections. This procedure was developed utilizing a sample procedure provided by the A/E.

The inspections included in the QCSSR Program addressed the following attributes, which were considered by the A/E to be significant to the load-carrying performance of the structural steel:

1. End Connections
 - a. Number, size, and type of bolts and thread engagement
 - b. Size of connection angles or plates
 - c. Configuration and size of welds
 - d. Presence of hardened and plate washers
2. Members
 - a. Member size
 - b. Existence, size and locations of field cut holes
 - c. Damage, i.e., dented or warped flanges and webs
 - d. Size of beam copes
 - e. Quality of field cut holes and beam copes, i.e., radius of re-entrant corners
3. Beam Stiffeners
 - a. Stiffener size
 - b. Details used to attach stiffeners

GKN QC inspectors provided as-built data on forms provided by the A/E. The forms provided identified the member to be inspected and the items that were to be verified. After completion of the field verifications, the forms were transmitted to CECO Project Construction Department (PCD) for review and in turn were transmitted to the A/E so that they could analyze any difference between the design and the

as-constructed condition. As required by GKN-QCP 31-1, contractor non-conformance reports were generated to document any discrepancies found during the field inspections.

The results of the review performed by the A/E are summarized in a June 20, 1985 Sargent & Lundy letter. Based on the review, one potential trend was identified where A307 bolts had been substituted for high-strength A325 bolts in friction connections. The trend is limited to Napoleon erected steel in the Containment Buildings and only the instanding joint of friction type connections for beams opposite sliding connections. The A/E recommended that all joints of this type be inspected to ensure that A325 bolts have been installed. If any A307 bolts were found during this inspection, they should be removed and replaced with A325 high-strength bolts, which should be tightened, all in accordance with the design drawings. GKN has been assigned this follow-up action. Also identified were isolated cases of connections wherein missing bolts were noted. Even though S&L evaluated these cases and found that they were not design significant, S&L recommended that the connections be restored to their original condition in accordance with the design drawings. GKN has been assigned this action. CECO PCD will generate non-conformance reports to track closure of the QCSSR Program.

The A/E final report concluded that the QCSSR Program has established that all of the erection of structural steel at the Braidwood Site is acceptable. This program showed that, based on a statistical

sampling plan with a 95% confidence/95% reliability criterion, the steel members erected by Napoleon, American Bridge and Mid-City are adequate to support design loads.

REFERENCES

1. Sargent & Lundy Report on QCSSR.
2. G.K. Newberg Procedure QCP-31-1.
3. Report on the Braidwood Construction Assessment Program (BCAP), November, 1985.

BRAIDWOOD "ON-GOING" CORRECTIVE ACTION PROGRAM
SAFETY RELATED PIPE SUPPORTS

The purpose of the program was to assure that all safety related pipe supports installed by Phillips, Getschow Co. (PGCo) prior to September 1982 were installed in accordance with the design drawings and specifications. During the original installation/inspection of these supports certain attributes were not required to be checked. As a result of problems encountered at another facility, CECo directed PGCo to include additional attributes on their inspection checklist for support installation in June of 1981. CECo also directed PGCo to reinspect past support installations for these attributes. CECo subsequently determined that these reinspection efforts were not proceeding in a timely manner. In order to devote the available manpower to this effort, CECo issued a stop work order for all new safety related supports (50.55e 82-08) in September 1982. In order to take the most conservative approach CECo decided to reinspect all supports installed up to the date of the stop work order.

The reinspection of the 3807 safety related pipe supports involved in the program was performed in accordance with PGCo Quality Control Procedure QCP-B23, "Installation and Inspection of Component Supports". Under QCP-B23, the supports were first inspected by the PGCo production crews and, where necessary, brought into Conformance with existing design documents by reworking or reinstalling the support. The support was then required to be inspected by PGCo QC inspectors, using the currently approved component supports installation procedure QCP-B23. Since a stop work order was self imposed on new safety related support installation,

the majority of the PGC0 hanger crews and the PGC0 hanger engineering office were involved in the retro-fit program. The remaining hanger personnel were working on non-safety related supports.

