



Commonwealth Edison

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July 6, 1984

Mr. James G. Keppler
Regional Administrator - Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Braidwood Station Units 1 and 2
Response to Inspection Report Nos.
50-456/83-09 and 50-457/83-09
NRC Docket Nos. 50-456 and 50-457

Reference (a): J. G. Keppler letter to J. J. O'Connor
dated May 7, 1984

Dear Mr. Keppler:

This letter is provided in response to the inspection conducted by Messrs. T. E. Vandell, R. D. Schulz, I. T. Yin, D. E. Keating, C. C. Williams, and D. R. Hunter on June 20-24, June 27-July 1, August 1-5, August 9, October 4-7, and October 24, 1983, and January 11-13, January 26, and February 9, 1984 of activities at our Braidwood Station. Reference (a) indicated that certain activities appeared to be in non-compliance with NRC requirements.

The Commonwealth Edison Company response to the Notice of Violation is provided as Attachment A to this letter. Our response to Unresolved Items 456/83-09-04 (A), 457/83-09-04 (A), 456/83-09-04 (B), and 457/83-09-04 (B), and the description of our program to verify the quality of installed piping components is included as Attachment B to this letter. An extension of the response period was requested from W. S. Little and R. F. Warnick of Region III on separate occasions, and extension was granted to July 6, 1984. We appreciate the extension of time given to us to respond to this matter.

Reference (a) revealed a number of deficiencies concerning the programs and procedures which had been established at Braidwood Station for the verification of correct material for ASME piping components, control of HVAC welding activities, and design control of field routed small bore piping and associated hanger installation activities. Our responses to the items of non-compliance describe the changes and improvements which we have made to those procedures as a result of our intensive and comprehensive reviews of your findings and those of other inspections. The information provided in this submittal also serves to respond to the additional questions raised in the Reference (a) letter transmitting the Notice of Violation.

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Commonwealth Edison believed that the programs and procedures, at the time of their approval, were adequate to assure the quality of the completed construction work. We acknowledge, however, that they contained deficiencies with respect to meeting all regulatory requirements, particularly with regard to the need for providing detailed documentation of activities. We also recognize the need in several cases to more rigorously follow and more effectively monitor approved procedures and activities.

Recently, an Atomic Safety and Licensing Appeal Board found that the critical questions regarding the assurance of quality of construction of complex nuclear power plants are whether identified construction deficiencies have been corrected, and whether there is a functioning quality assurance program so that there is reasonable assurance as to the overall integrity of the facility. Commonwealth Edison Company believes that the responses contained in the Attachments to this letter do substantiate that construction deficiencies have been and are being identified and corrected, and that there is aggressive implementation of Quality Assurance at our Braidwood Station.

We have established a number of corrective action programs to confirm the quality of specific areas of past construction work through a series of special inspections and documentation reviews. The programs have been designed to demonstrate that past construction work is of acceptable quality, and that deficiencies are identified and appropriately dispositioned. These quality confirmation programs include: the Reinspection of Safety Related Mechanical Equipment; a Quality Control Inspector Reinspection; the Piping Heat Number Material Traceability Verification Program; the Quality Control Structural Steel Review; an Electrical Installation Document Review; a Review of Safety-Related Pipe Supports; the HVAC Welding Reinspection; the HVAC Configuration Review; the HVAC Duct Stiffener and Fitting Detail Review; an Instrumentation Installation Verification; and a NSSS Component Support Verification Review.

Finally, we have made extensive management and organizational changes within the Commonwealth Edison management team and the contractor management organizations, and within the Commonwealth Edison and contractor Quality Assurance/Quality Control organizations which effect overview activities, to provide assurance that procedural requirements will be met, and to ensure aggressive and effective management involvement in our Quality Assurance Program. A description of these changes is included as Attachment C to this letter.

The combination of these efforts provide the basis for Commonwealth Edison Company's confidence in the performance of the site contractors, and our confidence that our Braidwood Station will be completed in accordance with regulatory requirements.

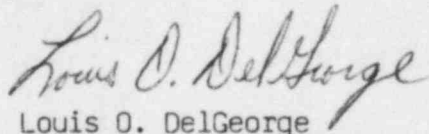
J. G. Keppler

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July 6, 1984

To the best of my knowledge and belief, the statements contained herein and in the Attachments to this letter are true and correct. In some respects, these statements are not based on my personal knowledge but upon information furnished by other Commonwealth Edison employees, contractors and consultants. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

Very truly yours,


Louis O. DelGeorge
Assistant Vice President

Attachments

cc: NRC Resident Inspector - Braidwood

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ATTACHMENT A

COMMONWEALTH EDISON COMPANY

RESPONSE TO INSPECTION REPORT

50-456/83-09 and 50-457/83-09

ITEM OF NONCOMPLIANCE:

1. 10 CFR 50, Appendix B, Criterion XVI, as implemented by Commonwealth Edison Company Quality Assurance Manual, QR No. 16.0, requires, in part, that measures be established to assure that conditions adverse to quality such as nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

Contrary to the above:

- a. 1/2" S/80, SA-312, Type 304, ASME Boiler and Pressure Vessel Code, Section III, Class 1, NB pipe heat number 745107 was discovered in Section III installations without material test reports or records of receiving and receipt inspections by either Commonwealth Edison Company or Phillips, Getschow Company as identified by Phillips, Getschow Company on September 17, 1982, on Nonconformance Report No. 789. The disposition of the Nonconformance Report resulted in accepting the pipe, after the only obtaining material test reports, without examining the pipe, initiating and maintaining receipt inspection records, or determining the total quantity of the pipe in storage and installed.
- b. The HVAC contractor had not established a corrective action program to assure that conditions adverse to quality such as deficiencies and deviations were analyzed for significance and subsequently that the causes of any significant conditions were determined and corrective action taken to preclude repetition. Through August 4, 1983, 2,513 Correction Notices had been written by the HVAC contractor for deficiencies and deviations, including numerous welding deficiencies and deviations, but the contractor's Quality Assurance Program did not require that Correction Notices be analyzed for significance.
- c. Corrective action was not adequate concerning Nonconformance Report No. BR-08, dated June 15, 1981, since the nonconforming welds completed by unknown welders were "accepted-as-is" after only a visual examination. The acceptance of a weld by visual examination pursuant to AWS D1.1 is based on the fact that a qualified welder performed the welding in accordance with the qualified process.

Response to Item 1a

RESPONSE

Commonwealth Edison Company acknowledges that the disposition of NCR 789 was incomplete.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Phillips, Getschow Company initiated NCR 1128 to document the additional disposition of NCR 789. NCR 1128 required the following:

1. Field engineering to issue copies of drawings showing the installation location of both Schedule 80 and Schedule 160 1/2" pipe, heat number 745107.
2. Phillips, Getschow Company Quality Control to verify wall thickness with UT thickness measurement device.
3. Thickness information to be given to Phillips Getschow Company field engineering for determination of proper pipe schedule installation.
4. The warehouse man shall initiate a Receiving Inspection Report to document the receipt of the Schedule 80 pipe. Phillips, Getschow Company Quality Control shall review documentation.
5. Total footage of pipe installed and in storage should be reconciled against the footage received for both Schedule 80 and Schedule 160 pipe.

These five (5) items could not be totally completed because all of the pipe could not be located. NCR 1128 was closed and was superseded by NCR 1640.

NCR 1640 has been dispositioned to locate all material in safety related and ASME Section III systems with heat number 745107 (1/2" Schedule 80 and Schedule 160 pipe) through the Piping Heat Number Material Traceability Verification (MiV) Program. (Additionally, this MTV Program will look at other material as discussed in Attachment B to this letter.) Wall thickness (schedule) will be verified by digital thickness measurement, and a Certificate of Conformance will be obtained from Guyon Alloys (the material supplier) to document that a quality system program was in place at the time of material shipments.

Response to Item 1a (cont'd)

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Over the past year, Phillips, Getschow Company has directed management attention towards improved review and dispositioning of NCRs. Included among the changes implemented, are additional training of personnel, hiring of more experienced personnel for NCR reviews, and procedure and Quality Assurance Manual reviews and revisions to NCR related sections. Phillips, Getschow Company Procedure QAP-12, "Control of NCRs" was totally rewritten to better control NCR processing. QAP-12, Revision 5 was issued in April, 1984. This revision included a new NCR form. Additionally, Phillips, Getschow Company Corporate Quality Assurance has completed a review of previously closed NCRs for thoroughness.

DATE OF FULL COMPLIANCE

1. Phillips-Getschow Company management actions, procedure and Quality Assurance Manual changes are complete.
2. Action to close NCR 1640 which will resolve this Finding is expected to be completed by January 31, 1985.

Response to Item 1b

RESPONSE

Commonwealth Edison Company acknowledges that Procedure B16.1.F (Nonconformance/Corrective Action) did not require trending of Correction Notices (CNs).

Correction Notices were first used in December, 1980. Between December, 1980 and November, 1982, seventy-two (72) Correction Notices had been written, all against new work. In October, 1982, the Pullman Sheet Metal 100% Weld Quality Retroinspection Program was initiated and in November, 1982 the Pullman Sheet Metal 100% Configuration Retroinspection Program was initiated. These retroinspections of previously erected work resulted in 912 welding related Correction Notices encompassing an approximate population of 55,000 welds. Overall, 90% of the initial production inspected welding were acceptable. Approximately 632 Correction Notices were written on non-welding related retroinspections (i.e. configuration, painting, etc.). The remaining 836 Correction Notices were written for construction activities completed after November 1982 such as first time inspector work. In many cases, Correction Notices were written to document and disposition minor items (i.e. paint missing, rusting of material, overspray of fireproofing).

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Pullman Sheet Metal performed a trend analysis of the 1616 backfit retroinspection program Correction Notices. This review did not identify any significant trends, but it did substantiate the basis of our change from a 10% welding quality control inspection to a 100% inspection of welding and configuration quality control inspection. Additionally, the remaining Correction Notices (of the total 2452 population) through August 2, 1983 were also trended. Again, no significant trends were identified. However, the trend analysis did lead to some procedure revisions and increased training of personnel. (It should be noted that generally, nonconforming items resulting from known reinspection/retroinspection programs are not included in the ongoing construction NCR data base trend analysis. Including these nonconforming items may distort any true current trends.)

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Pullman Sheet Metal Quality Assurance has performed a trend analysis of Correction Notices by computer since in August, 1983. Pullman Sheet Metal will generate a procedure by July 31, 1984 to more formally control trend analysis of NCRs and Correction Notices.

Response to Item 1b (cont'd)

DATE OF FULL COMPLIANCE

Trend analysis has been performed since August, 1983 and we are now in full compliance. Procedure issuance is expected to be complete prior to July 31, 1984.

