CONTENTION ITEM 5
(GENERAL)

The overall portion of Rorem QA
Subcontention 5 states as follows:

5. Contrary to Criterion III, "Design Control," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to establish measures to assure that applicable regulatory requirements and design bases are correctly translated into specifications, drawings, procedures, and instructions including provisions to assure that appropriate quality standards are specified in design documents and that deviations from such standards are controlled. Applicant has also failed to require that measures are established for the identification and control of design interfaces and for the coordination among participating design organizations, that the measures include the establishment of procedures among participating design and revision of documents involving design interfaces; and that the 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 performance of a suitable testing program.

STATEMENT OF MATERIAL FACTS AS TO
<u>WHICH THERE IS NO GENUINE ISSUE</u>

1. Contention Item 5.B does not relate to design control but rather to the faulty implementation of approved procedures regarding the QC inspection of coatings applied in the containment by the coatings contractor [General Affidavit of Kenneth T. Kostal on Q.A. Contention Item 5, p. 2, (hereafter "Kostal Affidavit, p. ___.")

2. Contention Item 5.A (as it relates to Sargent & Lundy) and 5.C deal with design document control problems which are isolated and minor. Contention Item 5.A (as it relates to Commonwealth Edison) involved isolated errors in implementing approved

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procedures for incorporating field design changes on controlled drawings. Affidavit of Michael A. Gorski on Rorem QA Contention Item 5.A pp. 7-9 (hereafter "Gorski Affidavit, p.-"). These minor implementation errors did not lead to any suggestion in the CAT inspection report that any enforcement action by the NRC Staff was appropriate (Gorski Affidavit, pp. 11-12). The CAT Inspection Report concluded that control of design documents is "generally adequate" (Gorski Affidavit, p. 11). No hardware changes were necessary to correct any of these problems. No common root causes could be ascribed nor generic implications found. (Kostal Affidavit, pp. 2-3.)

DISCUSSION

The thrust of Subcontention 5 is that Commonwealth Edison and its Architect Engineer Sargent & Lundy experienced a Quality Assurance breakdown with respect to design document control. In fact, nothing more than isola'ed instances of mistakes and the need for a minor change in a procedure has been shown. Indeed, one of the items of noncompliance asserted to be an instance of faulty design control, involved rather an isolated error in implementing quality control inspection procedures by the coatings contractor. No safety implications arose from any of the issues set forth in Subcontention 5, no hardware changes were necessary, no common root causes could be ascribed, and no patterns of violation are discernable. There is no genuine issue of material fact and Edison is entitled to summary disposition as a matter of law on the entire Subcontention 5.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF KENNETH T. KOSTAL

I, Kenneth Thomas Kostal, being first duly sworn, hereby depose and state as follows:

I am employed at Sargent & Lundy. My business address is 55 East Monroe Street, Chicago, Il 60603. I am a partner, assistant manager of the Structural Department and project director for the Braidwood Nuclear Power Station.

I graduated from the University of Illinois in 1965 with a BA in Architectural Engineering and in 1967 with a MS in Architectural Engineering. I have 20 years of experience in the field of civil engineering which includes civil/structural/architectural engineering and design work for fossil and nuclear power plants. My assignments have included 14 units with a total capacity in excess of 10,000 megawatts. I have also been involved in numerous studies.

Prior to joining Sargent & Lundy in 1967, I was engaged by the University of Illinois as an instructor in structural design and as an engineer responsible for structural design and construction drawings for light office buildings.

I am a registered professional engineer in 31 states and I also have a separate structural engineering license in the State of Illinois and am licensed in Alberta, Canada. Presently I am a member of the following organizations:

American Concrete Institute

American Institute of Steel Construction

American Nuclear Society

American Society of Civil Engineers

Structural Engineers Association of Illinois

Western Society of Engineers

As assistant manager of the Structural Department I assist the manager in coordinating structural, architectural and civil engineering design for Sargent & Lundy. I assist the manager in all matters of supervision, administration, personnel and technical policies. I have direct responsibility for the Specifications, Geotechnical and Water Resources and Site Development Divisions. As project director for the Braidwood Nuclear Power Station I assist the projects director for the Byron/Braidwood Stations in coordinating all project activities and overall management of the Braidwood Station. I supervised or directed the activities of Sargent & Lundy relating to the matters raised in Contention Item 5A, 5B, and 5C.

I am accountable to Commonwealth Edison Company as well as to the Sargent & Lundy partnership for the firm's satisfactory performance on the Braidwood Station. I am completely familiar with all Sargent & Lundy

operations and can enlist all of the firm's resources. I am responsible for assuring that Sargent & Lundy engineering policies and philosophies are applied to the design of the Braidwood Nuclear Station to assure the technical integrity of our work.

The general statements in the attached General Testimony of Kenneth T. Kostal on QA Contention Item 5, Testimony of Kenneth T. Kostal On Rorem Q.A Subcontention 5.A, Testimony of Kenneth T. Kostal On Rorem Q.A. Subcontention 5.B, Testimony of Kenneth T. Kostal On Rorem Q.A. Subcontention 5.C, and Testimony of Kenneth T. Kostal On Rorem Q.A. Subcontention 13.B are based either on personal knowledge or on reliable information provided to me by my subordinates. These statements are true and correct to the best of my knowledge and belief.

Kenneth T. Kostal

Kenneth T. Kostal

Subscribed and Sworn before me
this 16th day of December 1985

Karen Kalafatis

Notary Public

My Commission expires on 9/17/89

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GENERAL TESTIMONY OF KENNETH T. KOSTAL
ON QA CONTENTION ITEM 5

Q.1. What is the aspect of Contention Item 5 to which this testimony is directed?

A.2. This testimony is directed to the overall implication of QA Contention Item 5. the general segment of the contention states as follows:

> 5. Contrary to Criterion III, "Design Control", of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to establish measures to assure that applicable regulatory requirements and design bases are correctly translated into specifications, drawings, procedures, and instructions including provisions to assure that appropriate quality standards are specified in design documents and that deviations from such standards are controlled. Applicant has also failed to require that measures are established for the identification and control of design interfaces and for the 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.

Q.2. Based on the information you have provided in your testimony on the specific subitems under Contention Item 5, has Commonwealth Edison Company (CECo) failed to establish measures to assure that applicable regulatory requirements and design bases are correctly translated into specifications, drawings, procedures, and instructions, including provisions to assure that appropriate quality standards are specified in design documents and that deviations from such standards are controlled?

A.2. No.

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Q.3. Similarly, based on your other responses, has CECo failed to require that measures are established for the identification and control of design interfaces and for the coordination among participating design organizations, that the measures include the establishment of procedures among the participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces, and that design control measures provide for verifying or checking the adequacy of design, such as by the performance of design review, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program?

A.3. No.

Q.4. How did you reach those conclusions?

A.4. First, Contention Item 5.B does not have anything to do with design. It deals with an instance in which the applicable Midway Industrial Company Procedure adequately carried design intent and specifications into effect but the field installer did not meet specifications and quality control failed to pick up the deviation. Thus the coating problem was totally one of implementation and inspection, not of design.

Second, with respect to the S&L portion of Contention Item 5A, namely the ECN's for pipe hanger supports issued against superceded revisions, S&L's investigation showed that the implicit requirements of existing procedures were not followed in seven isolated cases. The circumstances giving rise to these cases were themselves isolated. No hardware changes were required, and the procedure change required to assure that a similar problem did not arise in the future was minor. The NRC Staff did not note this item as a violation nor did it identify it as an item requiring management attention. This situation did not, therefore, indicate design organization interface problems or coordination problems of any significance.

Third, the problem with slenderness ration design specifications, Contention Item 5C, was also insignificant. Correction of the problem required neither design modification nor hardware changes. The NRC Staff itself observed that the omission of the arbitrary upper limit for the slenderness ration technically constituted a violation of commitments made by S&L in its Structural Design Standards.

Q.5. Do the cited instances indicate the existence of any breakdown in Quality Assurance for design activities?

A.5. No. These items were isolated, unique situations which have not recurred. They had no common root cause and suggested no pattern. Moreover, they were of a relatively trival nature. I do not believe that these examples reflect any lack of design control. The various design activities have been controlled through Sargent & Lundy design standards, project procedures, and instructions. Through the course of the project, improvements have been made in these documents to address isolated inspection report findings and to assure adequate controls do exist for on-going work. These improvements have been high-lighted in the response to each contention item. However, finding problems and making improvements does not suggest a breakdown in Quality Assurance.

CONTENTION ITEM 5.A

Rorem QA Subcontention 5.A. alleges as follows:

5. Contrary to Criterion III, "Design Control," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to establish measures to assure that applicable regulatory requirements and design bses are correctly translated into specifications, drawings, procedures, and instructions including provisions to assure that appropriate quality standards are specified in design documents and that deviations from such standards are controlled. Applicant has also failed to require that measures are established for the identification and control of design interfaces and for the coordination among participating design organizations, that the measures include the establishment of procedures among participating design organizations fo 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.

A. The NRC CAT inspection concluded that in the area of the most significant finding was the failure to annotate unincorporated design changes on controlled design documents. The most significnt finding in the area of design change control eas design change documents written against superseded revisions of the approved design drawings. In at least one instance, this deficiency resulteed n a pipe support being installed and inspected to other than the latest approved design. (CAT Inspection Report 84-44/40, Exh. 10.)

STATEMENT OF MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE

First Part

1. The "design documents" referenced in contention item 5.A and subject to the document control requirement of 10 CFR Part 50, Appendix B, Criterion VI, are those drawings and specifications issued by Sargent & Lundy that are used for the fabrication, installation & inspection of safety related components, systems & structures. (Affidavit of Michael A. Gorski on Rorem QA Contention Item 5.A., pp. 1-2 (hereafter "Gorski Affidavit, p. _____.").

2. Resolution of field installation problems may require modification of a design specified in the applicable design document. When expeditious approval of a design change is required it is approved and issued to the field by means of a design change document separate from the underlying design document. These design change documents include FCRs, ECNs, and FCNs. (Gorski Affidavit, p.2.)

3. A design change approved by means of such a document is "unincorporated" until the applicable design document is formally revised by Sargent & Lundy. (Gorski Affidavit, pp. 2-3.)

4. Criterion VI of 10 CFR Part 50, Appendix B requires that approved design documents, including changes and revisions, be available at the appropriate work locations for construction and inspection activities. This ensures that installations will be performed and inspected to the most current approved design information. The prevalent method of complying with this requirement at Braidwood is to note the control number of the FCR, ECN or FCN on the affected design documents. (Gorski Affidavit, p. 3.)

5. To assure compliance with Appendix B requirements, each contractor at Braidwood performing safety related work has developed and implemented, or is subject to, document control procedures. CECo has similar procedures to control copies of design documents for its internal usage. These procedures assure that the most current design information is available for installation and inspection. (Gorski Affidavit, p.4.)

6. Among these procedures are procedures which require the annotation of unincorporated design changes on controlled design documents. The CAT Inspection reviewed a large number of these procedures and found no deficiencies. (Gorski Affidavit, pp. 4-6.)

7. To insure the proper implementation of these document control procedures appropriate personnel are trained in the procedures. In addition, the adequacy and implementation of these procedures is reviewed by internal site contractor QA and/or QA audits and/or surveillances. CECo QA also performs periodic audits and surveillances of document control activities to verify proper implementation of contractor procedures. The CAT inspection reviewed contractor and CECo audit and surveillance activities in this area and found no deficiencies. (Gorski Affidavit, p. 6.)

8. The majority of the deficiencies identified by the CAT inspection regarding annotation of unincorporated design changes involved the annotation of ECN's or FCR's on controlled drawings after these ECNs or FCRs had in fact been incorporated into drawing revisions. This situation has no impact on the quality of construction or inspection because redundant information is simply being noted on the documents. (Gorski Affidavit, p. 7.)

9. In a few cases, the CAT inspection identified unincorporated ECNs or FCRs that were not annotated on the applicable drawing. (Gorski Affidavit, p. 7.)

10. The CAT inspection identified only three such instances out of 180 documents reviewed. The deficiencies in these cases did not result from disregard of the applicable procedure but from isolated personnel errors. (Gorski Affidavit pp. 8-9.)

11. In addition, two of the three deficiencies occurred on CECo documents. These would have had no impact on the quality of construction or inspection activities because CECo's copies of design documents are not used for these purposes. (Gorski Affidavit, p. 9.)

12. In addition, failure to annotate ECNs or FCRs on design documents is unlikely to impact field installation because the ECN or FCR is issued, in the vast majority of cases, at the request of the installation contractor to make the installation practicable and/or possible. Hence, the contractor is constrained to performing the installation to this design change document, and he is expected to do so even in the unlikely event that the design change has not been annotated on the drawings as required by applicable procedures. Thus there is no safety impact in this situation. (Gorski Affidavit pp. 9-10.)

13. A second level of review that can verify that work has been installed to the latest design information is provided by the QC inspection to which all safety-related work is subject. In addition, CECo site QA performs inspections of a sample of the contractors' completed work, which provides a further, independent

verification of completed installations against current design documents. (Gorski Affidavit, p. 11.)

14. Several site contractors perform a final document review of completed installations and/or inspections, providing still another check that work has been performed to the most current design information. (Gorski Affidavit, p. 11.)

15. The comprehensive review performed by the CAT inspection identified no significant deficiencies in the area of unincorporated design change annotation on controlled drawings. The objective evidence documented in the CAT Inspection Report indicates that the appropriate procedural requirements were generally being implemented and that the few deficiencies identified were caused by isolated personnel error or misjudgment. (Gorski Affidavit, P. 12.)

16. The CAT Inspection Report concluded that "For the sample selected, the control of design documents is generally adequate." Although some minor deficiencies were found in the annotation of ECNs and FCRs on controlled documents, the CAT Report neither identified this area as a potential enforcement item in Appendix B of the report nor as a specific area requiring additional management attention in Appendix A of the report. (Gorski Affidavit, pp. 12-13.)

17. To further enhance control of unincorporated design changes, CECo is developing a computerized data base of outstanding design changes. This data base, which will be made available to site contractors in

the near future, will provide frequent information updating, as well as convenient and accurate access to unincorporated design changes. (Gorski Affidavit, p. 13.)

Second Part

18. Engineering Change Notices ("ECN's") are design control documents issued by Sargent & Lundy ("S&L") to make changes to its original design drawings. [Affidavit of Kenneth T. Kostal on Rorem QA Contention Item 5.A., p. 2 (hereafter "Kostal Affidavit, p. _____.")]

19. The ECN which gave rise to the CAT Inspection Report finding related to installation of large bore pipe supports. The vast majority of piping system ECN's are issued because the contractor encounters a field installation problem which requires a design change. Design drawing tolerances do not anticipate all field conditions which may be encountered during installation. The contractor then issues a field change request; that request is reviewed by S&L's site engineering office, which then issues an ECN to resolve the field installation problem. The ECN contains an approved revised drawing governing installation of the particular hanger. (Kostal Affidavit, pp. 2, 4)

20. On infrequent occasions, Sargent & Lundy engineers may issue an ECN in order to improve the constructability of a particular design. ECN's are also issued to disposition noncompliance reports covering unintended deviations from design documents during construction. The ECN's which are addressed in this Contention Item were all generated in response to field change requests. (Kostal Affidavit, p. 3)

21. Sargent & Lundy ensures that the as-built condition of piping subsystems complies with overal design criteria and intent of reanalyzing subsystems for which routing changes take the subsystem out of specified routing tolerances. (Kostal Affidavit, p. 3)

22. Field problems with hanger installation occasionally also necessitate reanalysis of the piping subsystem. Manual stress calculations are performed by the engineer when a hanger must be installed outside design tolerances to determine whether the deviation places unacceptable stresses on adjacent hangers. If such a calculation shows that the resulting loads on adjacent hangers are unacceptable, the engineer either reinforces the overstressed hanger or designates the subsystem for reanalysis. Reanalysed because hanger installation are relatively rare. (Kostal Affidavit, p. 4)

23. Sargent & Lundy's procedures which govern the ECN process provide that an ECN contain an intensive approved design drawing for use in the field. ECN interim drawings are published monthly in S&L's SIMS report notifying all field personnel of all drawing revisions; ECN's are also incorporated periodically in the record drawings maintained at Sargent & Lundy home office in Chicago as those drawings are revised. Field personnel check both the monthly SIMS report and the Field Office ECN Index to ensure that they are using the most recent drawing. (Kostal Affidavit, pp. 4-5)

24. When reanalysis requires changes in design for portions of subsystems, revised drawings are issued and are listed in SIMS.

When reanalyss of a subsystem is ongoing, the subsystem is listed on the biweekly Reanalysis List. S&L's former version of procedure GQ-3-13 did not explicitly mandate a hold on ECN's during reanalysis; however engineers were expected to determine whether reanalysis was in process, and not to issue ECN's until reanalysis was completed and revised drawings made available. (Kostal Affidavit, p. 5)

25. S&L decided to perform reanalyses for piping subsystems in its Chicago office. During the course of its reanalysis, construction continued on subsystems undergoing reanalysis. Because field engineers were attempting to resolve field installation problems regarding pipe supports for subsystems concurrently undergoing reanalysis in Chicago, in few cases field engineers generated new ECN's without communicating with S&L's Chicago office to determine whether any reanalysis drawing changes were being processed. (Kostal Affidavit, p. 6)

26. In order to determine the extent of the discrepancy, S&L reviewed all drawings issued for construction on the 1,275 pipe supports in the subsystems reviewed for reanalysis between July 1984 (when reanalysis began) and December 20, 1984 (when CAT inspection identified the problem) against the ECN monthly and daily indices to identify any suppots for which ECN's might have been issued against superseded revisions of drawings. (Kostal Affidavit, p. 7)

27. This examination identified seven support drawings (including the one identified by CAT inspectors) where ECN's were issued against superseded revisions. In light of the fact that approximately there were 1,275 hangers in the total population of reanalyzed subsystems, and a total of over 14,000 large bore pipe supports in 528 large bore piping subsystems at Braidwood, the seven cases re isolated instances not indicative of any significant problem. (Kostal Affidavit, p. 7)

28. The discrepancies identified in the seven cases were insignificant, and no hardware changes were necessary. The most recent revisions of the support drawings were later revised to incorporate the ECN's. (Kostal Affidavit, p. 7)

29. This problem was limited to piping subsystems. The other major systems in which substantial custom installation is performed, HVAC and electrical, had all reanalysis performed at the site engineering office and therefore the problem could not occur. (Kostal Affidavit, p. 7)

30. These seven instances would not have escaped discovery. Procedures for review of documentation prior to system turnover require comparison of drawing revisions and ECN's used to install which would have disclosed these discrepancies. (Kostal Affidavit, pp. 7-8)

31. The NRC did not consider this item significant. It neither cited it as a violation nor regarded it as significant enough to require management attention. (Kostal Affidavit, p. 9)

32. S&L has amended the applicbale procedure to insert an explcit hold on resolution of field problems until new drawings resulting from reanalysis are issued. (Kostal Affidavit, pp. 9-10)

33. The S&L design control sysrem functioned properly for all but a handful of cases in extreme circumstances. (Kostal Affidavit, p. 9)

DISCUSSION

First Part

The CAT Inspection Team noted minor problems with respect to annotation of unincorporated design changes on controlled design drawings. Resolution of field installation problems take place via field-initiated design change documents known as FCRs, ECNs, and FCNs such a design change is "unincorporated" until the controlled design drawing is revised to incorporate the field initiated changes

In order to satisfy the requirements of Appendix B, Criterion VI, controlled design drawings at work stations must either be annotated with control numbers of FCRs, ECNs and FCNs, or equivalent procedures must be utilized. CAT Inspectors found a number of instances in which field initiated design changes were annotated on controlled drawings whch had already incorporated those changes. This situation merely resulted n redundant information being provided. The CAT inspection also identified three instances of 180 documents reviewed in which unincorporated design changes were not annotated on controlled drawings hd not been revised to incorporate them.

These instances resulted not from improper procedures but from isolated personnel errors. Moreover, two of the three instnces occurred in Edison sets of drawings which were not used for construction.

Contractors normally initiate the very design changes at issue and wait for their approval to install. Thus they are extremely unlikely to use an improperly annotated controlled drawing, as opposed to the most recent unincorporated field design change, in installation. Moreover, QA inspection verifies that installation is to the most up to date design drawings. Other document reviews provide further confidence that failure to annotate will not result in faulty installation.

The CAT inspection concluded that control of design documents was generally adequate. Supporting documentation indicated that failures were isolated and that they were due to isolated personnel error. The NRC inspection team neither identified document control as a potential enforcement item nor identified it as requiring additional management attention.

Under these circumstances, the small number of discrepancies noted indicated no programmatic problems and were clearly isolated instances due to mistakes. No problem with Quality Assurance has been demonstrated. Thus there is no genuined issue of material fact as to this issue and Edison is entitled to summary disposition as a mattger of law.

Second Part

S&L ECN's relating to large bore piping are supposed to be issued against the most up to date revisions of controlled drawings. In seven instances, ECN's were issued against superseded revisions. These instances occurred during a period in which S&L had set up reanslysis of

the piping subsystems in its Chicago office while maintaining the authority to approve field initiated changes at the site engineering office. Reanalysis frequently resulted in the issuance of revised controlled drawings which should have formed the basis of further ECN's.

S&L's procedure called for site engineers processing ECN's to determine whether reanalysis for the relevant subsystem was in process so that they could assure that ECN's were not issued until drawing revision was complete. However, the procedure did not contain an explicit hold on ECN's for subsystem undergong reanalysis. Due to the separation of reanalysis from the site engineering office, in a few isolated cases engineers processed ECN's without determining that the subsystem was under reanalysis, and the ECN was issued against a superseded drawing.

S&L identified seven hangers out of 1,275 in systems which had undergone reanalysis which were written against superseded revisions. These discrepancies were insignificant, and no hardware changes were necessary.

The most recent drawings were revised to incorporate the ECN's. The procedure was amended to incorporate an explicit hold on ECN's for subsystems undergoing reanalysis. Procedures for review of documentation prior to sysfem turnover would have disclosed the identified discrpancies.

No other systems were subject to the same problem. All reanalysis for HVAC and electrical systemsd was performed at the site engineering office, where ECN's are also processed. Because of the close coordination in a single office, this problem could not arise for these systems.

The NRC did not consider the ECN problem significant. It neither took enforcement action nor considered this problem as requiring further management attention.

Under the circumstances, this is a minor problem with no generic implications. It raised no safety or even hardware implications. The program change required to correct it was minor, and the incidences were few and isolated. This item is therefore not indicative of any Quality Assurance problem. Thus there is no genuine issue of material fact and Edison is entitled to summary disposition as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF MICHAEL A. GORSKI
(on Rorem Q.A. Subcontentions 5A and 6.G)

I, Michael A. Gorski, being duly sworn, do depose and state:

I am employed by Commonwealth Edison Company as a Construction Field engineer at the Braidwood Station.

I graduated from the Illinois Institute of Technology with a B.S. degree in Electrical Engineering in 1974 and a B.S. degree in Mechanical Engineering in 1978.

Before coming to work at Braidwood in 1978, I was employed as an electrician by Newman Green, Inc., as as Quality Control Inspector by Commonwealth Edison Company at Dresden Nuclear Station, and as a construction supervisor involved with electrical transmission construction for Commonwealth Edison Company.

Since my employment at Braidwood Station I have held the following positions:

March 1978 - January 1984: Quality Assurance Engineer. Performed QA audits and surveillances of contractor activities. Performed various off-site QA Audits of contractor and Architect-Engineer organizations. Reviewed site contractor procedures. Reviewed and aided in the resolution of CECo and contractor nonconformances. Interfaced with NRC site inspectors and participated in the resolution of NRC inspection non-compliances. Participated in the training of QA Engineers and Inspectors as required. Performed receipt inspections of incomming shipments. Inspected concrete pours. Performed special projects at the request of the Site QA Superintendent and the Director of Quality Assurance Engineering and Construction. Aided contractor organization in the resolution of quality issues as required.

My Quality Assurance experience covers Electrical, Mechanical, HVAC and Structural disciplines. I was certified as a Level II and Level III Quality Assurance Engineer in accordance with Commonwealth Edison QA department requirements based on ANSI N45.2.6.

January 1984 to Present - Project Construction Field Engineer. I am currently assigned to the Project Construction Mechanical Compliance Group as the Group Coordinator. My activities include:

1) Supervision of three to four engineers involved with mechanical compliance activities (e.g., item 2 - 11 below)

2) Developing and implementing construction and Quality Program Procedures

3) Coordinating with Quality Assurance, Licensing the Architect/Engineer, Contractors and the NRC for resolution of quality issues relating to construction, including implementation of corrective action and corrective action to preclude repetition.

4) Preparing and evaluating responses to quality issues pertaining to construction such as Quality Assurance Audit Items and NRC Items of Noncompliance.

5) Reviewing of contractor procedures and revisions for compliance with design requirements, Code requirements and Quality Program requirements.

6) Reviewing and/or dispositioning contractor nonconformance reports to assure compliance with design, Code and Quality Program requirements.

7) Assisting the Licensing organization on issues relating to that process.

8) Special Projects as assigned by the Project Manager and Project Construction Superintendent.

9) Training and developing of training programs for Project Construction and contractor personnel as required.

10) Initiating and resolving Commonwealth Edison Nonconformance Reports.

11) Consultation with Project Construction personnel, Quality Assurance personnel and contractor personnel on day-to-day Quality items and issues.

12) Coordination of various contractor construction activities as required.

Since my employment in the Project Construction Department I have been basically involved in the Mechanical disciplines, interfacing with Electrical, Structural, and HVAC disciplines as required.

The answers to questions posed by counsel for Commonwealth Edison Company regarding Rorem Subcontentions 5.A and 6.G constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Michael A. Gorski

Michael A. Gorski

Subscribed and Sworn before me
this 18th day of December 1985

Carol J. McCoy

Notary Public

My Commission expires on 10/31/89.

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TESTIMONY OF MICHAEL A. GORSKI
(ON ROREM Q.A. SUBCONTENTION 5A)

Q.1. To which contention item is this testimony addressed?

A.1. QA Contention Item 5.A. The text of this contention item reads as follows:

> The NRC CAT Inspection concluded that in the area of [control of design documents] the most significant finding was the failure to annotate unincorporated design changes on controlled design documents. The most significant finding in the area of design change control was design change documents written against superseded revisions of the approved design drawings. In at least one instance, this deficiency resulted in a pipe support being installed and inspected to other than the latest approved design. (CAT Inspection Report 84-44/40, Exh. 10.)

(The words in brackets were added by Mr. Kostal of Sargent & Lundy to clarify an apparent clerical error in both the contention item and the CAT Inspection Report.)

Chapter VII of CAT Inspection Report 84-44/40 documents the observations of the CAT inspectors with regard to this subject. The first part of the quoted statement, which refers to control of design change documents, concerns site construction activities. My testimony is limited to this issue. The second part of the statement, which refers to design change control, concerns S&L's design practices.

Q.2. What are the "controlled design documents" referred to in the first statement from the CAT Inspection Report?

A.2. These "design documents" are those drawings and specifications issued by Sargent & Lundy that are used for the fabrication, installation and inspection of safety-related components, systems and structures. These documents fall under the requirement of 10 CFR 50, Appendix B, Criterion VI, that there be adequate control of design documents.

Q.3. What are the "unincorporated design changes" referred to in this statement from the CAT Inspection Report?

A.3. As construction work proceeds, it is sometimes necessary to resolve a field installation problem by modifying a design specified in a Sargent & Lundy drawing or specification. Such modifications may be approved by revising the applicable drawing or specification. However, when more expeditious approval of a design change is required, it is approved and issued to the field by means of design change documents separate from the design documents described above. The "unincorporated design changes" referred to in the CAT Inspection Report are design changes approved by means of these design change documents.

These documents include Field Change Requests (FCRs), Engineering Change Notices (ECNs) and Field Change Notices (FCNs). FCRs are a CECo design change document generally originated in the field by CECo or contractor personnel and approved by both CECo and S&L. ECNs are an S&L design change document originated in the field or S&L's Chicago office and approved by S&L. FCNs are a Westinghouse Electric Corporation (the Nuclear Steam Supply System vendor)

change document originated and approved by off-site Westinghouse personnel. FCRs, ECNs, and FCNs serve the function of transmitting approved design change information to the field installation forces in an expeditious manner prior to formal revision of the appropriate design documents by Sargent & Lundy. Before this formal revision, the changes approved via FCRs, ECNs and FCNs are "unincorporated" design changes.

Q.4. Why are unincorporated design changes annotated on controlled design documents?

A.4. Design documents used for the fabrication, installation and inspection of safety-related components systems and structures are subject to the document control requirements of 10 CFR 50, Appendix B, Criterion VI. Criterion VI requires that properly approved design documents, including changes and revisions thereto, be available at the appropriate location(s) for construction and inspection activities. This ensures that installations will be performed and inspected to the most current approved design information.

The prevalent method of controlling unincorporated design changes at the Braidwood site is to note the control number of the FCR, ECN or FCN on the design documents that are affected by the design change. This method provides a visual indication to anyone using the controlled design document that certain unincorporated design changes are outstanding against that particular document.

Q.5. What methods are utilized to ensure that unincorporated design changes are controlled in a correct and consistent manner?

A.5. In accordance with 10 CFR 50, Appendix B, Criteria VI (Document Control and V (Instructions, Procedures and Drawings), each contractor at the Braidwood site performing safety-related installation, fabrication or inspection activities has developed and implemented, or is subject to, document control procedures. CECo also has developed and implemented similar procedures to control copies of design documents for CECo internal usage. These document control procedures assure that design documents used for construction and inspection (drawings, specifications, etc.) and unincorporated design changes (ECNs, FCRs and FCNs) represent the most current design information.

Among these procedures are procedures which require the annotation of unincorporated design changes on controlled design documents, as discussed above. The NRC CAT Inspection reviewed a large number of contractor and CECo document control procedures. Included in that review were the following procedures that require annotation of unincorporated design changes:

- CECo PCD-02, "Engineering Change Notices", Rev. 0, May 24, 1984
- CECo PCD-03, "Field Change Request", Rev. 0, June 15, 1984
- PGCo Construction Procedure (PGCP) 1.1, "Control of Engineering Change Notices (ECN), Field Change Notices (FCN), Field Change Requests (FCR) and Field Problem Reports (FPR)", Rev. 9, May 31, 1984

- Phillips, Getschow Co. (PGCo) QCP B-29, "Document Control", Rev. 2, October 31, 1984

- Gust K. Newberg Construction Co. (GKN) Quality Assurance Manual (QAM) Section IV, "Document Control", Rev. 4, October 3, 1984

- GKN QCP Section 4, "Specification Control", Rev. 4, October 4, 1984

- GKN QCP 33, "Design Change Control", Rev. 5, October 25, 1984

- L.K. Comstock & Company, Inc. (LKC) Procedure 4.2.1, "Document Control", Rev. F, October 12, 1984

- Pullman Sheet Metal Works Inc. (PSM) Quality Assurance Program (QAP) Section B6.1.F, "Document Control", Rev. 2, September 9, 1983

- PSM Procedure B3.1.F, "Design Control", Rev. 4, December 2, 1983

Gust K. Newberg (GKN), the structural contractor, uses a different procedure to control design documents. Instead of annotating unincorporated design changes on the design documents, GKN's procedure requires that such unincorporated design changes be identified on a separate list, a copy of which is maintained at each GKN document control station.

As noted, the CAT Inspection reviewed the procedures listed above. It also reviewed the GKN procedure described above. The CAT Inspection Report identified no deficiencies in these procedures.

Q.6. What measures are taken to insure the adequacy and proper implementation of Commonwealth Edison Company and site contractor document control procedures?

A.6. Proper implementation of Commonwealth Edison Company and site contractor document control procedures is insured in part by training of appropriate personnel involved with issuance and control of documents. In addition, in accordance with 10 CFR 50, Appendix B, Criterion XVIII, implementation of these document control procedures used by the various site contractors is reviewed by internal site contractor Quality Assurance and/or Quality Control audits and/or surveillances of actual documents in field and office locations. In addition, Commonwealth Edison Quality Assurance performs periodic audits and surveillances of document control activities. All these audits and surveillances verify that contractor procedures are adequate and are being effectively implemented.

During the CAT Inspection, the NRC team reviewed CECo and contractor QA audit and surveillance reports concerning the distribution and control of design documents and design changes for findings, trends and corrective actions. The CAT Inspection Report noted no deficiencies concerning these audit and surveillance activities.

Q.7. What deficiencies did the CAT Inspection Report identify concerning the requirement that unincorporated design changes be annotated on controlled design documents?

A.7. The CAT Inspection identified two general deficiencies in this area based on the actual review of approximately 180 controlled contractor and Commonwealth Edison Project Construction Department documents.

The majority of the deficiencies noted involved the annotation of ECNs or FCRs on controlled drawings after these ECNs or FCRs had in fact been incorporated into drawing revisions.

In a very limited number of cases (three drawings out of approximately 180 drawings reviewed), ECNs or FCRs that represented design changes which were unincorporated on drawings were not properly annotated on the appropriate drawings as required by contractor and Commonwealth Edison Company (CECo) procedures.

Q.8. What is the potential impact of the deficiencies identified by the CAT Inspection in the area of annotation of unincorporated design changes on controlled documents?

A.8. For the sake of clarity, the two general deficiencies identified by the CAT Inspection in the area of annotation of unincorporated design changes on controlled drawings will be considered separately.

The annotation of ECNs and FCRs on controlled documents after these ECNs and FCRs have been incorporated into drawing revisions, although a violation of contractor or CECo document control

procedures, does not have any impact on the quality of plant construction or inspection since, in this situation, redundant information is being noted on the documents.

The cases identified where unincorporated ECNs and FCRs were not noted on controlled drawings are not considered to have substantial safety impact based upon the following reasons:

(a) The total number of controlled drawings identified by the CAT Inspection as not having properly annotated ECNs or FCRs was small compared to the total sample reviewed. The CAT Inspection Report, 84-44/40, indicates that approximately 180 contractor and CECo controlled documents were reviewed. Of these, only three documents were found not to have applicable ECNs or FCRs annotated on them.

(b) The three cases noted by the CAT Inspection where ECNs or FCRs were not annotated on the appropriate documents did not represent a total disregard of procedural requirements. In one case, FCR-L-13419 was not annotated on S&L drawing 20E-0-3091H01, Rev. E, at L.K. Comstock Document Station 28. The FCR was listed, however, on the appropriate Document Master Card. This fact indicates that the L.K. Comstock document control procedural requirements were partially executed. Therefore, the item identified by the CAT Inspection did not result from disregard of procedural requirements but rather from an isolated personnel oversight.

In the other two cases, two ECNs, 23416 and 23486, were not annotated on Commonwealth Edison Company Project Construction Department's controlled copy of drawing 20E-0-3237E, Rev. A. It was determined and subsequently documented in the CAT Inspection Report that this situation occurred due to a misunderstanding of a note on the ECNs. This situation did not represent a disregard of Commonwealth Edison Company document control procedure requirements. Rather, this condition resulted from the misinterpretation of notes unique to the ECNs involved and appears to be an isolated case.

These two cases involving CECo document control would have had no impact on construction or inspection activities because CECo as an organization performs no installation or in-line inspection activities. Contractor personnel do not perform installation or inspection activities to controlled documents in the CECo office.

Q.9. Are there any additional reasons why a failure to correctly annotate unincorporated design changes is unlikely to impact field installations?

A.9. Yes. In the vast majority of cases, design changes are made at the request of the installing contractor to resolve a field interference, provide component access or resolve some other field installation problem. Problems, conflicts and items requiring clarification identified by the contractors in the approved design

documents are forwarded to S&L for resolution. When resolution requires a design change, an FCR, ECN or drawing revision is prepared and issued to the contractor. Hence, the contractor performing the installation work is constrained to performing the installation to a design change document such as an ECN, since the design change document was requested by the contractor to make the installation practical and/or possible. Because of this need for a design change in order to make a particular installation practical and/or possible, it is expected that the contractor will perform the particular installation to the requested design change even in the unlikely event that the design change was not annotated on the appropriate drawing as required by contractor procedures. There is no safety impact in this situation when contractor document control procedures may not have been completely implemented (eg. a requested design change not annotated on the appropriate drawing), since the personnel performing the work in the field are required to have the design change document in order to perform the installation.

FCR L-3419, identified in the CAT Inspection Report, was written to suit field conditions as noted on the FCR. This FCR changed the dimension and details of a particular electrical hanger to suit field conditions in order to permit hanger installation. ECNs 23416 and 23486, the other design changes identified in the CAT Report, were written to resolve L.K. Comstock Nonconformance Reports 3042, 3043 and 3211. These ECNs provided special details to resolve field nonconformances for cable pan installation.

A second level of review that can verify that work has been installed to the latest design information, including unincorporated design changes, is implemented during Quality Control inspection activities. All safety-related work activities performed by Braidwood site contractors are subject to appropriate Quality Control inspection. This provides an opportunity to verify that the installed hardware has been installed to the latest design information. In addition to this first line Quality Control inspection, CECo site Quality Assurance performs various direct overview inspections of a sample of site contractors' completed installations (including Quality Control inspection). This provides a further, independent, verification of completed installations against current design documents.

Q.10. Are there any post-installation activities that may identify problems concerning unincorporated design changes?

A.10. Several site contractors perform a final document review on work and/or inspection documentation after the work is completed in the field. This final document review provides still another check to ensure that work was performed to the most current drawing and any applicable design changes which may not have been incorporated in the drawing.

Q.11. What was the overall CAT Inspection assessment of the area of annotation of unincorporated design changes on controlled documents?

A.10. As a result of the comprehensive reviews performed by the CAT Inspection, no significant deficiencies were noted in the area of unincorporated design change annotation on controlled drawings. As noted above, the CAT Inspection found no deficiencies in CECo or contractor document control procedures. The CAT Inspection also found no deficiencies in the CECo and contractor audit and surveillance programs in this area. Furthermore, the CAT Inspection Report recognized that the majority of deficiencies identified in these audits and surveillances were of a non-significant nature. The review of approximately 180 site contractors and Commonwealth Edison Company documents by the CAT inspectors resulted in the identification of three situations where FCRs or ECNs were not annotated on controlled drawing copies. The objective evidence documented in the CAT Inspection Report indicates that the appropriate procedural requirements were, for the most part, being implemented and that the lack of annotation of the ECNs and FCRs on the drawings was due to isolated personnel error or misjudgment. The actual field installation relating to five ECNs and FCRs was reviewed during the CAT Inspection and no hardware deficiencies were identified.

In conclusion the CAT Inspection Report stated: "For the sample inspected, the control of design documents is generally adequate." Although some minor deficiencies were found in the annotation of ECNs and FCRs on controlled documents, the CAT

Report neither identified this area as a potential enforcement item in Appendix B of the report nor as a specific area requiring additional management attention in Appendix A of the report.

Q.11. What actions have been taken to enhance the control of unincorporated design changes?

A.11. In order to further enhance the control of unincorporated design changes, Commonwealth Edison Company is developing a computerized data base of outstanding design changes. This data base is presently available in the Commonwealth Edison offices and will be made available to site contractors in the near future. This computerized data base will provide frequent information updating as well as convenient and accurate access to unincorporated design changes.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF KENNETH T. KOSTAL
(on Rorem Q.A. Subcontention 5.A)

Kenneth T. Kostal, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

____
Kenneth T. Kostal

Subscribed and Sworn before me
this ___ day of December 1985

____
Notary Public

My Commission expires on_______.

6595N

TESTIMONY OF KENNETH T. KOSTAL
(ON ROREM Q.A. SUBCONTENTION 5.A)

Q.1. To which contention item is this testimony addressed?

A.1. QA Contention Item 5.A. The text of this contention item reads as follows:

> The NRC CAT inspection concluded that in the area of [control of design documents] the most significant finding was the failure to annotate unincorporated design changes on controlled design documents. The most significant finding in the area of design change control was design change documents written against superseded revisions of the approved design drawings. In at least one instance, this deficiency resulted in a pipe support being installed and inspected to other than the latest approved design. (CAT Inspection Report 84-44/40, Exh. 10.)

(I have added the words in brackets to clarify an apparent clerical error in both the contention item and the CAT Inspection Report.)

The details of the CAT inspection with regard to this observation are found in Chapter VII of CAT Inspection Report 84-44/40. The first part of the above-quoted language, which refers to control of design change documents, is directed at site construction activities and not at Sargent & Lundy's (S&L's) design practices. The second part of the statement, which refers to design change control, is directed at S&L's design practices. This testimony addresses only the second issue.

Q.2. What were the "design change documents" written against superseded revisions of design drawings referred to in the CAT Inspection Report?

A.2. The reference in the CAT Inspection Report is to design control documents known as Engineering Change Notices (ECN's). ECN's were used to make changes to original design drawings. The particular ECN which gave rise to the CAT Inspection Report finding related to installation of large bore pipe supports.

Initial system design drawings for systems such as piping, HVAC, and electrical systems cannot and do not completely take into account the fact that these systems must be installed to fit already constructed conditions and that designs will necessarily evolve as installation proceeds. Designers use ECN's to make necessary changes as installation proceeds.

For piping systems, there are several situations which trigger issuance of ECN's. The vast majority of ECN's, perhaps 95%, are written because the contractor encounters a field installation problem which requires a design change. For example, original piping hanger design drawings are issued with certain tolerances for the various parameters, including location, used to specify pipe hanger design. The design drawing tolerances do not anticipate all field conditions encountered during installation which may require the particular hanger to exceed tolerances. One such installation condition would be an interference with another system. The contractor issues a field change request, and S&L's site engineering office reviews the field change request and issues an ECN to resolve the field installation problems.