As the retro-fit program progressed, freeing up PGC0 personnel, the stop work order on new safety-related support installation was lifted in stages. The entire stop work order was lifted on 10/3/83. By 12/31/83 PGC0 production crews and QC inspectors had completed rework or reinstallation and inspection of all safety-related component supports with the exception of 182 Containment Spray hangers. The Unit 1 Containment Spray hangers were not accessible at this time because the polar crane was not available for erection of the necessary scaffolding. On 8/15/85 the Unit 1 Containment Spray hangers were completed, leaving 9 Unit 2 Containment Spray hangers. The expected date for completion of the Unit 2 hangers is 1/87.

As part of BCAP, CECO examined records generated by the safety-related pipe support reinspections and reviewed the reinspection results to determine if the reinspection program was properly conducted. BCAP reviewed a total of 184 support documentation packages of the 3,807 supports included in the program. BCAP determined that 14 packages had indication of a partial reinspection being performed and seven packages had no indication of reinspections having been performed. This item was considered to have an effect upon the fulfillment of the safety-related pipe support commitment because it indicates that not all of the supports received the required reinspections. The overall BCAP conclusion however, was that the program, as conducted, provides assurance that the

support assembly, configuration, and welding are in accordance with the design drawings and that the program was effectively implemented.

To address the discrepancies in documentation noted by BCAP, CECO initiated NCR 6075. The corrective action, as stated on the NCR, will require a review by PGCo of all the hanger packages in question to ensure that all reinspections have in fact been performed under this program. In addition to this review, a final review of every hanger retro-fit package will be performed prior to N-5 sign-off. Once NCR 6075 has been closed, the program as conducted does provide assurance that all safety related pipe supports installed prior to September 1982 have been installed, inspected, and accepted in accordance with the approved design documents with the exception of 92 Unit 2 Containment Spray hangers.

REFERENCES

1. Licensing file on 50.55(e) report 82-08.
2. Phillips-Getschow Procedure QCP-B23.
3. Report on the Braidwood Construction Assessment Program (BCAP), November, 1985.
4. CEC Co NCR 6075.
5. Phillips-Getschow NCR 776.

BRAIDWOOD "ON-GOING" CORRECTIVE ACTION PROGRAM
INSTRUMENT RETROFIT VERIFICATION PROGRAM (IRV)

In June and July of 1983, NRC Inspection Report 83-10 and Commonwealth Edison (CECo) Site Quality Assurance Audit 20-83-33, identified several Phillips, Getschow Company (PGCo) Quality Control inspection attributes that were not included in the PGCo instrument installation procedure, PGCP-30. These attributes included verifying the proper color coding of instrument sensing lines, verifying that sensing line separation met the 18 inch separation criteria for redundant instrumentation and verifying that instrument sensing line pitch met the acceptable 1/2 inch per foot criteria. Both the NRC and Site Quality Assurance identified instances of installed instrumentation which violated these attributes. The potential for non-conforming conditions to exist as a result of the lack of verification of these attributes on installed instrumentation had the potential for jeopardizing trip or control functions of these instruments.

As a result of the identification of this concern, PGCo made procedural changes to include these missing inspection attributes in PGCP-30 for future instrument installations. Revision 7 to PGCP-30 was implemented for use in January 1984. Furthermore, training for PGCo Quality Control inspectors and installation personnel was performed at this time to address the changes to PGCP-30.

In order to assure the adequacy of past instrument installation work, CECo and PGCO committed to a reinspection program in January of 1984. The program, which was based upon the improved inspection attributes in

PGCP-30, Rev. 7, was implemented in June of 1984, under QCP-B32, "Instrument Retrofit Verification" (IRV). The scope of the IRV program was to reinspect all ASME Class B and H safety related instrument installations that had been installed prior to implementation of PGCP-30, Rev. 7 and the subsequent training of PGCo personnel to that revision. The time frame of the IRV program was defined as any isometric drawing issued to the field prior to February 1984. This included 293 ASME Class H and 68 ASME Class B safety related instrument installations and 153 non-safety related Class D instrument installations which were required to have the 18 inch separation requirements for redundant instrumentation.