Response to Item 1c

RESPONSE

Commonwealth Edison Company believes the corrective action for Pullman Sheet Metal NCR BR-08 was adequate. We do acknowledge that the explanation for the "accept as is" based on final visual inspection needs to be expanded to explain all the bases behind this disposition. The bases for accepting 53 unstamped welds out of more than 55,000 welds performed by qualified welders is given below.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Sargent and Lundy performed an engineering evaluation to address the nonconforming condition described in Pullman Sheet Metal NCR BR-08. Commonwealth Edison NCR 558 documents this evaluation. The results of this evaluation stated that if a weld was acceptable (except for not being marked with the welder's ID) as determined by a visual inspection of the completed weld, then the weld could be considered acceptable. This conclusion was based on the fact that all Pullman Sheet Metal welders at the Braidwood Site were qualified by testing and trained in applicable welding procedures. Furthermore, all filler metal used by Pullman Sheet Metal was certified and only issued to qualified welders. Consequently, Commonwealth Edison believes that an AWS Code basis does exist to conclude that the unstamped welds were made by the qualified welders, and that these welds can be accepted by visual inspection.

However, Commonwealth Edison Company does not wish the issue of replacing 53 welds to remain a point of contention between us and the Region. Consequently, we have directed Pullman Sheet Metal to either establish welder identification by in place physical markings or by other production or quality type records, or to replace the welds, if no welder identification can be established.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

As stated above, Commonwealth Edison believes the original corrective action was satisfactory; however, documenting the basis for acceptance was not sufficient. Project Construction Department personnel will be instructed to more fully ensure that corrective action bases are documented when reviewing Contractor nonconformance reports.

Response to Item 1c (cont'd)

DATE OF FULL COMPLIANCE

The dispositioning of the unstamped Pullman Sheet Metal (NCR BR-08) welds is expected to be completed prior to September 1, 1984. Project Construction Department personnel are scheduled to receive quality assurance training in July, 1984 at which time documentation of corrective action bases will be re-emphasized.

COMMONWEALTH EDISON COMPANY

RESPONSE TO INSPECTION REPORT

50-456/83-09 and 50-457/83-09

ITEM OF NONCOMPLIANCE:

2. 10 CFR 50, Appendix, B, Criterion V, as implemented by the Commonwealth Edison Company Quality Assurance Manual, QR No. 5.0, requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings, and shall be accomplished in accordance with these instructions, procedures, or drawings.

- a. Phillips, Getschow Company Construction Procedure 1.1, Revision 4, "Control of Engineering Change Notices and Field Change Requests," Section 5.3, requires that Document Control stamp applicable design documents with the field change request number.

Contrary to the above, Field Drawing M-2539C-4, Revision D, was not stamped with Field Change Request No. L-9194 and Field Drawing M-2542C-121, Revision A, was not stamped with Field Change Request No. 9988.

- b. Commonwealth Edison Quality Assurance Manual, Revision 77, Q.P. No. 7-1, "Control of Procured Material and Equipment - Receiving and Inspection," Section 5.2.1.5.7, "Dimensional," requires visual checks be performed on a random basis to assure that interface dimensions conform to drawings and/or specifications.

Contrary to the above, random visual checks of interface dimensions of piping components were not being done.

- c. Phillips, Getschow Company Quality Procedure-7, Revision 7, "Control of Inspection Equipment," requires in Section 7-9 that the Site Manager or Shop Superintendent maintain a log on each piece of calibrated inspection equipment listing all items inspected and person doing the inspection with each piece of inspection equipment.

Contrary to the above, there was no documented record or log specifying that a calibrated instrument was used to measure numerous pipe bends for ovality requiring inspection measurements to the thousandths of an inch. Examples include the bends on Drawings M-2546C-72, M-2546C-44, MC-2546C-42, and M-2546C-31.

ITEM OF NONCOMPLIANCE: (cont'd)

- d. Phillips, Getschow Company Construction Procedure-4, Revision 0 "Control of Rework of Component Supports," requires in Section IV that upon issuance of revisions to component supports, the Field Superintendent shall initiate a Field Change Order to the Field Engineer when an ASME Section III, Subsection NF weld is involved.

Contrary to the above, Field Change Orders were not written for revisions involving ASME Section III, Subsection NF welds for component support Drawings M-1RH02017R, Revision E, and M-1SII6021X, Revision B.

- e. The L. K. Comstock Company/L. K. Comstock Engineering Company (LKC/LKCEI) Quality Assurance Program manual requires in Section 4.2 that voided documents (drawings) be returned to the document control within 3 days.

Contrary to the above, drawings located in site document Station No. 5 were voided in that they were up to four revisions old and were neither returned to the Document Control as voided drawings nor marked as being voided drawings for information only.

Response to Item 2a

RESPONSE

Commonwealth Edison Company acknowledges that the two referenced Phillips Getschow Company drawings were not stamped with the appropriate Field Change Request numbers.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Phillips Getschow Company Field Drawing M-2539C-4, Revision D was since stamped with Field Change Request L-9194. Phillips Getschow Company Field Drawing M-2542C-121, Revision A was since stamped with Field Change Request L-9988.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Extensive attention has been placed on Document Control by Phillips, Getschow Company since August, 1983. Training has been intensified and increased, stressing that great attention to detail must be placed on all Document Control activities. The Document Control Station method of document issuance was started in November 1983 to minimize errors in keeping documents up-to-date. Subsequently, several Phillips, Getschow Company Quality Assurance and Commonwealth Edison Company Quality Assurance audits and surveillances have reviewed the current design change stamping efforts and have found that corrective actions have been acceptably taken.

(Reference: Phillips, Getschow Company Quality Assurance Audit #83-BR15, dated 7/26/83 with follow-ups on 9/20/83, 10/5/83, 11/18/83, 12/13/83 and 4/16/84; and Commonwealth Edison Site Quality Assurance Audit 20-83-15 including follow-up action presented in Surveillance 2981 and Site Quality Assurance Surveillance 3450.)

DATE OF FULL COMPLIANCE

Full compliance has been achieved.

Response to Item 2b

Commonwealth Edison Company acknowledges that random dimensional checks of piping interface dimensions were not being performed by Phillips Getschow Company.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Supplement S1, Revision 0 to Phillips Getschow Company Procedure QAP-33, Revision 1, titled "Receiving of Items, Material and Equipment" was written and approved for use on July 28, 1983 to provide a Quality Control inspection plan for dimensional verification of piping wall thickness on a 10% random basis. Subsequently, QAP-33 and this inspection requirement was incorporated into Phillips Getschow Company Procedure QCP-B4, Revision 4, dated September 17, 1983 titled "Material Control (Receiving, Storage and Handling of Materials, Items and Equipment)". This procedure was approved for use on January 23, 1984 and has been implemented since that time.

For the small bore and large bore pipe received prior to July 28, 1983 the action taken is summarized below:

- 1) One-hundred and twenty small bore pipe heats had been received of which forty-five heats had been installed in non-safety related piping systems. The remaining seventy-five heats were dimensionally inspected in the field for wall thickness, by Phillips Getschow Company, Quality Control using digital thickness gauges. All were found to meet minimum wall thickness acceptance criteria. (Subsequent to these inspections, a problem concerning a minimum wall violation due to pitting was identified for a portion of one heat of pipe in storage. This was subsequently reported to the NRC under 10 CFR 50.55(e) notification No. 84-10. Additional details and actions related to this problem will be presented in the 30 day report due July 21, 1984.)
- 2) One-hundred and twenty-four large bore heats had been received. A 10% sample from each heat was taken and was dimensionally inspected in the field for wall thickness by Phillips Getschow Company Quality Control, again using digital thickness gauges. All samples inspected were found to have acceptable pipe wall thickness.
- 3) A review was performed of Commonwealth Edison Company Material Receiving Reports (MRRs) for pipes received prior to the NRC inspection. This review identified that prior to 1980, random dimensional inspections were performed by Phillips Getschow Company, Quality Control inspectors during receipt inspections. The results of these inspections are included in the applicable MRR packages.

Response to Item 2b (cont'd)

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Continued implementation of Procedure QCP-B4 will prevent this item from recurring. Phillips, Getschow Company Quality Assurance will continue to monitor the implementation of this procedure through audits and/or surveillances.

DATE OF FULL COMPLIANCE

Full compliance has been achieved.

Response to Item 2c

RESPONSE

Commonwealth Edison Company acknowledges that the inspection equipment identification number was not always documented by Phillips Getschow Company quality control inspectors for the calipers used to measure ovality of pipe bends.

CORRECTIVE ACTION TAKEN AND RESULT ACHIEVED

The recording of inspection equipment identification numbers on field travelers, in conjunction with other related logs, has always been required by the Phillips, Getschow Company Quality Assurance Manual. Although a log was being maintained, it appears that because a specific blank was not provided on the traveler for the caliper identification number, the caliper number was not recorded. A letter was issued to Quality Control personnel on July 5, 1983 by the Quality Control Supervisor instructing them to indicate the caliper number on the traveler. A review by Phillips, Getschow Company Quality Control determined that none of the calipers used to measure ovality have ever gone out of calibration, or required repair or adjustment.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Phillips Getschow Company Construction Procedure PGCP-11, Revision 8 dated 9-13-83 and implemented 9-15-83 required the Quality Control inspector to list the calibrated instrument number next to each bend on the bend inspection checklist. This requirement was further clarified in Revision 10 implemented 3-28-84 when a specific line item for the calibrated instrument number became part of the checklist.

Additionally, Phillips, Getschow Company Quality Assurance Procedure QAP-7, Supplement Revision 4, dated 1-3-84 and approved 2-3-84 requires that specific identification numbers of inspection instruments used to accomplish inspections are to be recorded on the applicable checklists or travelers.

DATE OF FULL COMPLIANCE

Full compliance has been achieved.

Response to Item 2d

RESPONSE

Phillips Getschow Company Procedure PGCP-4, Revision 0, was not intended to be the governing procedure for revision work to the two component support examples at the time of the NRC inspection. Phillips Getschow Company Procedure QCP B23, "Installation and Inspection of Component Supports", Revision 3, issued December 8, 1982 and a subsequent revision was intended to control the revision work of component supports at that time. QCP-B23 did not require the use of field change orders to control changes for pipe supports. Phillips Getschow Company failed to formally withdraw PGCP-4 from issuance at the time QCP-B23 was issued for use.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Phillips Getschow Company by a letter to Commonwealth Edison Company dated June 23, 1983 formally requested that PGCP-4 be withdrawn from use based upon acceptable modification and incorporation of PGCP-4 requirements into QCP-B23. Commonwealth Edison Company authorized this withdrawal by a memo dated June 25, 1983. At this time, QCP-B23 latest approved revision is the governing procedure for component support changes.

CORRECTIVE ACTION TO PREVENT RECURRENCE

Over the past year, the Phillips, Getschow Company has completed the review and revision of many procedures. During this review, any procedural conflicts were addressed.

DATE OF FULL COMPLIANCE

Full compliance has been achieved.

Response to Item 2e

RESPONSE

Commonwealth Edison Company acknowledges that a small number of drawings located in L. K. Comstock site document Station No. 5 were not returned to Document Control within 3 days as required by L. K. Comstock/L. K. Comstock Engineering Incorporated Quality Assurance Program Manual, Section 4.2.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

As noted in the NRC inspection report, a complete audit of L. K. Comstock Station No. 5 was performed. Additional voided drawings were identified and removed from the current stick files.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

L. K. Comstock personnel received training in document control procedure requirements related to returning drawings within 3 days.