Occasionally also S&L engineers will develop a redesign for a hanger not responsive to an installation problem but simply to improve the constructability of a design. S&L site engineering issues an ECN for this type of design change. Finally, ECN's are used to disposition nonconformance reports covering unintended deviations from design documents during construction. In this instance S&L site engineering analyzes nonconforming conditions to assure that they fall within design requirements and issues an ECN to document the approval of the as-built condition.

Q.3. Into what category did the ECN which the CAT inspectors discovered was issued against a superseded revision fall?

A.3. All of the ECN's which are the subject of this testimony were generated in response to field change requests.

Q.4. How does S&L engineering assure that overall piping system and subsystem design intent continues to be met, given the amount of detailed engineering which is done in the field through ECN's?

A.4. S&L assures that original design criteria continue to be met by hardware changes and analysis. Piping system routing design contains guidelines for installation geometry, including dimensions, bend radius, and the like. Routing changes in the field sometimes require violation of these guidelines. Such subsystem changes require reanalysis to assure that the as-built condition of the piping system continues to comply with overall design requirements.

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Field problems with hanger installation may or may not require reanalysis of the piping system. Hanger designs also provide for tolerances on dimensions, differences in hardware components, and locations. If a hanger is installed outside these tolerances, the responsible engineer performs a manual stress calculation to determine whether the deviation has any deleterious effect on the adjacent hangers. If this hand calculation shows that loads on adjacent hangers are unacceptably high, the engineer may either strengthen the adjacent hanger or designate the subsystem for reanalysis. The purpose of the reanalysis would be to show that a more precise load calculation indicates that the as-built configuration is acceptable without hardware changes. Such reanalyses are relatively rare.

Q.5. How are pipe hanger design changes made via either ECN's or reanalyses normally made known to construction personnel?

A.5. The ECN process is controlled by Sargent & Lundy's Quality Assurance Procedure GQ 3-13, "Engineering Change Notices." When Sargent & Lundy site engineering issues an ECN, that document contains an interim approved design drawing for use in the field. Periodically ECN interim drawings are incorporated into a new revision of the record design drawing maintained at Sargent & Lundy's home office in Chicago. Once a month, Sargent & Lundy publishes its Support Information Management Systems (SIMS) Report, which notifies all field personnel of all drawing revisions, including those triggered by ECN's which have become effective during the preceding month. S&L Field personnel must

check the SIMS and the Field Office ECN index to find more recent drawing revisions issued against a record drawing to assure that they are working with the most up to date drawing.

Q.6. How are piping system design changes initiated by ECN and design changes initiated by reanalysis normally integrated?

A.6. Installation of each piping subsystem proceeds using ECN's for pipe hanger and other changes as necessary. However, in some cases a field change necessitates a reanalysis of the subsystem to assure that design criteria remain satisfied. If such a reanalysis requires changes in design for portions of subsystems, revised drawings are issued incorporating the changes due to reanalysis. These revised drawings are listed in SIMS to assure that field personnel are notified. Further ECN's must use the revised drawings as a benchmark.

When a reanalysis for a subsystem is underway, the subsystem is listed on the Reanalysis List, which is formally published every two weeks. S&L procedures governing use of ECN's called for the engineers processing requests for ECN's to determine whether reanalysis was in process, and if it was, not to issue ECN's until the reanalysis had been completed and revised drawings were available. However, this procedure did not <u>explicitly</u> call for a hold on ECN's during reanalysis.

Q.7. What circumstances led to the instance of S&L site engineering issuing an ECN prompted by a field change request against a superseded design drawing as noted in the CAT Inspection Report?

A.7. In January of 1984, when as-built drawings of piping subsystems began to come in, it became apparent that a substantial volume of piping system reanalysis would have to be performed. S&L determined that reanalysis for piping systems should be performed at its home office in Chicago. Piping subsystem reanalysis did not actually begin, however, until July, 1984.

While this reanalysis program proceeded, construction continued, including construction on subsystems undergoing reanalysis. S&L's Engineering Change Notice procedure required drawings updated from a reanalysis to be used when issuing a subsequent ECN for a field modification. However, engineers in S&L's field engineering office at Braidwood were attempting to resolve field installation problems with respect to pipe supports in certain systems which were concurrently undergoing reanalysis in Chicago for which revised drawings had not yet been issued. Since reanalysis was being done at a different location from site engineering, an opportunity for an oversight arose, and in a few cases engineers generated new ECN's without communicating with S&L's Chicago office to determine whether any reanalysis drawing changes were being processed for the supports which were the subject of the proposed ECN.

Q.8. What action did S&L take to determine the extent of the discrepancy identified in the CAT Inspection Report?

A.8. S&L reviewed all drawings issued for construction on the 1,275 pipe supports in the subsystems reviewed for reanalysis in

S&L's Chicago office between July 1984, when reanalysis began, and December 20, 1984, when the CAT inspection identified the problem, against the monthly ECN Index and Status Report maintained downtown and against the field ECN index, updated daily, to identify any supports for which ECN's might have been issued against superseded revisions of the drawings. Out of the 1,275 supports in subsystems reanalyzed during this period, S&L identified a total of seven support drawings, including the instance identified by the CAT inspectors, where ECN's were issued against superseded revisions of the support drawings because of the reanalysis effort.

Q.9. Is this a significant number of discrepancies?

A.9. No. There are approximately 528 large bore piping subsystems utilizing over 14,000 large bore pipe supports in safety-related structures at the Braidwood Station. In addition, the number of hangers in the population of reanalyzed subsystems was 1,275. This rate of discrepancies indicates that the seven cases were isolated instances.

Q.10. Were the discrepancies identified in the seven cases significant?

A.10. No. The differences between the drawings and the ECN's were not significant and no hardware changes were necessary. The most recent revisions of the drawings were subsequently revised to incorporate the ECN's.

Q.11. Are there other systems in which this problem could have occurred?

A.11. No. The other major systems in which substantial custom installation is performed are HVAC and electrical conduit/cable. For these systems, engineering control has always remained totally under site engineering, and no reanalysis was done at S&L's home office in Chicago. Thus, the situation of design revisions occurring in one location by one organization while other changes are being made in the field by another simply has not occurred: site engineering controls all design changes and drawing revisions for these systems. Thus the problem cannot occur.

Q.12. Would the discrepancies identified by the CAT Inspection Report have been identified prior to system turnover by S&L?

A.12. Yes. Procedures PI-BB-63 and BRFI-26, existing at the time of the NRC CAT inspections, would have identified these supports subsequent to support installation and inspection. S&L's Project Instruction PI-BB-63 requires that S&L review the information contained in the piping installation contractor's Close-Out Letters issued by the piping installation contractor for each piping subsystem. Included in the letter is a "Subsystem Close-Out Listing of Component Support Completions." This document lists each piping support installed in that subsystem along with the drawing revision and any ECN's used to install each support.

As required by BRFI-26, "Braidwood Field Instruction for Subsystem Close-Out," S&L prepares a "Support Close-Out Review Form." This prepared, reviewed and approved document compares the installed

support drawing revision to the current drawing revision level. It also compares ECN's used for support installation to current ECN's issued. The discrepant revision levels between ECN's and the latest support drawing revisions would be identified during the preparation of this document. Furthermore, in the process of incorporating the ECN on the support drawings, the preparer and/or reviewer would have noted the discrepant revision levels.

Q.13. Was this finding of the CAT Inspection Report cited as a violation of any of the criteria of Appendix B to 10 CFR Part 50 by the CAT inspectors?

A.13. No. This item was not cited as a violation. In fact, the CAT inspectors apparently did not consider it serious because it was not listed among the items to be considered for potential enforcement action in Appendix B of the same report. Furthermore, it was not even regarded as significant enough to be included among the items requiring additional management attention in Appendix A of the report.

Q.14. Do the seven items identified indicate that the S&L design change control system was not working properly?

A.14. No. The S&L design control system functioned properly in all but a handful of cases which arose in extreme circumstances.

Q.15. Has S&L taken steps to preclude the recurrence of the discrepancies of the type identified in the CAT Inspection Report?

A.15. Yes. In December 1984, S&L implemented wording changes in the applicable procedure to minimize the recurrence of this type of isolated discrepancy. S&L's "Braidwood Field Instruction for

Resolution of Hanger Field Problems," BRFI-4, was revised to explicitly establish a system to identify support drawing revisions prior to the monthly issuance of the S&L Support Information Management System Report. The required steps in field problem resolution now include review of subsystems being reanalyzed and, where support drawings have not been issued, the field problem resolutions are explicitly placed on hold until receipt of the revised drawing.

CONTENTION ITEM 5.B

Rorem QA Contention Item 5.B states in pertinent part:

5. Contrary to Criterion III, "Design Control," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to establish measures to assure that applicable regulatory requirements and design bases are correctly translated into specifications, drawings, procedures, and instructions including provisions to assure that appropriate quality standards are specified in design documents and that deviations from such standards are controlled. Applicant has also failed to require that measures are established for the identification and control of design interfaces and for the 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 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.

B. Repairs to coatings by Midway Industrials in the Unit 1 and 2 containments were performed utilizing a coating system not qualified for the Design Basis Accident in accordance with Section 5 of ANSI N101.2 (1972). (Inspection Report 85-15, Exh. 17.)

STATEMENT OF MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE

1. Portions of the steel containment liners and related auxiliary items such as equipment hatches on the insides of the Braidwood Unit 1 and 2 containments are coated with safety grade coating systems. Midway Industrial Contractor, Inc. (MIC) was responsible for installing the coating systems. The original coating installation took place in 1978. (Leigh Affidavit at p. 2.)

2. Two distinct but related coating systems are used in different areas of each containment. The most extensive area is covered with a single coating system consisting of a layer of inorganic carbolere-zinc primer (CZ-11) applied over bare metal. The less extensive coating consisted of a dual coating system utilizing a layer of CZ-11 primer over bare metal plus a layer of organic (epoxy-like) phenoline finish coat applied on top of the primer. (Kostal Affidavit at pp. 3-4)

3. The total amount of coated area in each containment, counting both single coating and dual coating system, is about 100,000 square feet. The total amount of coated area covered by the dual coating system is about 26,000 square feet per containment. (Kostal, pp. 5,7))

4. Under NRC regulatory requirements, coating systems must be designed to withstand the conditions of a design basis accident (DBA) without unduly degrading the performance of plant fluid systems. It is sufficient for this purpose if a coating system meets the requirements of ANSI Standard N101.2. (Kostal, pp. 2-3)

5. ANSI N101.2 requires that each coating system be qualified to the DBA. In practice, qualification is achieved by testing "coupons," i.e., sample metal substrates with the coating system applied as it will be in the field, to DBA ambient conditions. The coating system passes if the test coupon after exposure is compared to certain photographs of coating degradation in the applicable ASTM standard and shows degradation no more severe than that in a particular photograph. (Kostal, p.2)

6. Metal surface preparation is an important element of a coating system. Each coating method must be requalified for different metal preparation methods. The single coating system consisting of CZ-11 primer alone over bare metal was qualified over a metal surface prepared by sandblasting and over a metal surface prepared by power tool grinding. The dual coating system consisting of a CZ-11 primer coat covered with a phenoline-305 top coat was qualified in accordance with ANSI N101.2 only over a sandblasted metal surface. (Leigh Affidavit, at p. 2; Kostal Affidavit at pp. 3-4)

7. The applicable procedure for the application of coating systems was MIC procedure QCP-3. This procedure fully carried into effect the requirements of N101.2 by requiring that the dual coating system, CZ-11/Phenoline-305, be applied only over sandblasted metal surfaces. (Leigh Affidavit at p.2)

8. Containment liners were installed by first erecting 30 foot by 10 foot segments of liner plate into place, then welding them together. The 30 foot by 10 foot plates were sandblasted and coated with CZ-11 primer in the fabrication shop prior to erection, except that a narrow strip along each edge was left free of primer for welding. The plates were then welded together. (Leigh Affidavit at pp. 2-3)

9. After welding, the narrow, uncoated strips along each weld had to be coated with primer. However, by this time the weld strips had spots of weld spatter, small rust blooms, and occasional sharp edges. MIC personnel used a power tool to grind off these minor imperfections before applying the CZ-11 but did not re-sandblast the affected areas. (Leigh Affidavit at pp. 2-3)

10. Because the areas in question were to have a finish coat of Phenoline-305, the grinding of the affected areas without re-sandblasting created a situation in which the spots over which the dual coating system was applied on ground surfaces were not properly qualified in accordance with ANSI N101.2. (Kostal Affidavit at pp. 3-4)

11. ANSI N101.4 deals with Quality Assurance requirements for the application of coating systems in accordance with N101.2. N101.4 requires, inter alia, that surface preparation methods be properly inspected for conformity with the requirements specified in the application procedure. (Kostal Affidavit at pp. 2-3)

12. A Midway Level II Quality Control Inspector thoroughly inspected the removal of weld spatter, rust bloom, and sharp edges from the weld seams and the application of CZ-11 to them. However, he failed to note that this preparation and application was not in accordance with MIC QCP-3. This failure appears to have been an error in judgment occasioned by the fact that the weld spatter touch up was part of the ongoing coating application program and not a distinct repair activity. (Kostal Affidavit at pp. 4-5)

13. MIC issued NCR Nos. 23-26 to document the nonconforming condition. The MIC review of documentation associated with the preparation of these NCR's ascertained all affected areas. All of these areas were inspected by the same QC inspector. (Kostal Affidavit at p.5)

14. S&L engineers reviewed MIC field documentation to ascertain the location and extent of the unqualified coatings. S&L determined that the maximum potentially affected area was 127 square feet per unit out of over 26,000 square feet of dual coated area and 100,000 square feet of total coated surface. (Kostal, p.5)

15. The MIC Quality Control Supervisor independently developed information regarding the number of hours spent in surface preparation to ascertain the extent of the problem. His analysis roughly corroborated the S&L finding. (Kostal, p.6)

16. Applicable regulatory requirements allow for the existence of some unqualified coatings in containment. Perfection is not required. In particular, ANSI N101.4 provides for documentation for compiling a coatings exception list. The coatings exception list permits the totality of unqualified coatings in containment to be evaluated for acceptability in the light of the purposes of qualification. Edison has developed a coatings exception list and the areas relevant to this issue are on it. (Kostal, pp. 7-8)

17. The NRC Staff has accepted placement of the affected areas on the coatings exception list as adequate corrective action for this problem. (Kostal Affidavit at p.8)

18. MIC has created a coating repair procedure which deals explicitly with this problem. It sets forth different qualified coating systems for application to small repair areas. (Kostal, p.9)

19. The amount of unqualified coating due to the surface preparation problem is insignificant. The purpose of qualifying the coating system with a particular surface preparation method is to control adhesion and prevent delamination. If a coating were to delaminate in large pieces or sheets in large quantities after exposure to DBA conditions, it could clog the strainers of fluid systems necessary to control post-accident conditions in the plant. Proper surface preparation controls adhesion of the coating and prevents delamination. (Kostal, pp. 5-6)

20. The amount of unqualified coating at issue herein is miniscale in relation to the total coated surface and will not adversely affect the operation of fluid systems under post-accident conditions. (Kostal, p.6)

21. The failure mode of the dual coating system supports this conclusion. DBA tests indicate that failures occur through blistering, not delamination. A blistered coating will for the most part remain in place, with at most minor flaking which will not clog fluid systems. (Kostal, p.6)

22. The QA failure in this instance, namely the failure of the QC inspector to note the nonconforming condition, had nothing to do with design or design control. The requirements of ANSI N101.2 were properly incorporated into MIC QCP-3. The failure was one of implementation. (Kostal Affidavit, p. 9.)

DISCUSSION

The problem of unqualified coating in the containments arose because of the QC inspector's lack of awareness that he had observed a nonconforming condition. The containment liner coating system had to be qualified to ANSI N101.2 to assure that not so much of the coating system would delaminate under post DBA conditions as to create clogging of fluid system strainers. The liner coating system was in fact properly qualified. However, when small areas of the liners adjacent to welds were reworked, unqualified spots were created. The QC inspector, although he performed a thorough inspection, failed to note that the preparation he observed was nonconforming.

This failure occurred in the course of a large coating installation. The liner plates were delivered from the shop precoated with primer and pre-sandblasted in the proper way. After the bare liner plate edges were welded together, workers removed weld spatter and other minor imperfections with a power tool but did not re-sandblast the affected surfaces before coating. Because the spots were eventually coated with a dual coating system, the coatings on those spots became unqualified.

The amount of area affected is miniscule in comparison to the total affected surface. Any failure of these coated spots is unlikely to create significant strainer clogging, both because of the small amount and because the failure mode is blistering and flaking, not delamination.

The NRC accepts some unqualified coating in containment. Edison compiles a coatings exception list to provide a basis for judgment about the total of unqualified coating. The NRC Staff accepted placement of the affected areas on the coatings exception list as adequate resolution of this nonconformance.

The coatings problem was not a design flaw. ANSI N101.2 was properly translated into MCI QCP-3. The problem was one of improper execution and inspection.

The inspection problem was an isolated instance. It was limited to one inspector and to circumstances unlikely to re-arise. Moreover, MIC has instituted coating repair procedure QCP-3A which would preclude recurrence of similar problems. Under these circumstances, the failure was an isolated occurrence with no implications for other coating applications. Corrective action did not require repair, but simply listing on the coatings exception list. Moreover, the inspection lapse had nothing to do with design, since standards were properly translated into procedures. Under these circumstances, this item is not indicative of any generic QA failure, nor is it in any event indicative of a lack of proper design control. There remains no genuine issue of material fact. Edison is therefore entitled to summary disposition as a matter of law.

TESTIMONY OF KENNETH T. KOSTAL
(ON ROREM Q.A. SUBCONTENTION 5.B)

Q.1. To which contention item is this testimony addressed?

A.1. QA Contention Item 5.B. The text of this contention item reads as follows:

> Repairs to coatings by Midway Industrials in the Unit 1 and 2 containments were performed utilizing a coating system not qualified for the Design Basis Accident in accordance with Section 5 of ANSI N101.2 (1972). (Inspection Report 85-15, Exh. 17.)

Q.2. To what coating repairs does Inspection Report 85-15 refer?

A.2. The Inspection Report refers to the application of a small amount of containment liner coating material on metal surfaces from which welding spatter had been removed with a power tool. The small amount of metal surface in question was not re-prepared with sandblasting as required by the applicable coating application procedure. The Testimony of Richard Leigh describes the circumstances under which this failure to sandblast occurred.

Q.3. What are the regulatory requirements for containment liner coatings?

A.3. The basic regulatory requirements for containment liner coatings are referenced in the NRC's Standard Review Plan (SRP), Section 6.1.2. (NUREG 0800 (formerly 75/087), Rev. 2 (July 1981). According to the SRP, coating systems are to meet ANSI Standard N101.2 (1972) and the regulatory positions of Regulatory Guide 1.54. Regulatory Guide 1.54 in turn deals with the application of

the specific quality assurance requirements of ANSI N101.4 (1972) to the technical requirements of ANSI N101.2.

Q.4. What does ANSI N101.2 require?

A.4. ANSI N101.2 "Protective Coatings (Paints) for Light Water Nuclear Reactor Containment Facilities," requires that coatings within containment be qualified to Design Basis Accident (DBA) conditions. Such qualification is established by performing laboratory tests which simulate DBA conditions on each coating system. N101.2 requires that a test coupon be exposed to DBA conditions and then compared to ASTM coating standard. The coupon must compare favorably with the requirements defined in the ASTM standard.

Q.5. What does ANSI 101.4 require for quality assurance for coating systems?

A.5. ANSI 101.4 is designed to be the basis for quality assurance for coating systems. Its purpose is to set forth all planned and systematic actions necessary to assure that coated surfaces are in compliance with specifications and that compliance can be documented. This standard covers requirements for materials, surface preparation, application of the coating system, inspection requirements, and documentation. The principal requirement of ANSI 101.4 relevant to this issue is set forth in section 4.2 of that standard, which calls for inspection methods to determine that surface preparation is in accordance with the requirements of

N101.2. Section 6.8. 2 of N101.4 also requires that significant deviations be recorded on a coating exception record. Section 7.7.3 provides for a Coating Work Exception Record.

Q.6. Did the nonconfirming conditions identified in Staff Inspection Report 85-15 violate ANSI N101.2?

A.6. Yes. Recoating of weld spatter areas in the Braidwood Unit 1 and 2 containments performed by Midway Industrial Contractors in 1978 and 1979 were performed with a surface preparation method in conjunction with a metal surface system which had not been qualified together in accordance with ANSI N101.2.

Q.7. Why is this important?

A.7. As SRP Section 6.1.2 indicates, one of the principal purposes of qualifying coatings to ANSI N101.2 is to control the amount of solid debris from the deterioration of coatings after a postulated DBA which can clog fluid system strainers and thereby degrade operation of those systems in a post-accident environment. The qualification of the metal surface preparation method relates directly to this purpose since it concerns adhesion and the prevention of delamination of the coating.

Q.8. What was the problem with coating application at Braidwood that gave rise to the NRC finding in Inspection Report 85-15.?

A.8. Certain local spots of the liner coating had welding spatter removed from the steel surface with a power tool after initial application of the coating system. The surface was then recoated

with the containment liner coating system but without again sandblasting the metal surfaces in accordance with initial installation procedure.

Q.9. Why were these coating repairs identified as being in noncompliance with ANSI N101.2?

A.9. The coating system involved consists of two parts: an inorganic zinc-rich prime coat and an organic resin finish coat. DBA tests had been performed for power tool surface preparation in conjunction with the zinc primer coat alone. DBA tests had also been performed for a surface prepared by sandblasting in conjunction with the two-part system consisting of the zinc primer coat and the organic finish coat. However, the tests had not been performed for the two-part system applied over a power tool cleaned surface. Therefore, application of the finish coat over the primer coat on a power cleaned surface constituted a noncompliance with the requirements of ANSI N101.2.

Q.10. Did this problem involve a violation of quality assurance requirements?

A.10. Yes. Midway Industrials' coating application procedure clearly specified that the only allowed surface preparation method for the dual coat system was sandblasting. The cognizant Quality Control Inspector inspected the application and noted the correction of the weld spatter with a power tool and the spot application of the dual coating system over ground surfaces without further sandblasting. Yet he failed to properly report this application as a nonconforming condition.

Q.11. What was the reason for this failure?

A.11. The inspection records indicate that the correction of the weld spatter problem was part of the ongoing coating installation as opposed to a separate repair activity. The QC inspector appears to have erred in judgment in deeming the affected areas to be negligible when determining whether they were nonconforming.

Q.12. What actions were taken by Midway Industrial Contractors as a result of the nonconforming condition identified in Inspection Report 85-15?

A.12. Midway Industrial Contractors, Inc. generated NCR's Nos. 23, 24, 25, and 26 in the spring of 1985 to document this nonconforming condition. Midway's review of quality control documentation as part of the preparation of these NCR's identified all areas where the two-part coating system was applied over a power-tooled surface. All affected areas had been inspected by the same QC inspector.

Q.13. Is the nonconforming coating identified in Inspection Report 85-15 significant, in your judgment?

A.13. No. S&L engineers reviewed a field documentation review of Midway Industrial Contractors QC documents to determine the extent and location of the unqualified coatings during the month of October 1985. This review determined the maximum amount of area potentially affected to be 127 square feet per unit out of over 26,000 square feet of containment liner per unit coated with the two part system. There is a total of 100,000 square feet of coated surface in each containment.

NRC regulatory requirements as referenced in SRP Section 6.1.2 clearly contemplate the existence of some unqualified coatings in the containment. The important question is whether enough coating will deteriorate under DBA conditions and generate enough solid debris to fall into the containment sump and adversely affect the performance of post-accident fluid systems.

There are no hard and fast criteria by which this judgment can be made. However, in my engineering judgment, the amount of coating at issue in this testimony is miniscule and will not adversely affect the operation of fluid systems under post accident conditions.

Q.14. How was the determination of affected area made?

A.14. In order to disposition Midway NCRs 23, 24, 25 and 26, a CECo engineer in the System Materials Analysis Department determined the extent and location of the unqualified coatings. As a basis for this determination, a former Midway Level III coating inspector, who had been present during the repairing for weld spatter at the joining surfaces of panels documented his understanding of the procedure used. To conservatively account for this understanding, a calculation was performed to determine the area which could potentially have been affected by this repair process. This calculation addressed the entire population of weld seams where these repairs were made. We believe this was a conservative calculation since only spot repairs were performed in the proximity of the weld seams.

This conservative calculation determined the potential area affected to be 127 square feet per unit. This estimate was confirmed by a review of QC documents performed by the Midway QA Manager. This is a very small area in comparison with the over 100,000 square feet of coated containment liner per unit or the approximately 26,000 square feet per unit coated with the dual coating system.

The failure mode of unqualified dual system coating gives me added confidence in this conclusion. If it were the case that unqualified containment coating failed by delamination, that is, by having big sheets break loose, strainer clogging would be a potential threat. However, DBA tests showed that for the CZ-11/Phenoline 305 coating system, unqualified coating surfaces failed by blistering as opposed to delamination, with at most minor flaking for all surface preparation methods observed. Thus the coating by and large stays in place but develops bubbles and small particles. This failure mode minimizes the potential for clogging of strainers.

Q.14. What is a coatings exception list?

A.14. A coatings exception list is a list which documents unqualified coatings inside the containment. ANSI N101.4, Sections 6.8.2 and 7.7.3 provide for documentation for compiling such a list. The list permits CECO to evaluate the totality of unqualified coatings in the containments in order to allow a determination to be made about the acceptability of coatings in accordance with the

regulatory requirements referenced in SRP Section 6.1.2, 6.2.5, and 6.2.2. Commonwealth Edison has developed such a list. The nonconforming coating areas identified as a result of Inspection Report 85-15 are on the list.

Q.15. Does Inspection Report 85-15 recognize that deviations from qualified coatings are acceptable provided they are documented on a coatings exception list?

A.15. Yes, it does.

Q.16. Has the NRC staff accepted placement on the coatings exception list as adequate corrective action for this problem?

A.16. Yes. The areas of unqualified coatings associated with this noncompliance identified during the field documentation review have been documented on the list. This provides adequate corrective action for the noncompliance in accordance with ANSI N101.4. As a result, Midway NCR's 23, 24, 25 and 26 have been closed. Inspection Report 85-15 itself accepted this as an adequate corrective action for the noncompliance. In addition, during a November 14, 1985 NRC Inspection Exit Briefing, NRC Inspector W. Kropp stated that he had reviewed actions taken to resolve the item. Based on this review, the inspector indicated that these actions appeared to be acceptably implemented and that he would close this item in a forthcoming Inspection Report.

Q.17. Is there a possibility of recurrence of the problem of unqualified coating areas because of repairs?

A.17. No. In 1982, Midway Industrials created a coating repair procedure, QCP-3A. This procedure sets forth a different DBA-qualified system for repairs to CZ-11/Phenoline 305 coatings. Other but also qualified systems have been specified in successive revisions.

Q.18. Was this noncompliance an example of lack of design control under Criterion III of 10 CFR Part 50, Appendix B, as asserted in Intervenors' QA Contention?

A.18. No. In this case the applicable regulatory requirements and design bases, as specified in ANSI N101.2, had been correctly translated into procedures by Midway Industrial Contractors, the coatings contractor. Midway Industrial procedure PCD-3 specified a coating procedure for the dual coating system which had been tested in accordance with ANSI N101.2. In this case, the coating problems arose because Midway did not follow its own work procedure.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF RICHARD LEIGH
(on Rorem Q.A. Subcontention 5B)

Richard Leigh, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Richard Leigh
Richard Leigh

Subscribed and Sworn before me
this 5th day of December 1985

Carol J. McCoy
Notary Public

My Commission expires on 10/30/89

0565H

TESTIMONY OF RICHARD LEIGH
(ON ROREM Q.A. SUBCONTENTION)

Q.1. State your name and business address.

A.1. Richard Leigh, Midway Industrial Contractor, Inc. ("MIC"), Braidwood Station, Braceville, Illinois 60407.

Q.2. By whom are you employed and in what capacity?

A.2. MIC Quality Control Supervisor.

Q.3. For what period of time have you been employed as a QC supervisor at the Braidwood site?

A.3. Since January, 1984, I have been employed by MIC in its QC department since 1977.

Q.4. Briefly describe your employment in the Quality Control Department of MIC.

A.4. I began as a Level I Quality Control inspector assigned to the Commonwealth Edison's LaSalle Station. In June 1978, I was certified as a Level II Quality Control Inspector for coatings. I transferred to Braidwood in January 1984 and was certified as a Level III Quality Control Inspector for coating in January, 1985.

Q.5. What is purpose of this affidavit?

A.5. This affidavit is made in support of CECo's motion for summary dispostion of Rorem Contention Item 5.B. That contention item asserts that repairs to coating by Midway Industrial in the Unit 1 and 2 containment were performed using a coating system not

qualified for the Design Basis Accident in accordance with Section 5 of ANSI N101.2 (1972). This issue was identified as an item of non-compliance by the NRC Staff in Inspection Report 85-15.

Q.6. On what basis was it determined that the coatings were unqualified for the Design Basis Accident?

A.6. The coatings which were applied consisted of a carbolene-zinc primer coat and a phenolene top coat. The applicable specification required that the surface be prepared using sand blasting for proper adhesion of both coatings. Instead, the surface was prepared by power tool cleaning which does not roughen the surface to the same extent as sand blasting.

Q.7. On what dates were these unqualified coatings applied to the containment liner plate and equipment hatches?

A.7. MIC inspection report indicate that these coatings were applied from July 30 to August 7, 1978 and from September 28 to October 2, 1978.

Q.8. What was the condition of the containment liner plates and equipment hatches at the time these coatings were applied?

A.8. MIC records indicate that a full primer coat had been applied to the liner plate and equipment hatches prior to the dates identified in answer 6. The liner plate and equipment hatches had a prime coat applied in the shop prior to shipment to Braidwood which covered all surfaces accept the edges where they would be welded together. After assembly, the exposed portion of the liner

plate and equipment hatches were prepared by sand blasting and a primer coat was applied.

Q.9. Did you investigate the circumstances under which the unqualified coatings were applied?

A.9. Yes. In order to respond to the NRC item of noncompliance in 1985, I initiated nonconfomance reports 23, 24, 25 and 26. In order to disposition these NCR's I determined the amount of area to which the unqualified coating had been applied. I reviewed inspection reports which were prepaired as the entire containment liner was coated. I received two letters from Mr. A. Salem, who was the Level II QC inspector employed by MIC at the time these coatings were applied. These letters are dated April 25 and May 1, 1985. Mr. Salem's recollection was that the coatings applied on the dates set forth in Answer 6 were applied to scattered areas adjacent to the weld seams where weld spatter, sharp edges, and minute amounts of rust below the spatter were observed.

Q.10. Are there other documents which are maintained in the QC department of MIC which indicate the area to which the unqualified coatings were applied?

A.10. Yes.

Q.11. Please describe these documents.

A.11. Daily Coating Work Inspection Records were completed by Mr. Salem as these coatings were applied. These records describes the item to which coatings were applied, its location, the coatings operation, the surface preparation, material application and

coating thickness; a written description of the inspection activity and any remedial action observed; and a diagram of the area in which these activities took place.

Q.12. For which specific area within the containment did you review these inspection reports?

A.12. The containment liner plate, crane (girts) and equipment hatches.

Q.13. What were dates of inspection reports?

A.13. The dates set forth in Answer 6.

Q.14. Are you able to determine from your review of the inspection reports the amounts of area to which the unqualified coatings were applied?

A.14. No. While the description of the area which were prepared by use of a power tool are described in the inspection reports as "isolated areas", the sketches of the areas inspected do not identify the precise areas to which the unqualified coatings were applied. However, in the light of my review the Sargent & Lundy estimate of total affected area contained in the testimony of Kenneth T. Kostal appears reasonable.

Q.15. What do you conclude concerning the amount of area to which unqualified coating applied?

A.15. That area is limited to areas adjacent to weld seams in the containment liner, crane girts and equipment hatches. I base this conclusion on Mr. Salem's letters to me and the review of MIC inspection records I performed.

QA CONTENTION ITEM 5.C

Rorem Contention Item 5.C. states in pertinent part:

5. Contrary to Criterion III, "Design Control", of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to establish measures to assure that applicable regulatory requirements and design bases are correctly translated into specifications, drawings, procedures, and instructions including provisions to assure that appropriate quality standards are specified in design documents and that deviations from such standards are controlled. Applicant has also failed to require that measures are established for the identification and control of design interfaces and for the 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.

C. Edison employed designs for safety related HVAC duct supports based on chapter E36.0 of Structural Standard Document which did not limit the slenderness ratio for ceiling mounted duct supports. (Inspection Report 84-43/39, Exh. 19.)

STATEMENT OF MATERIAL FACTS AS
TO WHICH THERE IS NO GENUINE ISSUE

1. Sargent & Lundy (S&L) Structural Standards Document (SSD) controls S&L structural design activities. Chapter E36.0 of that document provides technical requirements necessary for the design of individual ceiling mounted HVAC duct supports. Affidavit of Kenneth T. Kostal on Rorem Q.A. Subcontention 5.C., p. 1 (hereafter "Kostal Affidavit, p. ___").

2. The slenderness ratio of a duct support is an important parameter in its design. The slenderness ratio can be used to determine the appropriate column loading for a long structural member in compression. (Kostal Affidavit, pp. 1-2.).

3. American Institute of Steel Construction (AISC) Code is incorporated in SSD Chapter E36-0. The AISC Code prescribes a series of equations setting forth the relationship between slenderness ratios for long structural members and allowable stresses. That relationship is used to design HVAC duct hangers for compressive loads encountered during postulated seismic events. (Kostal Affidavit, p. 2.)

4. The AISC Code also prescribe upper limits for slenderness ratios. (Kostal Affidavit, p. 2.)

5. The Code upper limits were contained in all other pertinent chapters of the SSD but was inadvertently omitted from Chapter E36.0. (Kostal Affidavit, p. 3.)

6. Chapter E36.0 otherwise properly incorporated the standards of the AISC Code. (Kostal Affidavit, p. 3.)

7. By adhering to the allowable stress relationship in the AISC Code, S&L assure that all duct supports were structurally capable of carrying intended loads. (Kostal Affidavit, p. 3.)

8. S&L revised Chapter E36.0 to incorporate maximum limits for slenderness ratios. (Kostal Affidavit, p. 4.)

9. S&L reviewed calculations for all 1121 safety related HVAC duct supports at Braidwood and determined that all supports complied with the maximum slenderness ratio limit provided by the Code. (Kostal Affidavit, p. 4.)

10. The NRC Staff recognized that the omission of the slenderness ration maximum limit technically constituted a violation, of committments made by S&L in its Structural Design Standards which did not have significant consequences and did not affect the stability or strength of installed duct supports. Inspection Report Nos. 50-456/85-40 (DRS) and 50-457/85-39 (DRS) issued on November 22, 1985, document that the NRC has closed this item. It found that Sargent & Lundy's revisions to the Structural Design Standard, Chapter E36.0 were acceptable, as were the results of its review of existing designs. (Kostal Affidavit, p. 3.)

DISCUSSION

Rorem's QA Contention, Subcontention 5.C alleges in pertinent part that, contrary to 10 C.F.R. Part 50, Appendix B, Criterion III, "Design Control", Edison has failed to assure the proper translation of regulatory requirements into specifications, drawings, procedures, and instructions. Specifically, Item 5.C alleges that Edison employed HVAC duct support designs derived from Sargent & Lundy Structural Standard Document Chapter E36.0 which did not properly limit the slenderness ratio for those supports.

Edison acknowledges that the drafts of Chapter E36.0 inadvertently omitted a maximum limit on slenderness ratios required by the relevant American Institute of Steel Construction (AISC Code section. However, no HVAC duct support was designed which in fact exceeded the standard. Moreover, compliance with other portions of the AISC Code assured that the supports were in any event structurally adequate.

A slenderness ratio is a parameter proportional to the length of a member divided by its width. For long columns, the structural adequacy of the member in compression can be determined from a series of equations established by the AISC Code. These equations were incorporated into Chapter E36.0, and all duct supports were designed to satisfy these equations. The AISC Code also contains maximum limits on slenderness ratios, which are not mandatory in all circumstances, but Chapter E36.0 did not contain these. Upon discovery of this inadvertent omission, S&L revised E36.0 to incorporate these limits. No support design violated

these limits, however, and the NRC concluded that the maximum slenderness ratio limitation in the AISC Code did not in any event affect the strength or stability of duct supports. No other chapter of the SSD omitted the slenderness ratio limitation. The NRC closed this item in Inspection Report 85-40/39.

The omission of the slenderness ratio limitations from Chapter E36.0 was an isolated situation. It did not have any safety or hardware significance. Under these circumstances the omission was an isolated minor oversight not indicative of any problem with Quality Assurance. No genuine issue of material fact is raised by this Contention Item. Edison is therefore entitled to summary disposition on this issue as a matter of law.

0600H

TESTIMONY OF KENNETH T. KOSTAL
(ON ROREM Q.A. SUBCONTENTION 5.C)

Q.1. To which contention item is this testimony addressed?

A.1. QA Contention Item 5.C. The text of this contention item reads as follows:

> Edison employed designs for safety-related HVAC duct supports based on Chapter E36.0 of S&L's Structural Standard Document which did not limit the slenderness ratio for ceiling mounted duct supports (Inspection Report 84-43/39, Exh. 19.)

Q.2. What is the Sargent & Lundy Structural Standards Document referred to in the excerpt from the Staff Inspection Report referenced by Intervenors?

A.2. This is a document used to control Sargent & Lundy structural design activities. Chapter E36.0, which deals with ceiling-mounted HVAC duct supports, provides technical requirements necessary for design of an individual HVAC component support in compliance with applicable Code provisions. It also provides procedures to assure that the design engineer does not omit any of the required technical requirements.

Q.3. What is a slenderness ratio?

A.3. The slenderness ratio is expressed mathematically as Kl/r, where l stands for length, r stands for the radius of gyration of the column cross-section shape and is a characteristic width of the member, and K is a constant which takes into account condition of end support of the member. The slenderness ratio is therefore proportional to the length of a structural member divided by the member's thickness or width. The slenderness ratio is a parameter

from which the failure load of a long column under compression loading can be predicted.

Q.4. Are slenderness ratios prescribed in a code applicable to the design of structural components?

A.4. Yes. The appropriate code utilized to design structural steel components is the American Institute of Steel Construction (AISC) Code. This code provides a series of design equations which, when utilized with unique slenderness ratio, assures that a member with that slenderness ratio subject to compression loads will not yield if the completed maximum stress is less than the code allowable.

Notwithstanding the applicability of the code's formulas up to large slenderness ratios, the AISC Code also states recommended upper limits for slenderness ratios. These upper limits are primarily intended for application when the column is a structural member in a building.

The AISC upper limits for slenderness ratios are far from absolute. The AISC specification provides the option for the engineer to use his professional judgment to establish the appropriate limit in specific instances.

Q.5. Did the Sargent & Lundy Structural Standards Document appropriately incorporate the known relationship between the behavior of allowable stresses as a function of slenderness ratios and the slenderness ratio limit of the AISC Code?

A.5. All chapters of the document incorporated the allowable stresses associated with slenderness ratios. All chapters except Chapter E36.0, dealing with HVAC duct supports, incorporated the arbitrary slenderness ratio limits. These slenderness ratio limits were omitted from that chapter through inadvertence.

Q.6. Did this omission result in Sargent & Lundy designing any HVAC duct supports that were inadequate to meet applied design loads?

A.6. No. The Structural Design Standard E36.0, applicable to HVAC duct supports, always addressed the Code provisions regarding allowable stresses associated with various slenderness ratios. By adhering to the allowable stress relationship in the Code, S&L assured that all members were structurally capable of carrying the intended design loads.

Q.7. Did the NRC staff recognize that the omission did not have significant consequences in Inspection Report 84-43/139?

A.7. Yes. Inspection Report 84-43/39 stated: ". . . the kl/r limitation in the AISC Manual does not affect the stability or strength of the ceiling mounted members which experience compressive loads only during a seismic event. However, failure to reflect the kl/r ratio limit of the AISC Manual in the documents governing design in this area is a violation."

As I state below, Inspection Report Nos. 50-456/85-40 (DRS) and 50-457/85-39 (DRS) issued on November 22, 1985, document that the NRC has closed this item. It found that Sargent & Lundy's

revisions to the Structure Design Standard, Chapter E36.0 were acceptable, as were the results of its review of existing designs.

Q.8. Did the omission of the slenderness ratio limit from the relevant chapter of the Structural Standard Document result in Sargent & Lundy designing any HVAC duct supports that exceeded the slenderness ratio limit of the Code?

A.8. No. To address this question Sargent & Lundy performed a review of all safety-related HVAC duct supports at Braidwood. All HVAC design drawings were reviewed to determine the total population of HVAC duct supports. The total number was 1,121. S&L then reviewed all the calculations associated with these supports to determine the slenderness ratios of each support. This review, which as stated above was found acceptable by the NRC inspectors, concluded that all supports complied with the slenderness ratio limits of the Code.

Q.9. Has the Sargent & Lundy Structural Standards Document been revised to rectify the omission identified by the NRC staff?

A.9. Yes. Chapter E36.0 of the Structural Standards Document was revised on October 31, 1984 to incorporate appropriate maximum limits for slenderness ratios. As I stated earlier, Inspection Report Nos. 50-456/85-40 (DRS) and 50-457/85-39 (DRS) found that these revisions were acceptable and closed this item.