Under PGCP-B32, the IRV program was carried out in two phases. Phase I gathered existing information on instrumentation installed in the field through field walkdowns, revised the existing isometric drawings to this information, and developed/implemented the corrective actions to be taken to bring the existing instrument installations up to the current requirements of PGCP-30, Rev. 7. Corrective actions which included repair and rework, if necessary, were implemented under the existing PGCo field change order (FCO) program. Phase II of the reverification program was the Quality Control reinspection of past instrument installations to the requirements of current procedure PGCP-30.

While performing the Phase I walkdowns, it was found that virtually all existing Class H and Class B safety related instrument installations would have to be reworked to bring them into conformance with the current PGCP-30 inspection requirements. The bulk of this rework was to

establish a consistent line pitch/slope of 1/2 inch per foot. In some cases, this required a complete removal and reroute of the existing instrument installation, but for the most part involved minor rework at specific locations to establish the specified pitch requirements. Work proceeded on this retrofit activity during the remainder of 1984.

In December of 1984, CEC Co QA re-evaluated the IRV program in Audit Report No. QA-20-84-592, and found the program as being implemented was acceptable. This led to the close-out of the original finding from Audit Report QA-20-83-33. At that time, due to the still on-going nature of IRV program work, CEC Co determined that, with the closing of audit QA-20-83-33, a tracking mechanism for the closure of the program was needed. Accordingly, CEC Co Project Construction Department (PCD) issued Nonconformance Report (NCR) 715 as a tracking mechanism for the program on February 1, 1985. The NCR indicated that completion of the on-going IRV program was required to resolve the identified instrument installation concern. Subsequent review of this NCR, along with additional concerns expressed by the NRC (as described below) established that the IRV program was reportable under the criteria of 10 CFR 50.55(e). CEC Co notified the NRC Region III Office of this fact on February 4, 1985 and designated this concern on 50.55(e) Report No. 85-03.

During the course of the retrofit program in January 1985, various NRC and CEC Co Site Quality Assurance audits identified further concerns with PGCP-30, Rev. 7 and the IRV procedure QCP-B32 that required PGCo to further enhance and refine these procedures. Some of these concerns,

identified in NRC Inspection Reports 84-42 and 84-38, were the use of non-proceduralized log notations to track the resolutions of deficient items through to final QC inspection and program completion, the lack of an established documentation system for identifying non-conforming conditions, and the issuance of uncontrolled drawings to conduct Phase II walkdowns. Of these concerns, only the uncontrolled document issue was tracked by the NRC as an open item. However, the existence of these concerns led CECo to place an administrative hold on the issuance of all open revision drawings for the performance of Quality Control field reinspections under the IRV on January 10, 1985 (Letter No. BRD 14,439). Thereafter, further discussions between CECo, PGCo and the NRC led to program revisions to QCP-B32 to address the NRC's as well as Site Quality Assurance's concerns.

On February 6, 1985 a revision to QCP-B32, was issued to resolve the uncontrolled documentation concern. It required that all documents used in the Phase II walkdown process be stamped "For Retrospection Only." In addition, the revision clarified the process for reverifying drawings once corrections were made to installed instrumentation. Based on these actions, CECo lifted its hold point on Quality Control reverification activities on February 14, 1985 (Letter No. BRD 14,702) and work was allowed to continue. The expressed concerns were closed out by the NRC in Inspection Report 85-023 on July 11, 1985. It should be noted that the concerns expressed with the IRV program during early 1985 involved documentation only and at no time was the validity or veracity of the IRV program or its implementation ever in question by any agency or person.

The procedural concerns noted were addressed and resolved through QCP-B32 revisions with no modification, rework, or affect on the implementation of the IRV program or its outcome.

In September of 1985 the reinspection and rework activities established under revised QCP-B32 was completed. All ASME Class B, and Class H safety related instrument installations defined in the scope of the IRV program, have been reworked and Quality Control inspected in compliance with the current requirements of PGCP-30. All 153 non-safety related Class D instrument installations defined in the scope of the IRV were verified to have the required 18 inch separation criteria or reworked, if necessary. No requirement exists to conduct Quality Control inspections on this nonsafety related installed instrumentation. Moreover, the procedural changes and subsequent training provided by PGCo to current revisions to PGCP-30 provides assurance that on-going instrument installation work performed after February 1984 will conform to the current requirements of the PGCo installation procedure and PGCo Quality Control specifications.