Additionally, the surveillance activities of the Documentation Control Department were increased. Between July, 1983 and January, 1984, sixteen (16) surveillances involving fifteen (15) documentation stations and a 100% check of the office engineering drawings were performed. As a result of the surveillances performed, 8,335 drawings were reviewed and 352 superceded drawings were found in the field. (However, 235 of these were in a single document station which is devoted to checking the status of past revision work. A 100% check of all drawings was subsequently performed at this document station.)

Additionally, between July, 1983 and January, 1984, L. K. Comstock Quality Control performed monthly random drawing control surveillances. The results of these surveillances indicate compliance with document control procedures.

In May, 1984, L.K. Comstock completed a field audit of all document stations performing safety-related work activities. Commonwealth Edison Site Quality Assurance Department completed a document control audit in April-May, 1984. Document control problems were found during both audits. As a result of both these audits, L.K. Comstock implemented a long range plan to streamline these document control systems. Overall, the changes improve the efficiency and control of document control operations. Specifically, the long

Response to Item 2e (cont'd)

range plan will effect the following:

- (1) Reduce the numbers of document stations from 44 to approximately 26.
- (2) Reduce the number of drawings at each station.
- (3) Change the style of document master cards and reduce the number of document master cards.
- (4) Eliminate void print files by the use of aperture cards.
- (5) Change the style and format of print transmittal forms and reduce the number of field drawing transmittals.
- (6) Computerize transmittals and returns.
- (7) Restructure the Document Control Department.

DATE OF FULL COMPLIANCE

Since June, 1983, substantial attention has been directed toward this concern. The long range plan is expected to be fully implemented prior to September 1, 1984.

COMMONWEALTH EDISON COMPANY

RESPONSE TO INSPECTION REPORT

50-456/83-09 and 50-457/83-09

ITEM OF NONCOMPLIANCE:

3. 10 CFR 50, Appendix B, Criterion II, requires, in part, that a quality assurance program be established which complies with the requirements of Appendix B and that the program be documented by written policies, procedures, or instructions and carried out in accordance with these instructions. The quality assurance program shall provide control over activities affecting quality and shall be accomplished under suitably controlled conditions including assurance that all prerequisites for the given activity have been satisfied including the need for special controls, processes, skills and the need for verification of quality by inspection. Criterion V requires, in part, that instructions be appropriate to the circumstances. Criterion IX requires, in part, that measures be established to assure that special processes, including welding are controlled and accomplished in accordance with applicable codes, standards, specifications, criteria and other special requirements.

Commonwealth Edison Company Quality Assurance Manual, QR 2.0, Paragraph 2.3, required that the Quality Assurance Program take into account the need for control of special processes including welding to attain and maintain the required quality. QR 9.0, Paragraph 9.4, required provision of process control records.

AWS D1.1-1977, Section 3, "Workmanship," as implemented by Sargent and Lundy (S&L) Specification F/L-2782, "HVAC Work," Amendment 7, requires, in part, that all applicable paragraphs of Section 3 be observed in the production and inspection of welded assemblies and structures produced by any of the processes acceptable under AWS D1.1-1977. Paragraph 3.4.3 of AWS D1.1-1977 requires, in part, that the contractor shall prepare a welding sequence for a member of structure which in conjunction with the joint welding procedures and overall fabrication methods will produce members or structures meeting the quality requirements specified.

AWS D1.1-1977, Section 6, "Inspection," requires that fabrication/erection inspections and tests be performed as necessary prior to assembly, during assembly, during welding, and after welding to ensure that materials and workmanship meet the requirements of the contract documents, including inspections to assure that electrodes are used only in the position and with the type of welding current and polarity for which they are classified and inspections to assure that the work meets the requirements of Section 3, "Workmanship," which includes fit-up and preparation of base metal prior to welding.

ITEM OF NONCOMPLIANCE: (cont'd)

Contrary to the above:

- a. Instructions were not appropriate to the circumstances in that welding procedures specifying the essential variables were not prescribed on drawings or welding sequences (travelers) for each specific HVAC installation, and Quality Control inspections during the welding process were not of adequate scope and frequency to assure the use of correct welding variables.
- b. Quality Control was not required to examine the HVAC components for fit-up prior to welding on those components where fit-up tolerances cannot be determined after welding, such as all-around fillet welds and full penetration welds. Consequently there was a lack of records documenting the conformance with the requirements of AWS D1.1-1977, Section 3, and the Commonwealth Edison Company Quality Assurance Manual. Additionally, instructions to the quality control inspectors regarding fillet weld gaps after welding were not appropriate to the circumstances in that the HVAC contractor Visual Weld Inspection Procedure, B10.2.F, stated that a 3/16" gap was acceptable whereas AWS D1.1-1977, Section 3.3, states that a 3/16" gap is allowed only if the leg of the fillet weld is increased by the amount of the separation or the contractor demonstrates that the required effective throat has been obtained.
- c. Quality Control was not required to examine the base metal prior to welding to assure that surfaces and edges were free of discontinuities. Consequently, there was lack of records documenting conformance with the requirements of AWS D1.1-1977, Section 3, and the Commonwealth Edison Company Quality Assurance Manual.

Response to Item 3a

RESPONSE

It is the Commonwealth Edison Company position that the up front programmatic controls provided by Pullman Sheet Metal were and still are adequate to control the welding activities performed by Pullman Sheet Metal. Overall, the quality assurance controls applied to welding activities and performed by Pullman Sheet Metal provided controls necessary to provide adequate confidence that HVAC structures, systems and components will perform satisfactorily in service. These controls were consistent with HVAC system requirements.

AWS D1.1-1977 has been referenced in Specification L-2782 and the Byron/Braidwood FSAR as the applicable code to which HVAC hangers and duct welding are to be performed at Braidwood Station. Contained within AWS D1.1 are many references requiring that "the weld inspector shall make certain" that certain pre-requisites have been met before the start of welding. Such pre-requisites include, but are not limited to, such items as welder qualifications, acceptable filler materials, and the use of correct welding processes and procedures. Such assurance can be provided in different ways. The individual inspector can document that all such pre-requisites have been met before the welding begins. Equally acceptable is the implementation of up-front programmatic controls which do not rely solely on a Quality Control inspector's pre-welding checks, and then a coupling of these controls with post-weld Quality Control visual inspection.

The following items provided confidence that such programmatic controls were in place at Pullman Sheet Metal and were functioning to provide assurance that the required welding quality was being provided:

- (1) S & L has reviewed and approved all duct brochure details, all field and shop procedures (including welding procedures), and all design documents. This review was performed to judge the technical adequacy of and adherence to FSAR commitments. These Pullman Sheet Metal procedures incorporated corrective actions for other HVAC concerns identified at LaSalle County and Byron Stations.

Response to Item 3a (cont'd)

- (2) Pullman has purchased and shipped only acceptable materials, including filler material, to Braidwood Station. This was verified by Commonwealth Edison in the field and in the Chicago Shop. Commonwealth Edison Company audits 20-82-20 (3-5-82) and 20-82-30 (8-23-82) specifically reviewed Pullman Sheet Metal's traceability of purchased material. These audits were the direct result of attention to previous problems identified in the HVAC areas at LaSalle County and Byron Stations. The audit results provide assurance that Pullman had supplied only acceptable materials, and had adequate documentation and control for all such material installed at Braidwood Station.
- (3) Documentation of training exists for all Pullman Sheet Metal welders in the approved procedures to which they were qualified. Such training covered the following welding aspects and requirements: material specifications, welding processes, position of welding, filler metal classification, single or multiple pass requirements, welding current, polarity, welding progression, pre-heat and interpass temperature, electrode size, amperes range, voltage range, and type of joint detail. This training documentation has been verified by Commonwealth Edison Site Quality Assurance.
- (4) Commonwealth Edison Site Quality Assurance had witnessed site welder qualification tests and ensured that welders were qualified. Since February, 1981, Commonwealth Edison Site Quality Assurance has witnessed over 400 guided bend welder qualification tests to AWS. The evaluations of such test results were performed by PTL (the independent on site testing laboratory working for Site Quality Assurance).
- (5) The Pullman Sheet Metal welders had only a limited number of acceptable welding procedures available. This, coupled with the relatively small numbers of welders working with familiar configurations and details, provide confidence that the proper WPS and filler material were used.
- (6) Between February, 1983 and May, 1983, Pullman Sheet Metal had performed 55 documented in-process welding inspections. No instances of the incorrect use of filler material or improper procedure implementation were observed. Between June, 1983 and December, 1983, an additional 583 in-process surveillances have been performed with no instances noted of the incorrect placement of filler material. Two (2) instances were found where the welding procedure was incorrect. The procedure was revised, reviewed and accepted.
- (7) Pittsburgh Testing Laboratory, working for Site Quality Assurance performed the following surveillance activities to assure that Pullman Sheet Metal was performing adequately:

Response to Item 3a (cont'd)

- (a) A 10% overview inspection of all Pullman Sheet Metal safety related final weld inspections. This activity started in 1980 and is ongoing.
 - (b) Random overview surveillances directed by Site Quality Assurance for specification compliance. Such surveillances covered configuration, housekeeping and storage, welding details, etc. A qualified inspector was utilized by Site Quality Assurance to perform this activity.
 - (c) Unit Concept Inspections (a planned series of surveillance modules) which provide independent design compliance verification were performed on Pullman Sheet Metal. This sample covered both Safety Related and Non-Safety Related, complete and incomplete construction, and included items already identified by Pullman Sheet Metal Quality Control.
- (8) Site Quality Assurance audits of Pullman's activities addressed not only Pullman Sheet Metal Quality Assurance Manual commitments, 10CFR50 Appendix B, and selected Pullman Sheet Metal's procedures, but also Regulatory Guides, Specification L-2782 requirements, and AWS requirements. The knowledge of problems identified at LaSalle County and Byron Stations in the HVAC areas was also used in determining areas to be checked to assure that those items did not recur.
- (9) Commonwealth Edison's auditing activities to assure the adequacy of Pullman's Quality Assurance program and procedure implementation resulted in Pullman performing a 100% visual verification/re-verification of all previous (1) welding, (2) duct and hanger configuration, and (3) equipment installation (January, 1983). When Pullman had completed significant portions of the above re-verification inspections but were falling behind in required rates of inspection, Commonwealth Edison Site Quality Assurance issued a Stop Work on all new work (except the Unit 1 VC Fan Room and the Unit 1 D/G Rooms) in June of 1983, to allow Pullman to complete the re-verification program.

Commonwealth Edison Company continues to have confidence in the adequacy of previous work. We understand that the subject of previous work (involving the Region's interpretation of AWS D1.1 Code) has been referred by NRC Region III to NRR for resolution. We have directed Pullman Sheet Metal to institute the welding control actions described below for future work.

Response to Item 3a (cont'd)

CORRECTIVE ACTION AND RESULTS ACHIEVED

Pullman Sheet Metal revised Procedure B9.4.F to incorporate a process sheet. The process sheet is utilized to pre-assign the welding procedure. One hundred percent (100%) in-process quality control inspection of welding activities began in August, 1983. This 100% inspection level continued until February, 1984. At that time, it was reduced due to the reverification of high confidence levels in Pullman Sheet Metal welders' ability to properly follow procedures.