ROREM CONTENTION ITEM 3C

Rorem Contention Item 3C states:

> 3. Contrary to Criterion II, "Quality Assurance Program," of 10 CFR Part 50, Appendix B, Commonwealth Edison Company has failed to establish a quality assurance program which complies with the requirements of Appendix B and which is documented by written policies, procedures and instructions and is carried out in accordance with those instructions. Edison has failed to assure that its QA program provides controls over activities affecting quality and that such activities are accomplished under suitably controlled conditions and are appropriately verified for quality by inspection.
>
> C. The Applicant's electrical contractor (Comstock) utilized Level I Quality Control Inspectors for inspection and acceptance of electrical welds. This involved 14 different Level I inspectors over four years (Inspection Report 85-06 Exh. 11).

MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. As a result of inspection activities related to the Braidwood Construction Assessment Program (BCAP), the NRC Staff assessed an item of noncompliance with respect to L.K. Comstock (LKC's) use of Level I inspectors to perform visual weld inspections, as well as another item of noncompliance (later withdrawn) relating to the BCAP Task Force's apparent failure to document this LKC practice as a BCAP observation. (Affidavit of George Orlov on Rorem QA Subcontention 12E (hereinafter, "Orlov affidavit" at pp. 3-12; Deposition of Ronald N. Gardner dated October 31, 1985 at Tr. 55-72).

2. Review of LKC and E.C. Ernst records establishes that a total of 13 Level I inspectors performed visual weld inspections over a period from March 1977 to April 1984. After April 1984 LKC only used Level II inspectors to perform visual weld inspections. (E.C. Ernst was

the original electrical contractor at Braidwood. In the spring of 1979, LKC took over the responsibilities for the electrical installation.) (Gieseker affidavit on Rorem QA Subcontention 3C (hereinafter, "Gieseker affidavit" at pp. 2-3.)

3. To address the concern regarding the LKC's and E.C. Ernst's use of Level I weld inspectors, CECo has developed the "Level I Reverification Program" (LRP). The LRP is designed to demonstrate on a sampling basis that the welds inspected by LKC and E.C. Ernst Level I inspectors contain no design significant discrepancies. (Gieseker affidavit at p. 4.)

4. The total population of inspection reports generated by LKC and E.C. Ernst Level I inspector is approximately 9,000. A random probability sample of 475 inspection reports will be selected and all the welds of interest covered by these selected inspection reports will be reinspected. This sample size is sufficient to allow one to conclude with at least 99% reliability at a 99% confidence level, that if there are no design significant weld discrepancies in the sample, there are none in the entire population. (Gieseker affidavit at pp. 5-6; Frankel affidavit on Contention Item 3C at pp. 8-10.)

5. If necessary a supplementary sample will be selected to ensure that a minimum of five inspection reports are selected for each of the 13 Level I inspectors. (Gieseker affidavit at pp 6, Frankel affidavit on Contention Item 3C at p. 9.)

6. LRP reinspections will be performed by currently certified LKC Level II inspectors, with overview by a Level III inspector. No reinspector will reinspect welds which he or she initially inspected or approved. The identities of the original inspectors and the original inspection results will be withheld from the reinspectors. The reinspectors will use currently approved LKC visual weld inspection procedures, which incorporate acceptance criteria that have been reviewed and approved by the NRC Staff. (Gieseker affidavit at pp. 7-8.)

7. Engineering evaluation will be performed to determine the design significance of each identified weld discrepancies. These evaluations will be performed in the same way as for the Byron Quality Control Inspector Reinspection Program. (Kostal affidavit on Rorem QA Subcontention 3C.)

8. If any design significant discrepancies are identified in the original sample, they will be repaired or otherwise appropriately resolved. The sample will be expanded to a size sufficient to establish again with 99% reliability at a 99% confidence level, that if there are no additional design significant discrepancies in the expanded sample, there are none in the remaining unreinspected portion of the population. If the number of design significant discrepancies found precludes obtaining an expanded sample size that is less than the entire population of Level I inspection reports, then the entire population will be reinspected. (Gieseker affidavit at pp. 8-9.)

DISCUSSION

Contention Item 3C raises a question as to the adequacy of visual weld inspections performed by L.K. Comstock (and E.C. Ernst) inspectors certified to ANSI N45.2.6-1978 Level I. This concern arises from an interpretation of the provisions of the ANSI N45.2.6-1978 code, which allows Level I inspectors to perform inspections but states that only Level II or Level III inspectors are capable of evaluating the acceptability of inspection results. The ANSI standard is silent as to the methods Level II or Level III inspectors must use to establish the acceptability of Level I inspection results or how this must be documented. The LKC and E.C. Ernst records are not sufficient to explain what methods were used at Braidwood. It is debatable whether there has been a violation of the ANSI standard, but Commonwealth Edison concedes that the NRC Staff's concern is reasonable and is responding to it. (Orlov Affidavit at pp. 4-10; Gieseker Affidavit at pp. 2-3; Gardner deposition at Tr. 55-72.)

To resolve this concern, Commonwealth Edison has developed a "Level I Reverification Program" (LRP). The LRP is designed to demonstrate on a sampling basis that the welds inspected by LKC and E.C. Ernst Level I inspectors contain no design significant discrepancies. If design significant discrepancies are found, they will be repaired or otherwise appropriately resolved, and the sample will be expanded to restore confidence in the remaining unreinspected portions of the population of welds originally inspected by the Level I inspectors. If necessary, the entire population will be reinspected. (Gieseker affidavit at pp. 4,9)

The results of the LRP are not yet available. Granting summary disposition of this contention item would in effect be a delegation by the Licensing Board to the NRC Staff to ensure that the LRP is carried out properly. In the Byron licensing proceeding, the Licensing Board was unwilling to delegate to the Staff the responsibility for determining the adequacy of the Quality Control Inspector Reinspector Program (QCIRP) See Commonwealth Edison Company (Byron Nuclear Power Station, Units 1 and 2) LBP 84-2, 19 NRC 36, 206-218 (1984). The Appeal Board sustained that aspect of the Licensing Board's decision stating:

> We are totally satisfied that the record before the Licensing Board was insufficient to disperse the cloud regarding adequacy of safety-related construction here. To be sure, as will be discussed in the next section, before the record closed the applicant had embarked upon programs designed to remove the concern engendered by the faulty inspector certification procedures. But neither the validity nor the results of those programs were (or, as a practical matter, could have been) explored in any depth at the hearing last summer. Although the applicant insists that it can and should now be left to the staff to undertake that exploration outside of the adjudicatory arena, we think otherwise. Because the efficacy and outcome of the remedial programs are central to a finding of reasonable assurance of proper facility construction, the intervenors are plainly entitled to have their day in court prior to a possible resolution of the quality assurance matter in the applicant's favor.

Commonwealth Edison Company (Byron Nuclear Power Station, Units 1 and 2) ALAB-770, 19 NRC 1163, 1175 (1984) (footnote omitted).

This case is different from Byron. The LRP is a much simpler, more limited program than the Byron QCIRP. Only 13 Level I inspectors employed by LKC/E.C. Ernst are involved. Only one type of inspection activity is being verified: visual weld inspections. The LRP is

designed to verify directly the quality of the welding work inspected by the 13 Level I inspectors; inferences about the training, qualifications or work methods of LKC/E.C. Ernst inspectors are not being made. The efficacy and possible outcomes of the LRP are described in the affidavits of Mr. Gieseker, Mr. Kostal and Mr. Frankel. Intervenors' "day in court" is their opportunity to respond to this summary disposition affidavit.

In short, although it is a sampling program, the LRP is closer in design and significance to the 100% reinspection programs which the Byron Licensing Board found it could delegate to the NRC Staff than it is to the Byron QCIRP which the Byron Licensing Board found it could not delegate. See LBP 84-2, supra, 19 NRC 36, 216-17. (In fact, under certain circumstances the LRP will become a 100% reinspection program.) Unless Intervenors can demonstrate that there is a genuine issue of material fact as to the adequacy of the LRP, summary disposition is appropriate.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF JAMES W. GIESEKER
(on Rorem Q.A. Subcontention 3C)

James W. Gieseker, being duly sworn deposes and states:

The following questions and answers constitute my testimony in the above-captioned proceeding.

Further affiant sayeth not.

James W. Gieseker
James W. Gieseker

Subscribed and Sworn before me
this 20th day of December 1985

Delene L. Lamb
Notary Public

My Commission Expires April 19, 1988
My Commission expires on_______.

0559H

TESTIMONY OF JAMES W. GIESEKER
(ON ROREM Q.A. SUBCONTENTION 3C)

Q.1. Please state your full name for the record.

A.1. James W. Gieseker

Q.2. By whom are you employed and in what capacity?

A.2 I am employed by the Commonwealth Edison Company (CECO) as a Project Construction Engineer. I have been employed by CECo since July 19, 1971. Since August 6, 1984 I have been assigned to CECo Braidwood Station. I am responsible for the Project Construction Department (PCD) Electrical Group interface with the electrical contractor L.K. Comstock Quality Control (QC) Department and inspections performed in the electrical area by the Nuclear Regulatory Commission. As such, I have knowledge of LKC's training program for personnel performing QC functions, including the programs for weld inspectors.

Q.3. Please summarize your education and professional experience.

A.3. I have a BSEE degree from Valparaiso University. Prior to being assigned by CECo to Braidwood Station, I was assigned to the LaSalle County Nuclear Generating Station. At LaSalle, I was in the CECo Quality Assurance Department from May 1976 to August 1979, the Construction Department from August 1979 to July 1982 and the station Technical Staff from July 1982 to August 1984. Prior to LaSalle, I was assigned to the CECo Transmission Engineering Department.

Q.4. What is the purpose of your affidavit?

A.4. The purpose of my affidavit is to describe the "Level I Reverification Program" (LRP) which has been instituted at Braidwood to confirm the adequacy of welds inspected by 13 E.C. Ernst/L.K. Comstock (LKC) Level I weld inspectors.

Q.5. Why was the LRP developed?

A.5. The LRP was developed to address an NRC Staff concern relating to L..K Comstock's practice of using Level I inspectors to perform visual weld inspections and Level II inspectors to review and accept the inspection reports generated by the Level I inspectors. The applicable standard, ANSI N45.2.6-1978, allows Level I inspectors to perform inspections but states that only Level II or Level III inspectors are capable of evaluating the validity and acceptability of inspection results. ANSI N45.2.6-1978 is silent as to what steps Level II or Level III inspectors must follow to establish the validity and acceptability of Level I visual weld inspection results, and what records must be kept to document these actions. Because LKC's records do not make it clear what the LKC Level II weld inspectors did to establish weld acceptability, the NRC Staff apparently concluded that LKC had used Level I inspectors for both inspection and final acceptance of welds in contravention of ANSI N45.2.6-1978 and 10 C.F.R 50 Appendix B Criterion II.

Although the NRC item of noncompliance states that it involves 14 LKC Level I inspectors over four years, subsequent review has shown that E.C. Ernst, the original electrical contractor at

Braidwood, (which was replaced by LKC in the spring of 1979), also used Level I weld inspectors. Moreover, the E.C. Ernst weld inspection forms did not contain any signature block indicating Level II review of Level I inspections. It is reasonable to treat the NRC Staff concern as including E.C. Ernst's use of Level I inspectors.

Q.6. Do you agree that LKC's and E.C. Ernst's use of Level I QC inspectors constitutes a violation of ANSI N45.2.6 and 10 C.F.R Part 50 Appendix B?

A.6. Commonwealth Edison Company agrees that the lack of documentation showing the methods used by Level II inspectors to establish the acceptability of the results of Level I inspecions is a procedural inadequacy.

Commonwealth Edison does not agree that this documentation deficiency amounted to a violation of ANSI N45.2.6-1978 and 10 C.F.R. Part 50 Appendix B, at least for LKC because LKC Level II's were in fact reviewing and accepting Level I, results in accordance with the ANSI N45.2.6-1978 Code. We do not have sufficient information about E.C. Ernst to come to a conclusion as to whether E.C. Ernst's use of Level I inspectors was a violation of then-applicable requirements.

In any event, we do agree that the NRC Staff concern is a reasonable concern and we have developed the LRP to address it.

Q.7. What is the purpose of the LRP?

A.7. The LRP is designed to demonstrate on a sampling basis that the welds inspected by LKC/E C. Ernst Level I inspectors contain no design significant discrepancies.

Q.8. Why was the decision made to develop and implement the LRP instead of relying on the existing "Quality Control Inspector Reinspection Program (QCIRP)"?

A.8. One consideration was that the certification period for five of the 13 LKC Level I weld inspectors extended past the QCIRP cut-off date for LKC (December 17 1982). Therefore some of the welds which are in the LRP population will have no chance for selection in the QCIRP. In addition, the Braidwood QCIRP is designed to address the qualification and training program for QC inspectors. The LRP is designed to test our confidence in the adequacy of the welds inspected by 13 LKC/E.C. Ernst Level I inspectors. Finally, after discussions with counsel for Commonwealth Edison Company, we determined that it is unlikely that the QCIRP can be completed on a schedule consistent with a timely Licensing Board decision in this case. Therefore the LRP was developed for the specific purpose of responding to construction item 3C.

Q.9. During what time period did LKC/E.C. Ernst employ Level I Inspectors to visually inspect welds?

A.9. Review of the inspection reports generated by the Level I inspectors indicates that this practice began in March 1977 and the last such inspection occured on April 1984. Thereafter, LKC used only Level II inspectors to perform visual weld inspections.

Q.10. How does the LRP determine which LKC/E.C. Ernst inspectors were certified as Level I weld inspectors during this period?

A.10. The certification packages for all LKC and E.C. Ernst inspectors were reviewed to determine which inspectors had been certified as Level I in welding and over what time frame the Level I certification extended. The LKC/E.C. Ernst files were then reviewed for weld inspection reports which were dated within the above established time frames. This review established that there were 17 LKC/E.C. Ernst Level I weld inspectors, but only 13 performed any weld inspections (not 14 as stated in the Contention Item). The total population of inspection reports generated by LKC/E.C. Ernst Level I weld inspectors is approximately 9,000 and the distribution among the particular Level I inspectors is as indicated in Exhibit 1.

Q.11. What is the nature of the welding work performed by LKC and E.C. Ernst?

A.11. The LKC/E.C. Ernst welding covered by the LRP is American Welding Society (AWS) welding including conduit supports, junction box supports, cable tray supports,cable tray hold-down welds, and auxiliary steel in electrical supports. This welding work is described in more detail in Mr. Kostal's affidavit.

Q.12. Will all completed inspection reports for each identified Level I inspector be reinspected under the LRP?

A.12. No, the LRP reinspection activity will be performed on a sampling basis.

Q.13. Please describe the sampling process to be used for the selection of inspection reports.

A.13. The inspection reports generated by the Level I inspectors will be placed in chronological order according to the date the Level I inspection took place. (These inspection reports typically include from two to ten welds). If more than one inpection report was generated on a particular day, that day's reports will further be sorted numerically by drawing, item number and finally by report number. The listing is then sequentially numbered. A random number table will then be used to select 475 inspection reports. As described in Dr. Frankel's affidavit, this sample size is sufficient to allow one to conclude, with at least 99% reliability at a 99% confidence level, that if there are no design significant weld discrepancies in the sample, there are none in the entire population. If a report is deemed non-reinspectable, another report shall be randomly selected to maintain the 475 sample quantity. After the 475 statistical sample is completed, a review shall be made to determine the number of inspection reports selected for each of the Level I inspectors. If a minimum of five inspection reports are not selected for any given Level I inspector, then a supplementary sample of inspection reports shall be randomly selected for that inspector to obtain this minimum quantity, if available.

The affidavit of Dr. Frankel describes the statistical concepts underlying the sampling process being employed for the LRP.

Q.14. Mr. Gieseker, what is the basis for CECo's selection of 99% reliability and 99% confidence levels for the LRP?

A.14. The NRC item of noncompliance is based on an interpretation of ANSI N45.2.6-1978, rather then the identification of hardware problems in the field. Moreover, LKC and E.C. Ernst Level I and Level II inspectors received the same training prior to certification and with the exception of experience, satisfied the same certification requirements. Therefore, Commonwealth Edison has confidence in the effectiveness of the inspections. The purpose of the LRP is to test this confidence through a sampling program. The 99% reliability and 99% confidence levels are a rigorous test, and little incremental benefit would result from specifying higher reliability and confidence levels.

Q.15. Please describe the LRP reinspection process.

A.15. The reinspection process provides that a currently certified LKC Level II inspector, other than the original inspector or inspection report reviewer, will verify the inspections performed by the original inspector. A reinspection checklist is prepared from the original inspection report that has been selected for reinspection. The information on the original inspection checklist is transferred to a duplicate checklist except that the original inspector/reviewer names, any remarks and the original inspection results are deleted. The reinspection checklist is then given to a currently certified Level II reinspector who performs the reinspection and completes the reinspection checklist. All of the safety related welds and welds that attach non-safety related but seismically designed hangers to a safety related structure covered by the original inspection report are

reinspected. For welds identified by the reinspector as not acceptable, a currently certifiable Level III inspector, independent of the contractor, reviews the discrepancies to assure uniformity of results among the reinspectors. For the purpose of LRP, the Level III decision shall govern.

Q.16. What acceptance criteria will be used for weld reinspections under the LRP?

A.16. The reinspectors will use the currently approved Comstock visual weld inspection procedure, which incorporates the Visual Weld Acceptance Criteria for Structural Welding at Nuclear Power Plants (VWAC), Revision 2. The NRC Staff has reviewed and approved these acceptance criteria. The results of the reinspections will be recorded and evaluated on a weld basis. As described in Mr. Kostal's affidavit an engineering evaluation will be performed to evaluate the design significance of identified discrepancies. The program will be expanded based on the number of discrepancies, if any, which are design significant.

Q.17. Why do you plan to select your sample on an inspection report basis, but evaluate your results on a weld basis?

A.17. The primary objective of the LRP is to verify the quality of the welds, so the results are evaluated on a weld basis. However, because LKC maintains its records on an inspection report basis, it would be impractical to select the sample on a weld basis. Among other things, this would require numbering each one of tens of thousands of welds in the population, and then making sure that the correct welds are reinspected. This would be administratively cumbersome.

Q.18. How is the program expanded if the existence of a design significant discrepancy is established?

A.18. If any design significant discrepancies are identified in the original sample of 475 inspection reports, then the sample will be expanded to a size sufficient to establish, again with 99% reliability and a 99% confidence level, that if there are no additional design significant discrepancies in the expanded sample, there are no unidentified design significant discrepancies in the remaining portion of the population which has not been reinspected. If the number of design significant discrepancies identified precludes obtaining a sample size that is less than the entire population of Level I inspection reports, then the entire population will be reinspected.

Of course, any design significant discrepancies identified in the LRP will be repaired or otherwise appropriately resolved.

Q.19. How will the results of LRP be documented?

A.19. A report will be generated at the completion of LRP to describe the program and the results. This report will be submitted to the NRC Staff.

Q.20. When the LRP is complete what will it indicate?

A.20. If no design significant discrepancies are identified, this will verify the quality of welds inspected by LKC/E.C. Ernst Level I weld inspectors between March 1977 and April 1984. This resolves the concern the NRC Staff had with LKC's use of Level I weld

inspectors. This together with the fact that only LKC Level II's inspected welds after April 1984 assures the overall adequacy of welds inspected by LKC inspectors at Braidwood. If any design significant discrepancies are identified the program requires sample expansion and engineering review to restore confidence in the quality of the remaining uninspected portion of the welds and to assuro that any identified deficiencies are appropriately resolved.

Q.21. Does this conclude your affidavit?

A.21. Yes.

EXHIBIT 1

INSPECTOR ID	Inspection Dates as LI First	Last	Inspections
C01	6/13/81	7/20/81	263
C07	8/31/81	6/23/83	4947
C10	6/19/82	11/22/82	875
C12	10/15/81	6/20/83	1594
C21	3/28/83	4/6/83	3
C34	2/28/78	5/31/78	63
C35	2/13/78	1/18/79	900
C36	1/22/82	8/10/82	245
C39	3/3/77	2/7/78	51
C41	7/12/78	7/13/78	5
C45	5/4/77	5/4/77	12
C52	8/15/83	10/31/83	69
C53	11/19/83	4/24/84	104
C37	Inspector was certified as Level I Inspector but did not perform any inspections		
C50	Inspector was certified as Level I Inspector but did not perform any inspections		
C51	Inspector was certified as Level I Inspector but did not perform any inspections		
C54	Inspector was certified as Level I Inspector but did not perform any inspections		

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF MARTIN R. FRANKEL
(on Rorem Q.A. Subcontention 3C)

Martin R. Frankel, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Martin R. Frankel
Martin R. Frankel

Subscribed and Sworn before me
this 19th day of December 1985

Nancy R. Coan
Notary Public

My Commission expires on MY COMMISSION EXPIRES OCTOBER 11,1986

TESTIMONY OF MARTIN R. FRANKEL
(ON ROREM Q.A. SUBCONTENTION 3C)

Q.1. Please state your full name for the record.

A.1. Martin R. Frankel

Q.2. Please describe your present positions and your job responsibilities.

A.2. At the present time I am Professor of Statistics, Bernard Baruch College, City University of New York, 17 Lexington Avenue, New York, New York 10010. I am responsible for the teaching of all graduate and undergraduate courses in survey sampling. In addition I teach courses in general statistics and in computer languages. I have been at Baruch College since 1971 with the exception of a two year period when I was an Assistant Professor of Statistics in the Graduate School of Business of the University of Chicago.

I also serve as Technical Director of the National Opinion Research Center, University of Chicago, In this position I am responsible for the statistical and technical quality of all contract survey research conducted by the Center.

Q.3. Please describe your educational and professional background.

A.3. I hold an AB degree in Mathematics from the University of North Carolina. I hold an MA degree in Mathematical Statistics and a Ph. D. degree in Mathematical Sociology from the University of Michigan. My doctoral dissertation was in the was in the area of inference from complex probability samples. This dissertation,

which was published by the Institute of Social Research of the University of Michigan under the title Inference From Complex Samples, is currently in its fifth printing.

I have been actively involved in the use of probability sampling techniques for a period of 19 years. Over this time period I have been involved in the design, selection and implementation of more than 100 different large scale samples. This work has been carried out for federal agencies, universities, an international organization and business firms.

The major professional organization for applied statisticians in the United States is the American Statistical Association. I was elected a Fellow of the Association in 1979 for my work in the area of probability survey sampling. I have served as Chairman of the Association's Section on Survey Research Methods and its Advisory committee to the U. S. Bureau of the Census. I also served as an Associate Editor of the Journal of the American Statistical Association for a period of 8 years.

In addition to the title mentioned above, I am coauthor of 2 books in the area of survey sampling. I am coauthor and author respectively of the chapters on probability sampling in The Handbook of Marketing Research (McGraw Hill, 1974) and the Handbook of Survey Research (Academic Press). I have published articles on survey sampling in various scientific journals. I am

one of the four members of the Editorial Board of the 8 volume <u>Encyclopedia of Statistical Sciences</u> (John Wiley and Sons).

I was elected to membership in the International Statistical Institute in 1983.

Q.4. Are you familiar with the Braidwood Level I Reverification Program ("LRP")?

A.4. I was consulted by Edison during its formulation and I had discussions with Messrs. Gieseker, McGath, Del George and counsel for Commonwealth Edison Company.

Q.5. Can you define the terms probability sample, non-probability sample and random sample?

A.5. A probability sample is a sample that is selected by a procedure that gives each element in a defined population a known, calcuable, non-zero probability of being included in the sample.

A non-probability sample is any sample that does not fall under the definition of a probability sample.

The term random sample is often used three different ways.

In the formal theory of probability sampling it is used to describe a type of probability sample in which all combinations of elements of a given size in the population and all subsets of this size have an equal chance of being selected into the sample. In

this context, random samples of elements may be defined as "selected without replacement" or "with replacement".

In general statistical theory, the term random sample is used to describe a sample from a population that may be treated mathematically as the product of independent, identically distributed random variables. As I will discuss later, there are numerous instances where samples which do not satisfy the probability sampling definition of random samples are treated as random samples in various analytical and inferential procedures.

The term random is also used by the general population and the media that serve this population. In this context the term does not seem to have any clearly defined meaning.

Q.6. As a general matter, in cases where it is possible to collect data about each item in a given population, is there any reason to sample the population instead?

A.6. There are various situations when it may be preferable to examine a sample of items from a population rather than the entire population. This preference for sampling may come about for three distinct reasons. First, time constraints may make it impossible to undertake a complete population examination but it may be possible to undertake and complete a sample study within the allotted time. Second, it may be difficult to justify the cost of a complete population examination but it may be cost

effective to examine a sample. Third, and sometimes most importantly, the use of a sample may produce study results that are more precise than the results that would be produce by a complete population enumeration or study. This may occur because the imprecision and uncertainty that is introduced because a sample is used may be less than the imprecision and uncertainty associated with undertaking a large scale study. For example, data collectors may not do as good a job counting a large number of items as they would if they had fewer items to count. In other words, on a per item or case basis, the errors associated with undertaking a large scale study may be significantly greater than those that occur in a smaller study. This difference in imprecision may more than offset the errors that occur because only a sample is examined.

A somewhat extreme example of the superiority of a sample over a complete population enumeration or study is provided by the decennial US census. Given the number of temporary employees that must be hired and trained in order to conduct the decennial population census, it is generally recognized that a more accurate projection of the number of inhabitants in the entire United States, as a whole, would be obtained if the count were carried out on a sample basis. In fact, it is a sample study, known as the PES (Post Enumeration Survey), that is used in order to evaluate the degree to which a census over or under count may have occurred.

Q.7. Can you describe the role probability samples in drawing inferences from a sample to a larger population?

A.7. The use of probability sampling methods generally assure that objective statistical inferences may be drawn about the large population from which the sample was selected. More specifically, support for one of the assumptions that must be made in order to apply various theories of mathematical statistics may be directly linked to the sample selection process.

In less technical terms, the use of probability sampling methods makes questions about sample adequacy amenable to answer via objective statistical methods.

The methods and techniques of probability sampling were first introduced in the late 1930s and early 1940s. Since that time it has been recognized that probability sampling generally simplifies the drawing of inferences to the larger population. This simplification is directly linked to the built in "objectivity" of the methods used in the selection of probability samples.

At the present time probability samples are used in order to produce a number of national level statistical series that inform Federal Government policy decisions. Examples of these statistics include the size of the labor force, the unemployment rate, the size of the money supply and various measures of health status.

Q.8. Can you describe the role of non-probability samples in drawing inferences from the sample to a larger population?

A.8. While it is true that probability sampling is generally preferred to non-probability sampling, this does not preclude the use of non-probability samples in making inferences about larger populations. There are many instances which involve public welfare and safety in which policy decisions are made on the basis of non-probability samples.

Examples of the use of non-probability samples in this context include the approval of drugs for general distribution and testing of products for the satification of safety standards.

Non-probability samples are somewhat more difficult to use than probability samples, for the purpose of making inferences to a larger population. This is because the adequacy of a non-probability sample is not assured by the sample selection method, but instead, must be evaluated by an individual or individuals who have substantive knowledge and experience related to the quantities under study.

Q.9. Can you please define the terms reliability and confidence level?

A.9. Both of these terms are used in a number of different contexts. In the present context the term reliability is used to denote the complement of the error or failure percentage rate. More specifically the reliability percentage is 100% minus the failure percentage. For example if the manufacturer of a certain product guaranteed that parts would pass certain tests with a reliability

rate of 99% this means that the manufacturer was guaranteeing that not more than 1% of the parts would not pass these tests.

The term confidence level is used in its standard statistical context. Specifically the term confidence level is a measure of the probability associated with the truth of a statistical statement. If a statement has a 95% confidence level this means that the probability that the statement is true is 95%.

Q.10. What kind of sampling program is the LRP?

A.10. The LRP makes use of a random probability sample of inspection reports which is capable of supporting objective statistical statements of reliability with calculable confidence levels. It also makes use of a supplementary sample which, in the context of the full population of all inspection reports, is a non-probability sample but is intended to inform statements of engineering judgment about the work of individual inspectors.

Q.11. What inferential statements can be made based on the results of the LRP?

A.11. The objective statistical inference statement that is made in conjunction with the results of the LRP will, of course, depend upon the results of the LRP itself. If no design significant discrepancies are found in the random sample of 475 inspection reports, this will, at minimum, support a statistical statement for the full population of 99 percent reliability at the 99 percent level of confidence.

The sample expansion criteria is designed to assure that if one or more design significant discrepancies are found, a sample of sufficient size will be added in order to support a statistical statement for the full population of 99 percent reliability at 99 percent confidence under the assumption that no further discrepancies are found. It is possible that the number of design significant discrepancies found may preclude obtaining a sample size which is less than the total population. In this case, it is my understanding that a reinspection of the full population will take place.

In discussions with Mr. Gieseker it is clear to me that engineering judgment will also provide the basis for certain inferences that will be made from the results of the LRP.

In this context it should be noted that the choice of sample size that will support the objective statistical inference was itself the result of engineering judgment on the part of Commonwealth Edison Company. Commonwealth Edison Company specified the desired level of reliability and confidence and I carried out the calculations of the required sample size from these specifications.

Q.12. Mr. Gieseker states in this affidavit that the LRP selection process will be on an inspection checklist basis, but the results will be evaluated and reported on a weld basis. How does this affect your previous answer concerning probability samples, reliability, and confidence levels?

A.12. The LRP is a commonly used type of probability sample known as a random sample of clusters or simply a cluster sample. As a result, the sample of 475 checklists will actually produce a sample of more than 475 welds. In the computation of the probabilities required for making the statistical inference previously mentioned, I have taken the most conservative approach possible. In other words, I have assumed that the sample size is 475 rather than some larger number equal to the number of the welds that will be reinspected. As a result, if on the basis of the results of the LRP, a statistical statement is made of reliability 99 percent with confidence 99 percent, the actual reliability level and confidence level are most likely somewhat higher than these claimed levels.

Q.13. Does this complete your affidavit?

A.13. Yes.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT OF KEN KOSTAL
(on Rorem Contention Item 3C)

Ken Kostal, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Kenneth Kostal
Ken Kostal

Subscribed ans Sworn before me
this 17th day of December, 1985.

Karen L. Kalafatis
Notary Public

My Commission expires on 9/17/1989.

TESTIMONY OF KENNETH T. KOSTAL
<u>(ON ROREM Q.A. SUBCONTENTION 3C)</u>

Q.1. Please state your full name and place of employment for the record.

A. Kenneth Thomas Kostal, Sargent & Lundy 55 East Monroe Street, Chicago, Illinois.

Q.2. Please describe your job responsibilities.

A.2 As assistant manager of the Structural Department I assist the manager in coordinating structural, architectural and civil engineering design for Sargent & Lundy. I assist the manager in all matters of supervision, administration, personnel and technical policies. I have direct responsibility for the Specifications, Geotechnical and Water Resources and Site Development Divisions. As project director for the Braidwood Nuclear Power Station I assist the projects director for the Byron/Braidwood Stations in coordinating all project activities and overall management of the Braidwood Station.

Q.3. Please describe your educational background and work experience.

A.3. I graduated from the University of Illinois in 1965 with a BA in Architectural Engineering and in 1967 with a MS in Architectural Engineering. I have 20 years of experience in the field of civil engineering which includes civil/structural/architectural engineering and design work for fossil and nuclear power plants. My assignments have included 14 units with a total capacity in excess of 10,000 megawatts. I have also been involved in numerous studies.

Prior to joining Sargent & Lundy in 1967, I was engaged by the University of Illinois as an instructor in structural design and as an engineer responsible for structural design and construction drawings for light office buildings.

I am a registered professional engineer in 31 states and I also have a separate structural engineering license in the State of Illinois and am licensed in Alberta, Canada. Presently I am a member of the following organizations:

American Concrete Institute

American Institute of Steel Construction

American Nuclear Society

American Society of Civil Engineers

Structural Engineers Association of Illinois

Western Society of Engineers

Q.4. Are you familiar with the Braidwood Level I Reverification Program (LRP)?

A.4. Yes. That program involves an effort by Commonwealth Edison Company to address an NRC Staff concern relative to L. K. Comstock's use of Level I inspectors to perform visual weld inspections.

Q.5. What is the purpose of your affidavit?

A.5. My affidavit describes the engineering evaluations to be performed by Sargent & Lundy engineers with respect to weld discrepancies

identified during the LRP. The welds of interest are those covered by the applicable provisions of the American Welding society (AWS) standard and produced by welders employed by E. C. Ernst (ECE) and L. K. Comstock (LKC). These S&L evaluations will be performed in exactly the same way as the evaluations of AWS welding performed by S&L for purposes of the Byron Quality Control Inspector Reinspection Program.

Q.6. Why is the AWS standard applicable to the LRP?

A.6. There are basically two codes that govern welding on nuclear power plants. The ASME code governs welding for piping and pressure vessels and the AWS code governs all other welding. All of the E. C. Ernst/LKC welds subject to the LRP are covered by the AWS code.

Q.7. What was the nature of the welding work performed by E. C. Ernst and LKC?

A.7. The E. C. Ernst/LKC AWS welding covered by the LRP program included conduit supports, junction box supports, cable tray supports, cable tray hold-down welds and auxiliary steel for electrical supports. Figure 1 depicts a typical cable tray support system. The circles on the Figure 1 are around areas that are welded connections. The vertical members are connected at the top by welding to either a plate embedded in concrete or a structural member (connection 1). The connection of the horizontal to vertical members is also a welded connection (connection 2). Figure 2 is a detail of the connection of the

horizontal to vertical connections. Figure 1 also shows the hold-down welds for the connection of the cable tray to the horizontal member (connection 3). Connection 1 in Figure 3 is the attachment of a vertical conduit support to a plate embedded in concrete or a structural steel member.

Q.8. How will any discrepant AWS welds produced by E. C. Ernst and LKC be evaluated in the LRP?

A.8. S&L will evaluate 100% of the discrepant welds identified in the LRP to determine whether any are design significant. The methods used to evaluate these welds will be the same methods used to evaluate AWS welding in the Byron QCIRP, as explained to the Licensing Board in the testimony of John McLaughlin of S&L.

Q.9. What does the term "design significant" mean?

A.9. "Design significance," relates to the ability of structural components to perform their intended function, which is to carry all design loads within code established allowable stresses. Code established allowable stresses are incorporated into the design criteria for all equipment supplied to Braidwood. These code established allowable stresses have been developed to provide required margins to safety against failure. Anything which affects the ability of a structural component to perform a function within the code allowable stresses has design significance. Sargent & Lundy's engineering evaluations will be performed for all discrepant welds identified in the LRP to establish the stresses on the inspected components installed at

the Braidwood Station to determine whether or not they exceed the code allowable stresses and consequently whether any items are found to have design significance.

Q.10. How will the discrepant welds be evaluated?

A.10. The first step in the engineering evaluation will be to acquire and review weld maps for the discrepant welds. A weld map is similar to a blown-up photograph of a weld. It provides a detailed discription and location of the discrepancy in the weld.

The review of the weld maps may indicate that some of the discrepant welds consist of arc strikes, spatter and convexity. Arc strikes and spatter are cosmetic discrepancies and they would only create a strength problem if there were a large amount in a given weld. Convexity is only a problem if the weld is subjected to fatigue loading, for example, cars passing over a bridge. Twenty thousand on and off loadings are required before a weld is considered subjected to fatigue loading. The welds on the structures under consideration are not subject to fatigue loading. These types of weld discrepancies do not reduce the load carrying capacity of the weld, and therefore, they have no structural impact.

A detailed engineering evaluation based on the weld maps will be conducted with respect to the other types of discrepant welds to determine the effect of any discrepancy on the strength of the weld. The types of discrepancies for which detailed engineering

evaluation would be done would include: cracks, missing welds, undercut, underlength, and lack of fusion.

In performing the detailed engineering evaluations, the discrepant portion of the weld will be disregarded for evaluation purposes. Once this is done, it is necessary to recalculate the capacities of the connections. For example, if the weld map indicated that there was 2" of porosity in a 12" weld, we would recalculate the capacity of the connection on the basis of only 10" of weld. This is conservative in that there is probably no reduction at all in the capacity of the connection for this 2" of porosity. In the case of welds with cracks, no credit is given in the evaluation for the presence of the weld.

Once the revised capacities of the connections are determined, a further evaluation of their ability to withstand the expected loads or forces is performed. The forces on the connections are made-up of two major loadings: The first is the dead weight or static load of the cables, trays and conduits. The second is the seismic load on the connection.

With respect to the static load, we will review the cable loadings to confirm that the loads of the cables are consistent with those assumed in the original design. Because maximum or bounding loads were used in the orig'.al design of the cable tray and conduit s, em, the actual loads are expected to be less than design loads.

We will reexamine the seismic loading and do a more detailed seismic analysis to determine the amount of design margin in the original design. The seismic loading used in the original design of the cable tray and conduit system is based on a response spectra design method, a very conservative design assumption used in the nuclear industry. The reevaluation of the seismic loading on the connections will be based on a time history seismic analysis which is a more accurate determination of the seismic loading.

The detailed evaluations described above will be conducted on all welds with the non-cosmetic discrepancies identified by the LRP. The results of these evaluations will be used to demonstrate whether or not the discrepant welds have design significance.

Q.11. Does this conclude your affidavit?

A.11. Yes.