REFERENCES

1. CEC Co NCR 715.
2. Licensing file on 50.55(e) report 85-03.
3. CEC Co Audit QA-20-83-33.
4. CEC Co Audit QA-20-84-592.
5. Letter dated February 14, 1985 from T.E. Quaka to D.L. Shamblin.
6. Letter dated January 9, 1985 from T.E. Quaka to D.L. Shamblin.
7. Phillips-Getschow Procedure PGCP-30, Revision 7.
8. Phillips-Getschow Procedure QCP-B32, Revision 3.
9. NRC Inspection Report 50-456/83-10; 50-457/83-10
(pages A0001667-A0001675).
10. NRC Inspection Report 50-456/84-42; 50-457/84-38
(pages A0002785-A0002803).
11. NRC Inspection Report 50-456/85-023; 50-457/85-023.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

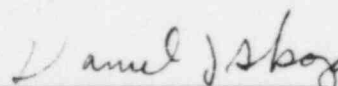
In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF DANIEL J. SKOZA

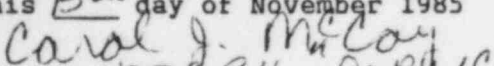
I, Daniel J. Skoza, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as Supervisor of Special Projects, Project Field Engineering Department at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenors Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for all but the final paragraph of the description of the "ASME Material Procurement" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


Daniel J. Skoza

Subscribed to and Sworn before me
this 5th day of November 1985


NOTARY PUBLIC
My Commission expires on

10/30/89

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF MICHAEL A. GORSKI

I, Michael A. Gorski, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as a Project Construction Department Field Engineer at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "Nameplate Documentation Retrieval Program" corrective action program and for the final paragraph of the description of the "ASME Material Procurement" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.

Michael A. Gorski
Michael A. Gorski

Subscribed to and Sworn before me
this 15th day of November 1985

Carol J. McCoy
NOTARY PUBLIC

My Commission expires on

10-30-89

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

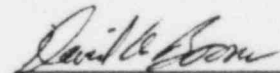
In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF DAVID A. BOONE

I, David A. Boone, being first duly sworn, depose and state as follows:

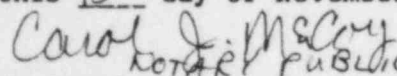
1. I am employed by Commonwealth Edison Company as a Consultant at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "CEA Inspections" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.



David A. Boone

Subscribed to and Sworn before me
this 15th day of November 1985


NOTARY PUBLIC
My Commission expires on
10-30-89

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

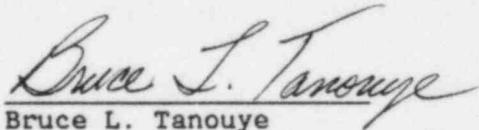
In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF BRUCE L. TANOUYE

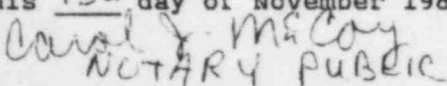
I, Bruce L. Tanouye, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as a Project Construction Department Field Engineer at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "Concrete Expansion Anchors in Repaired Concrete Areas", "CEA's in Finished Slabs", and "Structural Steel Installation Traveler (SSIT)" corrective action programs as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


Bruce L. Tanouye

Subscribed to and Sworn before me
this 15th day of November 1985


NOTARY PUBLIC
My Commission expires on
10-30-89

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

AFFIDAVIT OF CLIFTON D. GRAY III

Further affiant sayeth not.

10-20-89

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

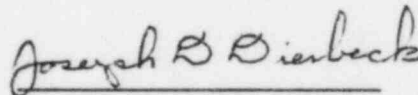
In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF JOSEPH D. DIERBECK

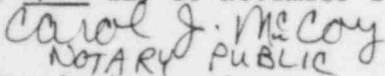
I, Joseph D. Dierbeck, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as a Project Construction Department HVAC Engineer at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the descriptions of the "HVAC Housings and Air Risers," "HVAC Duct Fittings" and "HVAC Installation Tolerances" corrective action programs as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


Joseph D. Dierbeck

Subscribed to and Sworn before me
this 15th day of November 1985


NOTARY PUBLIC

My Commission expires on

10-30-89

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF LAWRENCE H. STROPE

I, Lawrence H. Strobe, being first duly sworn, depose and state as follows:

1. I am employed by Daniels Construction as a Consultant Field Engineer in the CECO Project Construction Department at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "NSSS Component Support Verification" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.