The current in-process surveillance requirements as of May 9, 1984 are the following:

- 1) 10% of the welder work force or 10 welders, whichever is greater, will have in-process surveillances each week.
- 2) Each welding process will have a surveillance each month.
- 3) Each active welder will have at least one in-process surveillance every three months. (One within each calendar quarter.)
- 4) For each new welder or returning welder, ten (10) consecutive in-process surveillances must be completed before beginning the above requirements. These in-process surveillances must be acceptable.

While Commonwealth Edison Company does not believe that this procedural revision is a regulatory requirement, we acknowledge that the revised Procedure B9.4.F results in quality documentation and improvements in the control over the HVAC welding activities.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Commonwealth Edison Company will continue to monitor Pullman Sheet Metal welding activities. Should deficiencies be discovered, appropriate corrective action will be taken.

DATE OF FULL COMPLIANCE

Commonwealth Edison Company believes that full compliance has always been achieved. The procedure revision was in effect on September 28, 1983.

Response to Item 3b

RESPONSE

Refer to the discussion under Item 3a.

Additionally, over 90% of all the HVAC welds can be inspected for fit-up after the weld is completed. Although B10.2.F did not specifically require a check for the increased fillet size (when a 1/16" to 3/16" gap exists), all of the Pullman Sheet Metal Quality Control inspectors had been instructed in the AWS Code requirements and were aware of this requirement.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Approximately six (6) duct hangers include welds which cannot be fit-up inspected after weld completion. None of these hangers were completed prior to the below stated procedure change to check full penetration fit-up prior to welding. Equipment bases and gallery support standard details have some welds which cannot be checked for fit-up after welding completion. Fan bases for 1VX07C and 2VX07C have four (4) all around welds per base, and gallery supports for 1VX01F, 1VX03F, 1VX04F, 1VED1F, 2VX01F, 2VX03F, 2VX04F, and 2VE01F have all around welds of 4 x 4 x 3/8" angle to plates or structural steel. Commonwealth Edison Company believes the programmatic controls stated above were adequate to ensure correct fit-up of these welds. An NCR will be written to request the engineering disposition of the lack of fit-up inspection on these welds.

Angle splice alternate details are the only other items which cannot be checked for fit-up after weld completion. These full penetration welds are either square butt or bevel type welds. Any fit-up problems could be corrected by addition of filler metal to attain the proper fit-up gaps. During the 100% weld reinspection program described below, these welds were inspected for evidence of improper fit-up. All welds were deemed acceptable.

Beyond that described above, Pullman Sheet Metal has reinspected 100% of all other accessible welds previously made. During this inspection program, improper fit-up was specifically inspected for, and items if found, were identified on Correction Notices. All reinspection was performed utilizing Sargent and Lundy supplied AWS acceptance criteria.

Response to Item 3b (cont'd)

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

- A. Pullman Sheet Metal Procedure B10.2.F (visual weld inspection) was revised to specifically address checking for increased fillet size when a fit-up gap exists (1/16" to 3/16" gap for most Pullman Sheet Metal work).
- B. Pullman Sheet Metal Procedure B9.4.F (installation procedure) was revised to establish fit-up checks prior to welding in cases where fit-up cannot be checked after completion of the weld.

DATE OF FULL COMPLIANCE

Pullman completed the 100% weld reinspection by April 31, 1983.

Pullman Procedure B10.2.F was implemented in September, 1983 to address checking for required fillet size when gaps are present.

Pullman Procedure B9.4.F was implemented in September, 1983 to establish pre-welding fit-up checks, as required.

The disposition of the NCR concerning lack of fit-up inspection is expected to be accomplished by October 1, 1984.

Response to Item 3c

RESPONSE

AWS D1.1-1977, Section 3.2.1 states in part, "Surfaces and edges to be welded shall be smooth, uniform, and free from fins, tears, cracks, and other discontinuities which would affect the quality or strength of the weld. Surfaces to be". The discussion under Item 3a gives many of the controls applied to Pullman Sheet Metal HVAC welding activities. In part, these controls will preclude the use of materials with edge discontinuities which could impact welding activities.

Additionally, mild steel edge discontinuities are generally present in thick steel members. These discontinuities result from steelmaking processes. Pullman Sheet Metal welds thin members, generally from 1/16" to 1/2" in size. There is less likelihood for edge discontinuities in these sizes.

Quality Control has, by the time an item is fit-up in the field, inspected Pullman supplied sheet and structural items at least once. Items are inspected at the time of receipt in the Pullman Shop and at the time of shipping for shop fabricated items. Field fabricated items, are inspected at the time of receipt at the Braidwood site. These inspections include a check for discontinuities. Jobsite fabricated items are sawcut and not oxygen cut. This minimizes the likelihood of irregular edges.

Commonwealth Edison Company believes the necessary controls have been and are in place to preclude use of substandard materials. These controls are present throughout the fabrication/erection process.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Commonwealth Edison Company believes that adequate controls were in place for previous work to preclude use of substandard materials. No further corrective action is required.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Quality Control inspector and welder training to AWS D1.1-1977 includes checking for base metal condition during fit-up inspections. This action along with other programmatic controls will preclude the use of substandard materials.

Response to Item 3c (cont'd)

DATE OF FULL COMPLIANCE

Full compliance has been achieved.

COMMONWEALTH EDISON COMPANY
RESPONSE TO INSPECTION REPORT
50-456/83-09 and 50-457/83-09

ITEM OF NONCOMPLIANCE:

4. 10 CFR 50, Appendix B, Criterion XVIII, as implemented by the Commonwealth Edison Company Quality Assurance Manual, QR No. 18.0, requires, in part, that a comprehensive system of planned and periodic audits be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program.

Contrary to the above:

- a. Phillips, Getschow Company has not established and executed a plan for auditing the implementing procedures of the quality assurance program on a periodic basis to determine the effectiveness of the program in accordance with the PG Quality Assurance Manual, Section 16.
- b. L. K. Comstock Company/L. K. Comstock Engineering Company auditing activities neither conformed with the comprehensive annual schedule of planned and periodic audits established as required by Quality Assurance Program Manual Section 4.14.1, nor did they verify compliance with all aspects of the Quality Assurance Program.
- c. Pullman Construction Industries, Inc., did not meet their yearly schedule for audit activities required by their Quality Assurance Manual, Section 18, in that the following implementing procedures were not audited:
- B 3.1.F, Design Control
 - B 5.1.F, HVAC Repair Adjustment
 - B 9.3.F, Expansion Anchor Installation
 - B 10.2.F, Visual Weld Inspection
- d. The licensee's audits of the installation of small bore instrumentation and process piping were inadequate in that contractor hanger design calculation problems were not identified for more than two years.

Response to Item: 4a

RESPONSE

Commonwealth Edison Company acknowledges that Phillips, Getschow Company did not audit each of its implementing procedures. Rather, the Phillips, Getschow Company Quality Assurance Program required all Quality Assurance Manual sections to be audited over the year period. This requirement met and fulfilled ASME Code requirements. The audit schedule for the 1983/1984 period, dated March 17, 1983 provided for all Quality Assurance Manual sections to be audited. A special schedule was established to audit process control procedures.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Phillips, Getschow Company revised their audit schedule on August 21, 1983 to include auditing of all procedures annually. Procedures not used in the annual period will be designated not applicable at the time of the audit.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Commonwealth Edison Company verifies implementation of the Phillips, Getschow Company Audit Plans through our audits and surveillances.

DATE OF FULL COMPLIANCE

The revised Audit Plan has been implemented. Commonwealth Edison Company verification of the schedule has been completed. (Reference Commonwealth Edison Company comprehensive onsite/offsite audit of October 1983).

Response to Item 4b

RESPONSE

Commonwealth Edison Company acknowledges that L. K. Comstock did not fully implement their 1983 audit schedule. However, adequate Commonwealth Edison Quality Assurance audits were performed to cover all applicable L. K. Comstock activities. During the inspection visit, the NRC acknowledged that Commonwealth Edison Quality Assurance provided adequate quality audit coverage and that Site Quality Assurance was previously aware of the L. K. Comstock shortfall.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

A review of L. K. Comstock's audit coverage (corporate and site) for 1982 and 1983, indicates that a total of six (6) Quality Assurance manual subsections and six (6) field work procedures had not been audited as follows.

A review of the six (6) Quality Assurance manual subsections not audited by L. K. Comstock showed:

One (1) section covered the L. K. Comstock Policy Statement

One (1) section covered the overall program description

One (1) section defined the program applicability

One (1) section covered L. K. Comstock's reporting of 10 CFR Part 21 items

One (1) section covered the corporate review of the site Quality Assurance program

One (1) section covered the corporate Organization Chart

L. K. Comstock corporate Quality Assurance has since completed audits of the above sections.

For the six (6) work procedures:

Two (2) were new procedures as of late 1983 and therefore were not yet scheduled for audit

One (1) covered silver plating of bus bars (an infrequently performed operation which is subjected to a 100% Quality Control witness)

Response to 4b (cont'd)

One (1) covered site organization position delineation. This section is normally audited by corporate auditors during their audits

One (1) covered Production's use of a Revision Work Request (RWR). (However, the related Quality Control inspection of RWRs had been audited. Subsequently, the work instruction was audited during the week of January 9, 1984 by L. K. Comstock.)

One (1) covered Equipment/Junction Box Installation. (However, the related Quality Control inspection of equipment erection had been audited. Subsequently, the work instruction was audited during the week of January 9, 1984 by L. K. Comstock.)

Therefore, the active applicable work procedures and quality control inspection procedures have been audited by L. K. Comstock as of the week of January 9, 1984.

A concern raised by the inspector in the area of supporting evidence for L. K. Comstock audits prompted Site Quality Assurance to review copies of the objective evidence for the L. K. Comstock corporate offsite audits. Commonwealth Edison Company Quality Assurance with L. K. Comstock site Quality Assurance performed this review. (This information was not available onsite during the NRC inspection.) This review disclosed that there was sufficient objective evidence recorded to support the conclusions stated in the audit reports. Copies of this objective evidence are available at the site for review.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

As a result of the Commonwealth Edison Company Quality Assurance concerns, L. K. Comstock has placed two (2) fulltime, qualified auditors on site (one activated in October, 1983 and one in November, 1983). Counseling has been given to these auditors by Commonwealth Edison Company Quality Assurance to include more descriptive evaluations of audit results in their audit reports. Additionally, Procedures (4.14.3 and 4.14.1) have been revised to more clearly define the L. K. Comstock onsite auditing activities and qualification processes for site auditors.

L. K. Comstock site Quality Assurance has submitted an audit plan for 1984 which indicates that the Quality Assurance Program and their active safety related activities will be adequately covered.

Response to Item 4b (cont'd)

DATE OF FULL COMPLIANCE

All applicable site procedures were audited by the week of January 9, 1984. Procedures 4.14.3 and 4.14.1 were revised to reflect onsite auditing activities and qualification processes. Interim approval was granted on 2/29/84 and 11/2/83 respectively.