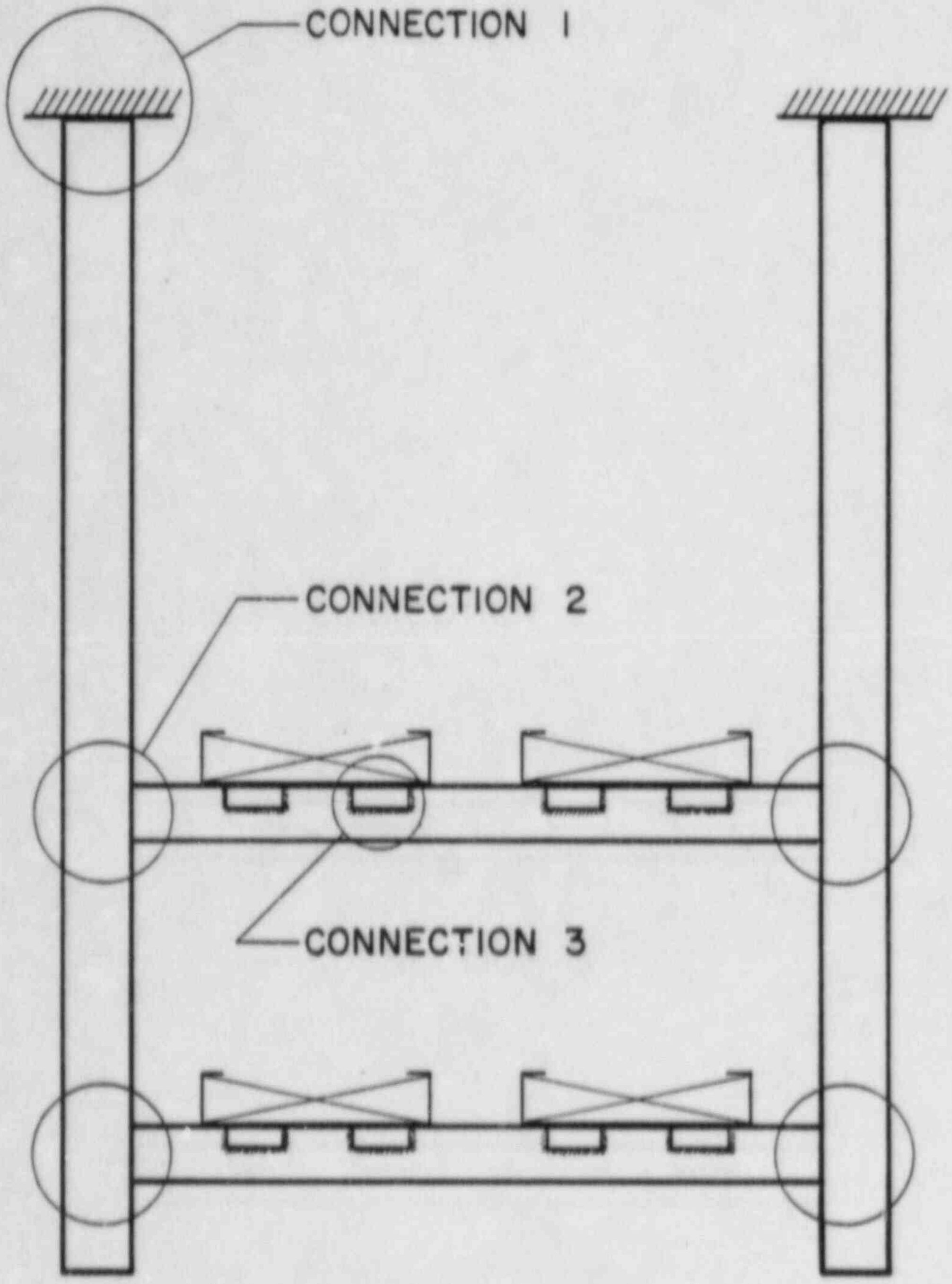

FIGURE 1

E.C. ERNST / L.K. COMSTOCK AWS WELDING FOR CABLE TRAYS

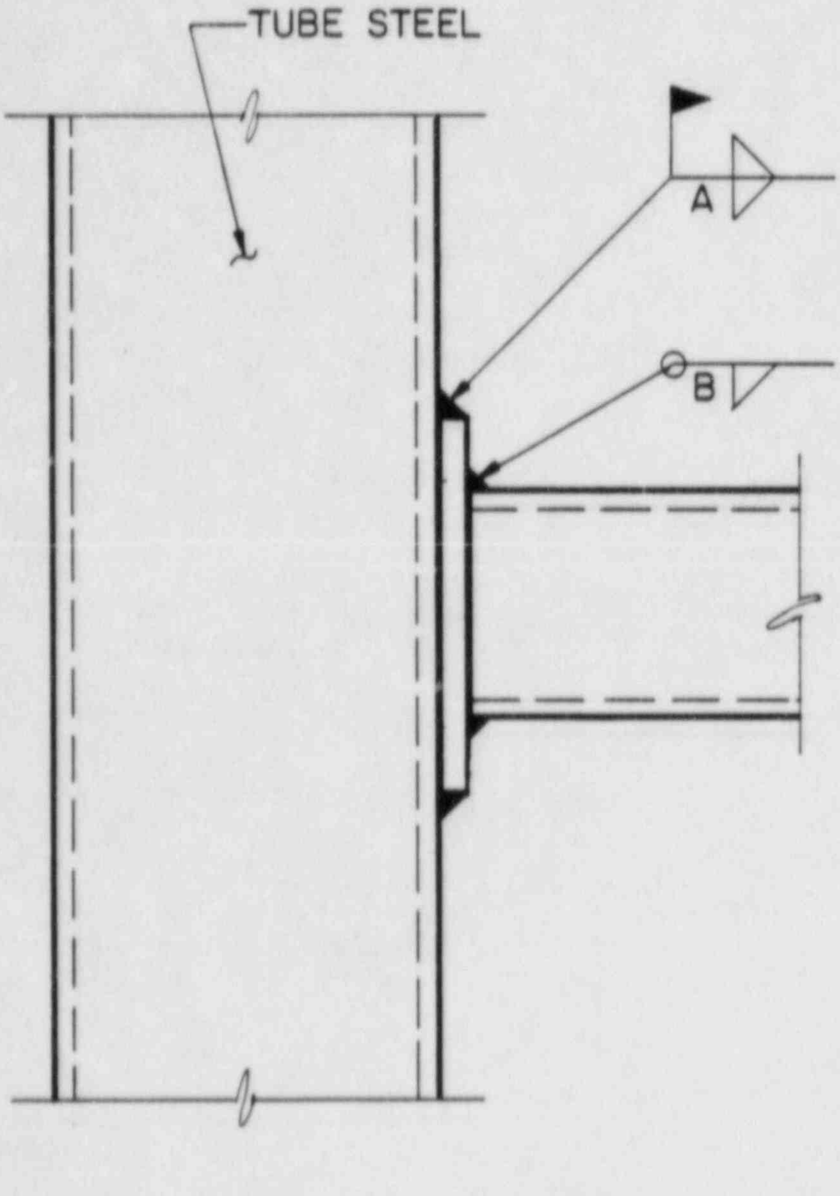

FIGURE 2

E.C. ERNST/ L.K. COMSTOCK AWS
WELDED CONNECTION
FOR CABLE TRAY SUPPORT

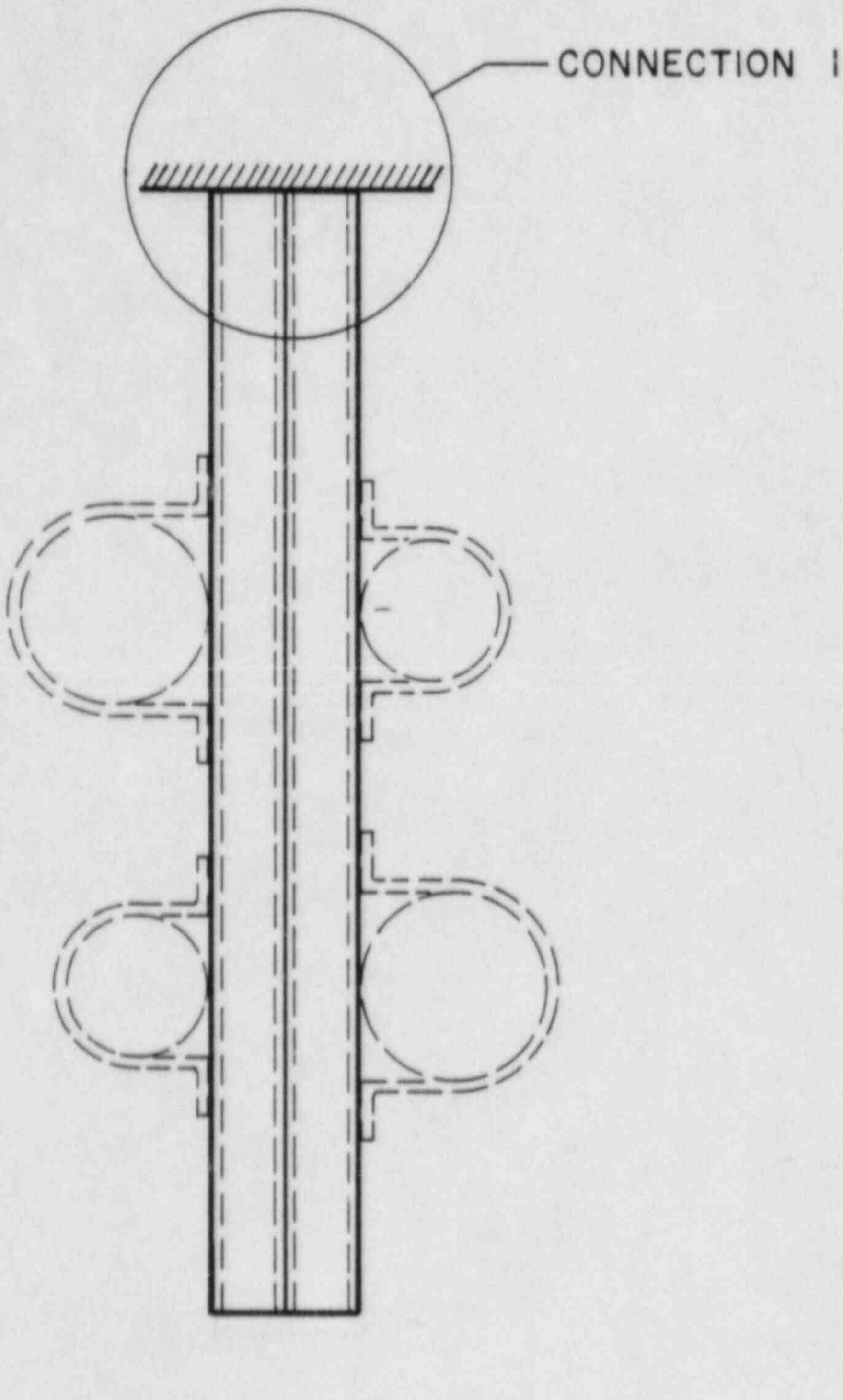

FIGURE 3

E.C. ERNST / L.K. COMSTOCK AWS
WELDING FOR CONDUIT SUPPORTS

ROREM'S AMENDED QA CONTENTION, ITEM 6.F

Rorem's Amended QA Contention, Item 6.F states:

> 6. Contrary to Criterion V, "Instruction, Procedure and Drawings," of 10 CFR Part 50, Appendix B , Commonwealth Edison Company has failed to ensure that activities affecting quality are prescribed by documented instructions, procedures, or drawings, and are accomplishe . in accordance with these instructions, procedures, or drawings.
>
> F. In June 1984, Phillips Getschow, piping contractor, found piping that violated minimum wall requirements. This defect was not reported to owner in accordance with 10 CFR 21.21. (Inspection Report 84-21/20, Exhibit 20.)

MATERIAL FACTS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. On June 1, 1984 during a receipt inspection, Phillips Getschow Company identified two (2) feet out of a ten (10) foot length of pipe which did not conform to the minimum thickness requirements of the material specification used for purchase of the pipe. This pipe was regarded as "customer supplied material" by Phillips Getschow. Phillips Getschow identified and documented this deficiency on PGCo NCR 1615. The disposition of NCR 1615 was to scrap the two feet of pipe containing the nonconforming section. This was the only length

of pipe of this heat number ever received at the Braidwood site. (Affidavit of David A. Boone at p.3-4) ("Boone Affidavit 6.F").

2. Phillips Getschow performed an undocumented 10 C.F.R. Part 21 evaluation of the deficiency identified on NCR 1615. This evaluation determined that the condition was not reportable under the provisions of 10 C.F.R. Part 21. (Boone Affidavit 6.F at p.4.)

3. Phillips Getschow Procedure QAP-110 required Phillips Getschow to notify Commonwealth Edison of the deficiencies such as those identified on NCR 1615. QAP-110 proceduralizes Phillips Getschow's obligations under 10 C.F.R. 21.21. Phillips Getschow failed to report this deficiency pursuant to QAP-110. (Boone Affidavit 6.F at pp. 5-6.)

4. Phillips Getschow Procedure QAP-12 required submittal of NCR 1615 to Commonwealth Edison for review. Commonwealth Edison's review of this NCR would have included a review of the failure of the two foot length of pipe to meet the wall thickness specification for reportability under 10 C.F.R. Part 21. (Boone Affidavit 6.F at pp. 6-7.)

5. Phillips Getschow failed to submit NCR 1615 to Commonwealth Edison. Phillips Getschow's failure to submit NCR 1615 to Commonwealth Edison was identified through Phillips Getschow's corrective action in response to a Phillips Getschow corporate audit. This audit reviewed, in part, Phillips Getschow's compliance with the

requirements of QAP-12, which required submission of NCR's to Commonwealth Edison. As a part of their response to the corporate audit, Phillips Getschow documented the failure to submit NCR 1615 to Commonwealth Edison on Phillips Getschow NCR 2027 issued on September 4, 1984. (Boone Affidavit 6.F at pp. 7-8.)

6. Phillips Getschow submitted NCR 2027 to Commonwealth Edison for review. Commonwealth Edison Project Construction documented its determination that NCR 2027, to which NCR 1615 was attached, was not reportable before it approved NCR 2027 on September 12, 1984. Mr. Boone has a specific recollection of reviewing NCR 1615 for reportability under Part 21 as a part of the review of NCR 2027. (Boone Affidavit 6.F at p.8.)

7. Phillips Getschow personnel responsible for submitting NCR's written against customer supplied material or items to Commonwealth Edison were given training on the PGCo QA Manual and implementing procedure QAP-12 on September 12, 1984 (Boone Affidavit for 6.F at p. 8.)

8. The NRC identified Phillips Getshcow's failure to notify Commonwealth Edison of the deficiency identified in NCR 1615 under QAP-110 as item 2 in Inspection Report 50-456/84-21, 50-457/84-20. The NRC inspector discussed this concern with Phillips Getschow on September 17, 1984. (Boone Affidavit 6.F at pp. 3,9.)

9. As a result of the NRC's concerns, on September 19, 1984 Phillips Getschow issued a Report of Noncompliance to Commonwealth Edison

pursuant to QAP-110 notifying Commonwealth Edison of the deficiency identified on NCR 1615. A Report of Noncompliance is the formal method prescribed by QAP-110 for initiating a Part 21 review by Commonwealth Edison. Upon notification, Commonwealth Edison informed the material supplier of the deficiency in the material and determined that the deficiency was not reportable under 10 C.F.R Part 21. (Boone Affidavit 6.F at pp. 9-10.)

10. As part of its response to the NRC's concern, Commonwealth Edison discussed this item with appropriate Phillips Getschow personnel to enhance awareness of the reporting requirements of QAP-110. (Boone Affidavit 6.F at p 10-11.)

11. The NRC found Commonwealth Edison's corrective action acceptable and closed the item of noncompliance. (Boone Affidavit 6.F at p. 11.)

12. Phillips Getschow has initiated changes to its QA Manual, QAP/BR-12 (formerly QAP-12) and to QAP/BR-110 (formerly QAP-110) and has developed QAP/BR-12.3 to enhance reporting. Under current procedure, Phillips Getschow performs a documented review of all NCR's for reportability under 10 C.F.R. Part 21. Only those NCR's which Phillips Getschow deems reportable are reported under QAP-110. (Boone Affidavit 6.F at pp. 12-13.)

13. Phillips Getschow has evaluated all closed PGCo NCR's generated on or before May 4, 1984 for potential reportability under 10 C.F.R.

50.55(e) and 10 C.F.R. Part 21. Phillips Getschow determined that none of these NCR's were reportable. Phillips Getschow also evaluated a random sample of NCR's generated between May 4, 1984 and April 3, 1985, and determined that none of these NCR's were reportable. Commonwealth Edison has evaluated those NCR's in this population which were not contemporaneously submitted for its review as required by Phillips Getshcow's procedure and has concurred with Phillips Getschow's reportability reviews in all cases. (Boone Affidavit 6.F at pp 12-13.)

14. Phillips Getschow is in the process of implementing revisions to QAP-110 which will provide more specific criteria for evaluation and reporting of NCR's under 10 C.F.R. Part 21. (Boone Affidavit 6.F at p. 11.)

DISCUSSION

Rorem's Amended QA Contention, Item 6.F challenges the adequacy of Commonwealth Edison's actions under Criterion V, "Instruction, Procedure and Drawings," of 10 C.F.R. Part 50, App. B. on the basis of a procedural violation identified by the NRC in Inspection Report 50-456/84-21, 50-457/84-20 Criterion V requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings and shall be accomplished in accordance with these instructions, procedures or drawings. The substance of this violation was that contrary to the requirements of Phillips Getschow procedure QAP-110, Phillips Getschow failed to notify Commonwealth Edison of a deficiency for evaluation of its reportability under 10 C.F.R. Part 21. Commonwealth Edison acknowledges that the failure of Phillips Getschow to submit a report to Commonwealth Edison regarding this deficiency pursuant to its regulation implementing its Part 21 responsibilities is a violation of Criterion V of 10 C.F.R. Part 50, App. B.

Part 21 of 10 C.F.R. establishes the circumstances in which firms constructing, owning, operating or supplying the components of any facility licensed by the NRC must notify the Commission of information reasonably indicating that the facility, activity, or basic components supplied to the facility contain defects which could create a substantial safety hazard. Section 21.21 of 10 C.F.R. requires in part that each individual, corporation, or partnership subject to its provisions adopt appropriate procedures to provide for either evaluating deviations or

informing the licensee or purchaser so that it can evaluate the deviation. 10 C.F.R. Section 21.21(a)(1). Phillips Getschow Procedure QAP-110 proceduralizes Phillips Getschow's obligations under 10 C.F.R. 21.21.

The affidavit of David A. Boone on Subcontention Item 6.F details the circumstances underlying the NRC's finding and the actions of Phillips Getschow and Commonwealth Edison which ensure that Commonwealth Edison and Phillips Getschow comply with the requirements of 10 C.F.R. 21.21. Mr. Boone's affidavit demonstrates that although Phillips Getschow did not follow its procedure for notifying Commonwealth Edison under QAP-110 in this instance, the incident was only a minor violation of Criterion V of 10 C.F.R. Part 50 Appendix B and had no significant implications for the quality of the Braidwood facility.

The deficiency which Phillips Getschow failed to report under QAP-110 was of a limited nature. Phillips Getschow identified during receipt inspection that less than two feet of a ten foot length of pipe did not conform to the minimum thickness requirements of the material specification used for purchase of the pipe. No other length of this heat number was ever received at the Braidwood site. Phillips Getschow identified and documented this deficiency on PGCo NCR 1615. The disposition of NCR 1615 was to remove and scrap the two feet of pipe containing the nonconforming section. Thus none of the nonconforming pipe was ever installed in the Braidwood facility. Consequently, Phillips Getschow's failure to report the deficiency to Commonwealth Edison under QAP-110 has no significance as to the hardware of the Braidwood facility.

Furthermore, Phillips Getschow failure to notify Commonwealth Edison of the deficiency identified on NCR 1615 under QAP-110 did not result in a failure to report to the NRC a deficiency reportable under 10 C.F.R. Part 21. When Phillips Getschow identified the nonconforming pipe, Phillips Getschow performed an undocumented review for Part 21 reportability. This review determined that the deficiency was not reportable. Later reviews of this deficiency by Commonwealth Edison reached the same conclusion.

In addition to QAP-110, Phillips Getschow's procedure provided another mechanism which could have adequately notified Commonwealth Edison of the deficiency identified on NCR 1615. At the time Phillips Getschow issued NCR 1615, Phillips Getschow procedure QAP-12 required Phillips Getschow to submit NCR's of this type to Commonwealth Edison for review. Commonwealth Edison's review of Phillips Getschow NCR's included a review for reportability under 10 C.F.R. Part 21 and 10 C.F.R. 50.55(e).

This additional review requirement in combination with Phillips Getschow's quality assurance program ensured that Commonwealth Edison eventually did review the deficiency identified in NCR 1615 for reportability. Although Phillips Getschow failed to submit NCR 1615 for Commonwealth Edison review, Phillips Getschow identified this failure as result of its own corporate audit procedures and documented the failure on NCR 2027. Phillips Getschow submitted NCR 2027 to Commonwealth Edison with NCR 1615 attached, and Commonwealth Edison determined that it was not reportable under 10 C.F.R. 50.55(e) and 10 C.F.R. Part 21. Phillips Getschow personnel responsible for submitting NCR's written against

customer supplied material and items were trained to the requirements of the PGCo QA Manual and QAP-12 to prevent recurrence. Commonwealth Edison approved the disposition of NCR 2027 on September 13, 1984, four days before the NRC inspector discussed Phillips Getschow's failure to notify Commonwealth Edison of the deficiency documented on NCR 1615 with Phillips Getschow's QC Manager.

As a result of the NRC inspector's concerns, Phillips Getschow and Commonwealth Edison undertook additional corrective actions which adequately resolved Phillips Getschow's failure to notify Commonwealth Edison of the deficiency identified by NCR 1615. Phillips Getschow issued a Report of Noncompliance in accordance with QAP-110. Commonwealth Edison informed the material supplier of the deficiency and once again determined that the deficiency was not reportable under 10 C.F.R. Part 21. To ensure that Phillips Getschow personnel observed appropriate reporting procedures, Commonwealth Edison discussed this item with appropriate Phillips Getschow personnel. This corrective action was acceptable to the NRC and the NRC closed this item.

Phillips Getschow's past failure to comply with procedures governing reportability of deficiencies under 10 C.F.R. Part 21 and QAP-110 is acknowledged. However, it is also undisputed that submission of Phillips Getschow NCR's to Commonwealth Edison also involved a review for Part 21 reportability. While Phillips Getschow had not rigorously submitted all NCR's to Commonwealth Edison for review, that deficiency had been identified by Phillips Getschow itself, through a corporate QA audit.

Two reviews of PGCo NCR's have taken place which would have shown if past processing of deficiencies had resulted in failure to alert Commonwealth Edison of deficiencies potentially reportable under 10 C.F.R. Part 21. As a result of PGCo Corporate Audit 84-18, Phillips Getschow reviewed all NCR's written against customer supplied material and items between March 1, 1984 and August 21, 1984 to determine if Phillips Getschow complied with requirements that these NCR's be submitted to Commonwealth Edison for review. This review was underway when the NRC conducted its inspection leading to the item of noncompliance in Inspection Report 84-21. On November 1, 1985, Phillips Getschow completed a much more extensive evaluation of past NCR's at the direction of Commonwealth Edison. This evaluation included all closed NCR's generated on or before May 4, 1984 and a random sample of NCR's generated between May 4, 1984 and April 3, 1985. Phillips Getschow evaluated these NCR's for reportability under 10 C.F.R. Part 21 and 10 C.F.R. 50.55(e). The review found no reportable deficiencies. If an NCR within the scope of this review did not receive a comtemporaneous Commonwealth Edison review required by previous revisions of QAP-12, Phillips Getschow submitted the NCR to Commonwealth Edison for review. For all cases, Commonwealth Edison concurred with the initial reportability reviews of Phillips Getschow.

Phillips Getschow's has revised its procedures to enhance reporting and evaluation of defects to ensure future compliance with 10 C.F.R. Part 21. These procedures provide more explict direction to personnel responsible for evaluation and reporting of defects. Under the revised procedures, Phillips Getschow identifies deficiencies on a Deficiency

Report ("DR"). Phillips Getschow evaluates all DR's for reportability under 10 C.F.R. Part 21 and 10 C.F.R. 50.55(e) and for potential upgrade to an NCR . If the deficiency documented by a DR is deemed reportable, the DR is mandatorily superceded by an NCR. Phillips Getschow performs a documented review for reportability of all NCR's, regardless of whether a particular NCR was deemed reportable as a DR. In addition, those NCR's most likely to have a reportable defect are submitted to Commonwealth Edison for its review. This population is approximately 50 percent of the NCR's initiated since the procedures were revised on September 16, 1985. Phillips Getschow is in the process of implementing QAP/BR-110, Rev. 1 to supercede QAP-110, Rev. 1. This revision provides more specific criteria for evaluation of 10 C.F.R. Part 21 reportability.

Although Item 6.F of Rorem's Amended QA Contention identifies an instance of noncompliance with Criterion V of 10 C.F.R. Part 50, Appendix B, the incident has no significant implications for the quality of the Braidwood facility. The particular procedural deficiency identified by the NRC has been corrected and did not result in any hardware deficiencies. The retrospective evaluations of reportability made by Phillips Getschow demonstrate that there has been no past failure to report appropriate deficiencies in accordance with 10 C.F.R. Part 21. Phillips Getschow has revised its procedures and trained appropriate personnel to ensure that in the future 10 C.F.R. Part 21 reviews and notifications will be conducted in accordance with the appropriate procedures. The NRC Staff has accepted these corrective actions and closed the item of noncompliance which can only be regarded as an isolated occurrence of a failure to adhere to Part 21 reporting requirements.

There is no genuine issue of material fact with respect to Item 6.F, and Commonwealth Edison is entitled to summary disposition on this item as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF DAVID A. BOONE
(on Rorem Q.A. Subcontention 6 f)

David A. Boone, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

David Boone
David A. Boone

Subscribed and Sworn before me
this 19th day of December 1985

Carol J. McCoy
Notary Public

My Commission expires on 10/30/89.

0574K

TESTIMONY OF DAVID A. BOONE
(ON ROREM Q.A SUBCONTENTION 6.F)

Q.1. Please state your full name, employer, and present position.

A.1. David A. Boone, I am employed by Daniel Construction Company on contract to Commonwealth Edison Company's Project Construction Department at Braidwood Station in the capacity of a Construction Field Engineer.

Q.2. State your educational and professional qualifications.

A.2. I am a high school graduate and have completed some college level courses. I have over sixteen years experience in operation, construction engineering, maintenance, training, testing and Quality Control/Quality Engineering at both military and commerical nuclear power facilities. I have extensive management experience in the areas of Quality Inspection and Quality Engineering. I have held the following positions:

10/69 - 6/78	United States Naval Nuclear Power Program - Highest position - Machinist's Mate First Class.
6/78 - 11/79	Stone & Webster Engineering Corporation - position Engineering Associate.
12/79 - Present	Daniel Construction Company - Significant Positions Held - Senior Quality Inspection Supervisor - Project Quality Engineer - Project Quality Manager (current)

I am certified as an ANSI N45.2.6 Level III Inspector under the Daniel Construction Company Program.

Q.3. Could you describe your responsibilities in connection with the Braidwood Project.

A.3. I am currently assigned to the Project Construction Mechanical Compliance Group. My activities include but are not limited to:

1) Developing and implementing construction and Quality Program Procedures

2) Coordinating with Quality Assurance, Licensing, the Architect/Engineer, Contractors and the NRC for resolution of quality issues relating to construction, including implementation of corrective action and corrective action to preclude repetition.

3) Preparing and evaluating responses to quality issues pertaining to construction such as Quality Assurance Audit Items and NRC Items of Noncompliance.

4) Reviewing of contractor procedures and revisions for compliance with design requirements, Code requirements and Quality Program requirements.

5) Reviewing and/or dispositioning contractor nonconformance reports to assure compliance with design, Code and Quality Program requirements.

6) Assisting the Licensing organization on issues relating to that process.

7) Special Projects as assigned by the Project Manager and Project Construction Superintendent.

Q.4. To which contention item is this testimony addressed?

A.4. This testimony is made in support of CECo's Motion for Summary Disposition on Item 6.F. of Rorem's Amended QA Contention. The text of this contention item reads:

6. Contrary to Criterion V, "Instruction, Procedure and Drawings," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that activities affecting quality are prescribed by documented instructions, procedures, or drawings, and are accomplished in accordance with these instructions, procedures, or drawings.

F. In June, 1984, Phillips Getschow, piping contractor, found piping that violated minimum wall requirements. This defect was not reported to owner in accordance with 10 C.F.R. 21.21. (Inspection Report 84-21/20, Exhibit 20.)

Q.5. Describe the finding in Inspection Report 84-21/20.

A.5. A routine NRC safety inspection was conducted by Messrs. L.G. McGregor and R.D. Schulz on September 4 through October 5, 1984. The results of these inspections were recorded in Report Number 50-456/84-21, 50-457/84-20. The report noted in Item 2 that during receipt inspection Phillips, Getschow Company identified a ten foot length of 8" S/120 SA-106 Grade B pipe with heat number 93739 which violated minimum wall requirements. The pipe was classified as ASME Section III Class 2 pipe. Contrary to 10 C.F.R. 21.21 and PGCo Procedure QAP-110, entitled "Reporting of Defects and Noncompliance," Phillips Getschow did not report the minimum wall defect to the owner.

Q.6. Is the deficiency referred to by the NRC inspectors correctly characterized as a minimum wall violation?

A.6. No. Minimum wall refers to the smallest wall thickness allowed by engineering for a particular application. Before pipe is installed, the concept of minimum wall is inapplicable. As this pipe was not installed, the concept was not applicable.

Q.7. What is the correct characterization of the deficiency referred to?

A.7. The pipe did not conform to the minimum thickness requirement of the material specification used for purchase of the pipe. While the distinction is not significant for purposes of reportability under 10 C.F.R. Part 21, the installation of pipe which does not conform to minimum thickness requirements does not necessarily mean that the pipe does not meet the minimum wall requirements of the Architect/Engineer. Therefore, such pipe could be acceptable for use in safety-related systems.

Q.8. When did Phillips Getschow find that the pipe in question violated the minimum thickness requirement of the material specification?

A.8. June 1, 1984. (The NRC Report incorrectly gives the identification date as June 13, 1984. June 13, 1984 is the date on which NCR 1615 was initiated.)

Q.9. What actions did Phillips Getschow take to document and disposition this deficiency?

A.9. The deficiency was identified and documented on PGCo NCR 1615. Less than two feet of the ten foot length was nonconforming. This is the only length of pipe with heat number 93739 ever received at the Braidwood site. The disposition of NCR 1615 was to remove and scrap the two feet which contained the nonconforming section. In addition, Phillips Getschow performed an undocumented 10 C.F.R. Part 21 evaluation. This evaluation determined that the condition was not reportable under the provisions of 10 C.F.R. Part 21.

Q.10. Was Commonwealth Edison notified of the deficiency?

A.10. No.

Q.11. On June 1, 1984, what procedural requirements did Phillips Getschow's program impose for identification and resolution of this deficiency?

A.11. Phillips Getschow Procedure QAP-12 required Phillips Getschow to initiate a Nonconformance Report (NCR) to document and disposition this deficiency.

Q.12. Was Phillips Getschow required to make a Part 21 evaluation of this deficiency?

A.12. The NCR procedure did not require Phillips Getschow to make a Part 21 evaluation. However, QAP-110 proceduralizes Phillips Getschow's obligations under 10 C.F.R. 21.21 by establishing the process for notifying the owner that a defect, deviation or area of noncompliance exists in a basic component or activity which could create a substantial safety hazard.

Q.13. What is a basic component for purposes of QAP-110?

A.13. Section 4.1 of QAP-110 defines "basic component." It includes a plant structure, system, component or part thereof which is necessary to assure the integrity of the reactor coolant pressure boundary, the capability to shut down the reactor and maintain it in a safe shut down condition; and the capability to prevent the consequences of accidents which could result in potential offsite radiation exposure. A "basic component" includes design,

inspection, testing or consulting services important to safety that are associated with the component hardware, whether those services are performed by the component supplier or others.

Q.14. What deviations or areas of noncompliance did QAP-110 require that Phillips Getschow report to the owner?

A.14. Section 6 of QAP-110 sets out notification procedures. Section 6.1 requires that all deviations or areas of noncompliance which are relative to a basic component shall be reported to the licensee for evaluation.

Q.15. Was the ten foot length of pipe identified in NCR 1615 a "basic component"?

A.15. Yes.

Q.16. Under Phillips Getschow procedures, should Phillips Getschow have reported the deficiency identified on NCR 1615 to Commonwealth Edison?

A.16. Yes, as required by QAP-110.

Q.17. What other means of notification, if any, would have alerted Commonwealth Edison of this deficiency?

A.17. PGCo Procedure QAP-12, Rev. 5 required the submittal of nonconformance reports of this type to Commonwealth Edison for review. An NCR submitted under this procedure would have adequately notified Commonwealth Edison of the deficiency. Commonwealth Edison's review of these NCR's included an evaluation of reportability under 10 C.F.R. 50.55e as governed by CECo

Procedure PM-04 "10 C.F.R. 50.55e Determination and Reporting", Rev. 0, Section 3.4. Commonwealth Edison's review under 10 C.F.R. 50.55(e) includes a review for reportability under 10 C.F.R. Part 21.

Q.18. Did Phillips Getschow submit NCR 1615 to Commonwealth Edison for review?

A.18. No.

Q.19. Did Phillips Getschow ever identify its failure to submit NCR 1615 for review?

A.19. Yes, this failure was identified as a result of corrective action taken for Finding #1 of Phillips Getschow Corporate Audit 84-18. This audit was conducted on June 1[illegible] through June 28, 1984. The purpose of the Phillips Getschow Corporate Audit was to verify compliance of Phillips Getschow personnel at the Braidwood site with Section 15, "Control of Nonconforming Items, Material or Activities", of the Phillips Getschow QA Manual. (Phillips Getschow procedure QAP-12 is the site implementing procedure for Section 15 of the Phillips Getschow QA Manual.)

Q.20. What was the corrective action taken for Finding #1?

A.20. Phillips Getschow reviewed all NCR's generated between March 1, 1984 and August 21, 1984 which were written against customer supplied material and items. The purpose of this review was to determine which NCR's had been submitted to Commonwealth Edison

for approval as required by Phillips Getschow QA Manual, Section 15. Prior to March 1, 1984, the QA manual did not require submission of NCR's written against "customer supplied material" to Commonwealth Edison. Phillips Getschow's failure to submit NCR 1615 to Commonwealth Edison for review was documented on Phillips Getschow NCR 2027 (issued September 4, 1984).

Q.21. Was NCR 2027 submitted for review to Commonwealth Edison?

A.21. Yes, on September 12, 1984.

Q.22. What was the result of Commonwealth Edison's review of NCR 2027?

A.22. Project Construction concurred with the disposition of NCR 2027 and determined that NCR 2027, to which NCR 1615 was attached, was not reportable. I personally recall reviewing NCR 1615 for reportability under 10 CFR Part 21.

Q.23. What corrective action was taken to prevent recurrence as a result of NCR 2027?

A.23. Phillips Getschow personnel responsible for submittal for this type of NCR were given training relative to the requirements of the governing sections of the PGCo QA Manual and implementing procedure QAP-12 on September 12, 1984.

Q.24. At the time of the NRC inspector's finding had Commonwealth Edison's review of NCR 2027 been completed?

A.24. Yes. Commonwealth Edison Project Construction Department approved NCR 2027 on September 13, 1984. On September 17, 1984, the NRC inspector discussed with the Phillips Getschow QC Manager the inspector's concern that Phillips Getschow did not report the deficiency identified on NCR 1615 in accordance with 10 C.F.R. 21.21 and QAP-110.

Q.25. What action did Phillips Getschow take as a result of the NRC inspector's concerns?

A.25. On September 19, 1984, Phillips Getschow issued a Report of Noncompliance to Commonwealth Edison in accordance with QAP-110 Rev. 1. This is the same action that PGCo should have taken under QAP-110 Rev. 0 at the time of the initial identification of the deficiency.

Q.26. What actions did Commonwealth Edison take as a result of the Report of Noncompliance?

A.26. Upon notification from Phillips Getschow, Commonwealth Edison Project Construction Department (PCD) informed the material supplier of the deficiency in the material. A formal followup letter to the supplier was issued on September 27, 1984. PCD forwarded the Report of Noncompliance to Project Field Engineering (PFE) for evaluation of reportability under 10 C.F.R. Part 21.

Q.27. What action did Project Field Engineering take?

A.27. Project Field Engineering reviewed the Report of Noncompliance on September 25, 1984 under Commonwealth Edison Procedure SNED/PE Q.40.

Q.28. What was the result of this review?

A.28. Project Field Engineering (PFE) determined that the deficiency was not reportable. PFE indicated that the item was too small a sample to determine if the component deficiency should be reported to other users.

Q.29. What further action, if any, did Project Field Engineering take?

A.29. Project Field Engineering subsequently requested Commonwealth Edison's Project Engineering Department to perform an evaluation.

Q.30. What was the result of Project Engineering's evaluation?

A.30. Project Engineering determined that the deficiency was not reportable.

Q.31. After the NRC's finding, what corrective action did Commonwealth Edison take to ensure that Phillips Getschow personnel observed the appropriate reporting procedures?

A.31. Commonwealth Edison discussed this item with appropriate Phillips Getschow personnel to enhance awareness of the reporting requirements of procedure QAP-110 "Reporting of Defects and Noncompliance." Daniel Shamblin, Project Construction Superintendent, conducted the initial discussions.

Q.32. Was this corrective action acceptable to the NRC?

A.32. Yes. The NRC closed this item as documented in Inspection Report 50-456, 50-457/85-007 (DRP) issued April 4, 1985.

Q.33. Before March 1, 1984, was Phillips Getschow required to submit for Commonwealth Edison's review NCR's documenting deficiencies of the type documented on NCR 1615?

A.33. Yes. QAP-12, the Phillips Getschow site procedure, required submission of such NCR's for CECo review.

Q.34. What additional actions, if any, has Commonwealth Edison taken to evaluate the reportability of past Phillips Getschow NCR's?

A.34. Between August 2, 1985 and November 1, 1985, Phillips Getschow Quality Control as directed by Commonwealth Edison Project Construction Department (PCD) performed a technical evaluation of selected closed PGCo NCR's in accordance with Phillips Getschow Work Instruction PGWI-37. The population of NCR's evaluated consisted of all closed NCR's between PGCo NCR 1 and NCR 1500 inclusive. These NCR's represent all closed PGCo NCR's generated between May 1976 and May 4, 1984. In addition, the evaluation included a random sample of 100 NCR's between PGCo NCR 1501 and NCR 4500 inclusive representing closed NCR's generated between May 4, 1984 and April 3, 1985.

Q.35. What did this evaluation entail?

A.35. Phillips Getschow evaluated these NCR's for technical adequacy, compliance to Phillips Getschow procedures, and potential reportability under 10 C.F.R. 50.55(e) and 10 C.F.R. Part 21.

Q.36. What was the result of Phillips Getschow's evaluation for reportability of these NCR's?

A.36. Phillips Getschow determined that none of the NCR's evaluated were reportable.

Q.37. What assurance does Commonwealth Edison have that Phillips Getschow's evaluation for reportability was adequate?

A.37. If an NCR within the population subject to this evaluation did not receive a comtemporaneous Commonwealth Edison review required by previous revisions of QAP-12, Phillips Getschow submitted this NCR to Commonwealth Edison for review. Commonwealth Edison reviewed these NCR's for adequacy and reportability. In all cases, Commonwealth Edison concurred with the initial reportability evaluations of Phillips Getschow.

Q.38. What other actions, if any, has Phillips Getschow taken to enhance reporting?

A.38. Phillips Getschow has initiated changes to its QA Manual, to QAP/BR-12 (formerly QAP-12), and to QAP/BR-110 (formerly QAP-110) and has developed QAP/BR-12.3. The substance of these changes is discussed in response to Q.39.

Q.39. What procedure does Phillips Getschow presently follow for reporting and evaluation of defects to ensure compliance with 10 C.F.R. Part 21.21?

A.39. At this time, three Phillips Getschow procedures govern Phillips Getschow's reporting and evaluation of defects to ensure compliance with 10 C.F.R. Part 21.21. These procedures are QAP/BR-12, Rev. 7 "Control of Nonconformance Reports"; QAP/BR-12.3, Rev. 2 with Supplement Rev. 0 "Control of Discrepancy Reports"; and QAP-110, Rev. 1 "Reporting of Defects and Noncompliances". When Phillips Getschow identifies a deficiency, it documents this deficiency on a Discrepancy Report ("DR"). The Phillips Getschow QC Manager evaluates each DR for the necessity of upgrading the DR to an NCR and for potential reportability under 10 C.F.R. Part 21 and 10 C.F.R. 50.55(e). If a DR is deemed potentially reportable the procedure requires that it be superceded by an NCR. Phillips Getschow performs a documented review of all NCR's for reportability under 10 C.F.R. Part 21 per the requirements of QAP/BR-12, Rev. 7. (Phillips Getschow began doing this review on May 9, 1985 under revisions made to the Phillips Getschow QA Manual. These changes were first incorporated in QAP/BR-12 on September 16, 1985.) QAP-110 Rev. 1 provides the evaluation requirements for this review. Those NCR's which Phillips Getschow deems reportable are reported to Commonwealth Edison as required by QAP-110, Rev. 1 on a Report of Noncompliance. Phillips Getschow has made additional revisions to QAP/BR-110, Rev. 1 (expected implementation by December 23, 1985 to replace QAP-110, Rev. 1). These revisions enhance the

directions to the responsible Phillips Getschow personnel concerning the evaluation of defects and noncompliances by providing more specific criteria than the previous procedure.

Q.40. Which nonconformance reports, if any, is Phillips Getschow required by its current procedures to submit to Commonwealth Edison?

A.40. Phillips Getschow submits for review by Commonwealth Edison those NCR's which are dispositioned "Repair" or "Accept-As-Is" (QAP/BR-12, Section 9.8) and NCR's that identify manufacturing defects on Code items that were furnished by Commonwealth Edison (QAP/BR-12, Section 9.7). This population includes those NCR's which are most likely to have a reportable deficiency. Since the implementation of QAP/BR-12, Rev. 7 approximately 50 percent of the NCR's initiated by Phillips Getschow have been submitted to Commonwealth Edison. Phillips Getschow submits these NCR's to Commonwealth Edison even if Phillips Getschow's Part 21 evaluation concludes that these NCR's are not reportable.

Q.41. What is the purpose of the Commonwealth Edison review of these NCR's?

A.41. Commonwealth Edison reviews these NCR's for acceptability of the corrective actions initiated to resolve the identified deficiencies, for acceptability of the corrective actions to prevent recurrence, and for reportability under 10 C.F.R. 50.55(e) as required by the current revisions of the Commonwealth Edison QA Manual and PCD-23, "Site Contractor Nonconformance Reports/Procedure Processing".

QA CONTENTION ITEM 6.G

Rorem Contention Item 6.G States in pertinent part:

> Contrary to Criterion V, "Instructions, Procedures and Drawings," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that activities affecting quality are prescribed by documented instructions, procedures, or drawings, and are accomplished in accordance with these instructions, procedures, or drawings.

G. Applicant placed purchase orders with an unapproved bidder, H.H. Howard Corporation of Chicago, that did not have an approved QA program. Purchase orders were for cleaning of 206,744 feet of safety-related piping. (Inspection Report 84-17, Exhibit 21.)

STATEMENT OF MATERIAL FACTS AS TO WHICH THERE IS NO DISPUTE

1. In 1981, Edison decided to have a large amount of SA 106 Grade B carbon steel piping chemically cleaned because rust and corrosion had formed on the inside and outside surfaces of the pipe from exposure to the elements. (Gorski Affidavit, p. 1)
2. The methods of chemical cleaning designated on Edison's purchase orders were standard commercial methods and Edison believed they would not adversely affect the pipe. (Gorski Affidavit, p. 2)
3. Edison therefore believed that the chemical cleaning process was non-safety-related and accordingly issued the purchase orders to H.H. Howard Company, a non-safety-related vendor. As such, H.H. Howard was not required to have an approved QA program. (Gorski Affidavit, p. 2)
4. H.H. Howard documented the chemical cleaning methods that would be used in a letter to Braidwood Project Construction. This list of methods was forwarded to Sargent & Lundy for review of technical

adequacy prior to approval by Edison. A Field Change Request allowing the cleaning was then approved. (Gorski Affidavit, p. 2)

5. Whether a service relating to safety-related equipment is itself safety-related is a matter of judgement. Edison's judgment that the chemical cleaning process was non-safety-related and therefore need not be performed subject to an approved QA program was erroneous. (Gorski Affidavit, p. 2)

6. Edison did not detect this error because at the time Edison's procedure controlling the purchase of services did not require review by Edison's Quality Assurance Department of all purchase orders relating to safety-related equipment. (Gorski Affidavit, pp. 2-3)

7. Edison performed a review of other purchases of this type of service and found no other purchases affecting safety-related pipe. (Gorski Affidavit, p. 3)

8. Edison revised its procedure controlling the purchase of services to prevent recurrence of this type of noncompliance. The revised procedure requires all purchases of services relating to safety-related equipment to include reviews by the QA Department. The procedure also requires that Construction Supervisors review purchase requests to assure that QA requirements are included. The procedure also requires that when a procurement document designates a service for safety-related equipment as non-safety-related, the document also designate the organization directing the work, the applicable QA program, required procedures and any necessary procedure training. Thus, even non-safety related services

performed in connection with safety-related equipment must be performed in accordance with an approved QA program. (Gorski Affidavit, pp. 3-4)

9. The NRC Staff reviewed the corrective action taken by Edison and found it acceptable. This issue was closed in NRC Inspection Report No. 84-42. (Gorski Affidavit, p. 4)

10. The issue whether the pipe cleaned by H.H. Howard Company is acceptable for use in safety-related applications is raised by Contention Item 11.C of Intervenors' QA Contention. Edison has performed a detailed analysis of this issue and will present that analysis in response to Contention Item 11.C. (Gorski Affidavit, p. 4)

QA Contention Item 6.G

DISCUSSION

Rorem's QA Contention, Subcontention 6.G, asserts that, contrary to Criterion V of Appendix B to 10 CFR Part 50, Commonwealth Edison company has failed to ensure that activities affecting quality are prescribed by documented instructions, procedures or drawings, and are accomplished in accordance with them, in that a quantity of safety-related piping was sent for chemical cleaning to a vendor which did not have an approved QA program. Edison acknowledges that having the pipe cleaned by a non-safety-related vendor was an error and constituted a noncompliance with the requirements of Criterion V, "Instructions, Procedures and Drawings", of Appendix B to 10 CFR Part 50. Edison's QA Manual, in Q.P. No. 4-1, requires that vendors of safety-related services be approved in an approved bidders' list and that purchase orders for such services be reviewed and accepted by Edison's Quality Assurance Department to assure that the necessary technical and quality requirements are included in the procurement documents, and that the procurement is being made from the plant location for which the vendor's Quality Assurance Program is approved. Purchase of the chemical cleaning services from H.H. Howard constituted a noncompliance with this requirement.