Lawrence H. Strobe
Lawrence H. Strobe

Subscribed to and Sworn before me
this 15th day of November 1985

Carol J. McCoy
NOTARY PUBLIC

My Commission expires on

10-30-89

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF ANTHONY J. D'ANTONIO

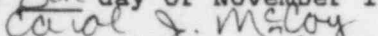
I, Anthony J. D'Antonio, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as Level III N.D.E. Inspector in CECO's QA Dept. at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "Southwest Fab Radiographs" and "PTL Radiographic Density" corrective action programs as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


Anthony J. D'Antonio

Subscribed to and Sworn before me
this 15th day of November 1985


NOTARY PUBLIC

My Commission expires on

10-30-89

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

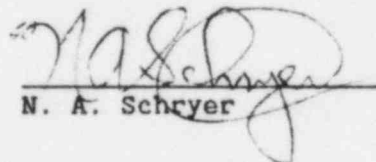
In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF N. A. SCHRYER

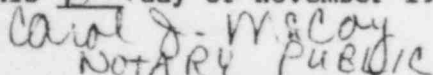
I, N. A. Schryer, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as a Consultant at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenors Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "Electrical Conductor Extension Butt Splices" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


N. A. Schryer

Subscribed to and Sworn before me
this 15th day of November 1985


NOTARY PUBLIC
My Commission expires on

10/30/89

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter Of)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
(Braidwood Station Units 1 and 2) 50-457

AFFIDAVIT OF MICHAEL J. KOPP

I, Michael J. Kopp, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as a Consultant at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenors Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "L.K. Comstock Document Review" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.

Michael J. Kopp
Michael J. Kopp

Subscribed to and Sworn before me
this 15th day of November 1985

Carol J. McCoy
NOTARY PUBLIC

My Commission expires on
10-30-88

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

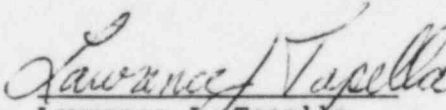
In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF LAWRENCE J. TAPELLA

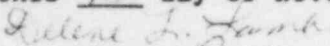
I, Lawrence J. Tapella, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as a Project Construction Department Field Engineer at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenors Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "Systems Control-Control Board Welding" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


Lawrence J. Tapella

Subscribed to and Sworn before me
this 15 day of November 1985


Notary Public
My Commission expires on
April 19 1988

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD


In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF MICHAEL R. DOUGHERTY


I, Michael R. Dougherty, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as a Consultant at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "Reinspection of Safety Related Mechanical Equipment" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


Michael R. Dougherty

Subscribed to and Sworn before me
this 15 day of November 1985


Notary Public
My Commission expires on

April 19, 1988

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

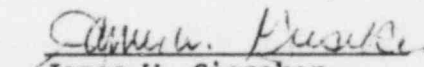
In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF JAMES W. GIESEKER

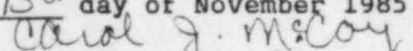
I, James W. Gieseke, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as Project Construction Department Field Engineer at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "Quality Control Inspector Reinspection Program" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


James W. Gieseke

Subscribed to and Sworn before me
this 15th day of November 1985


NOTARY PUBLIC

My Commission expires on

10-30-89

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

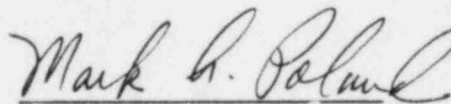
In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF MARK A. POLAND

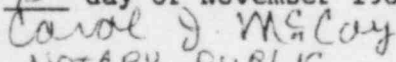
I, Mark A. Poland, being first duly sworn, depose and state as follows:

1. I am employed by Commonwealth Edison Company as a Project Construction Department Field Engineer at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "Quality Control Structural Steel Review (QCSSR)" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


Mark A. Poland

Subscribed to and Sworn before me
this 15th day of November 1985


NOTARY PUBLIC
My Commission expires on
10-30-89

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

AFFIDAVIT OF RICHARD J. FARR

Further affiant sayeth not.