Response to Item 4c

RESPONSE

Commonwealth Edison Company acknowledges that Pullman's 1982 and 1983 audit program did not cover all implementing procedures.

Commonwealth Edison Site Quality Assurance audit number 20-83-12, performed in March, 1983, identified the fact that Pullman failed to audit all of the eighteen (18) Criteria. The Pullman Quality Assurance program required that all Criteria of IOCFR50 Appendix B be audited, as a minimum, annually. This deficiency was closed by Commonwealth Edison Site Quality Assurance Surveillance number 2903 based on Pullman's documented reasons for this deficiency and completing their 1982 audit schedule in early 1983.

It was Pullman's intention to audit their program against the eighteen (18) IOCFR50 Appendix B Criteria. Thus, Pullman's audits dated April 4, 1983 and April 28-29, 1982 did not assess compliance to all current procedures.

Compliance with the eighteen Criteria was assessed by using their Quality Assurance Manual and implementing procedures together. This approach assured procedure adequacy and procedure compliance simultaneously on a sampling basis.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Pullman performed two (2) audits in August and December of 1983. These audits covered all sections of their Quality Assurance Program and assessed compliance with Pullman's implementing site procedures.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Pullman has implemented an audit schedule matrix listing Appendix B criterion, Quality Assurance manual sections, and procedures to be covered for future audits. This will assure that future audits cover not only Appendix B Criteria, but also the entire population of implementing procedures.

DATE OF FULL COMPLIANCE

Full compliance has been achieved thru implementation of the audit schedule matrix.

Response to Item 4d

RESPONSE

Commonwealth Edison Company does not agree with the NRC Finding that problems with the Phillips, Getschow Company support selection program were not identified and that correction of identified non-conformances were not performed in a timely manner. The history presented below represents the Site Quality Assurance Department activity in this area. The history demonstrates that an audit had been conducted and that work was stopped on safety related instrumentation piping support selection in October, 1981. The history also indicates the times when various instrumentation line and small bore process pipe activities had been started. (For example, safety related small bore process piping support selection started in January, 1983). The history demonstrates that Site Quality Assurance was actively involved in this area.

INSTRUMENTATION

Upon approval of Phillips, Getschow Company Procedure PGCP-22, Rev. 1, safety related instrumentation line support selection started in July, 1981. After enough work had been completed so that a representative sample could be taken, this area was checked by Commonwealth Edison Company Quality Assurance in an audit of October, 1981. This audit identified deficiencies that are summarized as follows:

1. Incorrect calculations
2. Improper calculation reviews
3. Three dimensional restraints not used per ECN 2194
4. Adjacent line weights not used in line weight calculations
5. Revision levels of applicable isometric drawings not listed on calculation sheets
6. System component weights obtained from an uncontrolled source (uncalibrated scale)
7. Quality Control not monitoring instrument group activities
8. Documented training not given to Procedures PGCP-21 and 22
9. Interface document not clearly written
10. Organization chart in error

Response to Item 4d (cont'd)

The details of these items, including Quality Assurance follow-up work, corrective actions, and item close-outs, are described in the audit close-out surveillance reports. This audit resulted in a stop work action being placed on Phillips, Getschow Company until February, 1982. All items were resolved and closed by March, 1982.

As an additional follow-up to the October, 1981 audit, an audit was performed in July, 1982. The concerns of the October, 1981 audit were re-checked as evidenced by approved checklist questions 1, 2, 3, 4, 5, 10, 11, 12, 14, 15, 16, and 17. All question areas were found acceptably implemented. At that time, based on the audit history, Commonwealth Edison Company Quality Assurance believed that instrument support selection was being performed in an acceptable manner, and that Phillips, Getschow Company was implementing their procedures in this area.

SMALL BORE

Small bore process pipe support selection started in January, 1983 upon approval of Revision 2 of PGCP-22 which then added support selection for small bore process pipe. Again, after work had been completed so that a representative sample could be taken, small bore pipe support selection was checked and instrumentation line support selection was re-checked in July, 1983 during audit QA-20-83-33. It was identified that Phillips, Getschow Company Procedure PGCP-22 did not give the step-by-step method for performing support selection calculations; that the procedure did not reference the current applicable ECN (4566); and that information on the calculation sheets was unclear or incomplete. This resulted in PGCP-22 being revised to more specifically define the methodology of performing support selection calculations. Revision 8 of this procedure was given interim approval by Commonwealth Edison Site Quality Assurance on November 10, 1983, and was accepted by Sargent and Lundy on December 2, 1983.

Though the above deficiencies were identified, for the calculations reviewed in Quality Assurance Audit 20-83-33, no cases were identified where calculations were being incorrectly performed or undersized pipe supports were being selected. The first process pipe support package was issued to the field for installation in August, 1983.

Response to Item 4d (cont'd)

Also, audit QA-20-83-33 identified that small bore pipe and instrumentation line support selection training files were incomplete. Corrective actions were defined and implemented to correct this item as well.

Subsequent to the NRC inspection, Site Quality Assurance continued to audit this area. Site Quality Assurance audit QA-20-83-49 dated 10/20/83 specifically audited support selection activities and design document control related to support selection work. Three (3) findings were identified which are summarized as follows:

- 1) Arithmetic errors were found in support selection calculations.
- 2) Drawings used to locate component supports were not verified "as constructed" drawings.
- 3) Drawings used as input for calculations were not the most current revision.

Each of these items has had corrective actions defined and completed, and verified by Site Quality Assurance as having been implemented. This audit was recently closed on 3/16/84.

In December, 1983, Quality Assurance audit 20-83-62 checked the implementation of Phillips, Getschow Procedure PGCP-22, Rev. 8, which had been revised to more clearly delineate and refine the technical support selection requirements provided by S & L in ECN 5776. Fifty-five (55) supports were reviewed in detail and no errors were identified indicating that the methodology used at that time was adequate to perform the support selection in an acceptable manner. As part of a recent audit of Phillips, Getschow Company, QA-20-84-518 dated 5/4/84, support selection was again checked and in this area, one (1) observation was identified for which corrective action has been defined.

As of June, 1984, the activities discussed above are being acceptably performed. Site Quality Assurance will continue to monitor this activity to assure proper compliance.

Commonwealth Edison Company overview of contractors continues to be improved as described in Attachment C.

COMMONWEALTH EDISON COMPANY
RESPONSE TO INSPECTION REPORT
50-456/83-09 and 50-457/83-09

ITEM OF NONCOMPLIANCE:

5. 10CFR 50, Appendix B, Criterion VI, requires that measures be established to control the issuance of documents and these measures assure that changes to those documents are reviewed for adequacy and approved for release by authorized personnel and are distributed to and used at the location where the prescribed activity is performed.

Commonwealth Edison Company Quality Assurance Manual, QR No. 6.0, Paragraph 6.1, requires that a document control system be used, including changes, and the documents and changes be reviewed and approved for release by authorized personnel. QP No. 6-2, Paragraph 4.3.1, requires that field changes to drawings be submitted with a Field Change Request.

Contrary to the above, adequate measures had not been established to control field changes to drawings being made during the installation of ASME Boiler and Pressure Vessel Code, Section III, Class 2 and 3, 2" and under piping. Craft personnel had been making field changes to the drawings by routing lines, assigning weld numbers, and adding material which resulted in a lack of necessary control of approving, updating, and releasing drawings.

Response to Item 5

RESPONSE

Commonwealth Edison Company acknowledges that control of field changes to drawings required upgrading. The Phillips, Getschow Company re-routing of ASME, Class 2 and 3, small bore piping was allowed by Specificatic F/L-2739. Phillips, Getschow Company Procedure, QCP-B21, Installation and/or Field Routing of Two Inch and Under Process Piping Systems - ASME Classes 1, 2, and 3 reflected the Specification requirements and procedural controls necessary to conduct re-routing. These controls involved drawing changes by Production, review of weld and bend additions or deletions by Quality Control and the ANI, and red line marking of actual field routed conditions. Commonwealth Edison Company agrees that a review of proposed field re-routes by the contractor Engineering Department does add more assurance that important safety considerations are not bypassed.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Phillips, Getschow Company Procedure, QCP-B21 was revised via Supplement, Revision 2, dated July 23, 1983 to require Phillips, Getschow Company Engineering Department review and approval of piping re-routes prior to installation. The method of Engineering Department review was further enhanced in Revision 6 to QCP-B21, dated October 10, 1983. The as-built routing of previous piping installations is currently being recorded. This work is being performed to Phillips, Getschow Company Procedure PGCP-40, Verification, Preparation and Transmittal of "As-Constructed" Drawings. The procedure establishes the criteria for quality control verification of dimensional piping configurations.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

QCP-B21, Revision 6, greatly increases the Engineering Department involvement in the preparation of initial small bore piping installation packages, the review of proposed re-routes, and the preparation of revised small bore piping installation packages. Additionally, the re-organization of the Phillips, Getschow Company Engineering Department, plus the addition of personnel, has led to greater contractor engineering involvement in the Phillips, Getschow Company day-to-day activities.

Response to Item 5 (cont'd)

DATE OF FULL COMPLIANCE

The organizational and procedural changes are complete. Full implementation of QCP-B21, Revision 6 was completed in early 1984. As-builts of previous installations are expected to be completed prior to December 31, 1984.

COMMONWEALTH EDISON COMPANY

RESPONSE TO INSPECTION REPORT

50-456/83-09 and 50-457/83-09

ITEM OF NONCOMPLIANCE:

6. 10 CFR 50, Appendix B, Criterion II, requires, in part, that a quality assurance program be established which complies with the requirements of Appendix B and that the program be documented by written policies, procedures, or instructions and carried out in accordance with these instructions. The quality assurance program shall provide control over activities affecting quality and shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained. Criterion III requires, in part, that measures be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions and that these measures included provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Criterion III also requires that measures be established for the identification and control of design interfaces and for coordination among participating design organizations; that the measures include the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces; and that the design control measures provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program."

Commonwealth Edison Company Quality Assurance Manual, QR No. 2.0, Paragraph 2.2, requires that the Quality Assurance Program be applied to safety-related systems in order to meet the requirements of ASME, Appendix B to 10 CFR 50, and certain provisions of ANSI N45.2 and N18.7. QP No. 3-1, Paragraph 2.0, required design requirements be applied and Paragraph 3-1 required the Architect/Engineer review and distribute revised documents.

Sargent and Lundy (S&L) Specification F/L-2739, "Piping System Installation (Section III and Non-Section III)...Braidwood Station Units 1 and 2," Paragraph 301.11, "Installation of 2" and Under Piping," controlled the basic field routing of each 2" and under piping system, including site design of safety-related small bore piping classes B, C, and H for operating temperatures up to 150°F maximum and field alteration of original system layouts and field selection of supports/restraints by calculation based on Architect/Engineer provided guidelines.