As the attached affidavit of Michael A. Gorski establishes, however, this noncompliance was an isolated incident, and Edison has taken effective corrective action to prevent recurrence. The acceptability of the pipe that was chemically cleaned by H.H. Howard Company is the subject of Contention Item 11.C of Intervenors' QA Contention.

QA Contention Item 6.G

As Mr. Gorski explains, Edison decided in 1981 to have chemical cleaning performed on a quantity of safety-related carbon steel small-bore pipe because rust and corrosion had formed on the pipe from exposure to the elements. Edison issued two purchase orders to the H.H. Howard Company for the cleaning process. The purchase order required that the process follow designated steps. These methods of cleaning were standard commercial methods and Edison believed they would not adversely affect the pipe. Edison therefore concluded that the cleaning process itself was not safety-related and accordingly issued the purchase orders to H.H. Howard, a non-safety-related vendor. As such, H.H. Howard was not required to have an approved QA program and was not on the approved bidders' list.

H.H. Howard documented the chemical cleaning methods that would be used in a letter to Braidwood Project Construction, and the list was forwarded to Sargent & Lundy for a review of technical adequacy prior to Edison's approval. Whether a given service relating to safety-related equipment is itself safety-related is a matter of judgment. Edison now recognizes that sending the pipe to a non-safety-related vendor for cleaning was an error in judgment.

This error went undetected because at that time, Edison's procedure controlling the purchase of services did not require that Edison's Quality Assurance Department review all purchase orders relating to safety-related equipment. Thus, although the Edison Quality Assurance Manual required QA review of all purchase orders for safety-related services, the procedure did not require QA review to determine whether all services purchased in connection with safety-related equipment were themselves safety-related.

QA Contention Item 6.G

To determine whether similar errors had occured in other purchases affecting safety-related pipe, Edison reviewed other purchases of this type of service. No other purchases affecting safety-related pipe were found.

To prevent recurrence of this type of noncompliance, Edison revised Braidwood Procedure PCD-07, "Site Purchasing Instructions". The revised procedure requires all purchase of services relating to safety-related equipment to be reviewed by the QA Department. It also requires that Construction Supervisors review purchase requests to ensure proper inclusion of quality assurance requirements. When a procurement document designates a service relating to safety-related equipment as non-safety-related, it must also designate the organization directing the work, the applicable QA program, required procedures and any necessary procedure training. Thus, even non-safety-related services performed in connection with safety-related equipment must be performed in accordance with an approved QA program. If the vendor does not have an approved QA program of his own, provision of the services must conform to the QA program of the organization directing the work, whether Edison or a site contractor. In such case, Edison or contractor QC personnel would be required to assure that these QA requirements were adhered to. The NRC Staff reviewed this corrective action and found it acceptable. The issue was closed in NRC Inspection Report No. 84-42.

QA Contention Item 6.G

Thus the noncompliance identified in the inspection report referenced in Contention Item 6.G has been determined to be an isolated occurrence and Edison has taken effective corrective action to prevent recurrence of similar noncompliances. The only remaining question is whether the pipe cleaned by H.H. Howard Co. is acceptable for use in safety-realted applications. This question is not within the scope of the noncompliance identified by the Staff and referenced in Contention Item 6.G because it is put squarely in issue by the noncompliance identified by the Staff and referenced in Contention Item 11.C. Edison has performed a detailed analysis of this issue and will present that analysis in response to Contention Item 11.C.

Edison is therefore intitled to summary disposition in its favor on Contention Item 6.G as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF MICHAEL A. GORSKI
(on Rorem Q.A. Subcontentions 5A and 6.G)

I, Michael A. Gorski, being duly sworn, do depose and state:

I am employed by Commonwealth Edison Company as a Construction Field engineer at the Braidwood Station.

I graduated from the Illinois Institute of Technology with a B.S. degree in Electrical Engineering in 1974 and a B.S. degree in Mechanical Engineering in 1978.

Before coming to work at Braidwood in 1978, I was employed as an electrician by Newman Green, Inc., as as Quality Control Inspector by Commonwealth Edison Company at Dresden Nuclear Station, and as a construction supervisor involved with electrical transmission construction for Commonwealth Edison Company.

Since my employment at Braidwood Station I have held the following positions:

March 1978 - January 1984: Quality Assurance Engineer. Performed QA audits and surveillances of contractor activities. Performed various off-site QA Audits of contractor and Architect-Engineer organizations. Reviewed site contractor procedures. Reviewed and aided in the resolution of CECo and contractor nonconformances. Interfaced with NRC site inspectors and participated in the resolution of NRC inspection non-compliances. Participated in the training of QA Engineers and Inspectors as required. Performed receipt inspections of incomming shipments. Inspected concrete pours. Performed special projects at the request of the Site QA Superintendent and the Director of Quality Assurance Engineering and Construction. Aided contractor organization in the resolution of quality issues as required.

My Quality Assurance experience covers Electrical, Mechanical, HVAC and Structural disciplines. I was certified as a Level II and Level III Quality Assurance Engineer in accordance with Commonwealth Edison QA department requirements based on ANSI N45.2.6.

January 1984 to Present - Project Construction Field Engineer. I am currently assigned to the Project Construction Mechanical Compliance Group as the Group Coordinator. My activities include:

1) Supervision of three to four engineers involved with mechanical compliance activities (e.g., item 2 - 11 below)

2) Developing and implementing construction and Quality Program Procedures

3) Coordinating with Quality Assurance, Licensing the Architect/Engineer, Contractors and the NRC for resolution of quality issues relating to construction, including implementation of corrective action and corrective action to preclude repetition.

4) Preparing and evaluating responses to quality issues pertaining to construction such as Quality Assurance Audit Items and NRC Items of Noncompliance.

5) Reviewing of contractor procedures and revisions for compliance with design requirements, Code requirements and Quality Program requirements.

6) Reviewing and/or dispositioning contractor nonconformance reports to assure compliance with design, Code and Quality Program requirements.

7) Assisting the Licensing organization on issues relating to that process.

8) Special Projects as assigned by the Project Manager and Project Construction Superintendent.

9) Training and developing of training programs for Project Construction and contractor personnel as required.

10) Initiating and resolving Commonwealth Edison Nonconformance Reports.

11) Consultation with Project Construction personnel, Quality Assurance personnel and contractor personnel on day-to-day Quality items and issues.

12) Coordination of various contractor construction activities as required.

Since my employment in the Project Construction Department I have been basically involved in the Mechanical disciplines, interfacing with Electrical, Structural, and HVAC disciplines as required.

The answers to questions posed by counsel for Commonwealth Edison Company regarding Rorem Subcontentions 5.A and 6.G constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Michael A. Gorski

Michael A. Gorski

Subscribed and Sworn before me
this 18th day of December 1985

Carol J. McCoy

Notary Public

My Commission expires on 10/30/89.

0582H

TESTIMONY OF MICHAEL A. GORSKI
(ON ROREM Q.A. SUBCONTENTION 6.G)

Q.1. To which part of Intervenors' QA contention is this testimony addressed?

A.1. To contention item 6.G. Intervenors' Subcontention 6 asserts that Commonwealth Edison Company has failed to ensure that activities affecting quality are prescribed by documented instructions, procedures or drawings, and are accomplished in accordance with them. Contention Item 6.G states:

> Applicant placed purchase orders with an unapproved bidder, H.H. Howard Corporation of Chicago, that did not have an approved QA program. Purchase orders were for cleaning of 206,744 feet of safety-related piping. (Inspection Report 84-17, Exhibit 21.)

Q.2. Why did Commonwealth Edison Company decide to have pipe chemically cleaned, as described in the Staff Inspection Report referenced by Intervenors?

A.2. A large shipment of SA 106 Grade B carbon steel small-bore piping was delivered to the Braidwood site at various dates from August 1977 to early 1979. At that time, construction activities at Braidwood had not progressed to the point where small-bore pipe would be installed. The pipe was stored outdoors on open racks. It was not covered, and the ends of the pipe were not capped.

In 1981, construction had proceeded to the point where installation of small-bore piping was initiated. By that time, rust and corrosion had formed on the inside and outside surfaces of the pipe from exposure to the elements, and it was decided to clean the pipe by immersion in a chemical bath before using it.

Q.3. Why did Edison decide to have the chemical cleaning performed by a vendor that did not have an approved QA program?

A.3. Edison issued two purchase orders, Nos. 254379 and 730091, to the H.H. Howard Company for the cleaning. The purchase orders required that the chemical cleaning process follow designated steps. The methods of cleaning were standard commercial methods and Edison believed they would not adversely affect the pipe. As a result, Edison believed the cleaning process itself was non-safety-related and accordingly issued the purchase orders to H.H. Howard, a non-safety-related vendor. As such, H.H. Howard was not required to have an approved QA program and was not on the quality assurance approved bidders' list. H.H. Howard documented the chemical cleaning methods that would be used in a letter to Braidwood Project Construction. This list of methods was forwarded to Sargent & Lundy for review of technical adequacy prior to approval by Edison. A Field Change Request allowing the cleaning was then approved.

Q.4. Was Edison correct that the cleaning process was non-safety-related and therefore did not need to be performed subject to an approved QA program?

A.4. No. Whether services relating to safety-related equipment are themselves safety-related is a matter of judgement. CECo acknowledges that this instance represented an error in judgment.

Q.5. Why was this error not detected by Edison?

A.5. At that time, Edison's procedure controlling the purchase of services did not require review by Edison's Quality Assurance Department of all purchase orders relating to safety-related

equipment. Therefore, although Edison's Q.A. Manual, Q.P. No. 4-1 required that safety-related services be reviewed by the QA Department, the procedure did not require QA review to determine whether all services purchased in connection with safety-related equipment were themselves safety-related.

Q.6. Did Edison perform a review to determine whether similar purchase had been made affecting safety related pipe?

A.6. Yes. Commonwealth Edison reviewed other purchases of this type of service and found no other purchases affecting safety-related pipe.

Q.7. What steps did Edison take to ensure that similar noncompliances would not occur again?

A.7. Commonwealth Edison Co. revised Braidwood Project Procedure PCD-07, "Site Purchasing Instructions", to require all future purchases of services relating to safety-related equipment to include reviews by QA. Also, the procedure requires that Construction Supervisors review purchase requests to ensure Quality Assurance requirements are included. When service and/or labor work for safety related equipment is designated as nonsafety related, appropriate interface wording must be included on the purchase request. This interface wording will include the organization (owner or contractor) directing the work, the applicable QA program, required procedures and any necessary procedure training. Thus, even non-safety-related services performed in connection with safety-related equipment must be performed in accordance with an approved QA program. If the

vendor does not have an approved QA program of his own, provision of the services must conform to the QA program of the organization directing the work, whether Edison or a site contractor. In such case, Edison or contractor QC personnel would be required to assure that these QA requirements were adhered to.

Q.8. Has the NRC Staff accepted this corrective action?

A.8. Yes. The NRC Staff reviewed the corrective action taken by Edison and found it acceptable. This issue was closed in NRC Inspection Report No. 84-42.

Q.9. Has Edison determined whether the pipe that was chemically cleaned by H.H. Howard Company is acceptable for use in safety-related applications.

A.9. Yes. This issue is raised by Contention Item 11.C of Intervenors' QA Contention. Edison has performed a detailed analysis of the acceptability of the pipe in question and will present that analysis in response to Contention Item 11.C.

RORBM, ET. AL. QUALITY ASSURANCE

CONTENTION ITEM 6.I.

CONTENTION ITEM 6.I

6. Contrary to Criterion V, "Instruction, Procedures and Drawings", of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that activities affecting quality are prescribed by documented instructions, procedures, or drawings, and are accomplished in accordance with these instructions, procedures, or drawings.

I. Material installed for the pipe whip restraint plate was not of proper specifications. (Inspection Report 84-09, Exh. 22.)

MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. A pipe whip restraint is a welded and/or bolted assembly intended to restrain piping movement in the unlikely event of a pipe break.

   (Affidavit of David A. Boone 6.I, at p. 3.)

2. Chicago Bridge & Iron (CB&I) fabricates the parts and supplies the restraints for Braidwood partially assembled. Phillips Getschow completes the assembly and provides necessary additional or replacement material. (Affidavit of David A. Boone 6.I., at p. 3.)

3. Prior to the first pipe whip restraint being installed at Braidwood, the Applicant's piping contractor, Phillips Getschow, implemented a procedure which was designed to assure that materials used in pipe whip restraints were in accordance with design drawings. (Affidavit of David A. Boone 6.I, at p. 3.)

4. Despite the existence of the procedure governing the use of materials in pipe whip restraints, there were instances when incorrect materials were installed in pipe whip restraints at Braidwood. (Affidavit of David A. Boone 6.I, at p. 4.)

5. During a regularly scheduled audit by Phillips, Getschow's Quality Assurance department in December 1983 - January 1984, one such instance of incorrect material usage in a pipe whip restraint was identified. (Affidavit of David A. Boone 6.I, at p. 4.)

6. In response to this audit finding, Phillips Getschow undertook a 100% review of all pipe whip restraint documentation data packs to determine whether incorrect material had been installed in other restraints and to assure that all such incorrect material uses were identified and documented on a nonconfomance report. (Affidavit of James R. Stewart, at pp. 3-4.)

7. The results of this 100% review indicated that at times the Superintendent failed to request correct material or the warehouseman failed to fill a Stores Request as written. (Affidavit of David A. Boone 6.I,at p. 7.)

8. All NCR's generated as a result of the data review pack were closed. The closure was achieved by either determining that the entire restraint had been deleted, replacing the incorrect

material with correct material, or using the installed material on the basis of a Sargent & Lundy approved Engineering Change Notice (ECN) or Field Change Request (FCR). (Affidavit of David A. Boone 6.I, at pp. 8-9.)

9. In order to assure that similar problems in the future were remedied prior to quality control accepting a whip restraint, the procedure governing the installation of whip restraints was revised. This revision provided for input from the Project Engineer before a Stores Request could be issued in order to reduce the possibility that the Superintendent would make an error in issuing a Stores Request. Similarly, Quality Control was required to verify that the warehouseman had properly filled the Stores Request and that the item identified on the Stores Request was the one installed in the field. (Affidavit of David A. Boone 6.I, at pp. 7-8.)

10. During an inspection conducted from May 1, 1984 to June 4, 1984 the NRC identified an instance of improper material usage in a pipe whip restraint. This particular instance had already been discovered by the Phillips Getschow 100% review and was described in a log maintained to record the results of the 100% review prior to the initiation of required NCR's. The nonconformance report which was to document the incorrect material identified by the NRC had not yet been issued. (Affidavit of David A. Boone 6.I, at p. 6, Affidavit of James R. Stewart, at pp. 3-4.)

11. After reviewing the corrective action undertaken by Phillips Getschow as a result of Phillips Getschow's own audit, the NRC closed the item of noncompliance involving the use of incorrect material in pipe whip restraints. (Affidavit of David A. Boone 6.I, at p. 9.)

12. A Phillips Getschow audit conducted between December 21, 1984 and March 12, 1985 found that all material substitutions examined during the audit contained correct material. (Affidavit of David A. Boone 6.I, at p. 8.)

13. Since Phillips Getschow revised its pipe whip restraint installation procedure, no installation of material has necessitated the issuance of an NCR for use of incorrect material. (Affidavit of David A. Boone 6.I, at p.9.).

DISCUSSION

Intervenors' Rorem, et. al., cite to the NRC item of noncompliance concerning improper material usage in a pipe whip restraint as evidence that the Applicant has failed to satisfy Criterion V of 10 C.F.R. Part 50, Appendix B.

Criterion V requires the Applicant to establish procedures, instructions, or drawings to prescribe all activities affecting quality and assure that such activities are accomplished in accordance with these procedures, instructions or drawings.

The Affidavits of David A. Boone and James R. Stewart demonstrate that the cited NRC item of noncompliance does not evidence a violation of this Criterion. The facts sworn to by Mr. Boone indicate that there was a written procedure implemented, prior to the installation of any pipe whip restraints, which controlled the use of material in those pipe whip restraints. Mr. Boone's affidavit also demonstrates that Phillips Getschow Quality Assurance Program identified, prior to the NRC inspection, the fact that incorrect material had, in some instances, been installed in pipe whip restraints. Mr. Stewart's affidavit states that the resolution of this self-identified concern required the contractor to review all of the data packs for the pipe whip restraints in the plant and issue nonconformance reports for all incorrect uses of material. Once this review was complete, Mr. Boone's affidavit indicates, it was determined that material substitutions found were caused by errors on the part of the

Superintendent or warehouseman. In order to assure such problems did not result in the installation of incorrect material in the future, the contractor revised its procedure governing the installation of whip restraints to involve engineering personnel when any material substitution for pipe whip restraints takes place. A subsequent audit as well as the fact that no NCR's have been issued for incorrect material being installed subsequent to the procedure revision indicates that this revision has in fact stopped such problems from reoccurring.

Mr. Stewart's affidavit shows that the incorrect material usage set forth in this subcontention was not identified by the NRC until after Phillips Getschow personnel who had already identified the nonconforming condition showed to the NRC inspector a log maintained to track the results of the 100% review. The contractor's self-initiated corrective action would have resulted in all nonconforming conditions being documented on an NCR.

Finally, as indicated in Mr. Boone's affidavit, the NRC item of noncompliance was closed by the NRC Staff upon its review of the contractor's self-initiated corrective action which was instituted to resolve the contractor's own prior audit concern.

The undisputed facts sworn to by Mr. Boone and Mr. Stewart concerning this item of noncompliance do not support the Intervenor contention that Criterion V of 10 C.F.R. 50, Appendix B was violated. Not only did the contractor have a procedure

governing the use of material in pipe whip restraints but also the contractor's quality assurance program identified discrepancies in the implementation of that program and promptly and adequately remedied them. Thus, the facts actually demonstrate an effective program to assure that work is not only prescribed by documented procedures but also that work is actually accomplished in accordance with those procedures as required by Criterion V of 10 C.F.R. Part 50, Appendix B.

The Appeal Board in Union Electric Company (Callaway Plant, Unit 1), ALAB-740 18 NRC 343, 346 (1983), held that the critical issue in deciding a quality assurance contention is a determination whether there is reasonable assurance that, as built, the facility can and will be operated without endangering the public health and safety. The Appeal Board established a two part test to resolve this issue. First, there must be a determination whether all ascertained construction errors have been cured. Second, a Licensing Board must decide whether there has been a breakdown in the quality assurance procedures of sufficient dimensions to raise legitimate doubt as to the integrity of the plant. In this instance, the undisputed facts establish that both the Callaway criteria have been met.

1. All ascertained construction errors have been remedied; and

2. The facts surrounding this item of noncompliance indicates a properly and effectively operating quality assurance program on the part of Phillips Getschow.

Therefore, Commonwealth Edison Company is entitled to summary disposition on this item of intervenor's quality assurance contention as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF JAMES R. STEWART
(on Rorem Q.A. Subcontention 6.I)

James R. Stewart, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

James R. Stewart
James R. Stewart

Subscribed and Sworn before me
this 19th day of December 1985

Carol J. McCoy
Notary Public

My Commission expires on 10/30/89.

0584H

TESTIMONY OF JAMES R. STEWART
(ON ROREM Q.A. SUBCONTENTION 6.I)

Q.1. Please state your full name for the record.

A.1. James R. Stewart

Q.2. By whom are you employed and in what capacity?

A.2. I am employed by Phillips, Getschow Company, Commonwealth Edison's Mechanical Contractor at the Braidwood Station, as the Project Engineer.

Q.3. Please summarize your educational and professional background.

A.3. Education - I am a high school graduate with two years of college in industrial and mechanical engineering.

Experience - I have worked for over seventeen (17) years in heavy mechanical construction on power generating facilities, both fossil and nuclear, as well as in chemical plant maintenance.

Positions held:

6/66 - 9/67	John Deere - summer development program while attending college;
5/68 - 9/69	United Engineers & Constructors - at Commonwealth Edison's Quad Cities Nuclear Station as a draftsman;
9/69 - 11/69	Southern Technical Services - on contract to Geigy Chemical at McIntosh, Alabama as a maintenance coordinator.
11/69 - 1/76	Jelco Incorporated - various engineering and staff positions at NPPD's Cooper Nuclear Station and at the Salt Lake City headquarters;
2/76 - 4/82	Morrison Construction Company - at Commonwealth Edison's LaSalle County Station as the Planning and Scheduling Supervisor and Project Engineer;

4/82 - 7/83 McCartin - McAuliffe Mechanical Contractor - field engineer at Kilngas Coal Gasification Project and Area Coordinator at Illinois Power's Clinton Nuclear Station;

7/83 - 8/83 R.A. Weirick & Associates - on contract to Commonwealth Edison Byron Station as a Project Construction Department Field Engineer

8/83 - Present Phillips, Getschow Company - at Commonwealth Edison's Braidwood Station as Project Engineer

Q.4. Please describe your responsibilities in connection with the Braidwood Project.

A.4. As the Phillips, Getschow Project Engineer I am responsible for all Phillips, Getschow on site engineering activities.

Q.5. To which contention item is this testimony addressed?

A.5. Rorem et. al, Quality Assurance Contention Item 6.I.

6. Contrary to Criterion V, "Instruction, Procedures and Drawings", of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that activities affecting quality are prescribed by documented instructions, procedures, or drawings, and are accomplished in accordance with these instructions, procedures, or drawings.

I. Material installed for the pipe whip restraint plate was not of proper specifications. (Inspection Report 84-09, Exh. 22.)

Q.6. In response to Phillips, Getschow Audit 83-BR22, was anything done to assure that there were not other instances of incorrect material usage in pipe whip restraints?

A.6. Yes. In order to close out the finding in audit 83-BR22, Phillips, Getschow reviewed all whip restraint data pack documentation to identify all installations of incorrect material. This review involved the following steps.

1. For those installations where the Superintendent had indicated on the drawing the use of Phillips-Getschow material in accordance with by PGCP-18, the Stores Requests were checked to determine whether the material supplied by the warehouse was that indicated on the drawing. Additionally, those drawings were checked against the design drawings to assure correct material usage.

2. For those instances where a Stores Request indicated that material had been issued but the drawing did not indicate the use of the material, it was necessary to field verify whether the material had been installed. This verification was accomplished by checking the traceability number on the part installed to determine whether it was PGCo material or CB&I material. If PGCo material had been installed, the drawings were revised to so indicate and it was determined whether the material installed was correct by checking the design drawings. If CB&I material was installed, it was determined whether the material was correct by checking the CB&I and/or design drawings. For all of the PGCo material found to be installed, the traceability number on the Stores Request matched the number on the item in the field.

Q.7. At the time the NRC Inspector was conducting the inspection which eventually was documented in NRC Inspection Report 50-456/84-09 and 50-457/84-09, was there any documentation indicating that for drawing 1WR-RC1-6, the 1'9" x 2'1" x 1" whip restraint plate installed was of incorrect grade?

A.7. Yes. The log used in the 83-BR22 review of the whip restraint packages existed and in particular the indication in the log of the incorrect plate material, which was eventually cited by the NRC, was shown to the inspector. However, Phillips, Getschow had not yet completed the final review of the log's contents necessary to generate the required NCR's.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF DAVID A. BOONE
(on Rorem Q.A. Subcontention 6.I)

David A. Boone, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

David A. Boone
David A. Boone

Subscribed and Sworn before me
this 19th day of December 1985

Delene L. Lamb
Notary Public

My Commission Expires April 19, 1988
My Commission expires on_______.

0564H

TESTIMONY OF DAVID A. BOONE
(ON ROREM Q.A. SUBCONTENTION 6.I)

Q.1. Please state your full name for the record.

A.1. David A. Boone

Q.2. By whom are you employed and in what capacity?

A.2. I am employed by Daniel Construction Company on contract to Commonwealth Edison Company's Project Construction Department at Braidwood Station in the capacity of a Constuction Field Engineer.

Q.3. Please summarize your educational and professional background.

A.3. Education - High School graduate with some college level courses. Experience - Over sixteen years experience in the operation, construction engineering, maintenance, training, testing and Quality Control/Quality Engineering at Nuclear Power facilities both Military and Commercial. Extensive management experience in the Quality Inspection and Quality Engineering areas.

Positions held -	10/69 - 6/78	United States Naval Nuclear Power Program - Highest position - Machinist's Mate First Class.
	6/78 - 11/79	Stone & Webster Engineering Corporation - position Engineering Associate.
	12/79 - Present	- Daniel Construction Company - Significant Positions Held - Senior Quality Inspection Supervisor - Project Quality Engineer - Project Quality Manager (current)

Certified as an ANSI N45.2.6 Level III Inspector under the Daniel Construction Company Program.

Q.4. Please describe your responsibilities in connection with the Braidwood Project.

A.4. I am currently assigned to the Project Construction Mechanical Compliance Group. My activities include but are not limited to:

1) Developing and implementing construction and Quality Program Procedures

2) Coordinating with Quality Assurance, Licensing, the Architect/Engineer, Contractors and the NRC for resolution of quality issues relating to construction, including implementation of corrective action and corrective action to preclude repetition.

3) Preparing and evaluating responses to quality issues pertaining to construction such as Quality Assurance Audit Items and NRC Items of Noncompliance.

4) Reviewing contractor procedures and revisions for compliance with design requirements, Code requirements and Quality Program requirements.

5) Reviewing and/or dispositioning contractor nonconformance reports to assure compliance with design, Code and Quality Program requirements.

6) Assisting the Licensing organization on issues relating to that process.

7) Special Projects as assigned by the Project Manager and Project Construction Superintendent.

Q.5. To which contention item is this testimony addressed?

A.5. Rorem et. al, Quality Assurance Contention Item 6.I.

6. Contrary to Criterion V, "Instruction, Procedures and Drawings", of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that activities affecting quality are prescribed by documented instructions, procedures, or drawings, and are accomplished in accordance with these instructions, procedures, or drawings.

I. Material installed for the pipe whip restraint plate was not of proper specifications. (Inspection Report 84-09, Exh. 22.)

Q.6. What is a pipe whip restraint?

A.6. A welded and/or bolted structural assembly intended to restrain piping movement in the unlikely event of a pipe break.

Q.7. Currently, how many pipe whip restraints are designed to be installed in the plant?

A.7. There are 31 restraints designated for each unit for a total of 62. That number has been considerably higher in the past but the NRC has considerably reduced the number needed in the plant.

Q.8. By whom are these restraints supplied?

A.8. Chicago Bridge & Iron (CB&I) fabricates the parts and supplies the restraints partially assembled.

Q.9. Who completes the assembly of the restraint and installs them in the plant.

A.9. Phillips Getschow Company completes the assembly and installs the restraints. Also, Phillips Getschow supplies additional material as required.

Q.10. Is there a procedure which governs the installation of these pipe whip restraints at Braidwood?

A.10. Yes. Phillips, Getschow Procedure PGCP-18, "Whip Restraint Installation".

Q.11. When was this procedure first implemented?

A.11. PGCP-18 was first implemented on December 29, 1980, which was approximately ten (10) months before installation began on the first restraint.

Q.12. Prior to April 26, 1984, how did the procedure provide for the use of additional or replacement material?

A.12. During the installation of a whip restraint, if it was noted that material needed for the installation was missing or damaged, or if additional material is needed due to revised design, the Superintendent made out a Stores Request to requisition the needed material based upon his review of the design documents. The Superintendent was also required to clearly identify on the applicable drawing the material replacement and initial and date the drawing.

Q.13. Under the procedure in effect prior to April 26, 1984, was there ever a problem with incorrect replacement material being used?

A.13. Yes.

Q.14. How was this problem identified?

A.14. Phillips, Getschow Site Quality Assurance identified the use of incorrect material in a pipe whip restraint during a regularly scheduled audit of Phillips, Getschow activities at Braidwood conducted between December, 1983 - January, 1984. - Reference PGCo Internal Audit #83-BR22.

Q.15. What specific deficiencies concerning the use of material in whip restraints, was described by the audit?

A.15. The audit identified one (1) restraint out of the nine (9) whip restraints reviewed where PGCo supplied material of incorrect specification was used to replace a missing CB&I part. In particular, drawing 1WR-RC1-1 called for ASTM A-572 grade 50 material for Gusset 3/4" x 13" x 13", but the Stores Request

indicated ASTM A-515 grade 70 material had been used. This discrepancy was identified by examining Stores Requests documents for materials withdrawn for use in the applicable whip restraints.

Q.16. What corrective action was taken to remedy the one use of incorrect replacement material?

A.16. Phillips Getschow initiated NCR 1537 identifying the incorrect replacement on May 17, 1984. Additionally as described in James R. Stewart's affidavit a 100% review of all pipe whip restraint data packs was undertaken to identify uses of incorrect material.

Q.17. What were the results of the pipe whip restraint data pack review?

A.17. Eleven (11) additional whip restraints were found to have material of the incorrect specification installed out of the one hundred and ninety two (192) whip restraint data packages that had been issued. The number of whip restraints in the plant has subsequently been greatly reduced and many restraints that were already installed were deleted.

Q.18. Were NCR's also written for these uses of incorrect material?

A.18. Yes.

Q.19. Were these NCR's written on the day an incorrect material replacement was found?

A.19. No.

Q.20. Did documentation exist prior to the writing of the NCR's which showed that these material substitutions were incorrect?

A.20. Yes. The reviewers of the whip restraint data packages were keeping a log which indicated the results of their review. This log was created as an organizational and administrative record to track the data package review. After the review was completed this log was to be used to generate NCR's for all nonconforming conditions identified. This review was completed on April 13, 1984.

Q.21. Did the NRC identify an incorrect material use in a pipe whip restraint?

A.21. Yes.

Q.22. When was this finding made?

A.22. During the inspection conducted between May 1, 1984 and June 4, 1984 as documented in Inspection Report Nos. 50-456/84-09 and 50-457/84-09 which was after the 100% review of pipe whip restraint data packs was complete.

Q.23. What precisely was the NRC finding?

A.23. The inspector stated that for drawing 1WR-RC1-6, a 1'9" x 2' 1" x 1" whip restraint plate was supposed to be ASTM A572 GR.50 material but was in fact ASME SA-516 GR. 60.

Q.24. When was the NCR issued for the incorrect substitution identified by the NRC?

A.24. NCR#1537 was initiated on 5/17/84.

Q.25. What was the cause of the incorrect material replacements identified during the review?

A.25. The cause of the improper uses of material uncovered during the pipe whip restraint data pack review was either the Superintendent requesting incorrect material or the warehouseman failing to fill the Stores Request as written.

Q.26. Was anything done to assure that the same problem did not arise in the future?

A.26. Yes. The procedure which controls the installation of pipe whip restraints, PGCP-18, was revised. The revision, Revision 10, became effective on April 26, 1984. Under this revision, if the Superintendent finds he needs to replace a damaged or missing part, he is required to issue a Field Problem Report (FPR). This FPR is then sent to the Project Engineer. The Project Engineer then determines whether Phillips-Getschow can supply proper replacement material. Based on the Project Engineer's disposition of the FPR, the superintendent then issues a Stores Request for the type of material identified in the FPR by the Project Engineer. Once the material is installed, the Superintendent indicates the replacement material on the drawing. Quality Control is also required to verify the replacement. If additional material is needed because of a change in design, the Project

Engineer issues a Field Change Order (FCO) directing the Superintendent to install the additional material. The Superintendent then requisitions the material required by the FCO in accordance with Phillips, Getschow Procedure QCP-B4.2. Quality Control is also required to verify the replacement.

Q.27. Has there been any subsequent audit to verify the effectiveness of the change in the procedure instituted as a result of PGCo Internal Audit #83-BR22?

A.27. Yes, PGCo Internal Audit #84-BR40 conducted between 12/21/84 and 3/12/85.

Q.28. What did the Audit find?

A.28. All material substitution items examined were found acceptable.

Q.29. Have all of the NCR's concerning incorrect material usage that were issued as a result of pipe whip restraint data pack review been closed?

A.29. Yes.

Q.30. What was the disposition for each incorrect material usage?

A.30. Due to the variations in the actual deficiencies or complexity of the deficiencies identified, the dispositions varied. The following chart explains the disposition for each incorrect material usage.

Drawing No.	NCR No.	Disposition
1WR-FWR-2	1537	1
1WR-MS-P6	1537	1, 3
1WR-MS-P11	1537	1
1WR-MS-P17	1537	1
1WR-MS-P26	1537	1
1WR-RC1-1	1537	1
1WR-RC1-6	1537	2
1WR-MS-R12X	1809	2
1WR-MS-P16	1810	1
2WR-FWR-5	1810	1
1WR-FWR-19	1811	1
2WR-FWR-39	2790	3

1. Installed material was accepted by the Architect/Engineer, S&L, via an FCR/ECN and the production drawing was updated to reflect the material substitutions.

2. Installed material was replaced with correct material.

3. Whip restraint was subsequently deleted from plant design and material was removed and restraint was either sent to stock or scrapped.

Q.31. Have there been any pipe whip restraints installed since Revision 10 of PGCP-18 took effect on April 26, 1984?

A.31. Yes.

Q.32. Have there been any NCR's issued which indicated that material installed subsequent to April 26, 1984 was of incorrect specification?

A.32. No.

Q.33. Has the NRC closed the item of noncompliance which it issued as a result of its own identification of this issue.

A.33. Yes, as documented in Inspection Report Nos. 50-456/85-015 and 50-457/85-016, dated May 16, 1985.

ROREM SUBCONTENTION 9A

Rorem Contention 9A states in pertinent part:

> 9. Contrary to Criterion IX, "Control of Special Processes," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure 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.
>
> A. 127 safety-related structural steel fillet welds were painted prior to acceptance of the work and the welds were subsequently visually inspected for acceptance, with 79 accepted in the painted condition. In addition, visual weld inspections were not performed on safety-related full penetration welds completed under the jurisdiction of Structural Specifications F/L-2735 and F/L-2722 prior to May 1, 1984. The welds were accepted based on other methods of non-destructive examination, but were not accepted in accordance with the requirements of Section 8.15, Quality of Welds, Visual Inspection.

Subcontention 9A encompasses two separate events. Event I involves alleged inspection of fillet welds through paint. Event II involves an alleged failure to perform visual weld inspections on certain full penetration welds. Only Event I will be addressed in this Motion for Summary Disposition.

MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. In May, 1984, while conducting a review of Pittsburgh Testing Laboratories' (PTL) documents in connection with an unrelated matter, an NRC inspector found one visual weld inspection report which indicated that certain fillet welds had been inspected through paint. This inspection report

had been prepared in 1980. The inspection report related to an inspection of structural steel fillet welds installed by Napoleon Construction Company. (Fred D. Forrest Affidavit, p. 3).

2. The NRC inspector brought this visual weld inspection report to the attention of PTL's site manager. PTL's site manager acknowledged that an inspection of fillet welds through paint was contrary to PTL procedures. (Fred D. Forrest Affidavit p. 3). The NRC issued an item of noncompliance, severity level ___ as a result of these improper inspections.

3. To determine whether there were further visual weld inspections which had been done through paint, the PTL site manager ordered a review of all PTL visual weld inspection reports which totaled approximately 4000 at that time. (Fred D. Forrest Affidavit p. 3).

4. Five additional visual weld inspection reports were found which contained a similar notation indicating that visual weld inspections had been done after the welds were painted. The six visual weld inspection reports involved were reports numbered 561, 709, 711, 713, 716 and 717. PTL found no other visual weld inspection reports indicating that inspections had been conducted of painted welds. (Fred D. Forrest Affidavit pp. 3-4).

5. The welds covered by Report 561 had been visually inspected through paint, but Edison QA had also directed that the welds be subjected to magnetic particle inspection. Despite

the prior successful magnetic particle inspection, Edison instituted an NCR to disposition the breach of visual weld examination procedures reflected in Report 561. The subject welds were reinspected visually and by use of magnetic particle examination in an unpainted condition pursuant to this NCR. (Fred D. Forrest Affidavit pp. 3-4).

6. The other five visual weld inspection reports identified were all completed by a single PTL inspector in a 9-day period in 1980. The five reports encompassed approximately 125 fillet welds. (Fred D. Forrest Affidavit p. 4).

7. PTL instituted an NCR to investigate and correct the problem represented by these five visual weld inspection reports. The method chosen by PTL to disposition this problem was to have the paint removed from the subject welds and to conduct a reinspection of each weld. (Fred D. Forrest Affidavit p. 4).

8. Upon further investigation, it was determined that certain of the original welds had been deleted in work done subsequent to 1980. It was also determined that certain how many of the welds were currently inaccessible because of work done subsequent to 1980. For all welds which were still in existence and accessible, Gust K. Newberg Construction Company ("Newberg"), the structural steel welding contractor at Braidwood in 1984, removed the paint from each weld. Within approximately one week of the discovery of the problem, PTL had

conducted a reinspection of all of the welds which were still in existence and accessible. (Fred D. Forrest Affidavit, pp. 4-5).

9. Upon reinspection, PTL accepted some of the welds and did not accept others. Most of the welds which were not accepted by PTL upon reinspection were reworked by Newberg. These reworked welds were subsequently inspected and accepted by PTL. (Fred D. Forrest Affidavit pp. 4-5).

10. It was determined upon reinspection that certain of the fillet welds that had been placed in 1980 were shorter than what was called for by the design drawings. These welds were noted by PTL and brought to the attention of Newberg. The reason these welds were shorter than what was called for by the design drawing was because the fit-upp did not allow a full length weld to be installed. Because the configuration of the weld joint did not permit installation of a full length weld, these welds could not be reworked. Newberg instituted an NCR to disposition this problem. The welds which were shorter than called for by the design drawings and which could not be corrected were analyzed pursuant to the NCR by Sargent & Lundy the Architect/Engineer. Sargent & Lundy determined after analysis that the welds were of sufficient length. (Fred D. Forrest Affidavit pp. 5-6).

11. In addition, three of the welds encompassed by the subject reports were dispositioned pursuant to Edison NCR's. Two of these welds were inaccessible because of work

done since 1980. These were analyzed by Sargent & Lundy. One of the inaccessible welds was found not to require analysis because subsequent work had made it redundant.
The other was accepted by Sargent & Lundy after reviewing the results of PTL's reinspection of the other welds included in the subject inspection reports. Sargent & Lundy found that the design margin for the inaccessible weld was high compared to the type of weld deficiences found in similar welds, concluding the weld could be accepted "as is". The third weld which was the subject of an Edison NCR was a fillet weld which was shorter than called for by the design drawings and for which there was insufficient room to place a longer weld. Sargent & Lundy found that the weld was of sufficient length. (Fred D. Forrest Affidavit p. 5).

12. By January, 1985, all of the welds which had not been deleted had been inspected and accepted or dispositioned pursuant to Newberg and Edison NCR's. (Fred D. Forrest Affidavit p. 6).

13. In each instance where a weld was inspected after it was painted, the PTL inspector documented this fact. A 100% review was done of PTL visual weld reports and each instance of a visual weld inspection through paint has now been identified. The total population of these visual weld inspection reports are inspection report numbers 561, 709, 711, 713, 716 and 717. (Fred D. Forrest Affidavit p. 3).

14. All of the welds which were included in visual weld inspection report numbers 561, 709, 711, 713, 716 and 719 have now been reinspected in an unpainted condition and accepted or have been dispositioned pursuant to Newberg and Edison NCR's. (Fred D. Forrest Affidavit p. 6).

15. There is no evidence that Edison QA has instructed PTL to inspect welds through paint other than in the instance of these identified inspection reports and there is no indication that PTL has ever made inspections of welds through paint other than in the instance of these reports. (Fred D. Forrest Affidavit pp. 6-7).

16. After discovery of this problem in May, 1984, Edison issued a letter to PTL directing that all future visual weld inspections shall be done while welds are in an unpainted condition to prevent recurrence of the problem. PTL's site manager has also instructed his inspector's that all inspections shall be done in accordance with procedures. (Fred D. Forrest Affidavit pp. 6-7).

17. NRC has closed out this item of non-compliance after review of the corrective action taken by the Licensee and its contractors. (NRC Inspection Report numbered 50-456/85-40 and 50-457/85-39).