My Commission expires on

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD


In the Matter Of)
)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-456
) 50-457
(Braidwood Station Units 1 and 2)

AFFIDAVIT OF DAVID L. JONES

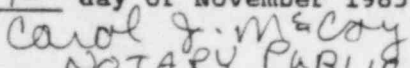
I, David L. Jones, being first duly sworn, depose and state as follows:

1. I am employed as a consultant by Commonwealth Edison Company in the position of Construction Supervisor for Instrumentation at Braidwood Nuclear Station.
2. My business address is Braidwood Nuclear Power Station, Braceville, Illinois 60407.
3. I have participated in the preparation of the response to Specific Interrogatory No. 7 filed by Intervenor Rorem, et. al. in their Second Set of Quality Assurance Interrogatories and Request to Produce. Interrogatory 7 requests, in part, detailed descriptions of certain corrective action programs being undertaken at the Braidwood Site. In particular, I have responsibility for the description of the "Instrument Retrofit Verification Program (IRV)" corrective action program as identified in the April 8, 1985 correspondence from David H. Smith to James G. Keppler and/or in Appendix B to the BCAP June 1984 program description transmitted by James J. O'Connor to James G. Keppler by letter of June 22, 1984.
4. To the best of my knowledge and belief, the description of this corrective action program is true and correct.

Further affiant sayeth not.


David L. Jones

Subscribed to and Sworn before me
this 15th day of November 1985


NOTARY PUBLIC

My Commission expires on

10-30-89

November 15, 1985

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:)	
COMMONWEALTH EDISON COMPANY)	
)	Docket Nos. 50-456
(Braidwood Nuclear Power)	50-457
Station, Units 1 and 2))	

CERTIFICATE OF SERVICE

I Lisa C. Styles, one of the attorneys for Commonwealth Edison Company, certify that Applicant's First Partial Response to Rorem's Second Set of Quality Assurance Interrogatories and Request to Produce dated November 15, 1985 have been served in the above-captioned matter on those persons listed in the attached Service List by United States mail, postage prepaid, this 15th day of November, 1985, except where service has been made as otherwise noted.

Mr. William L. Clements
Chief, Docketing and Services
United States Nuclear Regulatory
Commission
Office of the Secretary
Washington, DC 20555

Herbert Grossman, Chairman
Administrative Law Judge
Atomic Safety and Licensing Board
U.S. Regulatory Commission
Washington, D.C. 20555

Dr. Richard F. Cole
Administrative Law Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Ms. Bridget Little Rorem
117 North Linden Street
P.O. Box 208
Essex, IL 60935

Dr. A. Dixon Callihan
Administrative Law Judge
102 Oak Lane
Oak Ridge, Tn 37803

*Robert Guild
Douglass W. Cassel, Jr.
Timothy W. Wright, III
BPI
109 North Dearborn Street
Suite 1300
Chicago, Il 60602

Stuart Treby, Esq.
Elaine I. Chan, Esq.
Office of the Executive Legal
Director
United States Nuclear Regulatory
Commission
Washington, DC 20555

William Little
Director of Braidwood Project
Region III
United States Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Atomic Safety and Licensing
Board Panel
United States Nuclear Regulatory
Commission
Washington, DC 20555

Charles Jones, Director
Illinois Emergency Services
and Disaster Agency
110 East Adams
Springfield, Il 62705

Atomic Safety and Licensing
Appeal Board Panel
United States Nuclear Regulatory
Commission
Washington, DC 20555

Jan Stevens
United States Nuclear Regulatory
Commission
7920 Norfolk Avenue
Phillips Building
Belhesda, Maryland 20014

*Messenger delivery on November 15, 1985.


Lisa C. Styles

ISHAM, LINCOLN & BEALE
Three First National Plaza
Suite 5200
Chicago, Illinois 60602
(312) 558-7500

Dated: November 15, 1985