ITEM OF NONCOMPLIANCE: (cont'd)

Contrary to the above, the licensee's control of site designed small bore (2" and under) process and instrumentation piping systems was considered inadequate and ineffective based on the following deficiencies:

- a. The programs and procedures established by the licensee and the Architect/Engineer (Sargent and Lundy Engineers (S&L) prior to October 1983, did not provide sufficient assessments and verifications of Phillip, Getschow Company design capabilities prior to authorizing field routing of Class 2 and 3 small bore piping and field design of supports/restraints. The lack of assessments and verification resulted in inadequate understanding of the S&L specifications by Phillips, Getschow Company to ensure the field routing of small bore piping was performed within the design requirements. Furthermore, the field routing of Class 2 and 3 small bore pipes, without detailed drawings being issued by S&L or PG, resulted in the licensee's established Quality Assurance Program requirements being bypassed and prevented the timely identification of nonconforming conditions.
- b. The Phillips, Getschow Company small bore pipe routing procedures lacked specific quantitative field design, installation, and inspection criteria to provide clearance and/or separation from equipment and components as required by S&L specification, F/L-2739, Paragraph 301.11.
- c. Procedure PGCP-22 requirements had not been completely followed for small bore piping calculations performed by PG for lines 1CCE3AA-1/2", 1CCE3BA-1/2", 1D0D8BC-2", and 1D0D8BA-01.
- d. Field Engineer authorities, duties, and qualifications were not fully delineated in the PG Quality Assurance Manual, Rev. 0, dated September 26, 1983, in that some of the specific work functions being performed by field engineering, such as pipe hanger design and calculation, were not adequately described.
- e. The PG training program was considered to be inadequate and ineffective based on the numerous errors identified in the PG hanger calculations.
- f. The use of the Information Request System by PG, in lieu of the Field Change Request (FCR) system, compromised the final design change acceptance review and approval.

Response to Item 6a

RESPONSE

Commonwealth Edison Company does not believe that the above Item [456/83-09-09(A); 457/83-09-09(A)] is an example of a violation of 10 CFR 50, Appendix B, Criteria II or III. Rather, we believe the intent of Criterion II and III have been met by the program established for small bore piping design and installation.

The Item of Non-Compliance includes the concern that the Phillips, Getschow Company is performing design activities during the field routing of Class 2 and 3 small bore piping and during support selection activities. In the October 24, 1983 site meeting held with NRC representatives, Commonwealth Edison stated that the Specification wording allowed Phillips, Getschow Company to re-route small bore piping when required to clear conflicts or interferences within certain pre-approved guidelines given in the Specification, which when followed, do not compromise the design basis of the piping. The conceptual pipe routing drawing, initially designed by Sargent & Lundy, when used in conjunction with the Specification, constitutes an approved design at all times. Furthermore, submittal of "as-built" piping drawings to Sargent & Lundy was required. Finally, the as-built design will be reviewed prior to system acceptance. Commonwealth Edison Company demonstrated how the Specification wording was sufficient such that the re-routed piping met three (3) design checks (functionality, seismic interaction and piping stress). Additionally, Commonwealth Edison demonstrated how this small bore piping program was controlled from start to finish, and represented an efficient method to achieve a well designed piping system (i.e. minimize snubbers, etc).

Additionally, during the October 24, 1983 site meeting, Commonwealth Edison and Sargent and Lundy discussed the reasons why the support selection guidelines given to Phillips, Getschow Company to select supports are analogous to a construction drawing. Sargent and Lundy authorized the support selection guidelines. They represent a pre-calculated, pre-approved set of span length and support type selection rules which Phillips, Getschow Company must follow. Phillips, Getschow Company cannot deviate from the rules to create unique support location and types. For situations where unique support locations or types are required, Phillips-Getchow Company routinely requests Sargent & Lundy to perform this selection and a design check. The legal authority (i.e. Professional Engineer's stamp) remains with Sargent and Lundy under the guidelines; Phillips, Getschow Company does not Professional Engineer stamp the support drawings generated in the selection process. Phillips Getschow Company is not the design organization.

Response to Item 6a (cont'd)

It remains our position that the Phillips, Getschow Company support selection activities were not design activities.

During the December 20, 1983 Enforcement Conference, Commonwealth Edison Company presented a chart indicating the difference between LaSalle County Station and Braidwood Station small bore piping support design activities. This difference resulted because of the assessment made by Commonwealth Edison Company and Sargent and Lundy that small bore piping support "design" activities should remain with the Architect/Engineer, and should not be placed with the Piping Contractor.

Commonwealth Edison Company plans no additional corrective actions regarding our programs for assessing contractor capabilities. We will continue to monitor and verify compliance of contractor activities with Specification requirements.

Response to Item 6b

RESPONSE

Commonwealth Edison Company acknowledges that the Phillips Getschow Company small bore pipe routing procedures and the Sargent and Lundy Specification F/L-2739, required upgrading to clearly delineate quantitative clearance requirements for re-routed piping. PGCP-40, Verification Preparation and Transmittal of "As Constructed" Drawings, Revision 0, dated May 31, 1983 included a requirement to note on the "as-constructed" drawing when the piping installation was within 3 inches of another installation and indicate the point of that condition. This post-installation check went beyond the current Specification requirement, and did provide the Architect/Engineer the opportunity to evaluate clearances of piping from other installations.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Sargent and Lundy Specification F/L-2739 was revised to require a minimum 3 inch clearance requirement of piping components from all other installations. Phillips, Getschow Company revised their piping installation procedures to require a contractor engineering department review of proposed field re-routes for conformance with Specification requirements prior to installation.

The notation of piping installations within 3 inches of another installation per PGCP-40 will determine if previous installations meet necessary clearance requirements.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Implementation of revised piping installation procedures should assure that proper clearance requirements are reviewed prior to re-routing.

Commonwealth Edison Company and Sargent and Lundy plan to conduct an assessment to ascertain if other site contractor's specifications and drawings adequately define component clearance requirements. Additionally, a comprehensive plant walkdown is planned prior to Fuel Load to ascertain and resolve apparent component clearance problems.

Response to Item 6b (cont'd)

DATE OF FULL COMPLIANCE

Specification F/L-2739 and Phillips, Getschow Company procedural revisions were completed in February, 1984. The assessment of other site contractors and our overall approach to clearances is in progress, and is expected to be completed in August, 1984. The comprehensive plant walkdown and any required corrective work will be complete prior to Fuel Load.

Response to Item 6c

RESPONSE

Commonwealth Edison Company acknowledges this Finding.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

The supports for lines 1CCE3AA-1/2", 1CCE3BA-1/2", 1D0D8BC-2" and 1D0D8BA-01 have been sent to Sargent and Lundy for review. Sargent and Lundy has also conducted a review of all safety-related Phillips, Getschow Company support selections on process piping. Their review of 172 supports, indicated that 3 supports require installation tolerance adjustment, and 14 supports require re-calculation to the revised Phillips, Getschow Company support selection procedure. A field review indicated that the three supports were installed within the revised installation tolerance. The re-calculation of the 14 other supports has been completed.

Commonwealth Edison Company Site Quality Assurance performed a special audit of support selection activities (Audit No. QA-20-83-49). Although some calculational deficiencies were identified, no cases were found which required a physical change to the installed supports.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Sargent and Lundy has revised the piping support guidelines to better clarify their requirements such that support selectors do not need to interpret the guidelines. Procedure PGCP-22 Revision 8, dated 11/9/83 has been issued to enhance the procedure itself, as well as its implementation and training aspects. The procedural revision provided for better calculational consistency and reduction of the chance for error. Extensive re-training has been given to support selection personnel. Additionally, Sargent & Lundy has conducted a special technical audit of Phillips, Getschow Company support selection activities. Lastly, Site Quality Assurance will continue to monitor support selection activities by audit and surveillance.

DATE OF FULL COMPLIANCE

The guideline changes, procedural changes and re-training have been completed. The Sargent & Lundy technical audit and necessary corrective actions have been completed.

Response to Item 6d

RESPONSE

Commonwealth Edison Company acknowledges that the Field Engineer authorities, duties and qualifications could have been more fully delineated in the Phillips, Getschow Company Quality Assurance Manual, dated August 26, 1983.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Phillips, Getschow Company initiated a change to their Quality Assurance Manual changing Section 1.19, "Field Engineer" to read "Project Engineer". His duties are explained in general terms in the Quality Assurance Manual. Phillips, Getschow Company Engineering Policy EP-1, Revision 0, dated February 27, 1984, Engineering Personnel Qualifications and Review Criteria for Responsibility Assignment, more fully delineates the duties of the Engineering Department personnel.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

Phillips, Getschow Company initiated broad management changes within their site organization on August 1, 1983. The management changes included a new Site Manager, Project Engineer, Assistant Project Engineer, and four Engineering Group Supervisors among others. The new management reviewed and more completely defined not only the Project Engineer's, but all engineering personnel job functions and responsibilities. This review resulted in a more structured organization.

DATE OF FULL COMPLIANCE

The Phillips, Getschow Company management review and re-organization was completed on February 27, 1984.

Response to Item 6e

RESPONSE

Commonwealth Edison Company does not dispute the NRC assessment that the Phillips, Getschow Company training program was inadequate. Commonwealth Edison Company Site Quality Assurance Audit No. 83-33 (July, 1983) identified the need for training program improvements.

Phillips, Getschow Company Procedure PGCP-22, 2" and Under and 2 1/2" - 4" Process and Instrument Line Supports in Category I Buildings, Revision 7, dated April 16, 1983, required the Field Engineer supervisor to be responsible for training of qualified personnel to perform piping layout and support selection. Phillips, Getschow Company Procedure, PGCP-29, Qualifying and Training Procedure for Phillips, Getschow Company Field Hanger Selection Personnel was referenced in PGCP-22, Revision 7. The training Procedure, PGCP-29, establishes the qualification and training requirements for personnel performing support selections. The basic requirements for support selection personnel include the following:

- a. experience of one (1) year in support selection or a high school education.
- b. documented training in PGCP-22.
- c. familiarization with applicable project documents (i.e. piping line lists, piping design tables, support detail drawings, etc.).
- d. documented on-the-job training.
- e. proficiency requirements/reviews.

A review of training records indicates that the active and inactive support selectors in October, 1983 had the necessary training per PGCP-29. These records are available at the site for NRC review.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Sargent and Lundy completed an independent review of previous process piping support selections. This review amounted to an independent design check of Phillips, Getschow Company support selection work. The independent review results (discussed under Item 6c) are available at the site for review.

Phillips, Getschow Company has re-written PGCP-22 (Rev. 8) to enhance the procedure itself, as well as its implementation and training aspects. The procedure re-write reflects improvements by the new Phillips, Getschow Company management and input from Sargent and Lundy to clarify any support selection guidelines. The procedure now specifies a more consistent methodology by which a

Response to Item 6e (cont'd)

selector could better select and document calculations for individual supports. It highlights and reinforces the Sargent and Lundy requirements for the selector so he could more effectively select and calculate supports. Additionally, training requirements of PGCP-29 have been written into PGCP-22 (PGCP-29 has been deleted) and training has been expanded in scope, quantity and intensity, including the addition of a proficiency test. All selector personnel have been re-trained to PGCP-22, Revision 8. A total review of recently completed support selection has been conducted by Sargent and Lundy and Commonwealth Edison Company to ensure correct procedural implementation. All reviews and audits indicate acceptable implementation of PGCP-22, Revision 8.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

In December, 1983, Commonwealth Edison Company Quality Assurance conducted a technical audit (20-83-62) that checked the implementation of Phillips, Getschow Procedure PGCP-22, Rev. 8, which had been revised to more clearly delineate and refine the technical support selection requirements provided by Sargent and Lundy in ECN 5773. Fifty-five supports were reviewed in detail and no errors were identified which indicates that the methodology used at that time was adequate to perform the support selection in an acceptable manner. PGCP-22, Revision 8 training will continue on an ongoing basis.