DISCUSSION

In Subcontention 9A, Intervenors have alleged that Commonwealth Edison Company failed to establish proper procedures to control special processes in violation of Criterion IX of 10 CFR Part 50, App. B. While Applicant concedes that the events set forth in the contention constitute a violation of PTL procedures which implement Criterion IX, it is apparent that the facts establish that this violation was an isolated occurence having no safety significant.

In 1984, an NRC inspector, reviewing records of Pittsburgh Testing Laboratories ("PTL") in connection with an unrelated matter, found one visual weld inspection report which indicated that certain fillet welds had been inspected through paint. This was contrary to Braidwood Quality Procedures.

Upon learning of this problem, PTL reviewed the approximately 4,000 visual weld inspection reports which had been completed up to that point in 1984 to determine whether there were other instances where fillet welds had been inspected through paint. Of the approximately 4,000 reports reviewed, it was determined that six instances existed in which fillet welds had been inspected in a painted condition. In one of these instances, the documents indicated that Edison QA allowed the inspection through paint, but required that magnetic particle testing also be done on the fillet welds. The five other instances in which welds were inspected through paint had all been done by one PTL inspector during a 9-day period in the Fall of 1980.

These instances of inspection of painted welds do not show that the Licensee has failed to establish measures to assure that special processes are accomplished in accordance with "applicable codes, standards, specifications, criteria and other special requirements." In fact, it is clear that the Licensee had established such measures. Licensee had contracted with PTL to inspect all of the subject welds. A procedure had been set up to document the inspection and to record the results of the inspection. The undisputed facts show that in this case the inspection took place, the fact of the inspection was recorded and the results of the inspection were documented. These six visual weld inspections conducted contrary to procedures are not evidence of a failure on the part of the Licensee to establish measures to control special processes. They are, rather, evidence of an isolated failure to implement proper procedures which were otherwise fully adhered to.

This item of non-compliance raises no question about the quality of the work in the field at Braidwood. All of the welds which were inspected through paint in 1980 have been reinspected in an unpainted condition and accepted by PTL or have been dispositioned pursuant to contractor or Licensee NCR's. For welds that were inaccessible or of improper length, the NRC disposition took place only after analysis of the welds by Sargent & Lundy, the Architect/Engineer. There can be no question about the quality of the work in the field created by these welds.

Despite the fact that there were no instances where welds were inspected through paint within three years of the date that NRC first identified the problem visual weld inspection report, the Licensee has taken steps to ensure that such instances do not recur. Upon identification of the problem, the Licensee sent a directive to its contractor, PTL, stating that all future weld inspections shall be done of welds in an unpainted condition. The site manager for PTL has instructed his employees that all weld inspections shall be done in accordance with procedures.

The undisputed facts concerning this event demonstrate that the Licensee has established measures to ensure special processes are accomplished in accordance with applicable requirements. Upon discovery of instances in which established procedures had been breached, the Licensee took appropriate action to assure that the violation of procedures did not result in any hardware problems in the field. Licensee also took appropriate steps to ensure that no similar breaches of procedure occur in the future. These conclusions are further supported by the fact that the Licensee's procedures and its corrective actions have been reviewed by NRC Region III personnel and, following review, this matter has been closed. (NRC Inspection Report numbered 50-456/85-40 and 50-457/85-39).

No factual issues have been raised by Intervenors which controvert the facts established by the Affidavit of Fred Forrest. Accordingly, there is no genuine issue of material fact with respect to the portion of Subcontention 9A which

deals with the inspection of fillet welds through paint. Commonwealth Edison Company is, therefore, entitled to summary disposition of this portion of the subcontention as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF FRED D. FORREST
(on Rorem Q.A. Subcontention 9A)

Fred D. Forrest, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Fred D. Forrest
Fred D. Forrest

SUBSCRIBED AND SWORN to
before me this 18th day
of December, 1985.

Ruth Bennett
Notary Public

My Commission expires on 8-17-87.

Q.1. Please state your name.

A.1. Fred D. Forrest

Q.2. Who is your employer?

A.2. Pittsburgh Testing Laboratories (PTL).

Q.3. Do you work at Commonwealth Edison Company's Braidwood Nuclear Generating Station (Braidwood)?

A.3. Yes.

Q.4. What is your position with PTL at Braidwood?

A.4. I am PTL's Site Manager. I have held that position since November 18, 1982.

Q.5. What are your responsibilities as PTL's Site Manager?

A.5. Essentially, I am responsible for the supervision of all employees and all work done by PTL at the Braidwood site.

Q.6. Please briefly describe your employment experiences in the nuclear energy industry.

A.6. I began work for PTL in the mid 1970's. All of my nuclear inspection experience has been with PTL. For approximately the first two and a half years that I worked for PTL, I was an inspector assigned to the Trojan Nuclear Generating Station in Ranier, Oregon. After a two year break in service, I returned to PTL in 1978 to work in the Portland, Oregon district office as a PTL inspector and then as Non-destructive Examination (NDE) Supervisor. In that position, I had inspection responsibilities in a variety of nuclear power plants throughout that PTL district. There I

gained experience as an inspector in a variety of disciplines including visual weld inspections. From the Portland district office, I went to work for PTL at the Surry Nuclear Generating Station in Surry, Virginia. I initially served as NDE Supervisor for PTL on site and was then promoted to site manager. I remained at Surry until I became site manager at Braidwood.

I am certified as a Level II Inspector in a variety of disciplines. These include radiographic examinations, liquid penetrant inspections, mag particle inspections, and material receipt inspections.

Q.7. What is the purpose of your testimony?

A.7. The purpose of my testimony is to explain the corrective action PTL took as a result of the NRC item of non-compliance found in NRC Inspection Report numbered 50-546/85-21 and 50-547/85-20. In this report, NRC found that:

> "127 safety-related structural steel fillet welds were painted prior to acceptance of the work and the welds were subsequently visually inspected for acceptance, with 79 accepted in the painted condition.

This item of non-compliance is set forth in Rorem Quality Assurance Subcontention 9D.

Q.8. Did PTL conduct an investigation of this NRC finding?

A.8. Yes.

Q.9. Please describe the scope and the results of that investigation.

A.9. In May, 1984 an NRC Inspector was examining documents in the PTL vault at Braidwood in connection with an unrelated matter. While reviewing documents, the inspector found a visual weld inspection report that had a notation on the bottom stating "Inspected through paint per CECo QA." This inspection report related to a visual inspection of structural steel fillet welds that had been installed by Napoleon Construction Company. The subject weld inspection had been completed in 1980.

The NRC Inspector brought this report to my attention. I acknowledged that a "first-line" inspection of fillet welds through paint was contrary to PTL procedures at Braidwood.

To determine whether this report reflected a widespread inspection problem, I ordered a 100% review of prior inspection reports to find out whether other welds had been inspected through paint. It was determined, after review of approximately 4,000 reports, that six weld inspection reports numbers 561, 709, 711, 713, 716, and 717, reported that welds had been inspected after the welds were painted. The welds covered by Report 561 had been visually inspected through paint at the direction of Edison QA but Edison QA had also directed that the weld be subjected to magnetic particle inspection. Despite the fact of the magnetic particle inspection, Edison instituted NCR 774 to disposition this problem. The welds were reinspected visually and by

use of magnetic particle examination in an unpainted condition pursuant to this NCR.

The other inspections were all performed by a single inspector during a nine day period in 1980 and covered approximately 125 welds. No other similar incidents were discovered.

I also requested that a search be made of our files to determine whether there was any further documentation concerning the reported direction to PTL from Licensee's QA to inspect these welds through paint. No further documentation of this reported direction was found nor were we able to find any documentation explaining why the direction was reportedly given.

Q.9. What steps were taken to disposition the problem visual weld reports.

A.9. PTL instituted NCR 191 (Rev. 1) to disposition these problem visual weld inspection reports. Essentially, the method chosen to deal with the problem was to remove the paint from all of the welds encompassed by the five visual weld inspection reports, and conduct a reinspection of those welds. PTL directed Gust K. Newberg Construction, which in 1984 was performing structural steel weld work on site, to remove the paint from the subject welds. A number of the welds had been deleted subsequent to the original installation in 1980 and several others were inaccesible. For all that had not been deleted and were accesible, the paint was

removed from the weld and the welds were reinspected. The reinspection was completed within approximately a week of the initial discovery of the problem. For those welds which were not approved following reinspection after removal of the paint, orders were issued to repair the welds. When the repair work was completed, those welds were again inspected. All rework and inspections were completed by January, 1985.

Three of the welds encompassed in the subject reports were dispositioned pursuant to Edison NCR's. Two of these welds were inaccesible because of work done since 1980. These were brought to the attention of Sargent & Lundy, the architect/engineer. One of the inaccessible welds was found to create no problems because subsequent work had made it redundant (NCR 628). The other was accepted by Sargent & Lundy after reviewing the results of PTL's reinspection of the other welds on the subject inspection reports. Sargent & Lundy found that the design margin for the weld was high compared to the type of weld deficiencies found in similar welds, concluding the weld could be accepted "as is." The third weld which was the subject of an Edison NCR was a fillet weld which was shorter than called for by the design drawings and for which there was insufficient room to put a longer weld. Sargent & Lundy found that the weld was of sufficient length (NCR 629).

In addition, PTL determined, during the reinspection following the removal of the paint, that

several other welds were shorter than what was called for by the design drawings. These had also occurred because the configuration of the joint did not permit installation of a full length weld. These welds were dispositioned in Newberg NCR 213-993. Pursuant to that NCR, Sargent & Lundy reviewed the welds and confirmed that the weld lengths were acceptable.

Q.10. Have all of the welds covered by visual weld inspection reports numbers 709, 711, 713, 716 and 717 now been reinspected and accepted or otherwise dispositioned?

A.10. Except for those welds deleted in work done subsequent to the original inspections in 1980, all affected welds have been reinspected and accepted or have been dispositioned pursuant to the above-described Licensee and Newberg NCR's.

Q.11. The NRC, in Inspection Report numbered 50-456/ 85-40 and 50-457/85-39, concluded that the visual weld reports indicating inspection of welds through paint were "deemed to be an isolated occurrence." Do you agree with this conclusion?

A.11. Yes. In our 100% review of PTL's weld inspection reports, no further incidents of inspection of welds through paint were discovered. In addition, I know from personal experience that the Licensee has never directed PTL to inspect welds through paint during the period that I have been at Braidwood Station since 1982. Further, as Site Manager for PTL, I have always instructed PTL employees to

inspect pursuant to procedures.

Q.12. Have any steps been taken to ensure that this problem does not recur?

A.12. Yes. Licensee has directed PTL by letter that all future "first-line" weld inspections shall be conducted only of welds in an unpainted condition.

Q.13. Do you know if this item of non-compliance involving inspection of welds through paint has been closed out by the NRC?

A.13. Yes. This item of noncompliance was closed out by NRC in NRC Inspection Reports numbers 50-456/85-40 and 50-457/85-39.

Rorem Subcontention 9.C.

Contention Item 9.C.

9. Contrary to Criterion IX, Control of Special Process, of 10 CRF Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that measures be established to assure that special processes, including we' ig are controlled and accomplished in accordance with applicable codes, standards, specifications, criteria and other special requirements.

* * *

C. Nine L.K. Comstock filler metal withdrawal authorization forms documented the release of E7018 weld rod for cable pan welds between May 25, 1982, and July 28, 1985 (Inspection Report 84-13, Exhibit 24).

MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. Filler metal withdrawal authorization forms at L.K. Comstock (LKC) document the release of electrodes to welders. During a routine safety inspection from June 5 through July 6, 1984, NRC resident inspectors reviewed over 300 such forms and found that nine of them documented the release of #7018 weld rod, an E70 series electrode, for use in cable pan welding. The NRC Staff assessed a severity level IV item of noncompliance as a result of this finding. Sargent & Lundy drawings and LKC procedures had specified use of E60 series electrodes for cable pan welding. Although five of the nine forms indicated that E6013 weld rods had been used, their heat numbers corresponded to E7018 weld rods. Thus, the accuracy of the metal withdrawal authorization forms [identification of weld rods as E60 or E70 series] was indeterminate. [Affidavit of James W. Gieseker, pp. 2, 3 (hereafter "Gieseker Affidavit")]

2. Cable pans are thin gauge carbon steel channels supported by hangers at regular intervals. The cable pan welds for which E60 series had been specified, but E70 series weld rods may have been used, are those which attach a cable pan to its support. Nonconformance Report (NCR) 3275 was issued by LKC to track and disposition the discrepancy. (Gieseker Affidavit, pp. 3-4).

3. LKC took the following steps to disposition NCR 3275. First, LKC procedure 4.3.10 Rev. D was revised in order to improve control of filler metal. Additionally, appropriate personnel involved in issuance and control of filler metal received training in the applicable procedure. Finally, LKC committed itself to a review of all filler metal withdrawal forms issued since the start of the project to identify any additional document discrepancies in which actual heat numbers might not match the type of electrode withdrawn, as was the case with five of nine withdrawal forms discussed above. The NRC closed this item on March 12, 1985 in Inspection Reports No. 50-456/85-005 (DRS); 50-457/85-005 (DRS). (Gieseker Affidavit, p. 4).

4. LKC did not complete a review of all such forms; instead, it found that the more efficient means of disposition the discrepancy was to review all material test reports for all E60 series electrodes used by it. Its review established that none of the E60 series electrodes used by LKC have a tensile strength of less than 70,000 pounds per square inch, which is the minimum tensile strength for E70 series electrodes. (Affidavit of Randall L. Kurtz, p. 3 (hereafter "Kurtz Affidavit); p. __"); Gieseker Affidavit, pp. 4-6).

5. The material certification reports, together with Sargent & Lundy's evaluation, establish that it is of no design significance that E60 weld rod might have been used where E70 weld rod was called for, and conversely, that E70 weld rod might have been used where E60 weld rod was called for. Design requirements would have been met in either case. Accordingly, LKC revised NCR 3275 to delete its commitment to review all filler metal withdrawal forms issued since the beginning of the project. (Kurtz Affidavit, pp.3-4; Gieseker Affidavit, pp. 5-6).

6. Use of one electrode series rather than the other for cable pan welds would not result in a greater percentage of rejectable welds. The E60 series electrodes were specified for welding of cable pans, because of those electrodes require less skill on the part of the welder. Welds made with E70 series electrodes exceed the strength requirements of welds designed as E60. Sargent & Lundy revised its drawings to permit the use of either E60 or E70 series weld rods for cable pan welds. Moreover, sound welds should result with either electrode series when qualified welders follow suitable welding procedures. Adequate quality welds are assured in any event because welders and procedures were qualified to use both filler metals. Finally, 100% of all welds are visually inspected, thus providing further assurance as to the quality of the welds. (Kurtz Affidavit, p. 3; Gieseker Affidavit, pp.5-6).

7. A subsequent NRC inspection found that no significant deficiency exists in either LKC's control of filler metal withdrawal or in its documentation. Inspection Report No. 50-456/85-009 (DRS); 50-457/85-009 (DRS). A random sample of LKC filler metal withdrawal

forms covering a three-year period by the NRC inspector identified one typographical error and one misfiling. No other deficiencies were found. The report also concluded that LKC had in place adequate weld filler material controls, in light of the corrective action LKC had taken in NCR 3275 to improve control of filler metal. (Gieseker Affidavit, p. 6.)

DISCUSSION

Rorem Subcontention 9.C. contends that nine filler metal withdrawal forms documented the release of E70 series electrodes for cable pan welding, and that E60 series electrodes were specified for such application by Sargent & Lundy, in violation of Criterion IX of 10 C.F.R., Part 50, Appendix 3.

The affidavits of James Gieseker and Randall Kurtz amply demonstrate that while a technical violation may have occurred, it and other similar documentation discrepancies as to use of E60 and E70 series weld rods were of no design significance.

An analysis of the material certification reports for E60 series weld rods revealed that the tensile strength of the E60 material used by LKC actually meets or exceeds AWS minimum tensile strengths for E70 electrodes. Even if a complete review of all LKC filler metal withdrawal forms for the project had been undertaken, and even if E60 electrodes had been used when E70 electrodes had been specified, the

discrepancy would be of no design significance. A subsequent NRC inspection found that no significant deficiency exists in either LKC's control of filler metal withdrawal or in its documentation. Inspection Report No. 50-456/85-009 (DRS); 50-457/85-009 (DRS). A review of a random sample of LKC filler metal withdrawal forms covering a three-year period by the NRC inspector identified one typographical error and one misfiling. No other deficiencies were found. The report also concluded that LKC had in place adequate weld filler material controls, in light of the corrective action LKC had taken in NRC 3275 to improve control of filler metal.

The affidavits of Messrs. Gieseker and Kurtz also demonstrate that all welders were qualified to use either material, and the procedures for welding the materials were qualified as well. Moreover, Sargent & Lundy revised its drawings to permit use of either electrodes series for cable pan welds. Their affidavits also demonstrate that 100% of all welds are visually inspected, providing further assurance of the quality of the welds. Moreover, even though several documented instances exist reflecting that E70 series electrodes had been used where E60 series electrodes had been specified, the E70 series electrodes provide a greater strength weld than an E60 electrode.

Accordingly, there was no need for LKC to review all filler metal withdrawal forms since the beginning of the project, as it originally committed to itself to doing, since any such discrepancies would have no design significance. Thus, the documented discrepancies as well have no design significance. While this discrepancy constitutes a

technical violation of Criterion IX, 10 C.F.R. Part 50, Appendix B, Sargent & Lundy's analysis, as well as LKC's review of material certification reports demonstrate that it actually had no design significance. Mr. Kurtz's affidavit additionally establishes that AWS D1.1-1975, the welding code which is required by Sargent & Lundy specification for Braidwood Project, neither requires nor prohibits use of either series for use in cable pan welds.

The NRC findings, together with in the affidavits of Messrs. Gieseker and Kurtz establish that there is no genuine issue of material fact regarding this subcontention. Commonwealth Edison Company is entitled to summary disposition of this subcontention as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT OF RANDALL L. KURTZ
(on Rorem Subcontention 9C)

Randall L. Kurtz, being duly sworn deposes and states:

The following questions and answers constitute my testimony in the above-captioned proceeding.

Further affidant sayeth not.

Randall L Kurtz
Randall L. Kurtz

SUBSCRIBED AND SWORN to before me this 18th day of December, 1985.

Marilyn A. Bumak
Notary Public

My Commission Expires July 15, 1987

TESTIMONY OF RANDALL L. KURTZ
(On Rorem Subcontention 9C)

Q1. What is your name?

A1. My name is Randall L. Kurtz.

Q2. By whom are you employed and what is your business address?

A2. I am employed with Sargent & Lundy Engineers as the Supervisor of the Project Section in the Quality Control Division (QCD). My business address is 55 East Monroe, Chicago, Illinois 60603.

Q3. What is your professional and educational experience?

A3. I have been employed at Sargent & Lundy Engineers since May 10, 1976. I am responsible for assuring that QCD Project Section activities are performed in accordance with client project requirements, Sargent & Lundy procedures and accepted QA/QC standards. I have a Bachelor of Science degree in Metallurgical Engineering from Purdue University. I am an American Welding Society Certified Welding Inspector and a Level III visual examiner in accordance with Sargent & Lundy procedures.

Q4. What is the purpose of this affidavit?

A4. This affidavit is made in support of Commonwealth Edison Company's motion for summary disposition of Rorem Subcontention 9C.

Contention Item 9C

9. Contrary to Criterion IX, Control of Special Process, of 10 CFR Part 50, Appendix B, Commonwealth Edison Company has failed to ensure 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.

* * *

C. Nine L. K. Comstock filler metal withdrawal authorization forms documented the release of E7018 weld rod for cable pan welds between May 25, 1982, and July 28, 1985, (Inspection Report 84-13, Exhibit 24).

Q5. What kind of filler material does Comstock use for welding of carbon steel materials?

A5. Comstock uses E60 series or E70 series electrodes.

Q6. What is the difference between E60 series and E70 series electrodes?

A6. The American Welding Society has standardized the method for classification of filler metals. The letter E designates an electrode. The first two digits, 60, for example, designate tensile strength of at least 60,000 pounds per square inch of the deposited metal, in the as-welded condition.

Q7. Would use of one electrode series rather than the other result in a greater percentage of rejectable welds?

A7. No. The E60 series electrodes were originally specified for thin gauge metals such as cable pans because they require less surface preparation and less skill on the part of the welder. The E60 series electrodes have been used to advantage on galvanized materials such as cable pans. When using an E70 electrode on galvanized material, additional surface preparation is required. If a properly qualified welder follows a suitable welding procedure, a sound weld should result with either electrode series.

Q8. Since Sargent & Lundy did originally specify the use of E60 series electrodes for cable pan welds, would the use of E70 series electrodes be unacceptable?

A8. No. A weld made with E70 series weld rod exceeds the strength requirements of those welds designed as E60. Use of E60 or E70 weld rods for this application is neither required nor prohibited by AWS D1.1.1975. Adequate quality welds are assured in either case since welders and procedures have been qualified to use both filler metals. Furthermore, 100% of all welds are visually inspected, thus further assuring the quality of the welds. Sargent & Lundy has issued ECN 23028 revising its drawings to allow for the use of either E60 series or E70 series weld rod for cable pan welds.

Q9. Is this discrepancy significant?

A9. No. The discrepancy is of no design significance. Design requirements would be met regardless of whether E60 or E70 series weld rods are used.

Q10. Is the filler metal withdrawal form provide the only assurance that a suitable filler material has been used?

A10. No. All welds are made in accordance with a written welding procedure. The welding procedure specifies which filler metals are acceptable for a particular application. Welders' compliance with written welding procedure is verified by random in-process inspections. Additionally, filler material certification documents and heat numbers of filler material establish the tensile strengths and other relevant suitability factors of filler materials.

Q11. Does this complete your affidavit?

A11. Yes.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF JAMES W. GIESEKER
(on Rorem Q.A. Subcontention 9C)

James W. Gieseker, being duly sworn, deposes and states:

The following questions and answers constitute my testimony in the above-captioned proceeding.

Further affiant sayeth not.

James W. Gieseker
James W. Gieseker

Subscribed and Sworn before me
this 20th day of December 1985

Deline L. Lamb
Notary Public
My Commission Expires April 19, 1988

My Commission expires on_______.

0610H

TESTIMONY OF JAMES W. GIESEKER
(On Rorem Subcontention 9C)

Q1. Please state your full name for the record.

A1. James W. Gieseker.

Q2. By whom are you employed and in what capacity?

A2. I am employed by the Commonwealth Edison Company (CECo) as a Project Construction Engineer. I have been employed by CECo since July 19, 1971. Since August 6, 1984 I have been assigned to CECo Braidwood Station. I am responsible for the Project Construction Department (PCD) Electrical Group interface with the electrical contractor L. K. Comstock (LKC) Quality Control (QC) Department and inspections performed in the electrical area by the Nuclear Regulatory Commission. As such, I have knowledge of LKC's QC procedures and inspections, including welding and weld rod control.

Q3. Please summarize your education and professional experience.

A3. I have a BSEE degree from Valparaiso University. Prior to being assigned by CECo to Braidwood Station, I was assigned to the LaSalle County Nuclear Generating Station. At LaSalle, I was in the CECo Quality Assurance Department from May 1976 to August 1979, the Construction Department from August 1979 to July 1982 and the station Technical Staff from July 1982 to August 1984. Prior to LaSalle, I was assigned to the CECo Transmission Engineering Department.

Q4. What is the purpose of this affidavit?

A4. This affidavit is made in support of Commonwealth Edison Company's motion for summary disposition of Rorem Contention 9.C.

Contention Item 9.C.

9. Contrary to Criterion IX, Control of Special Process, of 10 CRF Part 50, Appendix B, Commonwealth Edison Company has failed to ensure 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.

* * *

C. Nine L. K. Comstock filler metal withdrawal authorization forms documented the release of E7018 weld rod for cable pan welds between May 25, 1982, and July 28, 1982 (Inspection Report 84-13, Exhibit 24).

Q5. What is the basis for the contention?

A5. NRC resident inspectors conducted a routine safety inspection from June 5 through July 6, 1984. The scope of this inspection included the review of structural supports for 10 cable tray hangers. The inspectors examined these supports to determine compliance with the applicable drawings and procedures. Attributes examined consisted of support configuration, dimensions and weld details. In addition, L. K. Comstock and Pittsburgh Testing Laboratories inspection reports were reviewed as well as L. K. Comstock Procedures 4.8.3. (Weld Inspection) and 4.3.10 (Storage, Issue and Control of Weld Material).

During the review of over 300 filler metal withdrawal authorization forms, which document the issuance of weld rods, NRC inspectors noted that nine filler metal authorization forms documented the

assignment of #7018 weld rod, an E70 series electrode, for use in cable pan welding. According to Sargent & Lundy Drawing 20E-0-3251, Revision AC, and L. K. Comstock Procedure 4.3.3, dated January 29, 1982, use of E60 series weld rod was specified for cable pan welding. The results of the inspection were documented in NRC Inspection Reports 50-456/84-013; 50-457/84-013. Comstock then issued Nonconformance Report 3275 (NCR 3275) to track and disposition the item of noncompliance.

Q6. Were any other discrepancies identified during the NRC inspection?

A6. Yes. The designated class of weld rod for five of the nine filler metal withdrawal forms indicated E6013. The heat numbers on these forms, however corresponded to E7018 material. Thus, it was uncertain whether E60 or E70 series was used in any particular cable pan weld. This was subsequently identified as a documentation error by the NRC inspector.

Q7. Please describe the purpose of cable pans.

A7. In order to support cables as they are routed between components and equipment, a network of cable pan systems had been designed throughout the plant. The cable pan consists of a 14 gauge (0.105 inches, thin gauge) carbon steel channel from 12 inches to 30 inches wide. The cable pan system is supported by hangers at regular intervals of approximately 8 feet. The cable pan welds for which E70 series weld rod may have been used are those which attach the

cable pan to its support. The Affidavit of Mr. Kurtz describes the differences between E70 series weld rod and E60 series weld rod.

Q8. What steps were taken to disposition NCR 3275?

A8. Comstock Procedure 4.3.10 Rev. D was revised in order to improve control of filler metal; additionally, personnel involved in issuance and control of filler metal received training in the applicable procedure. Comstock also agreed to review all filler metal withdrawal forms issued since the start of the project to determine whether additional documentation discrepancies might exist (such as those where five of the nine filler metal withdrawal forms indicated actual heat numbers which corresponded to E70 electrodes, but the forms reflected withdrawal of E60 electrodes). The NRC closed this item in Inspection Reports No. 50-456/85-005 (DRS); 50-457/85-005 (DRS) dated March 12, 1985.

Q9. Did Comstock complete this review of all filler metal withdrawal forms for such discrepancies?

A9. No. After some preliminary consideration of this massive task, Comstock performed a review of the certified material test reports for the E60 series electrodes used by Comstock. This material review was deemed to be far more efficient than review of all withdrawal forms issued since the beginning of the project, because the results of this analysis would validate the past use of either E60 or E70 series electrodes by Comstock for any kind of electrical welding. Although I address the results of that analysis in more

detail below, the review established that the E60 series electrodes used by Comstock met or exceeded minimum tensile strengths of E70 series electrodes.

Q10. Are the discrepancies identified in this contention significant?

A10. No. As explained in the Affidavit of Mr. Kurtz, the E60 series weld rod had been specified for cable pan welding because of thin gauge materials. A weld made with E70 series weld rod exceeds the strength requirements of welds made with E60 electrodes. Adequate quality welds are assured in either case since welders have been qualified to use both filler metals. Furthermore, 100% of all safety-related welds are visually inspected, providing further assurance of their acceptability. Sargent & Lundy drawings have been revised to allow for the use of either E60 series of E70 series weld rod for cable pan welds. Moreover, as I mentioned above, Comstock found it more efficient to review all E60 series material test reports for all such electrodes used by them. That review established that none of the E60 series electrodes used by Comstock have a tensile strength less than 70,000 pounds per square inch, which, as the Affidavit of Mr. Kurtz describes, is the minimum allowable tensile strength of E70 series electrodes. Accordingly, Comstock re-evaluated NCR 3275 and issued NCR 3275, Rev. 1, which deletes the commitment to review all Comstock weld filler metal withdrawal forms issued since the start of the project. L.K. Comstock's completed review of all material certification documents found that all E60 series weld rod used meets or exceeds the requirements for E70 series weld rod. Thus, the identified

discrepancies are of no design significance. Any additional discrepancies regarding Comstock's possible use of E60 electrodes rather than E70 electrodes (and vice versa) for past welds which might have been identified had Comstock undertaken to complete a review of all filler metal withdrawal forms issued since inception are also of no significance.

Finally, special unannounced NRC safety inspection regarding allegations as to the same overall descrepancy found that no significant deficiency exists in either LKC's control of filler metal withdrawal or in its documentation. Inspection Report No. 50-456/85-009 (DRS); 50-457/85-009 (DRS). A random sample of LKC filler metal withdrawal forms covering a three-year period by the NRC inspection identified one typographical error and one misfiling. No other deficiencies were found. The report also concluded that LKC had in place adequate weld filler material controls, in light of the corrective action LKC had taken in NCR 3275 to improve control of filler metal.

Q12. Does this conclude your affidavit?

A12. Yes.

ROREM SUBCONTENTION 9D

Rorem contention 9D states in pertinent part:

> 9. Contrary to Criterion IX, "Control of Special Processes," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure 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.
>
> D. [A] quality [structural steel, flux core welding procedure,] was not approved for use by the Architect-Engineer, Sargent & Lundy, but was released for use in installation by the structural steel contractor and documented as being used for cover plate welds. Furthermore, the welder documented as performing the welding was not qualified. In addition, RPS Division loop B, reactor coolant flow, completed socket weld joints, have no piping records identifying the welder or welder filler metal utilized. (The words in brackets represent corrections to Intervenors' misquotation of the NRC item of non-compliance set forth in contention 9.D.)

Subcontention 9D encompasses two separate events. Event I involves the alleged use of an unapproved structural steel welding procedure by an allegedly unqualified welder. Event II involves the absence of complete documentation for a socket weld joint for instrumentation piping. A separate statement of material facts as to which there is no genuine issue to be heard is provided for each event. The two events are discussed together, since they were characterized as separate examples of one severity Level 5 of noncompliance by the NRC Staff

EVENT I

MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. The Arc Welding process is used at Braidwood by the Structural Steel Contractor, Gust K. Newberg Construction

Company (Newberg). Arc Welding is the process where an electric arc is used to melt the metal in an electrode along with the metal in two pieces of base material in order to fuse the two pieces of base material. The two pieces of base material meet in a joint. The electrode is moved along the joint mixing the metals to fuse the two pieces of base material. (Cedric Reynolds Affidavit pg. 4).

2. Two types of arc welding have been used at Braidwood. These are the Shielded Metal Arc Welding (SMAW) process and the Flux Core Arc Welding (FCAW) process. In the SMAW process a solid metal rod is placed in a holder. Electricity is passed through the rod and the holder is manually manipulated to deposit the weld material at the weld joint In the FCAW process, a spool of wire is used in place of the .. The wire is mechanically fed from a hand held device. The FCAW process allows the continuous deposit of weld material without having to stop to replace the welding rod as is necessary in the SMAW process. (Cedric Reynolds Affidavit pgs. 4-5).

3. Information concerning structural steel welds is documented by Newberg on Structural Steel Installation Traveller (SSIT) packages. The SSIT packages include information concerning the identity of the welder performing the welds, the welding processes used, a designation of the type of welding rod or welding wire used, the time the weld was performed and a drawing showing the weld joint configuration. (Cedric Reynolds Affidavit pg. 7).

4. In early August, 1984, an NRC inspector reviewing a Newberg SSIT package, concluded that Newberg had used an unapproved FCAW welding procedure (WPS) and that the weld had been performed by a welder who was not qualified to used the FCAW WPS. (Cedric Reynolds Affidavit pgs. 7-8).

5. On August 10, 1984, Newberg issued a stop work order for all welding being done by Newberg on site. On August 14, 1984, Commonwealth Edison Company (Edison) issued a stop work order with respect to the same work. The Edison stop work order indicated that it was to remain in effect until the problem identified by NRC could be investigated and necessary corrective action taken to prevent recurrence. (Cedric Reynolds Affidavit pgs. 7-8).

6. Newberg first conducted an investigation of the specific problem identified by NRC. This included a review of the problem SSIT package, an interview of the welder involved and a review of the welder's qualifications. (Cedric Reynolds Affidavit pg. 8).

7. Based on this investigation, it was concluded that the welder had used the correct welding process, SMAW, for the joint in question. It was also determined that the welder was fully qualified for the SMAW process. However it was found that Newberg Engineering had specified, in the SSIT, the use of a FCAW WPS rather than a SMAW WPS. It was also determined that the specified WPS, while it was a procedure which was pre-qualified by the American Welding Society, had not been reviewed

and approved by the Licensee and the Architect/Engineer as required by the Architect/Engineer's specifications for Braidwood. The welder had copied this incorrect WPS number onto the section of the SSIT package where the WPS which was actually used was to have been identified. (Cedric Reynolds Affidavit pg. 8).

8. To determine whether the problem reflected in this one SSIT package was an isolated occurrence or more wide spread, Newberg and Edison QA also conducted a review of a sample of additional SSIT packages. Problems were found in some additional SSIT packages. (Cedric Reynolds Affidavit pg. 8).

9. Steps were taken by Edison and Newberg to assure that the problems found in the SSIT packages were not repeated in later SSIT packages. First, Newberg's quality procedures were revised. In the revised procedures, Newberg established a hold point for QC review and approval of the SSIT packages. This hold point occurred before welding commenced in the field. To provide further assurance that the correct WPS had been used, Edison QA established a hold point after the completed SSIT packages had been reviewed by Newberg QRC. These revised procedures were made applicable to those packages in process at the time of the stop work order as well as all subsequent packages.

Second, steps were taken to retrain the engineers and iron workers in the welding program to the latest approved

procedures and requirements. The training program for all Newberg engineers and iron workers involved in the welding program was conducted within three weeks of initial identification of the SSIT problem. Newberg also developed an ongoing training program designed to prevent reccurrence of this type of problem.

Finally, Newberg began attaching copies of the proper WPS to each SSIT package. This was done to provide for easy reference by production, as well as by quality personnel reviewing the packages. (Cedric Reynolds Affidavit pgs. 9-10).

10. On August 20, 1984, the stop work orders of Edison and Newberg were lifted. The stop work orders were lifted only after each of corrective actions described above had been instituted. (Cedric Reynolds Affidavit pg. 10).

11. In addition to the actions taken to prevent recurrence of the problem, steps were also taken to ensure that any problems existing in SSIT packages which had been previously completed were identified and to ensure that a detailed final review was done of all future SSIT packages. To accomplish this, Newberg instituted QCP 29-1. Under this procedure, checklists were established against which the all SSIT packages were to be reviewed. (Cedric Reynolds Affidavit pg. 10-11).

12. An analysis was also made to determine whether the documentation problems found in the SSIT packages were reflected in hardware problems in the field. It was

determined, after analysis by the Licensee and Newberg, that the SSIT documentation problem did not reflect any deficiencies in structural steel welding performed by GKN. (Cedric Reynolds Affidavit pg. 11).

13. After reviewing the Licensee's and Newberg's response to the SSIT documentation problem identified, NRC closed this item of non-compliance. (NRC Inspection Report numbered 50-456/84-40 and 50-457/84-37).

EVENT II

MATERIAL FACTS AS TO THERE IS NO GENUINE ISSUE TO BE HEARD

1. In an Inspection conducted between July 7 and August 31, 1984, an NRC inspector identified an incomplete weld installation package prepared by Phillips, Getschow Company. The weld installation package did not contain information identifying the welder or the weld filler material that was used on an instrummentation piping weld. (NRC Inspection Report numbered 50-456/84-17 and 50-457/84-17).

2. The weld installation package identified by NRC as being incomplete had not yet been the subject of a final review by Phillips, Getschow QC pursuant to QCP-B30. (John D. Carlson Affidavit pg. 6).

3. In order to investigate and correct the problem identified by NRC, Phillips, Getschow instituted an NCR. (John D. Carlson Affidavit pg. 4).

4. To disposition the NCR, Phillips, Getschow removed the subject weld and installed a new weld in its

place. All relevant information concerning the new weld was fully documented in the weld installation package. (John D. Carlson Affidavit pg. 4).

5. At the time that the weld installation package problem was identified, it was the responsibility of Phillips, Getschow's QC Supervisor to assure that all information was properly recorded on the weld installation package pursuant to Quality Control Procedure QCP-B8 (Rev. 5). To prevent recurrence of a similar problem, Phillips, Getschow procedures were revised to make it the duty of production personnel to document relevant information concerning weld installation. This procedure revision was reflected in Quality Control Procedure QCP-B21. Under the revised procedures, Phillips, Getschow QC had only review responsibilities. (John D. Carlson Affidavit pg. 5).

6. The incomplete weld installation package identified by NRC was scheduled for review by Phillips, Getschow QC in the routine course of its document inspection activities under QCP-B30. Phillips, Getschow QC inspection procedures are designed to detect the type of problem identified by NRC in this weld installation package. (John D. Carlson Affidavit pg. 6).

7. NRC has reviewed the corrective action taken by Phillips, Getschow to assure the quality of the subject weld and to prevent recurrence of similar problems. After review, NRC has closed this item of non-compliance. (NRC Inspection Report Numbers 50-456/84-40 and 50-456/84-37).

DISCUSSION

Subcontention 9D asserts that two examples of one Severity Level 5 item of noncompliance demonstrate that Applicant has failed to comply with Criterion IX of 10CFR Part 50, App. B in that welding by Gust K. Newberg ("GKN") and Phillips Getschow ("PGCo") was not controlled and accomplished in accordance with applicable codes and standards. The example involving GKN constitutes a procedural violation of Criterion IX with no safety implication for welds performed by GKN welders. The example involving PGCo does not constitute such a violation since procedural controls were in place which would have caught the deficiency identified by the NRC Staff.

The first event listed by intervenors in Subcontention 9D involves a GKN Structural Steel Installation Traveller ("SSIT") package which was reviewed by NRC. Upon review of the package, NRC concluded that (1) a structural steel welder had used a welding procedure which was not approved and (2) the welder was not qualified to use the listed procedure. This item was identified by an NRC inspector while reviewing SSIT packages in August, 1984.

An investigation of this matter was conducted by GKN, the structural steel contractor, under the direction of the Licensee. The investigation revealed that the welder had actually used an approved procedure and that the welder was qualified on the procedure he did use. It was determined that what had occurred was that GKN's Engineering Department had specified an incorrect procedure, and the welder had then indicated on the SSIT package that he had used the incorrectly specified weld procedure even though this was not the case.

This incident does not show that the Licensee had failed to establish measures to control special processes. Measures were in place at the time this problem surfaced which required that SSIT packages be circulated identifying the proper welding procedure to be used and documenting the procedure actually used. The packages were designed so that the GKN's Engineering Department would list the procedure to be used for each weld and provide the welder with a drawing graphically showing the weld location, the configuration of the weld and the type of procedure to be used. The production department was then required to list the actual weld procedure used. GKN's quality procedures provided for a review of the SSIT packages upon completion. The only negative implication that can be drawn from the documentation problem identified by NRC is that the procedures established to ensure the proper conduct of special processes were not implemented properly in this one instance.

However, the response of the Licensee and contractor when this event was identified demonstrates the commitment of each to performance of work of the highest quality and shows that corrective action was taken to prevent recurrence of this problem. Upon discovery of this instance of a documentation error in an SSIT package, GKN, under the direction of the Licensee, instituted a program to determine whether this was an isolated incident or reflected a more substantial problem. Stop work orders were issued by both the Licensee and the contractor for all welding work being performed by the contractor on site. These orders remained in effect until the scope of the problem could be ascertained and steps taken to ensure that similar problems did not recur.

During the period that the stop work orders were in effect, GKN investigated and determined the cause of the problem found in the identified SSIT package, and reviewed other completed SSIT packages to determine whether there were similar documentation problems. GKN also instituted training programs for all of its personnel associated with the welding program to emphasize the importance of proper documentation and to train them as to current procedural requirements, it reviewed all SSIT packages in process to make sure that no similar problems existed before the packages were re-issued to the field, and it revised its quality assurance procedures to establish a hold point for QC review before any new packages were sent to production and a hold point for Licensee QA review after final review of completed packages by GKN's QC. Only after each of these actions had been completed, were the stop work orders lifted with respect to welding work of GKN.

An analysis was also made to determine that the problem reflected in the SSIT package identified by NRC, as well as other documentation problems discovered during the course of the follow-up investigation, did not result in defective welds. As is fully discussed in Cedric Reynolds affidavit, it was determined that these procedural irregularities had no effect on the quality of structural steel welding performed by GKN.

In addition to the efforts made to prevent recurrence of the problem and to analyze its implications for work in the field, the Licensee and contractor took steps to ensure that if similar problems did recur they would be identified and corrected. GKN instituted a new quality control procedure (QCP 29-1) governing

review of completed SSIT packages. Under this procedure, a checklist was developed against which each SSIT package is to be reviewed by QC personnel. This procedure is being followed for the review of all past, present and future SSIT packages completed by GKN.

Before the problem SSIT package was identified, measures existed to assure that welding processes were properly performed. Despite those measures, a breach of the procedures occurred. When further investigation indicated additional documentation discrepancies, Applicant and GKN initiated extensive corrective action to remedy the discrepancies and to prevent recurrence. Certainly, this event cannot be considered evidence of a failure on the part of Applicant to control special processes.