DATE OF FULL COMPLIANCE

All procedural changes and re-training have been completed.

Response to Item 6f

RESPONSE

Commonwealth Edison Company acknowledges this Finding.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Phillips, Getschow Company initiated a review of all previous Information Requests (IRs) to ascertain whether other design information was obtained via the IR system. The review included a check to ensure that any applicable design information had been incorporated into permanent design drawings and specifications. The Phillips, Getschow Company Information Request form has been revised to include the requirement that design information must be transmitted via an Engineering Change Notice (ECN) or Field Change Request (FCR), and the IR itself cannot direct design change actions.

Phillips, Getschow Company personnel training programs now include instructions stating that "verbal instructions cannot alter design documents being utilized".

A review was made of design documents being utilized by Engineering Department personnel. Out-of-date documents have been purged. Procedure PGCP-22, Revision 8, Section 7.8 specifically addresses these concerns, and Phillips, Getschow Company Procedure, PGCP1.1, Control of Engineering Change Notices (ECN), Field Change Notices (FCN), Field Change Requests (FCR) and Field Problem Reports (FPR) was revised to more tightly control the usage of design documents. A Work Instruction, PGWI-3, Clarification and Augmentation of Phillips, Getschow Company Design Change Revision Review - (ECN, FCN, FCR, DRN, Specification Changes, Etc.) was written to describe and clarify the method by which Change Documents are reviewed and processed by the Field Engineering Supervisor (Project Engineer).

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

An increased emphasis has been placed on document control within the Phillips, Getschow Company organization, as also discussed in Attachment C. The management, organizational and procedural changes which have taken place should prevent future document control problems.

DATE OF FULL COMPLIANCE

The IR review and any required dispositions are expected to be complete prior to August 1, 1984.

ATTACHMENT B

COMMONWEALTH EDISON COMPANY

RESPONSE TO UNRESOLVED ITEMS

456/83-09-04 (A), 457/83-09-04 (A)

456/83-09-04 (B), 457/83-09-04 (B)

The Reference (a) inspection of the verification program for the installation of safety-related piping materials revealed that Phillips, Getschow Company did not have a documented inspection program for quality control inspectors to examine small bore piping components at installation to assure correct material usage. Therefore, quality control inspection records verifying correct material installation for small bore piping did not exist.

In addition to the small bore piping programmatic problems, Phillips, Getschow Company did not have a documented inspection program for quality control inspectors to verify correct material at installation for large bore piping prior to Revision 12 of the Phillips, Getschow Company Quality Assurance Manual, dated November 19, 1982. Therefore, quality control inspection records verifying correct material at installation for large bore piping did not exist prior to November 19, 1982.

DISCUSSION

Phillips, Getschow Company Procedure QCP-B21, Installation and/or Field Routing of Two Inch and Under Process Piping Systems - ASME Classes 1, 2 and 3, established the procedural controls for inspection and verification of correct small bore process piping material. Phillips, Getschow Company Audit No. 83-BR3 (April 26, 1983) identified a Finding, whereby the verification on the Production drawing of different heat numbers in the case where more than one (1) heat number per drawing was being used, was not completed. In response to NRC concerns related to material traceability, Commonwealth Edison Company filed a potential 10 CFR 50.55(e) deficiency report in July, 1983. This 50.55(e) report stated that Quality Control verification of heat or mark numbers of installed piping systems was not adequately documented.

CORRECTIVE ACTIONS TAKEN AND RESULTS ACHIEVED

Procedure QCP-B21 was revised in June, 1983 to require verification of Code small bore material heat numbers on drawings. Specifically, the Quality Control inspector would verify all entries of traceability numbers made by Production and this verification would be documented by initial and date.

In order to establish a level of confidence that material traceability exists for previous Code small bore piping installations, Phillips, Getschow Company began traceability verifications in August, 1983. This verification was based on random samples of previously installed Code small bore piping selected in accordance with Military Standard MIL-STD-105D.

The sample inspection program performed by Phillips-Getschow is complete. The preliminary results were reviewed by NRC personnel as documented in the NRC Inspection Report Nos. 50-456/83-09 and 50-457/83-09. The sample inspection program identified a small number of cases in which installed piping material was not in compliance with design requirements. Additionally, a Commonwealth Edison Site QA Audit 20-93-33 dated July 15, 1983, identified a case in which installed piping material was of a code class different from that required by the design. As a result of this sample inspection program and subsequent discussions with NRC personnel, we have since developed the Piping Heat Number Material Traceability Verification (MTV) Program.

CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE

The MTV Program includes field inspections for material markings and reviews of supporting installation documentation for material traceability. A comparison of field markings against traceable documentation will be performed to establish the validity of the existing documentation as an acceptable means of maintaining traceability. The scope of this program includes ASME small bore piping installed prior to August 31, 1983, and ASME large bore piping installed prior to November 30, 1982. (Documentation of the verification of material traceability by QC personnel has been generated for piping installed subsequent to these dates.) This Program will ensure that the installed material is traceable and that the material is in accordance with design requirements. Details of this Program are contained in Phillips-Getschow Procedure QCP B31 which is available on site for review.

The procedure requires completion of the following steps:

1. A material verification field walkdown on 100% of previously installed piping will be completed. The material heat number will be recorded and/or verified by a Quality Control inspector. A check will be made to ensure that the field verified heat number is approved for use at Braidwood Station.
2. A Quality Control verification will be made of field verified material heat numbers against the heat numbers recorded on the Stores Request for each installation package. This verification will establish that material withdrawn from Stores was installed in the correct location.
3. A Quality Control verification will be made of field verified material heat numbers to ensure that the correct material is installed for the specific application.
4. For those cases where material heat markings are no longer available in the field, a Quality Control review will be made of the Stores Request to verify that the material was approved for use at Braidwood Station and was the correct material for specific application.

The necessary installation and quality control documentation will be updated to record the above verification program. Non-conformance reports will be generated to disposition material which cannot be verified by the above program.

DATE OF FULL COMPLIANCE

Procedure revisions and training to the revised procedures are complete. The 100% material verification program has been initiated and is expected to be completed prior to April, 1985.

ATTACHMENT C

COMMONWEALTH EDISON COMPANY
ORGANIZATIONAL AND MANAGEMENT CHANGES AT BRAIDWOOD STATION

Since the Commonwealth Edison and NRC Enforcement Conference held in August 1982, Commonwealth Edison has performed a number of evaluations of various past and ongoing construction work at Braidwood Station. Independent evaluations were performed by experienced Commonwealth Edison Construction and Quality Assurance Engineers (known as the Technical Support Group), and by a team of experienced engineers from a construction management organization, Daniel Construction Company. Further, several unusually extensive Commonwealth Edison evaluations have been performed by the General Office and Site Quality Assurance Departments, including the INPO Self Evaluation (20 people-3000 manhours) and a 35 person team audit (2800 manhours). These various reviews, evaluations and audits involved all site contractors and included both present and past work.

In early 1984, Commonwealth Edison Company employed a senior management evaluation team led by Vice Adm. J. D. Williams (Ret.) to conduct an extensive review of the Braidwood Project. In June, 1984, INPO conducted an extensive construction site evaluation. This is yet another step taken by Commonwealth Edison Company management to provide attention to, and involvement in support of the Commonwealth Edison Company Quality Assurance Program.

As a result of all of these efforts, significant organizational and management changes have been made within the Commonwealth Edison organization, as well as within our site contractor organizations. A description of the Commonwealth Edison Company organizational and management changes follows.

A fulltime Project Manager was assigned to the Braidwood Project in early September 1982. This change was made to ensure that the necessary management attention was constantly focused on Braidwood Station.

A new Project Mechanical Supervisor was assigned within the Project Construction Department. This individual has extensive construction and quality assurance experience received at our LaSalle County and Dresden Stations. The individual has been working for a period of time within the Phillips, Getschow Company organization for the purpose of assessing first-hand the effectiveness of their operation.

In late 1982, an individual from the Technical Support Group was retained in the position of Project Quality Control Coordinator. This individual reported directly to the Braidwood Project Manager. The Project Quality Control Coordinator was charged with the responsibility for follow-up on Technical Support Group recommendations, and to coordinate Braidwood Site responses to NRC and Quality Assurance Department items.

Throughout 1983, six (6) additional experienced Construction Field Engineers joined the Project Construction Department. Many of these engineers have experience from our LaSalle County Station.

In mid-1983, the Braidwood Site Project Field Engineering Group was established. Additionally, the Project Field Engineering Manager, Supervisors and most of the staff engineers all have extensive LaSalle County engineering or construction experience.

In order to effect the timely resolution of construction installation problems, Commonwealth Edison Company management directed the "on-site" Sargent and Lundy Engineering Group to be increased. The staffing level of this group grew from approximately 20 to 329 by the end of 1983. Moving the engineering effort closer to the field was perceived to be a major method of improving the communications between construction and engineering, and assuring the timely resolution of field problems. Nearly 80 of the Sargent and Lundy site engineering personnel came with experience from either our Byron or LaSalle County Station.

In order to incorporate our overall LaSalle County and Byron experiences in the area of system completion, turnover and testing, Commonwealth Edison established the new position of Startup Superintendent for Braidwood Station. The individual assuming this position has extensive Byron startup experience and earlier Zion startup experience. This was perceived to be a major mechanism for incorporating both the overall methodologies, as well as the specific experiences gained at our Byron and LaSalle County Stations into the startup approach to be used at Braidwood Station.

In April, 1984, the Project Licensing and Compliance Group was established with a Superintendent reporting directly to the Braidwood Project Manager. The individual assuming this position has extensive LaSalle County technical and licensing background. The formation of this group is to assure high level Project Management attention and responsiveness to NRC, Quality Assurance, and INPO matters. This organization replaced the previous Project Quality Control Coordinator position.

Most recently, the former LaSalle County Station Construction Superintendent, who had been the Braidwood Project Field Engineering Manager since the inception of Project Field Engineering, became the Braidwood Project Construction Superintendent. Concurrent with this change, the former Project Mechanical Supervisor was promoted to a newly created position of Braidwood Project Construction Assistant Superintendent. This arrangement allows the Construction Superintendent to devote the majority of his efforts toward Quality Assurance and NRC matters.

Finally, there have been various enhancements in the Commonwealth Edison Company Quality Assurance Department. Recently, the reporting level of the Manager of Quality Assurance was changed from the Vice Chairman to the Chairman and President. This change was made to further assure full responsiveness to and interface with Quality Assurance by the Projects organization. Additionally, the new position of Assistant Manager of Quality Assurance was created, whose work location currently remains full-time at the Braidwood site. Several other changes in Commonwealth Edison Company Quality Assurance are delineated later in this Attachment C.

CONTRACTOR MANAGEMENT AND QUALITY ASSURANCE/QUALITY CONTROL

ORGANIZATIONAL AND OVERVIEW CHANGES

Following the Enforcement Conference in 1982, Commonwealth Edison Project Management met with management of all Braidwood Site Contractor, Production, and Quality Control/Quality Assurance personnel. During these meetings, the importance of quality and quality documentation as a top priority among all site activities in comparison to production oriented goals was stressed by Commonwealth Edison. Contractors were encouraged through those meetings and other meetings to bring in the best available management talent in order to accomplish the Braidwood Project goals.

Phillips, Getschow Company Organizational Changes

As a result of the various reviews and activities carried on in early 1983, Commonwealth Edison Project Management determined the need to substantially increase the level of management talent in the Phillips, Getschow Company organization. Phillips, Getschow Company was encouraged to seek the best available people. Phillips, Getschow Company responded by hiring into their organization a number of personnel previously employed by the LaSalle County Station mechanical contractor. Specifically, beginning August 1, 1983, Phillips, Getschow Company added a Site Manager, an Assistant to the Site Manager, a Site Superintendent, a Staff Assistant to Quality Control/Engineering, and a Project Engineer. In September and October, 1983, Phillips, Getschow Company added two Area Superintendents, an Area Assistant Superintendent, an Area General Foreman, and a Night Superintendent. All the above individuals had prior nuclear experience with construction at LaSalle County Station.

In the Engineering area alone, besides the Project Engineer, Phillips, Getschow added an Assistant Project Engineer and four Group Supervisors with a combined total nuclear experience of forty-five years. Later, seven other experienced personnel were added in the Engineering area. To improve coordination with Quality Control on systems completion, the Engineering Group developed a Systems Turnover and Testing Group.

When several concerns were identified in the quality documentation area, the new Phillips, Getschow Company management established what came to be called the "Document Station Concept". This concept was based on Phillips, Getschow Company's desire to have standardized and stringent control over all processed documents. Six Field Engineers were placed into four separate field documentation stations. This Document Station Concept was successfully implemented at LaSalle County Station. Of the nineteen document technicians utilized for this concept, eight technicians had previous LaSalle County experience.

Several changes were made in the Phillips, Getschow Company Quality Control organization. The organization was split into a field section and an office section. The overall Quality Control workforce was increased from 57 people to 125 people. A new Phillips, Getschow Company Quality Control Supervisor was assigned to the Braidwood Site. Additionally, Phillips, Getschow Company assigned a General Foreman of Field Inspectors in order to provide more direct field supervision of the quality inspection efforts. Phillips, Getschow Company also established the position of Lead Quality Control Technician with eight individuals functioning in that position. These individuals are involved in the document review areas. Three of the eight people had LaSalle County experience.

Phillips, Getschow Company revised their Quality Control Technician Certification Procedure and increased the number of quality control technicians from eighteen to fifty-six. These technicians increased their involvement in the initial and final reviews of quality documentation. They also became involved in early implementation of the ASME Section III N-5 Review Program. The number of field inspectors increased from twenty-five inspectors to fifty inspectors. The increased number of field inspectors resulted in a substantial increase in the amount of in-process construction work monitoring performed by Phillips, Getschow Company Quality Control.

In October, 1982, a fulltime Quality Assurance manager function was established on site within the Phillips, Getschow Company organization. Three additional Quality Assurance engineers were hired in early 1983. This group performs increased auditing and surveillance activities of the Phillips, Getschow Company work activities.

L. K. Comstock Company Organizational Changes

Several management, engineering, and quality control organizational changes were made within the L. K. Comstock Company organization. The number of ANSI N45.2.6 Level II inspectors was increased from 11 inspectors to 47 inspectors. The overall inspector workforce increased from 22 people to 51 people. Further, when Quality Control office personnel were added, the overall Quality Control manpower increased from 25 people to 64 people.

Several Quality Control management changes and operational improvements were made by L. K. Comstock Company. In November, 1982, a new Quality Control Manager was hired and charged with improving the organization and retrievability of quality documentation. This individual was replaced in August, 1983 when very little progress was made toward improving quality documentation retrievability. During 1983, a position of Supervisor of Inspectors was established, as were the positions of Lead Inspectors. This organizational change allowed better control over the inspection effort and assured timely completion of inspections. An inspection status/control system was implemented which allowed for timely and accurate determination of inspection status.

Fulltime Quality Assurance Engineers were hired by L. K. Comstock Company in 1982 and 1983. The amount of auditing and surveillance of the L. K. Comstock quality program was significantly increased with the addition of these quality assurance personnel.

In the area of document control, L. K. Comstock Company implemented improved document tracking systems, replaced the Document Control Supervisor in February, 1983, and increased the number of document control personnel from seven people to fourteen people.

Pullman Sheet Metal Organizational Changes

Pullman Sheet Metal increased non-production craft personnel from eighteen to eighty, and at the same time increased Quality Control/Quality Assurance personnel from three to nineteen. The Pullman Sheet Metal personnel increases were made in order to provide better control and review of documentation, and to implement the various aspects of ongoing retroinspection programs. Specifically, Pullman added several new departments including Engineering and Document Control (9 people), Survey and Research (5 people), Field Change Requests/Field Engineering Notices (5 people), and Correction Notices Group (3 people).

G. K. Newberg Organizational Changes

Within the G. K. Newberg Company organization, Quality Control manpower was increased from three to six throughout 1983. Additionally, the G. K. Newberg site engineering department assumed greater responsibilities for preparation of traveler documents prior to issuance to the construction forces.

CONTRACTOR AWARENESS OF QUALITY

We are continuing our efforts to assure that all construction workers and their supervisors understand their role in building quality into our Braidwood Station. While we believe the results of reinspection and retroinspection programs conducted to date generally demonstrate that the requisite quality has been built into Braidwood Station, many of the identified problems concern the extent to which documentation is necessary to prove this requisite quality. It is to this aspect in particular that Commonwealth Edison Company has and is continuing to direct our efforts towards overall improvement.

To this end, the following has or will be accomplished:

1. Regular meetings are held with contractor management including first-line supervisors to discuss quality (including documentation) related matters.
2. A special emphasis is being put forth by the Commonwealth Edison Company Project Construction Superintendent stressing that "quality is a production related function".
3. The amount of craft and supervisory training has been substantially increased over the past six months.
4. Many procedures have undergone significant enhancements.
5. Management changes as described earlier have led to a greater awareness in performing quality work.

COMMONWEALTH EDISON COMPANY
QUALITY ASSURANCE ORGANIZATIONAL AND OVERVIEW CHANGES

The CECO Audit and Surveillance program methodology was for CECO Quality Assurance to cover the 10CFR50 Appendix B Criteria and the contractors' Quality Assurance Program requirements but not each and every contractor procedure implementation. As is provided in the regulations, the subtier implementation of the contractors' procedures is the contractors' responsibility under their program. Assurance of this implementation is by audits of the contractors' auditing by CECO Quality Assurance. The key aspect to address the Region's concern was that more frequent and broader coverage by the contractor and Commonwealth Edison, particularly involving implementation of contractor procedures, was needed to identify problems in a timely manner.

As discussed in our response to Non-compliance Item 4, the subject contractors have included the auditing of active procedures in their audit schedules. Further guidance to Commonwealth Edison Company Quality Assurance personnel for performance of audits and/or surveillances as described below should ensure that contractor activities meet all established requirements.

The Quality Assurance overview of contractor work activities has been changed as described below.

1. The Site Quality Assurance Organization has been augmented with experienced personnel from LaSalle County Site Quality Assurance as well as with experienced personnel being hired.
2. The Quality Assurance Organization has been restructured to provide for closer and additional supervision of Site Quality Assurance activities. Specifically, an experienced manager has been assigned to a new position, Assistant Manager of Quality Assurance, and two additional supervisors have been added to the Site Quality Assurance Organization.
3. Site Quality Assurance manpower levels have been increased from twenty-five Commonwealth Edison Company personnel in January 1983 to the present level of forty-five.
4. Quality Assurance auditing has been improved by the addition of an Audit Coordinator and the increased frequency of audits of the major site contractors about doubled such that about 10 to 12 audits are being conducted each five to six weeks. Audits are being performed with varying scope from very broad to very specific questions. Identification of the root cause for identified deficiencies is being emphasized. Guidelines have been established to assure that sufficient samples of documentation are being reviewed.

5. Quality Assurance surveillance activities have been enhanced by the use of standardized checklists. The rationale behind this approach is that our Quality Assurance people will have positive direction as to what they must look at, that the checklists will provide a format to write objective evidence as the surveillance is being performed, that the objective evidence can be used in place of extensive report writing, and that the surveillance activities can be reproduced and verified at a later date by supervision.
6. Overinspections by the Independent Testing Agency (PTL) at Braidwood Station are being increased from about 10% to a goal of 25%. As a result, the number of PTL inspectors has been increased to perform the overinspections for Commonwealth Edison Company Quality Assurance. These inspectors cover the three disciplines of electrical, mechanical and structural, and are qualified to ANSI N45.2.6. (The Unit Concept Inspections involve another seven to eight people.) Both the overinspections and the Unit Concept Inspections are each headed by lead inspectors.
7. As for the Independent Testing Agency, the manpower level has significantly increased due to the increased work coverage undertaken in the past 6-8 months.
 - A. The PTL organization at the construction site has been restructured to provide:
 - a) Project Manager - technically qualified with strong management characteristics.
 - b) Assistant Project Manager - technically qualified to direct the detailed work activities in the field.
 - c) Two Group Supervisors
 - One to head all the NDE and other testing activities.
 - The other to head the overinspection, Unit Concept Inspection and other inspection groups.
 - d) Document Coordinator
 - e) Another Quality Assurance Auditor

- B. PTL has established a technical person in their Chicago Area Office to ensure the PTL Organization at Braidwood Station is carrying out its responsibilities acceptably. This overview is intended to ensure the inspectors and technicians are performing acceptably on a continuing basis.

Special emphasis is placed on the Independent Testing Agency inspection activities because this is the point where there is significant coverage very shortly after the construction work is completed and is the process by which we have the largest opportunity to identify essentially all deficiencies. This should go a long way toward early identification of problems.

- C. To ensure that PTL performs their work activities acceptably, additional direct coverage by Commonwealth Edison Company Quality Assurance has been established over the daily activities of the Independent Testing Agency.

Basically, a lead person, as in the past, will coordinate and administer the contract activities. In addition, Commonwealth Edison Site Quality Assurance people have been assigned responsibility for the specific work activities. The specific work activities to be closely monitored by separate Quality Assurance people are the NDE examinations and other testing, and the Unit Concept Inspections. An additional Quality Assurance person is being brought to the site to oversee the 25% goal of overinspections. This narrow and concentrated coverage by Site Quality Assurance should ensure and achieve positive results.

These actions should enhance our opportunities to identify deficiencies and potential problems.