The second event specified in contention 9D involves identification by NRC of one incomplete PGCo welding documentation package. The package did not identify the welder or the welding material used for an instrumentation piping weld. This event does not raise any concern about the quality of the weld. The subject weld was removed by PGCo and a new weld was installed. All relevant information was documented concerning the new weld.

More importantly, the incomplete weld package does not call into question the adequacy of PGCo's Quality Assurance program. PGCo had a procedure in place at the time for review of all completed welding packages (QCP-B30). The NRC inspector at the time that this item of non-compliance was identified noted that "The piping contractor's quality control office personnel had not

performed a review of the completed document package for drawing 1FT 426 and probably would have identified this deficiency." (NRC Inspection Report Numbers 50-456/84-17 and 50-547/84-17). The affidavit of John Carlson, PGCo's QC Manager, confirms that the routine inspection done on all completed welding packages was specifically designed to identify the type of problem discovered by NRC. Thus, it is apparent that the NRC item of noncompliance with respect to the PGCo example occurred only because the inspection took place before existing PGCo procedure were able to be implemented. Those procedures were specifically designed to discover the very deficiencies found by the NRC Staff.

Despite the fact that the NRC aggregated the two items as examples of a single item of noncompliance it is apparent that they represent disparate events. The specific GKN example represents an isolated violation of Criterion IX which was itself cured readily, with no implication for the quality of the weld itself. The extensive follow-on corrective action self-initiated by Applicant and GKN demonstrates a strong commitment to quality. The specific PGCo example is even less germane since the undisputed facts establish both the absence the absence of any weld quality issue and the existence of PGCo procedures which would have caught the procedural deficiencies identified by the NRC. There being no material facts as to which there is a genuine issue to be heard, Summary Disposition should be entered on Subcontention 9D in favor of Applicant.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF JOHN D. CARLSON
(on Rorem Q.A. Subcontention 9D.)

JOHN D. CARLSON, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

John D. Carlson
JOHN D. CARLSON

Subscribed and sworn to before me
this 18th day of December, 1985.

Margaret Russo
NOTARY PUBLIC

My Commission expires 4-6-89.

Q.1. Please state your name.

A.1. John D. Carlson.

Q.2. Who is your employer?

A.2. Phillips, Getschow Company.

Q.3. What is your present position with Phillips, Getschow?

A.3. I am Quality Control Manager at Commonwealth Edison Company's Braidwood Nuclear Generating Station (Braidwood).

Q.4. How long have you held the position of Quality Control Manager at Braidwood?

A.4. Approximately a year.

Q.5. What position did you hold before that?

A.5. I was the Quality Control Supervisor for Phillips, Getschow at Braidwood. I was in that position from May, 1983 until I became Quality Control Manager.

Q.6. What are your job duties as Quality Control Manager.

A.6. As Quality Control Manager, I am responsible for the supervision of all quality control inspections and review activities on site.

Q.7. How did your job duties as Quality Control Supervisor differ?

A.7. My job duties as Quality Control Supervisor were essentially the same as for Quality Control Manager.

Q.8. Would you describe your work experience as it relates to your quality responsibilities for Phillips, Getschow?

A.8. I began work in the nuclear energy industry in July, 1978. My first position was at Braidwood Station with Phillips, Getschow Company. I was there for more than a year as an inspector and technician. My responsibilities during that period included material receipt inspections, equipment calibration and installation document review. In 1979, I was transfered to Zion Station. I was at Zion for approximately three years. I originally held the position of Inspector, doing document reviews. By the time I left the site, I had been promoted to Quality Control Supervisor with responsibilities relating to maintenance and construction

contracts that Phillips, Getschow had with Commonwealth Edison Company at Zion. Beginning in September, 1982, I served as Assistant Q.A. Manager for Phillips, Getschow in its corporate offices for about eight months before returning to Braidwood in May, 1983 as Quality Control Supervisor.

Q.9. You held the position of Quality Control Supervisor at Braidwood in August, 1984, is that correct?

A.9. Yes.

Q.10. What is the purpose of your testimony?

A.10. The purpose of my testimony is to explain the corrective action Phillips, Getschow took as a result of the NRC item of non-compliance found in NRC Inspection Report numbered 50-456/84-17 and 50-457/84-17. In that report NRC found that:

> "[T]he inspector reviewed the documentation packages for the installations, which included assuring that the welder and welding procedures were qualified in accordance with the ASME Boiler Pressure Vessel Code, Section IX; and that the weld filler metal was traceable. Piping Welding Procedure 1A-88-0, Revision 8, designated for use on drawing 1FT-426, Sheet 2, Revision B, required the use of ER 308 weld filler metal. RPS Division Loop B, reactor coolant flow, completed socket weld joint, identified as FW 21 and FW 22 on drawing 1FT-426, Sheet 2, Revision B had no piping records identifying the welder or weld filler metal utilized for the pipe-elbow connections. Failure to control welding is a violation of 10 CFR 50, Appendix B, criteria IX.

This item of non-compliance is set forth in Rorem Quality Assurance Subcontention 9A.

Q.11. Did you or someone under your supervision conduct an investigation of this NRC finding.

A.11. Yes.

Q.12. Would you describe the nature of that investigation.

A.12. Phillips, Getschow instituted NCR number 1886 to determine how to deal with the problem identified by the NRC as well as what corrective action could be taken to prevent recurrence.

Q.13. What was done to correct the problem identified by NRC?

A.13. NRC found that one of Phillips, Getschow welding packages relating to a socket weld joint was incomplete in that it did not have an identification of the welder or the weld filler metal that had been used for the weld. Both of these pieces of information are required to be reported on the welding package. Since we did not have a record of the welder or the weld filler metal used, we removed the subject weld and rewelded the joint. Details concerning the new weld were properly documented on the welding package.

Q.14. Did Phillips, Getschow review any other packages to determine if a similar problem existed?

A.14. No. We already had a procedure for review of documentation in completed packages. The problem identified by NRC was not discovered by Phillips, Getschow only because

NRC intercepted the packages before our final review was completed. Therefore, we had no reason to suspect that similar problems existed in other packages.

Q.15. What was done to prevent recurrence of the problem.

A.15. At that time, Phillips, Getschow was in the process of modifying all of its procedures to assure that initial documentation responsibilities were placed on the production personnel rather than the quality control personnel. In dispositioning NCR 1886, Phillips, Getschow revised its Quality Control Procedure QCP-B21 to require that the production superintendent record on the weld package the weld rod heat and/or lot numbers for the weld filler material used, the welder identification and the rod size. Before revision of this procedure, the QC Supervisor had responsibility for recording this information on the welding package pursuant to Quality Control Procedure, QCP-B8 (Rev. 5).

Q.16. What was the purpose of making this change as to the person responsible for recording the weld information on the weld package?

A.16. The purpose of the revision was to assure that responsibility was assigned to production for completion of all documentation relating to production work. The revision made it clear that quality control had a review responsibility only and not a first-line responsibility to enter data on the field welding packages.

Q.17. The NRC in its inspection report, numbered 50-546/84-12 and 50-547/84-17, stated concerning this documentation problem that "The piping contractor's [Phillips, Getschow's] quality control personnel had not performed a review of the completed document package for drawing 1FT-426 and probably would have identified this deficiency." (Emphasis supplied) Do you agree that the documentation error found by NRC in the welding package would have been picked up during Phillips, Getschow's routine Quality Control review of the welding package.

A.17. Yes. Under quality control procedure QCP-B30, Phillips, Getschow's Quality Control routinely reviews all completed welding packages. The welding package in which the error was identified by NRC had not yet been reviewed. This type of error, certain information not recorded on the document, is an item that would be checked during our routine review.

Q.18. Do you know whether NRC has reviewed the results of Phillips', Getschow's investigation and corrective action taken?

A.18. Yes, the original Inspection Report in which this item was reported, numbered 50-546/84-17 and 50-547/84-17, NRC stated that its inspection showed that action had been taken to correct the identified item of non-compliance and to prevent reoccurrence." NRC stated further that "no

reply to this item of non-compliance is required and we have no further questions regarding this matter."

Q.19. Was this item of non-compliance closed out by NRC?

A.19. Yes, it was closed out by NRC in NRC Inspection Report numbers 50-456/84-40 and 50-457/84-37.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF CEDRIC REYNOLDS
(on Roren Q.A. Subcontention 9D)

CEDRIC REYNOLDS, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Cedric P. Reynolds
CEDRIC REYNOLDS

Subscribed and sworn to before me
this 18th day of December, 1985.

Margaret Russo
NOTARY PUBLIC

My Commission expires on 4-6-89 .

Q.1. Would you state your name please.

A.1. Cedric Reynolds.

Q.2. Who is your employer?

A.2. Gust K. Newberg Construction Company.

Q.3. Do you currently work at the Commonwealth Edison Company Braidwood Nuclear Generating Station (Braidwood)?

A.3. Yes.

Q.4. What is your position with Newberg at Braidwood?

A.4. I have the job title of Quality Audits/ Engineering.

Q.5. How long have you held that position?

A.5. Since April, 1984.

Q.6. Please briefly summarize your work and educational experience.

A.6. I have been employed in the nuclear energy industry since 1978. I started with Perini Power Construction out of Framingham, Masschusetts working at the Seabrook Nuclear Generating Station in Seabrook, New Hampshire. My first position with Perini was as a QC Inspector. I stayed with

Perini for approximately 5 years in their QA/QC department. During the last two and a half years, I was a quality engineer and auditor with quality engineering responsibilities for Perini's structural welding program. I was also a certified level II ASME/ANSI inspector with Perini.

In 1983, I became employed with Newberg as a Quality Engineering Supervisor at Marble Hill Nuclear Generating Station. I stayed at Marble Hill until April, 1984 when I was transferred to Braidwood.

I have a Bachelor of Science in Civil Engineering from the University of New Hampshire.

Q.7. In addition to the two and a half year period during which you had quality engineering responsibilities for Perini's structural welding program at Seabrook, have you had other experience in the welding field.

A.7. At both Marble Hill and Braidwood, I was responsible for review of welding procedures. I am also certified by the American Welding Society as a welding inspector.

Q.8. Please describe your duties in your current position with Newberg.

A.8. They fall into several categories. I am the lead auditor for Newberg. This means that I am responsibile for implementing, planning and supervising all audits conducted. Also, as quality engineer I am responsible for writing and reviewing procedures, I have responsibility for QA Manager review of all process sheets and travellers as well as review responsibilities for NCR's and other deficiency reports. I also perform a review of all inspector certification packages. Finally, in the absence of the QA Manager, I become responsible for all routine duties of the QA Manager except level III inspection approval of procedures.

Q.9. Would you please describe the scope of Newberg's welding assignment at Braidwood.

A.9. Newberg is currently responsible for the welding of structural steel included within our civil contract .

Q.10. What is the purpose of your testimony?

A.10. The purpose of my testimony is to explain the corrective action Newberg took as a result of the NRC item of non-compliance found in NRC Inspection Report numbered 50-456/84-17 and 50-457/84-17, that:

> The quality welding procedures authorized for use by Newberg Engineering personnel on April 12, 1984, included quality welding procedure 43GW-11,Revision 0, June 11, 1984. This flux core arc welding procedure had not been approved for use by Sargent & Lundy, the architect engineer, as required by Gust K. Newberg quality control procedure, Section 1, QAM and QC Procedure control, Revision 3; and the Commonwealth Edison Quality Assurance Manual, QP. No. 5-1. Furthermore, the

> Quality Welding Procedure 43 GW-11 was documented in the Field Verification Section as being used, and a welder (A-4), who was not qualified for flux core welding, was documented as being the welder that performed the welding in accordance with the flux core procedure 43 GW-11.

That item of non-compliance is set forth in Rorem Quality Assurance Subcontention 9A.

Q.11. Before inquiring further about this finding and Newberg's and the Licensee's response to this finding, I would like to ask you to define several terms related to the welding field. First, would you briefly describe what an arc welding process is.

A.11. Arc Welding is the process where an electric arc is used to melt the metal in an electrode along with the metal in two pieces of base material in order to fuse the two pieces of base material. The two pieces of base material meet in a joint. The electrode is moved along the joint mixing the metals to fuse the two pieces of base material.

Q.12. At Braidwood, what type of arc welding was done?

A.12. Flux cored (FCAW) and shielded metal (SMAW) arc welding processes have been used at Braidwood by Newberg.

Q.13. How do these processes differ?

A.13. In the SMAW process a solid metal rod is placed in a holder. Electricity is passed through the rod and the holder is manually manipulated to deposit the weld material at the weld joint. In the FCAW process, a continuous

wire is used in place of the rod. The wire continuously feeds mechanically from a hand held device. The FCAW process allows the continuous deposit of weld material without having to stop to replace the welding rod as is necessary in the SMAW process.

Q.14. Earlier you mentioned the American Welding Society (AWS). What is this association and what does it do?

A.14. AWS is an organization concerned with developing standards and sound practices for application in the structural welding field.

Q.15. Are your familiar with the term Pre-Qualified AWS joints as that applies to the welding field?

A.15. Yes.

Q.16. What is a Prequalified AWS Joint.

A.16. Where two pieces of metal are joined together by a weld, the intersection of those pieces of metal is called a joint. There are certain joint configurations which are commonly used by welders. For these common joint configurations, AWS has developed and tested procedures for welding these joints. The procedures specify appropriate base materials and electrode type for each joint. The procedures which AWS has developed and tested for welding these common joint configurations are called pre-qualified joint procedures.

At Braidwood pre-qualified AWS joint procedures must still be submitted to the Licensee and architect/engineer for approval. However, for the pre-qualified joint procedures, no independent destructive testing need be done by the welding contractor to show that the weld procedure is capable of producing a sound weld.

Q.17. Are Newberg's welders at Braidwood qualified in accordance with the AWS code?

A.17. Yes. All shielded metal arc welders at Braidwood Station, with the exception of 3 carpenter welders who do only tack welding, are qualified to perform all of the pre-qualified joints recognized by AWS for shielded metal arc welding. All flux cored arc welders at Braidwood are qualified to perform all pre-qualified AWS joints applicable to flux cored welding.

The welders are qualified by Newberg production in accordance with the AWS Code. Each is required to weld test coupons which are then examined and tested to verify that the welder is capable of producing sound welds.

Q.18. Are you familiar with the terms fillet weld, partial pentration weld and full penetration weld?

A.18. Yes. A fillet weld is used to join two pieces of metal intersecting in a "lap" or "T" joint. The weld material is deposited along an edge of one of the pieces of base materials at the intersection to fuse the materials.

Partial penetration and full penetration welds are both groove type welds. Weld material is deposited between the two base materials, not just along the edge of the base material as in a fillet weld. The partial penetration weld is a groove weld which does not develop the full thickness of the base material or, in other words, does not maintain the full structural strength of the base materials being joined. A full penetration weld is a groove weld in which the weld does develop full base material thickness and maintains the full structural strength of the material joined.

Q.19. How is information related to installation of structural steel welds documented at Braidwood?

A.19. Information concerning structural steel welds is documented on the Structural Steel Installation Traveller packages (SSIT). These packages are initially prepared by an engineer in Newberg's Engineering Department. An independent review is then done by a second engineer before the package is released to the field. In the field, production personnel record parameters that were used for welds installed and when the work was completed. A final review of all completed SSIT packages is done by QC.

Q.20. Did NRC's finding which is quoted above relate to one of these SSIT packages?

A.20. Yes. Based on its review of an SSIT package, NRC concluded that an unapproved flux cored welding procedure had been used for structural steel welding and that the

weld had been performed by a welder who was not qualified to do flux cored welds.

Q.21. Did Newberg conduct any investigation of that finding?

A.21. Yes.

Q.22. What did Newberg's investigation consist of?

A.22. Newberg reviewed the problem SSIT package identified by NRC, reviewed other similar packages, interviewed the welder involved and investigated the welder's qualifications.

Q.23. What did Newberg conclude based on the investigation?

A.23. We concluded that the welder involved had used the SMAW welding process for the welding in question. We also found that the welder was fully qualified in the SMAW process. However, engineering had specified in the SSIT the use of an FCAW welding procedure (WPS) which, although pre-qualified by AWS, had not gone through formal approval channels at Braidwood, meaning review by the Licensee and the architect/engineer. The specified FCAW WPS was also not suitable for the joint configuration. The welder copied this incorrect WPS number onto the section of the report where the WPS actually used was to be identified. Based on the welder's interview, fabrication details of the plates supplied the welder, as well as a review of the information recorded concerning the welding rod used, it was determined that the welder had used the correct welding parameters from the correct SMAW WPS not the FCAW WPS which was incorrectly specified.

Q.24. After discovering the cause of the problem identified by the NRC inspectors, what further was done?

A.24. The problem SSIT package was identified by NRC in early August, 1984. On August 10, 1984, Newberg issued a stop work order for all welding being done by Newberg on the site. On August 14th, the Licensee issued a stop work order with respect to the same work. Its stop work was designed to ensure that corrective actions were taken before the start of further welding activities. While the stop work order was in effect, four steps were taken to assure that the problem discovered was not repeated.

First, the welding procedures were revised. The change in procedure was instituted to ensure that correct WPS's were designated on the SSIT packages before welding began. Under the revised procedure, Newberg established a hold point for QC review and approval. This hold point occurred before welding in the field. To provide further assurance that the correct welding procedure had been used, Commonwealth Edison Company ("Edison") QA established a hold point after the completed SSIT packages had been reviewed by Newberg QRC. This revised procedure was made applicable to those packages in process at the time of the stop work order as well as all subsequent packages.

Second, steps were taken to retrain the engineers and ironworkers in the welding program to the latest approved procedures and requirements. A training

program for all of Newberg's engineers and ironworkers involved in the welding program was conducted between August 14 and 20, 1984. Among other things, the importance of proper documentation was emphasized as well as the requirement that all WPS's be approved by the architect/engineer before use in the field. In addition, Newberg developed an ongoing training program designed to prevent recurrence of this type of problem.

Third, there was a review undertaken of all of the SSIT packages for welds in process to assure that correct welding procedures were being used before the packages were reissued to the field.

Finally, Newberg attached a copy of the specified WPS's on the front cover of each package for easy reference.

After each of these steps had been taken, the stop work orders were lifted. The Licensee's authorization lifting its stop work order was delivered to Newberg on August 20, 1984. Newberg issued an order to production lifting Newberg's stop work order on the same day.

Q.25. Has anything further been done with respect to the problem identified by NRC?

A.25. Yes. Futher review of the SSIT packages revealed that several types of problems were frequently appearing in the SSIT packages. These included specifying unapproved or improper WPS's by engineering, failure of engineering to specify WPS's on some SSIT packages, recording of unapproved

or improper WPS's by production, recording by production of WPS's that were not used, failure by production to list all WPS's used, and recording by production of WPS's not specified by engineering. The Licensee issued NCR 646 to address these problems. The problems were also reported to NRC pursuant to 10 CFR 50.55(e). To identify and correct all problems, Newberg has developed a quality procedure for review of all completed SSIT packages (QCP 29-1). This procedure requires that all SSIT's be inspected against specific checklist items before the package is closed by Newberg. The Licensee will not close NCR 646 until this review program is satisfactorily completed.

Q.26 As part of the investigation of the problem discovered by NRC, was any attempt made to determine whether the documentation problems discovered by NRC reflected a hardware problem in the field.

A.26. Yes. An investigation was made and it was determined that there is no hardware problem in the field.

Q.27. What is the basis for that conclusion?

A.27. There are several bases for the conclusion that no hardware problem exists concerning structural steel welds done by Newberg. The first assurance concerning the quality of the welds in the field results from the training and qualification of the welders who work on this job. As with any work, ultimate responsibility for the quality of the work lies with the tradesmen on the job. The welders

at Braidwood are currently each fully qualified to perform all pre-qualified AWS joints for the welding process each uses, with the exception of three carpenter welders who do only tack welds.

The SSIT package given to a welder for each weld performed contains a drawing which shows the weld symbol indicating the weld type to be used for each joint configuaration. Newberg's qualified welders, therefore, have no problem identifying the appropriate weld to be used for each joint configuration, in spite of any incorrect documentation of a WPS included in the package.

Second, the vast majority of welds done at Braidwood are for pre-qualified AWS joints. Thus, welders were following proper procedures to produce sound welds even if Newberg had not completed the required approval steps by submitting a WPS for review by the Licensee and Sargent & Lundy. In those instances where unapproved WPS's were used, all have subsequently been approved following appropriate review by the Licensee and Sargent & Lundy.

Third, specifying incorrect WPS's on the SSIT package is extremely unlikely to result in unacceptable welds in the field since the WPS's in use at Braidwood are controlled as to essential variables, that is those variables which if changed would affect the "qualified" status of the procedure. These include rod size, amperage and voltage. Only one rod or wire type is used throughout all of the WPS's and

all of the WPS's call for the rod or wire to be used within the manufacturer's recommended voltage and amperage specifications. Thus, from one WPS to the next, the only essential variable that changes is the joint configuration. As long as the welder welded the correct joint configuration, his work had to be in accordance with the WPS since the rod or wire voltage and amperage are consistent across all WPS's. Even if a welder relied upon the joint configuration found in a SMAW WPS while using the FCAW process, the variables differ so slightly between processes in the WPS's that the weld would still be sound. This has been confirmed by discussions with the architect/engineer.

Fourth, for many of the WPS's which are incorrectly identified in the SSIT package, it is possible to confirm that the correct WPS was used by reviewing other information recorded in the package. For instance, in the SSIT package identified by NRC, production identified that a FCAW WPS had been used. However, just below the identification of the WPS in the package, production had listed the type of welding rod used. Since a welding rod would be used only for the SMAW process, we could confirm that the welder had used an SMAW process.

Fifth, surveillances were conducted to ensure that correct welds using appropriate WPS's were being placed in the field. These surveillances were done before the welds were completed. As part of these surveillances, QC

checked to see that the correct electrode, fit-ups and joint configuration were being used. For these surveillances, the welders would place the structural steel in the proper joint configuration and place a tack weld to hold the structural steel in place until the QC inspector could inspect the joint against the design drawings. The QC inspector, using design drawings, would check to see that the correct joint configuration was being used. These surveillances were originally done on the greater of 10% of the welds or 10 welders per week. After discovery of the SSIT package documentation problem, this was increased to 25% of the fit-ups. As of May, 1985 the percentage of fit-ups subject to inspection was increased to 100%.

Finally in addition to inspection of the fit-ups, final visual inspections are made of all welds after completion of the weld. Non-destructive testing is also done on 100% of the full penetration welds. The nondestructive testing done on these welds involves either radiographic or ultrasonic testing. Both of these test procedures involve volumetric analysis of the weld so that any defective weld would be discovered.

Visual inspections are done by QC inspectors against the design drawings. The QC inspector would be able to tell whether the weld was a fillet weld or a groove weld and therefore, whether the weld was in accordance with the type called for by the design drawings. Any descrepancies

between weld types in SSIT packages and design drawings would be discovered. The visual inspection would also reveal imperfections in the weld likely to result in impairment of the structural integrity of the weld.

With these protections and checks built into the system, it was concluded that there is no hardware problem with the welds in the field.

Q.28. Has the item of non-compliance relating to SSIT package documentation identified by NRC in its Inspection Report numbered 50-456/84-17 and 50-457/84-17, subsequently been closed out by NRC.

A.28. NRC reviewed this issue again and closed it out in NRC Inspection Reports Numbers 50-456/84-40 and 50-457/84-37.

Rorem Subcontention 10.F.

Rorem Subcontention 10.F. states:

> 10. Contrary to Criterion X, "Inspection" of 10 CFR Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that a program for inspection of activities affecting quality was established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures and drawings for accomplishing the activity.
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> * * *
>
> F. Electrical Contractor, Comstock, inspected and accepted a junction box which was later determined to have deficiencies in the location of the anchors used for mounting the junction box. Anchors were accepted even though they were 3" from the required location specified by Sargent & Lundy Drawing 20E-1-3571.

MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. The junction box referred to (1JB217R) was mounted to a wall with three drilled 1/2" diameter concrete expansion anchors along its left side and three 1/2" diameter cap screws drilled and tapped to an embedded steel plate along its right side. The anchors and cap screws were mislocated; an L.K. Comstock (LKC) QC Inspector accepted the junction box contrary to the applicable Sargent & Lundy drawings and specfications and in violation of Criterion X, 10 C.F.R. Part 50, Appendix B. That inspector also failed to verify and document the installation torques for the cap screws. LKC issued Nonconformance Report (NCR) 4139 to track and disposition the discrepancy. (Affidavit of James W. Gieseker, pp. 2-3, 4 (hereafter "Gieseker Affidavit, p. __")). [Affidavit of Lawrence V. Jacques, pp. 3-4 (hereafter "Jacques Affidavit, p. ___")].

2. The bottom left concrete expansion anchor and the bottom right cap screw of the junction box were located approximately 3" lower than specified by Sargent & Lundy's design drawing. Thus, the bottom left concrete expansion anchor did not meet the 7" edge distance requirement specified for concrete expansion anchors located adjacent to edges of concrete. This edge distance discrepancy of the bottom left anchor was the only aspect of the discrepancy which degraded the mounting capacity of the junction box. Full capacity was retained for the remaining two concrete expansion anchors and the three cap screws. The locations of the top anchors were within design tolerances provided by specification. (Jacques Affidavit, pp. 3-5).

3. Sargent & Lundy evaluated the junction box mounting by performing calculations to reduce the capacity of the mislocated concrete expansion anchor to account for its reduced edge distance. The junction box mounting as installed was found by these calculations to be acceptable. The overall impact of the discrepancy on the mounting was not significant. The installed location of the anchors was actually more favorable for resisting the seismic forces for which the mounting was designed, because the centroid of the anchor group was closer to the box's center of gravity. (Jacques Affidavit, pp. 4-5).

4. In addition to Sargent & Lundy's calculations, further steps were taken by LKC to disposition NCR 4139. First, LKC halted all inspection activity in the area of junction box/equipment inspection by the LKC QC inspector involved. All other safety-related junction boxes which had been inspected by that inspector were identified, located, and reinspected. No discrepancies were found in any of the existing junction

boxes. Appropriate crafts personnel were retrained in LKC procedures regarding concrete expansion anchors and equipment/junction box installation procedures. With respect to installation torque for the cap screws of the junction box, it was verified that adequate torque had been achieved during installation, and documentation was completed accordingly. (Gieseker Affidavit, pp. 3, 4).

5. The NRC closed this item in Inspection Reports No. 50-456/85-032 and 50-457/85-031. More recently, the NRC has documented the results of its inspection of three additional junction box installations in Reports No. 50-456/85-038 (DRP); 50-457/85-037 (DRP). It was found that all three were installed correctly. Thus, this discrepancy was an isolated case. (Gieseker Affidavit, pp. 4-5).

DISCUSSION

Rorem Subcontention 10F contends that a junction box was not mounted in accordance with the location specified by Sargent & Lundy, that anchors were 3" from the specified location, and that an LKC QC inspector accepted the junction box.

Although Applicant concedes that the discrepancy constituted a violation of Criterion X, 10 C.F.R. Part 50, Appendix B, the affidavits of Messrs. Gieseker and Jacques establish that the discrepancy is of no design significance, and that adequate steps were taken to ensure that this was an isolated case. As the affidavit of Mr. Jacques states, the only degradation resulting from the mislocation was that involving the

bottom left concrete expansion anchor to take account of its installed location. The other two concrete expansion anchors and the three cap screws were unaffected. Sargent & Lundy performed calculations to reduce the capacity of the concrete expansion anchor to take account of its installed location. These calculations demonstrated that the junction box mounting as installed was acceptable, and that the overall impact of the mounting discrepancy was insignificant. Moreover, it was found that the installation was actually more favorable for resisting the seismic forces for which the junction box mounting had been designed.

As Mr. Gieseker's affidavit demonstrates, LKC took steps to ensure that the discrepancy was an isolated one. Appropriate crafts personnel were given additional applicable training. Inspection activity by the involved inspector as to junction box/equipment was halted. All six existing safety-related junction boxes which the inspector had inspected were reinspected, and no discrepancies were found. Finally, even though installation torque of the cap screws had not been verified and documented by the original inspector, it was subsequently established that proper torque had been achieved, and documentation issued accordingly.

The trivial nature of this item of noncompliance identified by the subcontention is further demonstrated by the fact that no physical rework of the junction box installation was required, and that no similar discrepancies had been found with any other junction box. LKC's disposition of the discrepancy, together with the NRC's recent inspection of three additional junction boxes, conclusively demonstrate that the

discrepancy was an isolated one. Accordingly, there is no genuine issue of material fact regarding the subcontention. Commonwealth Edison Company is entitled to summary disposition of this subcontention as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT OF LAWRENCE V. JACQUES

(on Rorem Subcontention 10F)

Lawrence V. Jacques, being duly sworn deposes and states:

The following questions and answers constitute my testimony in the above-captioned proceeding.

Further affiant sayeth not.

Lawrence V. Jacques

Lawrence V. Jacques

SUBSCRIBED AND SWORN to before me this 18th day of December, 1985.

Marilyn S. Bunck

Notary Public

My Commission Expires July 15, 1987

TESTIMONY OF LAWRENCE V. JACQUES
(On Rorem Subcontention 10F)

Q1. What is your name?

A1. My name is Lawrence V. Jacques.

Q2. By whom are you employed and what is your business address?

A2. I am employed with Sargent & Lundy Engineers as a Structural Project Engineer. My business address is 55 East Monroe, Chicago, Illinois 60603.

Q3. What is your professional and educational experience?

A3. I have been employed at Sargent & Lundy Engineers since June 2, 1975. As a Structural Project Engineer, I am responsible for directing the activities of Structural Design Engineers, Structural Analysts, Geotechnical Engineers and Hydrologists in the design of building structures, site structures and system structural components for the Byron and Braidwood Nuclear Power Stations. I have a Bachelor of Science degree in Civil Engineering from Marquette University. I am a Registered Professional Engineer in the state of Wisconsin and a Registered Structural Engineer in the state of Illinois.

Q4. What is the purpose of this affidavit?

A4. This affidavit is made in support of Commonwealth Edison Company's motion for summary disposition of Rorem Subcontention 10F.

Contention Item 10F

10. Contrary to Criterion X, "Inspection" of 10 CFR Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that a program for inspection of activities affecting quality was established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures and drawings for accomplishing the activity.

* * *

F. Electrical Contractor, Comstock, inspected and accepted a junction box which was later determined to have deficiencies in the location of the anchors used for mounting the junction box. Anchors were accepted even though they were 3" from the required location specified by Sargent & Lundy Drawing 20E-1-3571.

Q5. What is the basis for the contention?

A5. The NRC conducted a routine safety inspection March 25 through May 3, 1985. During this inspection, it was reported that concrete expansion anchors and cap screws used to support a junction box were mislocated, and that an L.K. ("LKC") Comstock QC Inspector had nevertheless accepted the junction box. The results of this inspection were documented in NRC Inspection Reports 50-456/85-15(DRP); 50-457/85-16(DRP). A second inspection of the junction box was then performed by another LKC junction box/equipment inspector, who confirmed the incorrect location and documented it on Nonconformance Report 4139.

Q6. What is a junction box?

A6. A junction box is a sheet metal enclosure to which conduits are connected. A conduit is a steel pipe in which

one or more cables are conveyed. A junction box may serve as an access point for cable pulling, as a transition point between conduits, and/or as an enclosure for the termination of cables.

Q7. What are concrete expansion anchors and cap screws?

A7. A concrete expansion anchor is a device used to support components attached to concrete structures. It is basically a bolt with a collapsed wedge assembly that is placed in a drilled hole in the concrete and set by applying a specified torque to the anchor thereby causing the wedge to expand within the hole. The anchors are utilized in various diameters and lengths.

A cap screw is a common fastener for attaching two steel components. As with concrete expansion anchors, torque requirements for cap screws are specified by Sargent & Lundy.

Q8. Describe the discrepancy identified in this contention.

A8. Junction box 1JB217R is 24" wide by 42" high. It is mounted to a wall with three drilled 1/2" diameter concrete expansion anchors along its left side and three 1/2" diameter cap screws drilled and tapped to an embedded steel plate along its right side. The bottom left

concrete expansion anchor and the bottom right cap screw were located approximately 3" lower than specified by Sargent & Lundy's design drawing 20E-1-3571, detail 9784. The bottom left concrete expansion anchor as installed does not meet the 7" edge distance requirement specified for 1/2" diameter concrete expansion anchors located adjacent to edges of concrete.

Q9. What was the purpose of a 7" edge distance requirement for concrete expansion anchors located adjacent to edges of concrete?

A9. The 7" distance from the center of the concrete expansion anchor to the edge of concrete is required in order to develop the full concrete cone pull-out capacity of the anchor; in other words, to ensure that enough concrete surrounds the anchor to develop its full capacity in pull-out.

Q10. Is the discrepancy significant?

A10. No. In addition to other steps taken to address the discrepancy, as reflected in the affidavit of Mr. Gieseker, Sargent & Lundy evaluated the junction box mounting by performing calculations to reduce the capacity of the mislocated concrete expansion anchor to account for the reduced edge distance. The edge distance discrepancy was

the only aspect of the location discrepancies which degraded the mounting capacity of the junction box. The locations of the top anchors are within installation tolerances provided by specification (L-2790; Form BY/BR/CEA). The installed location of the anchors is actually more favorable for resisting the seismic forces for which the junction box mounting was designed, since the centroid (middle) of the anchor group, as installed, is now closer to the center of gravity of the junction box. The junction box mounting as installed was found by calculation to be acceptable despite the reduced edge distance of the bottom left concrete expansion anchor. Full capacity is retained for the remaining two concrete expansion anchors and the three cap screws. The overall impact of the discrepancy on the mounting is not significant.

Q11. Does this conclude your affidavit?

A11. Yes.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF JAMES W. GIESEKER
(on Rorem Q.A. Subcontention10F)

James W. Gieseker, being duly sworn deposes and states:

The following questions and answers constitute my testimony in the above-captioned proceeding.

Further affiant sayeth not.

James W. Gieseker
James W. Gieseker

Subscribed and Sworn before me
this 10th day of December 1985

Nancy R. Coon
Notary Public

My Commission expires on MY COMMISSION EXPIRES OCTOBER 11,1988.

0611H

TESTIMONY OF JAMES W. GIESEKER
(on Rorem Subcontention 10F)

Q1. Please state your full name for the record.

A1. James W. Gieseker.

Q2. By whom are you employed and in what capacity?

A2. I am employed by the Commonwealth Edison Company (CECo) as a Project Construction Engineer. I have been employed by CECo since July 19, 1971. Since August 6, 1984 I have been assigned to CECo Braidwood Station. I am responsible for the Project Construction Department (PCD) Electrical Group interface with the electrical contractor L. K. Comstock (LKC) Quality Control (QC) Department and inspections performed in the electrical area by the Nuclear Regulatory Commission. As such, I have knowledge of LKC's QC inspections, including those of junction box/equipment.

Q3. Please summarize your education and professional experience.

A3. I have a BSEE degree from Valparaiso University. Prior to being assigned by CECo to Braidwood Station, I was assigned to the LaSalle County Nuclear Generating Station. At LaSalle, I was in the CECo Quality Assurance Department from May 1976 to August 1979, the Construction Department from August 1979 to July 1982 and the station Technical Staff from July 1982 to August 1984. Prior to LaSalle, I was assigned to the CECo Transmission Engineering Department.

Q4. What is the purpose of your affidavit?

A4. This affidavit is in support of CECo's motion for summary disposition of Rorem Subcontention 10F.

Subcontention Item 10F

> 10. Contrary to Criterion X, "Inspection" of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that a program for inspection of activities affecting quality was established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures and drawings for accomplishing the activity.
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> F. Electrical Contractor, Comstock, inspected and accepted a junction box which was later determined to have deficiencies in the location of the anchors used for mounting the junction box. Anchors were accepted even though they were 3" from the required location specified by Sargent & Lundy Drawing 20E-1-3571.

Q5. What is the basis for the contention?

A5. The NRC conducted a routine safety inspection March 25 through May 3, 1985. During this inspection, it was reported that concrete expansion anchors and cap screws used to support a junction box were mislocated, and that an LKC QC Inspector had nevertheless accepted the junction box. The results of this inspection were documented in NRC Inspection Reports 50-456/85-15 (DRP); 50-457/85-16 (DRP). A second inspection of the junction box was then performed by another LKC junction box/equipment inspector, who confirmed the incorrect location and documented it on LKC Non-conformance Report 4139 ("NCR 4139").

Q6. What steps were taken with respect to LKC NCR 4139?

A6. All inspection activity in the area of junction box/ equipment inspection by the inspector involved was halted. All seven safety-related junction boxes which had been inspected by the QC inspector who failed to identify the discrepancies in 1JB217R were identified and located. One had been removed because of unrelated rework. All six remaining junction boxes were reinspected by another qualified LKC QC Inspector. No discrepancies were found in any of the six other boxes. Additionally, the appropriate crafts personnel were retrained in LKC procedures regarding concrete expansion anchors and equipment/junction box installation procedures (LKC Procedure #4.3.6. Rev. "D", and 4.3.13 Rev. "E", respectively). Finally, the Affidavit of Mr. Jacques explains additional analysis undertaken by Sargent & Lundy with respect to the effect of the as-installed spacing of the anchors.

Q7. Were any other discrepancies identified during the reinspection with respect to junction box 1JB217R?

A7. Yes. It was found that the installation torque for the cap screws had not been verified and documented.

Q8. Was the discrepancy significant?

A8. No. It was subsequently verified that adequate torque for the cap screws had been achieved during installation, and the documentation for this installation was completed accordingly.

Q9. In your opinion, were the discrepancies with junction box 1JB217R an isolated case or an example of a problem with junction box installation and inspections?

A9. In my opinion, this is an isolated case, for several reasons. First, no other discrepancies were found during LKC's reinspection of the other junction boxes inspected by the inspector involved in this discrepancy. Second, the NRC closed this item in Inspection Reports No. 50-456/85-032 and 50-457/85-031. The results of a routine NRC Inspection conducted on September 9 through October 18, 1985, further support my opinion as to the isolated nature of the discrepancy. During the course of that inspection, three other installed junction boxes (IJB011A, 1JB005A, and 1JB015A) were inspected for compliance with established requirements, including that installation be in accordance with current drawings and in the locations specified. The NRC found that these three junction boxes were installed correctly. Reports No. 50-456/85-038 (DRP); 50-457/85-037 (DRP).

Q10. Does this complete your affidavit?

A10. Yes.

Rorem Contention Item 12(E)

Rorem Contention Item 12E states in pertinent part:

12. Contrary to Criterion XVI, "Corrective Actions," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that measures were established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected identified and corrected. And in the case of significant conditions adverse to quality, Applicant failed to ensure that the cuase of the condition is determined and corrective action taken to preclude repetition.

E. Although BCAP had identified that Level I QC inspectors had inspected and accepted construction activities, this nonconforming condition was not documented as a BCAP observation. (Inspection Report 85-06, Exh. 11).

MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. In late 1984, the Braidwood Construction Assessment Program (BCAP) Task Force noted that Comstock's procedures for visual inspections of welds required that the inspectors who performed the inspections be certified to at least Level I, and also required that each inspection report would be reviewed and approved by a Level II inspector. [Affidavit of George Orlov on Rorem QA Subcontention 12E, (hereinafter, "Orlov affidavit") at p. 5]. The question arose within the BCAP Task Force whether this practice was consistent with the requirements of the applicable standard, ANSI N45.2.6-1978 (Id.)

2. ANSI N45.2.6-1978 is ambiguous as to what methods Level II inspectors must use to establish the acceptability of Level I inspectors' visual weld inspection results, and the degree of responsibility which may be given to Level I inspectors performing such visual weld inspections. (Orlov affidavit at p. 4-5; Deposition of Ronald N. Gardner dated October 31, 1985 at Tr. 66-71.)

3. In late 1984, the Assistant Director of BCAP, George Orlov, told NRC Project Inspector Ron Gardner that the BCAP Task Force would document this concern with respect to Comstock's practice by issuing an observation. However, in February 1985 Mr. Orlov told Mr. Gardner that the BCAP Task Force would not issue such an observation because Comstock's practice did not depart from the requirements of ANSI N45.2.6-1978 (Orlov affidavit at pp. 6-9; Gardner deposition at Tr. 57-58, 62-63).

4. After this conversation, Mr. Orlov sensed that he had failed to convince Mr. Gardner that Comstock's practice was acceptable. Accordingly, he discussed Mr. Gardner's concern with the BCAP Task Force Director, who directed him to document the question concerning Comstock's practice by issuing an observation. (Orlov affidavit, p.10). This observation was in fact issued on February 27, 1985 (Orlov affidavit at p. 10, and Exhibit A).

5. Prior to the completion of Mr. Gardner's inspection on March 1, 1985, the BCAP Task Force failed to communicate effectively to Mr. Gardner the fact that this observation had been issued. (Orlov affidavit at p. 10).

6. On March 8, 1985 the NRC Staff issued Inspection Report 50-456/85-006; 50-457/85-006 which included as an item of noncompliance the following statement:

> Although the Braidwood Construction Assessment Program (BCAP) had identified that Level I QA inspectors had inspected and accepted construction activities, in violation of the requirements delineated in ANSI N45.2.6, this nonconforming condition was not documented as a BCAP observation.

(Orlov affidavit, at p. 3)

7. CECo responded to this Inspection Report on May 6, 1985 and showed Mr. Gardner the BCAP observation written on February 27, 1985. (Orlov affidavit at p. 10 and Exhibit B). On June 27, 1985 the NRC Staff agreed that this was not an item of noncompliances. The NRC Staff stated that the information presented in CECo's response was not known to the NRC inspector at the time of the inspection. (Orlov affidavit, Exhibit C).

DISCUSSION

Rorem contention item 12(E) asserts that the BCAP Task Force identified a nonconforming condition but failed to document it as a BCAP observation. The allegedly nonconforming condition relates to Comstock's use of Level I inspectors for visual weld inspections.

The fact is that the BCAP Task Force did issue an observation documenting Comstock's practice. The NRC Staff has withdrawn the item of noncompliance upon which this contention item is based. There was no violation of Criterion XVI of 10 CFR Part 50 Appendix B.

It is true that there was a failure of communication between the BCAP Task Force and the NRC Staff inspector, for which Commonwealth Edison accepts responsibility. However, it is also apparent from the circumstances that the proposed item of noncompliance would never have been issued had the NRC Staff inspector not been monitoring the activities of the BCAP Task Force exceptionally closely, and had the

Assistant Director of BCAP not been open and candid in advising the NRC Staff inspector of the Task Force's deliberations concerning whether the identified Comstock practice was or was not a violation of the applicable requirements of ANSI N45.2.6-1978. The circumstances do not suggest that the failure of communication was anything other than an isolated incident.

The steps CECo is taking to resolve the NRC Staff's concern regarding Comstock's use of Level I inspectors are described in the affidavits submitted in response to contention item 3C. These actions are not material with respect to this contention item 12E. Even if the Licensing Board concludes that there is a genuine issue of material fact as to contention item 3C, the Licensing Board can grant summary disposition of Contention Item 12E.

Contention Item 12E asserts that the BCAP Task Force failed to document something which in fact it did document. This contention item is based on a factual error. Accordingly, Commonwealth Edison Company is entitled to summary disposition of this contention item as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF GEORGE ORLOV
(on Rorem Q.A. Subcontention 12E)

George Orlov, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

George M. Orlov
George Orlov

Subscribed and Sworn before me
this 30th day of December 1985

Carol J. McCoy
Notary Public

My Commission expires on 10/30/89

0571H

TESTIMONY OF GEORGE ORLOV
(ON ROREM Q.A. SUBCONTENTION 12E)

Q.1. Mr. Orlov, by whom are you employed and in what capacity?

A.1. I am under a consulting contract to Commonwealth Edison Company (CECo) through Science Applications International Corporation (SAI) of McLean, Virginia. I currently hold the position of Assistant Director of the Braidwood Construction Assessment Program (BCAP) Task Force within the CECo organization.

Q.2. What are your responsibilities in this position?

A.2. I am responsible for the implementation of two of the elements of the BCAP. These are the Construction Sample Reinspection and the Reverification of Procedures to Specification Requirements elements of the BCAP. I provide technical direction to the supervisors of these elements and provide management support to the BCAP Director, to whom I report.

Q.3. How long have you been employed as Assistant BCAP Task Force Director?

A.3. I have been in this position since June 1984.

Q.4. Please summarize your education and professional experience.

A.4. I have a BS in Physics and an MS in Nuclear Engineering, both from the Massachusetts Institute of Technology. I designed experiments in nuclear reactors to study neutron and radiation physics from May 1977 to December 1978 for Simulation Physics Corporation, Bedford, Massachusetts. I performed nuclear fuel cycle and

safeguards research for SAI from January 1979 to May 1981. From May 1981 to February 1984 I was seconded into Cincinnati Gas & Electric Company's organization at the Zimmer Nuclear Power Station. From May 1981 to October 1982 I held the position of Quality Engineer. From October 1982 until September 1983, I held the position of Assistant Director, Quality Confirmation Program. From September 1983 to February 1984, I held the positions of Director, Quality Confirmation Program and Director, Program to Verify the Quality of Construction. I came to Braidwood in February 1984 and shortly thereafter, began work on BCAP.

Q.5. Mr. Orlov, Intervenors' amended quality assurance contention, item 12E states:

> 12. Contrary to Criterion XVI, "Corrective Action," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that measures were established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. And in the case of significant conditions adverse to quality, Applicant failed to ensure that the cause of the condition is determined and corrective action taken to preclude repetition.
>
> E. Although BCAP had identified that Level I QA inspectors had inspected and accepted construction activities, this nonconforming condition was not documented as a BCAP observation. (Inspection Report 85-06, Exh. 11.)

Are you familiar with the facts underlying this matter?

A.5. Yes, I am.

Q.6. What is the purpose of this affidavit?

A.6. The purpose of this affidavit is to show that, contrary to contention item 12E, the BCAP Task Force did document as a

potentially nonconforming condition the concern referred to relating to Comstock's use of Level I inspectors. The NRC Staff has indicated its agreement that the inspection finding upon which contention item 12E is based is not an example of noncompliance. Accordingly, contention item 12E has no basis in fact.

Q.7. Mr. Orlov, what was the inspection finding to which contention item 12E refers?

A.7. Contention item 12E refers to Inspection Report 50-456/85-006 (DRP); 50-457/85-006 (DRP), dated March 8, 1985, item of noncompliance 2a which states that:

> Although the Braidwood Construction Assessment Program (BCAP) had identified that Level I QC inspectors had inspected and accepted construction activities, in violation of the requirements delineated in ANSI N45.2.6, this nonconforming condition was not documented as a BCAP observation.

Q.8. Mr. Orlov, please explain what ANSI N45.2.6 is.

A.8. ANSI N45.2.6-1978 entitled "Qualifications of Inspection, Examination, and Testing Personnel for Nuclear Power Plants" is a standard sponsored and published by the American Society of Mechanical Engineers (ASME). In its forward, it describes itself as a "standard for general industry use that would define the qualifications of personnel whose activities result in or assure attainment of quality construction".

Q.9. Why is it applicable to Commonwealth Edison's Braidwood project?

A.9. The Braidwood Final Safety Analysis Report (FSAR) in its appendix A, commits to US NRC Regulatory Guide 1.58 Revision 1 (with minor exceptions). The Reg. Guide 1.58 Rev. 1 endorses the use (again with minor amplifications) of ANSI N45.2.6-1978

Q.10. What is a Level I QC inspector?

A.10 A Level I QC inspector is a QC inspector certified in accordance with the provisions of ANSI N45.2.6-1978 to a "Level I". Their capabilities are described in ANSI N45.2.6-1978 paragraph 3.2 and their experience and educational requirements are delineated in paragraph 3.5.1.

Q.11. What are the requirements of ANSI N45.2.6 with respect to inspection and acceptance of construction activities by Level I QC inspectors?

A.11. Paragraph 3.2 of ANSI N45.2.6-1978 states "A Level I person shall be capable of performing inspections, examinations, and tests that are required to be performed in accordance with documented procedures and/or industry practices." Paragraph 1.4.1 defines inspection as "a phase of quality control which by means of examination, observation, or measurement determines the conformance of materials, supplies, parts, components, appurtenances, systems, processes, or structures to predetermined quality requirements". From these two paragraphs, one can conclude that a Level I inspector can determine the conformance of items, that is, accept or reject them. Table I of ANSI N45.2.6-1978 states Level I's shall be capable of "Recording inspection, examination, and testing data" and of "Implementing

inspection, examination, and testing procedures". Table I also states that evaluating the validity and acceptability of inspection, examination and testing results is to be performed by Level II inspectors. The difference between these capabilities of Level I inspectors as described in Table 1 and those capabilities as described in paragraph 3.2 creates some ambiguity as to the degree of responsibility that may be given to a Level I inspector performing inspections.

Q.12. What, if anything, did the BCAP Task Force find with respect to the use of Comstock Level I QC inspectors to inspect and accept construction activities at Braidwood?

A.12. In developing checklist instructions for use in the review of the electrical contractor's documentation, it was noted that the implementing procedures, and in specific those procedures addressing the visual inspection of welds, required that inspectors who perform the inspections be certified to at least Level I, and that each inspection report would be reviewed and approved by a Level II inspector. The question arose within the BCAP Task Force if this practice was consistent with the capabilities described by Table I of ANSI N45.2.6-1978.

Q.13. When did the BCAP Task Force first identify this practice?

A.13. This would have occurred in the late fall of 1984.

Q.14. Did the BCAP Task Force document this practice as a nonconforming condition by issuing an observation?

A.14. Not at that time.

Q.15. Why not?

A.15. BCAP had not identified a deficiency. We had raised some questions with respect to the acceptability of the electrical contractor's use of Level I inspectors to perform visual weld inspections. We needed to do a more thorough review of the contractors entire program relative to this use of Level I's, the ANSI standard, the Reg. Guide, and the FSAR, to determine what requirements were applicable to Braidwood and whether the contractors total program met these requirements.

Q.16. Did anyone at the BCAP Task Force inform the NRC Staff of BCAP's finding with respect to Level I inspectors?

A.16. I recall discussing this subject with Mr. Gardner.

Q.17. When?

A.17. I believe it was late November or December 1984.

Q.18. Why?

A.18. At that time, the NRC BCAP inspector, Mr. Gardner, was following the BCAP Task Force activities closely. To the best of my recollection, I was discussing this subject with the CSR Lead Electrical Engineer when Mr. Gardner was in the BCAP Task Force offices. I felt that it was appropriate to inform Mr. Gardner of what we were doing in this area.

Q.19. Please recount to the best of your ability what you said to Mr Gardner, and he said to you, at that time.

A.19. I informed Mr. Gardner of our review of the electrical contractors procedures, that these procedures allowed Level I inspectors to perform welding inspections, and that the BCAP Task Force was trying to determine if this was consistent with ANSI N45.2.6 Table 1, particularly with respect to the Level I's ability to collect data. Mr. Gardner expressed interest and indicated that he too would look into this question and perhaps discuss this subject with the region.

Q.20. What action, if any, did Mr. Gardner take with respect to this issue?

A.20. Mr. Gardner again discussed the subject of the acceptability of the contractors use of Level I inspectors for the visual inspection of welding with me in January 1985. He expressed to me the opinion of the region that the Level I inspectors could be used for data collection, in accordance with Table 1 of ANSI N45.2.6, but that visual weld inspections, being subjective in nature, did not fit the description of data collection, and as such, required Level II inspectors. I then told Mr. Gardner that it appeared from the evidence available that BCAP would initiate an observation on this subject. Mr. Gardner refers to this discussion on page 4 of NRC Inspection Report 50-456/85-02; 50-457/85-02.

Q.21. And did you then document this on a BCAP observation?

A.21. I initially requested the CSR Lead Electrical Engineer to document this matter on an observation report. In reviewing the requirements to be documented on the observation, it was observed

that the contractor procedures governing inspection certification allowed Level I inspectors to perform inspections, and that these procedures were consistent with the text of ANSI N45.2.6-1978. The questions raised regarding Level I inspectors were derived from review of Table 1 of ANSI N45.2.6-1978, not the text itself. Upon reviewing the text of ANSI N45.2.6-1978 against the contractors program for certification and use of Level I inspectors, it was observed by BCAP that the contractors program apparently was in conformance with the provisions of N45.2.6 with respect to the use of Level I inspectors. Specifically, Comstock used Level I inspectors in the visual inspection of welding to document the acceptance of various specific attributes for which acceptance criteria is well defined in the inspection procedure. The procedure went further and required a Level II inspector to review and approve the inspection report. This Level II review, as described in the contractors' program, appeared to be consistent with the text of ANSI N45.2.6-1978 in that Level II inspectors are capable of reporting inspection results and in evaluating the acceptability of inspection results. I concluded that the electrical contractor's use of Level I inspectors for visual weld inspection, as described in the contractor's program and procedures, appeared to be in conformance with ANSI N45.2.6-1978.

Q.22. Did you ever tell Mr. Gardner that the use of Level I QC inspectors would not be documented as a BCAP observation?

A.22. Yes

Q.23. Why?

A.23. In February 1985, Mr. Gardner came to my office to follow-up on the issue regarding the electrical contractors' use of Level I inspectors for visual weld inspections. At that time, I informed Mr. Gardner that the BCAP Task Force had not documented this issue as a BCAP observation because I felt there existed no departure from requirements.

Q.24. What did you say to Mr. Gardner, and what did he say to you at that time?

A.24. I explained to Mr. Gardner why the BCAP Task Force previously thought that this issue was an observation. That is, the contractors program for the use of Level I inspectors for visual weld inspection did not seem to comport with the requirements contained in Table 1 of ANSI N45.2.6-1978. However, when this program was reviewed against the actual text of ANSI N45.2.6-1978 specifically paragraphs 3.2 and 3.3 in conjunction with 1.4.1, the program appeared to be in conformance.

Q.25. What did the BCAP Task Force eventually do with respect to the Level I QC inspector issue?

A.25. On February 27, 1985, the BCAP Task Force issued observation CSR-R-G-ELE-XXX-171 relating to the use by the electrical contractor of Level I inspectors to perform visual weld inspections (See Exhibit A).

Q.26. Why did the BCAP Task Force issue this observation?

A.26. It appeared to me that although Mr. Gardner expressed interest in my explanations of the acceptability of the electrical contractors program with respect to the use of Level I and Level II inspectors for visual weld inspections, my explanations did not alleviate his concerns. I discussed with Dr. Kaushal, the BCAP Task Force Director, Mr. Gardner's apparent residual concerns. Because of Mr. Gardner's concerns, Dr. Kaushal directed me to initiate the observation, which I then did.

Q.27. At any time prior to the completion of the inspection documented in Inspection Report 85-006, did you inform Mr. Gardner that a BCAP observation had been issued for this item?

A.27. On February 27, 1985, Dr. Kaushal, and I discussed this issue with Mr. Gardner via telephone. At that time, either Dr. Kaushal or I explained to Mr. Gardner that an observation had been written by BCAP regarding Comstock's use of Level I QC inspectors by L.K. Comstock for the visual inspection of welding. It is likely, in retrospect, that Mr. Gardner may not have understood us. The Level I issue was one of many we were discussing at that time. We were conversing using a "speaker phone", the transmission quality of which was not great under the best of conditions and was prone to "drop out" when truck or wind gust noises entered Dr. Kaushal's construction trailer office.

Q.28. After Inspection Report 85-006 was issued on March 8, 1985, did CECo submit a response to this proposed item of noncompliance?

A.28. CECo responded to the Inspection Report in a letter from D.L. Farrar to J.G. Keppler dated May 6, 1985. (See Exhibit B)

Q.29. What did NRC Staff determine with respect to this proposed item of noncompliance?

A.29. The NRC Staff agreed that item 2a of the Notice of Violation was not an example of noncompliance and would remove it from their records. They further stated that the information presented in our response was not known to the NRC inspector at the time of the inspection. (Exhibit C).

Q.30. What happened to Observation CSR-R-G-ELE-XXX-17 after it was issued?

A.30. The observation was validated on February 27, 1985 and processed accordingly. That is, it was forwarded to CECo's Project construction Department (PCD) for inclusion in a nonconformance report (NCR). In addition, the concern described in the observation is discussed on page B-15 of the Report on the Braidwood Construction Assessement Program submitted to the NRC in November 1985.

Q.31. Has BCAP formulated any corrective action to address the potential nonconforming condition?

A.31. No.

Q.32. Why not?

A.32. BCAP has no responsibility for formulating actions resolving the observations it identifies. This is the responsibility of the Project Construction Department (PCD) under the CECo NCR program.

I have been informed that the steps PCD is taking to resolve this concern are discussed in Mr. Gieseker's affidavit submitted in response to contention item 3C.

Q.33. Does this complete your affidavit with respect to contention item 12E?

A.33. Yes.

BCAP OBSERVATION RECORD

1. OBSERVATION NO. CSR-R-G-ELE-xxx-

PART 1 — OBSERVATION IDENTIFICATION & DESCRIPTION

2 DESCRIPTION OF ITEM(Equipment,Material,Component,Procedure): L.K. Comstock Electrical Welding

3. PACKAGE NO. n/a

4. SYSTEM (if known): n/a

5. CHECKLIST/ITEM NO. n/a

6. UNIT 1 [ ] n/a UNIT 2 [ ] COMMON 0 [ ]

7. SUPPORT SERVICE REQ. NO. n/a

8. ELEMENT

[X] CSR [ ] RPSR [ ] RSCAP

9. OBSERVED DURING:

[ ] Reinspection [ ] Documentation Review [X] Procedure Review [ ] Implementation Review [ ] Other

10. DESCRIPTION OF OBSERVATION:

See attached sheet(1 page)

11. PREPARED BY: [signature] 2/27/85

Signature Date

PART 2 — OBSERVATION CLARITY, COMPLETENESS, AND ACCURACY REVIEW

12. COMMENTS/CLARIFICATION:

13. SUITABLE FOR FURTHER PROCESSING: YES [ ] NO [ ]

14. REVIEWED BY:

Signature Date

CSR - R - ~~E-XXX~~
Attachment P. 1 of 1
2/27/85

Subject: Qualification of Inspection Personnel

During the development of CSR checklists and instructions for the review of electrical documentation, it was observed that it was general practice (prior to 6/30/84) within L.K. Comstock to use Level I inspectors to perform and document the performance of inspections. These inspections by Level I inspectors were performed in conjunction with a review and concurrence signature by a Level II inspector on the inspection record.

Example: L.K. Comstock Procedure 4.8.3 Rev. F specifies Level I or Level II certified inspectors to perform the visual inspection of welds (ref. Paragraph 3.24) and requires a Level II inspector to review the inspection record.

Concern: Do Comstock Procedures 4.1.3, 4.13.1, and 4.8.3, in allowing Level I inspectors to implement inspection procedures and perform field inspection, subject to review of the inspection results by a Level II inspector, adequately address the regulatory requirements established by the Braidwood FSAR, Reg. Guide 1.58 Rev. 1, ANSI N45.2.6 - 1978? Do these procedures adequately describe the Level II inspector's validation of Level I inspection procedure implementation?

References:

ANSI N45.2.6 - 1978

L.K. Comstock Procedures 4.1.3 Rev. B, 4.13.1 Rev. C, 4.8.3 Rev. F

(1003J)

Orlov Affidavit on Contention Item 12E Exhibit B

Little
Transfer attorney

Commonwealth Edison
One First National Plaza Chicago Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

May 6, 1985

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 Reports Nos.
50-456/85-006 and 50-457/85-006
NRC Docket Nos. 50-456 and 50-457

REFERENCE (a): R. F. Warnick letter to C. Reed
dated March 8, 1985

Dear Mr. Keppler:

This letter is in response to the inspection conducted by Mr. R. N. Gardner on February 4 through March 1, 1985, of activities at Braidwood Station. Reference (a) indicated that certain activities appeared to be in noncompliance with NRC requirements. The Commonwealth Edison Company disagrees with the items listed in the Notice of Violation. Our detailed discussion of the bases for our disagreement is provided in the enclosure.

Commonwealth Edison Company has initiated increased interface of the Project Licensing and Compliance group with the NRC BCAP resident inspector. It is our desire to assure that routine onsite communications with the NRC are clear and provide an appropriate level of attention to NRC concerns.

The delay in submitting this response was discussed with Mr. R. F. Warnick on April 8, 1985 and Mr. W. S. Little on April 22, 1985.

If you have any further questions on this matter, please direct them to this office.

Very truly yours,

Dennis Farrar

D. L. Farrar
Director of Nuclear Licensing

/klj
Enclosure
cc: NRC Resident Inspector - Braidwood

MAY 8 1985

0082K

ENCLOSURE ONE

COMMONWEALTH EDISON COMPANY ONE
RESPONSE TO INSPECTION REPORT
50-456/85-006 AND 50-457/85-006
ITEM 50-456/85-006-02 AND 50-457/85-006-02

Item of Noncompliance

1. 10 CFR, Appendix B, Criterion II, states, in part, that "The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components.... The program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained."

   Commonwealth Edison Company Quality Assurance Manual, Quality Requirement No. 2.0, Section 2.3, states, in part, that "Qualifications and certifications will be...established to meet the applicable requirements of...ANSI Standard N45.2.6...Contractor personnel engaged in inspection...will be required to be trained, qualified, and certified to perform their specific activity in accordance with the above requirements.

   ANSI N45.2.6-1978, Paragraph 4, states, in part, that "Personnel who are assigned the responsibility and the authority to perform functions covered by this standard shall have, as a minimum, the level of capability shown in Table 1. Table 1 requires a Level II capability for personnel evaluating the acceptability of inspection and examination results. According to Table 1, Level I inspectors are authorized to act as data takers but they are not authorized to determine the acceptability of construction activities.

   Contrary to the above, the licensee's electrical contractor utilized Level I Quality Control (QC) inspectors for inspection and acceptance of electrical welds. This practice involved 14 different Level I inspectors over a four year time period.

RESPONSE

Commonwealth Edison Company does not agree that this is an example of non-compliance. We do believe, however, that resolution of this issue does lead to an enhanced inspection program.

The subject of inspector activities has been previously reviewed by NRC personnel and CECo QA personnel at Braidwood Station. We believe that a review of pertinent historical information is useful and provides insight into the practices previously utilized. This information, including a review of ANSI N.45.2.6 requirements, is enclosed as an attachment to this response.

Commonwealth Edison Company believes that no corrective action is necessary. Commonwealth Edison Company has confidence in the quality of the Braidwood Station. Further confirmation of the quality of the installed hardware, including welds by the electrical contractor, is provided by BCAP and other reinspection/overinspection programs already in progress at Braidwood.

In order to reach resolution of this issue, the following response acknowledges the previous practices while providing for enhanced inspection activities in the future.

Commonwealth Edison Company will issue a memo by May 15, 1985, to site contractors that will provide the following directions for the use of inspectors in ANSI N.45.2.6 programs:

1. Level II or Level III inspectors are to be used for inspection and acceptance of welds.

2. For all other types of inspections, Level II inspectors are to be used whenever practical. If Level I inspectors are used, specific data is to be recorded for each item inspected. This data will be reviewed by a Level II inspector, certified in the appropriate discipline, to determine the acceptance of the installation.

ATTACHMENT TO ENCLOSURE ONE
50-456/85-006 AND 50-457/85-006
ITEM 50-456/85-006-02 AND 50-457/85-006-02

In order to provide the proper perspective to this issue, we believe that it is necessary to document pertinent information regarding ANSI N45.2.6 and historical information specifically related to the use of electrical contractor Level I QC inspectors at Braidwood. This review will address:

1. Review of ANSI N45.2.6-1978 Requirements.

2. Review of NRC Item 50-456/80-06-01; 50-457/80-06-01, part j.

3. Review of NRC Item 50-457/83-18-01-03A; 50-457/83-17-01-03A, section regarding Level II review of Level I data.

4. Review of Quality Assurance Audit QAA 84-122, Open Item #1, Concern #5.

REV W OF ANSI N45.2.6-1978 REQUIREMENTS

For completeness and ease of reference, a copy of ANSI N45.2.6-1978 is enclosed.

In the description of the item of non-compliance, paragraph I quoted 10 CFR, Appendix B, Criterion II to establish requirements for indoctrination and training. Commonwealth Edison Company does not dispute this paragraph.

In the description of the item of non-compliance, paragraph II quoted the Commonwealth Edison Company Quality Assurance Manual to establish the applicability of ANSI N45.2.6-1978. Commonwealth Edison Company does not dispute this paragraph.

In the description of the item of non-compliance, paragraph III sentence 1 quotes from paragraph 4 of ANSI N45.2.6-1978. Sentences 2 and 3 of paragraph III of the item of non-compliance, however, are not quotes from ANSI N45.2.6-1978.

In order to understand the intent of the standard, we refer to paragraph 3.2 of ANSI N45.2.6-1978 which states, in part, that:

> "A Level I person shall be capable of performing the inspections, examination, and tests that are required to be performed in accordance with documented procedures and/or industry practices."

The ANSI N45.2.6-1978 furthermore provides in paragraph 1.4 definitions of Inspection, Examination, and Testing as follows:

"1.4.1 Inspection. A phase of quality control which by means of examination, observation, or measurement determines the conformance of materials, supplies, parts, components, appurtenances, systems, processes, or structures to predetermined quality requirements.

1.4.2 Examination. An element of inspection consisting of investigation of materials, supplies, parts, components, appurtenances, systems, processes, or structures to determine conformance to those specified requirements which can be determined by such investigation. Examination is usually nondestructive and includes simply physical manipulation, gaging, and measurement.

1.4.3 Testing. The determination or verification of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating conditions."

Therefore, ANSI N45.2.6-1978 does specifically provide that Level I persons are capable of performing inspections, examination, and tests and ANSI N45.2.6-1978 does specifically define these to mean determination of the conformance to predetermined or specified requirements. Commonwealth Edison Company believes that this is how L. K. Comstock Level I weld inspectors were utilized.

4-'83

The Level II review of the inspection results was performed to determine validity and acceptability. In retrospect neither the procedure nor the documented objective evidence on the inspection checklist were sufficient to determine the method used by the Level II for establishing validity and acceptability of the results during the 4 year period in question.

Review of NRC Item 50-456/80-06-01; 50-457/80-06-01

NRC Inspection Report 50-456/80-06; 50-457/80-06 dated July 9, 1980 addressed the qualification level of individuals performing procedure 4.8.3. Specifically, Item 50-456/80-06-01, 50-457/80-06-01, part j stated:

"In weld procedure 4.8.3, the qualification level for the performance of the inspectors was not indicated."

In response to this NRC concern, L. K. Comstock QC Procedure 4.8.3 was revised to state:

"Inspection and Documentation shall be performed by a Level I or Level II Inspector qualified per Section 4.1.3 of the Q.C. Manual."

ATTACHMENT TO ENCLOSURE ONE
50-456/85-006 AND 50-457/85-006
ITEM 50-456/85-006-02 AND 50-457/85-006-02

The NRC Region III personnel reviewed, accepted, and closed this item, as documented in Inspection Report 50-456/80-12 and 50-457/80-11 dated October 23,1980. The NRC stated:

> "...Procedure 4.8.3 has been revised to clarify the functions of the welding inspector and his level of qualification."

Thus NRC Region III reviewed, accepted, and closed the specific subject of L. K. Comstock Level I QC personnel performing inspections of electrical welds in accordance with procedure 4.8.3.

Review of NRC Item 50-456/83-18-01-03A; 50-457/83-17-01-03A

NRC Inspection Report Item 50-456/83-18-01-03A 50-457/83-17-01-03A addressed the subject of review of data by a Level II inspector when a Level I inspector records the data. Specifically, this item stated, in part,

> "(8) Procedure 4.8.5, "Inspection of Class 1E Safety-Related Cable Pan Installation", Revision A, dated February 4, 1983.
>
> Paragraph 3.2.2.1 - This paragraph needs to be revised to require the Level II inspector performing the review of Form 17 for completeness to also review the data for acceptability/rejectability when a Level I inspector records the data. All procedures/forms need to be revised, as required, to clarify this requirement."

In L. O. DelGeorge letter to J. G. Keppler dated March 23, 1984. Commonwealth Edison Company provided the following response to this item:

> "Response/Corrective Action Taken
>
> Commonwealth Edison Company acknowledges the need to revise Procedure 4.8.5 so that the scope of a Level II inspector's review of a Level I inspector's records clearly includes recorded data for acceptability and rejectability. Prior to the NRC Inspection, in an in-house letter, L. K. Comstock's Project Quality Control Manager clarified the level of review to be completed when Level I and Level II inspectors sign reviews. These clarifications will be incorporated into all applicable L. K. Comstock procedures. We further believe that the actual practice of a Level II signing for a Level I has been in accordance with ANSI N45.2.6.

ATTACHMENT TO ENCLOSURE ONE
50-456/85-006 AND 50-457/85-006
ITEM 50-456/85-006-02 AND 50-457/85-006-02

Date of Completion

Applicable L. K. Comstock procedures are expected to be revised by March 30, 1984."

As a result of this item, various L. K. Comstock procedures were revised. Specifically, Procedure 4.8.5 (Inspection of Class 115 Safety-Related Cable Pan Installations) Revision C was revised to address the specific concern. Procedure 4.13.1 (Quality Control Documentation Requirements of Quality Related Records) Revision C paragraph 3.4.2.2 generically specified "When a Level II Inspector reviews the documentation of a Level I, the Level II evaluates the validity and acceptability of the inspection and test results as recorded by the Level I". Procedure 4.8.3 (Weld Inspection) Revision F paragraph 3.24.1 was added to address specific concern.

The NRC Region III personnel reviewed, accepted, and closed this item, as documented in Inspection Report 50-456/84-19; 50-457/84-18.

QUALITY ASSURANCE AUDIT QAA 84-122

The same concern identified by the NRC inspector was previously identified as a concern by Commonwealth Edison Company General Office Audit QAA-84-122 of L. K. Comstock at Braidwood which was performed 9/10/84 through 9/14/84 and documented in a report dated 9/21/84. Specifically, Open Item #1, concern #5 states:

"5. (Question #28) Although Comstock did not currently employ Level I Inspectors, the Welding Inspection Procedure 4.8.3 revision E addressed their utilization in the completion of weld and other related inspections. Level I Inspectors would be required to pass judgement on the acceptability of observed conditions to utilize the checklists supplied by this procedure.

Commonwealth Edison Co's Q.A. Department will only allow a Level I Inspector to operate in the capacity of a data gatherer. That data in turn, must be analyzed for acceptance by an inspector of a higher level.

Recommendations:

Either the references to the employment of Level I inspectors should be deleted from the Comstock's procedures outlining their inspection program or those inspection procedures should be revised to precisely define the limited nature of the Level I capabilities."

ATTACHMENT TO ENCLOSURE ONE
50-456/85-006 AND 50-457/85-006
ITEM 50-456/85-006-02 AND 50-457/85-006-02

This item was classified as an open item based on the fact that there were no Level I L. K. Comstock Welding Inspectors at the time of the audit. Commonwealth Edison Company has conducted Q.A. Follow-up on this issue by surveillances which documented the following status:

Q.A. Follow-up 12/12/84

Concern #5 - L. K. Comstock has revised procedure 4.8.3 in revision G to eliminate all references to a Level I Q.C. inspector.

Q.A. Follow-up 2/1/85

Concern #5 - Procedure 4.8.3 revision G received final approval on 1-11-85.

Q.A. Follow-up 2/12/85

Concern #5 - This concern remains open pending the establishment of a program for evaluating the acceptability of previous work performed by Level I inspectors.

We feel that, in light of questions raised by Q.A. and the NRC, it is prudent to assure that all parties involved are fully satisfied. The corrective actions listed in our response to this NRC item are also being presented to Q.A.

ENCLOSURE TWO

COMMONWEALTH EDISON COMPANY
RESPONSE TO INSPECTION REPORT
50-456/85-006 AND 50-457/85-006
ITEM 50-456/85-006-01A AND 50-457/85-006-01A
ITEM 50-456/85-006-01B AND 50-457/85-006-01B

Item of Noncompliance

2. 10 CFR 50, Appendix B, Criterion XVI, states, in part, that "Measures shall be established to assure that conditions adverse to quality, such as...nonconformances are promptly identified and corrected."

   Commonwealth Edison Company Quality Assurance Manual, Quality Requirement No. 16, Section 16.1, states, in part, that "A corrective action system will be used to assure that such items as...nonconformances...which are adverse to quality...are promptly identified and corrected."

   Contrary to the above, the following instances of failure to take proper corrective actions were identified:

   a. Although the Braidwood Construction Assessment Program (BCAP) had identified that Level I QC inspectors had inspected and accepted construction activities, in violation of the requirements delinated in ANSI N45.2.6, this nonconforming condition was not documented as a BCAP observation.

   b. Thirty-seven BCAP observations, which dealt with the lack of QC verified "red-lined" record copy drawings, were invalidated by the BCAP taskforce even though the documented basis for the invalidation of the observations did not support the invalidations.

Response 2.a

Commonwealth Edison Company does not agree that this is an example of an item of non-compliance. Contrary to the description of this item in the notice of violation, this issue was documented on BCAP Observation Record CSR-R-G-ELE-XXX-171 on February 27, 1985. Unfortunately, due to apparently ineffective communications between BCAP personnel and the NRC inspector, the NRC inspector was not aware that this observation was issued during the week prior to his monthly exit interview meeting.

ENCLOSURE TWO

ITEM 50-456/85-006-01A AND 50-457/85-006-01A
ITEM 50-456/85-006-01B AND 50-457/85-006-01B

The NRC inspector has now seen the Observation Record CSR-R-G-ELE-XXX-171.

It is Commonwealth Edison Company's position that BCAP Observations will be documented and processed in accordance with BCAP Procedure BCAP-06, "Observation and Discrepancy/Concern Processing".

Response 2.b

Commonwealth Edison Company disagrees that this item, as stated in the notice of violation, is an example of non-compliance. This is because, contrary to the violations as stated, the BCAP task force did not invalidate any of the 37 BCAP observations in question. We do acknowledge that there does exist a valid concern regarding documentation of review of certain red-line drawings by Phillips Getschow QC inspectors and that this concern was identified and documented by Commonwealth Edison Company Quality Assurance.

In order to fully understand the details of this issue, the following review of events is presented. It is especially noteworthy that several events occurred quickly and in parallel in the January 1985 timeframe.

Phillips Getschow (PGCo) is the contractor responsible for the generation and QC verification of as-constructed drawings for piping systems. PGCP-40 is the procedure governing this activity. Revision 3 of this procedure, which is similar to earlier revisions, requires

"5.3 the Supervisor-Quality Control shall:
5.3.1 Dimensional verify installed piping
5.3.2 Compare the As-Constructed drawing to the As-Installed condition...
5.3.5 Return verified drawing and form PG/QA-5-33, Section 3(a) properly signed to the Project Engineer."

Paragraph 4.4 allows the delegation of authority to appropriately certified personnel.

The thirty-seven observations were generated by a review by BCAP of the contractor documentation supporting the verification of as-constructed dimensions using BCAP checklist and instruction CSR-R-M-1 Rev. 1. The instructions to the BCAP document reviewer were:

"2.3 By reviewing the data package, verify the existence of the QC verified red-line record copy isometric leading up to the As-Constructed isometric.

> 2.4 Verify that the preparer(s) of the red-lined record copy isometric has a minimum certification level of Level II QC inspector ... [Certification Area: Process Piping and Instrumentation]."

Additionally, Sections 2.1 and 2.2 require a QC signature on the final As-Constructed drawing. These instructions were based on BCAP's interpretation of PGCP-40, which indicated that the field verified drawing should be signed.

In their review of the "red-lined" drawings, BCAP found many which were not signed by QC personnel. This resulted in the observations referenced in the item of noncompliance. These observations were processed by BCAP as valid in accordance with procedure BCAP-06 and sent to PCD and S&L for further processing. They were validated because BCAP had no information at that time to indicate that the QC signature on the red-line drawing was not required. S&L reviewed these observations per BCAP-06 Rev. 6 paragraph 4.6.1, at the end of December 1984, with the evaluation recommending that the observation be invalidated:

> "There is no requirement for a "red-lined record copy isometric", as per S&L Specification F/L-2739, Article 301.11 and per Phillips Getschow Procedures QCP-B21, Rev. 6 and PGCP-40, Rev. 3."

However, in accordance with BCAP-06 paragraph 4.7.1, it is BCAP which must make the final determination of validity. Step 4.4 must be completed by BCAP before an observation is deemed invalid. This step had not taken place for the thirty-seven observations in question. BCAP has taken no steps to formally invalidate these observations. They remain valid at this time.

On January 14, 1985, the Independent Expert Overview Group (IEOG) identified a concern regarding S&L's recommendations that these observations be invalidated and documented their concern on their observation BCAP-OBS-007 which stated,

ENCLOSURE TWO

ITEM 50-456/85-006-01A AND 50-457/85-006-01A
ITEM 50-456/85-006-01B AND 50-457/85-006-01B

> "Observation: S&L has responded to several BCAP Observations ... declaring them to be invalid because no "red-lined record copy isometric" is required. However, Phillips, Getschow Co. Procedures QCP-B21, Revision 6 and PGCP-40, Revision 3 both require some form of verification drawing to be signed by QC. This is a copy of the installation drawing which has been marked in the field to show actual dimensions and configuration of work completed in the plant for that part of construction. Whether it is called a "red line" drawing, a verification drawing, or a field verification installation drawing is a technicality. The name of the drawing was not the subject of the observations listed below. At issue in these observations is the lack of a signature or initials of a certified QC inspector. For this reason, the following S&L responses to BCAP Observations invalidly have been marked "Invalid...."

Also on January 14, 1985, a meeting was held, allowing PCD, PGCo, and S&L to explain their positions to BCAP regarding the contractor's documentation requirements supporting the generation and QC acceptance of "as-constructed" isometrics. At this meeting, an agreement was reached between the involved parties as to what documentation was required by the applicable procedures. The meeting was documented by a January 15, 1985 letter BR/PCD 85-43 from the PCD Superintendent to the BCAP Director.

On this basis, on January 25, 1985 BCAP responded to the IEOG observation as follows,

> "DISCUSSION:
>
> During the preparation phase of Documentation Review Checklist, CSR-R-M-1, Rev. 0, "Small Bore Piping Configuration", the PGCO Procedures, QCP-40, Rev. 3 and QCP-B21, Rev. 6, were reviewed and interpreted to require a "QC Signature" on the verification drawing ("Red-Line"). During the subsequent document review activities, several observations were written by the BCAP Inspectors and processed as valid. As a result of these observations, a meeting was held on January 14, 1985 between CECo PCD, S&L, PGCo, and BCAP in which PGCo provided a clarification of the documentation requirements of the above referenced procedures. A QC Signature on the verification drawing was not required. Rather, QC was to sign section 3(a) of the "Stop Work Order", signifying completion, and to sign the QC approval block on the mylar of "As-Constructed" drawing. PCD later issued a memorandum, BR/PCD 85-43, on

January 15, 1985 confirming this clarification. Based upon this clarification and a subsequent review of the PGCo procedures by BCAP, it has been determined that the referenced observations are invalid. The PGCo Procedures do not require that the verification drawings ("Red-Line") require a QC signature. The inspector performs the field verification, marking as necessary on the verification copy and signs the Stop Work Order to signify completion. The Engineering Department then revises the drawing mylar, as necessary, to reflect the marked-up verification copy. The mylar is then resubmitted to the QC organization for review and approval. These QC signatures on the "Stop Work Order" form and the mylar of the "as-constructed" drawing provide adequate quality documentation of Quality Control's Verification of the as-constructed dimensions.

"CORRECTIVE ACTIONS:

The QC-signed "Stop Work Order" form is the document which signifies QC acceptance of the "red-line" drawing, and will therefore be the document reviewed by BCAP in lieu of the "red-line" drawing. The Small Bore Piping Configuration Documentation Review Checklist will be revised to reflect this change. Those portions of the document reviews performed to date affected by this revision will be redone using the revised checklist and instructions. The Observations describing the lack of a QC signature on the "red-line" drawing previously processed as valid will be reprocessed as invalid Observations."

Immediately following the January 14, 1985 meeting described above, BCAP's discussions with BCAP QA determined a course of action that included revision of the checklist to properly reflect procedural requirements, a re-review of the contractor documentation to the new requirements, a surveillance of the contractor's activities in this area by site QA which was to be arranged by BCAP QA, and subsequent to these activities, the invalidation of the previously generated observations.

The site QA surveillance #4151 was performed on January 22-24 and February 4-5, 1985 and documented on 2/14/85. It identified certain examples of nonadherence to the contractor procedures.

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ITEM 50-456/85-006-01A AND 50-457/85-006-01A
ITEM 50-456/85-006-01B AND 50-457/85-006-01B

In accordance with the above specified Corrective Actions, the BCAP instruction CSR-R-M-1 was revised on 2/1/85 and the re-review of the contractor's documentation began shortly thereafter. This re-review documented concerns similar in nature to those identified by the QA surveillance. Because of these concerns, BCAP has not invalidated the 37 observations.

In conclusion, we believe BCAP's actions were prudent. The corrective actions specified in the response to the IEOG observation, in conjunction with the CECo site QA surveillance, would assure that any relevant concerns with the contractor's QC program for the verification of as-constructed drawings would have been identified. The thirty-seven observations in question will remain valid until a determination can be made as to the existence of acceptable documentation supporting certified QC inspectors verification of the as-constructed drawings.

AN AMERICAN NATIONAL STANDARD

Qualifications of Inspection, Examination, and Testing Personnel for Nuclear Power Plants

ANSI/ASME N45.2.6 - 1978

(REVISION OF ANSI N45.2.6-1973)

SPONSORED AND PUBLISHED BY

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

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An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American National Standards are subject to periodic review and users are cautioned to obtain the latest edition.

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This Standard was approved by the ASME Committee on Nuclear Quality Assurance and the ASME Nuclear Power Codes and Standards Committee, and was subsequently approved by the American National Standards Institute on August 31, 1978.

Date of Issuance: January 15, 1979

FOREWORD

(This Foreword is not a part of the American National Standard on Qualification of Inspection, Examination, and Testing Personnel for Nuclear Power Plants.)

This Standard delineates the qualifications required of personnel who perform inspections, examinations, and tests that assure the quality of important parts of nuclear power plants prior to and during the construction, pre-operational, and startup testing and operating phases. The Standard was originally developed by the American National Standards Committee N45 on Reactor Plants and Their Maintenance.

In May of 1969, the N45 Committee of ANSI established an ad hoc committee (N45-2.6) on Qualification of Personnel. The purpose of this committee was to prepare a standard for general industry use that would define the qualifications of personnel whose activities result in or assure attainment of quality construction. The ad hoc committee was composed of representatives of key segments of the nuclear industry including utilities, reactor suppliers, construction contractors, component manufacturers, and consultan. The original version of the Standard was issued in 1973 as ANSI N45.2.6-1973.

In August, 1973, the U.S. Atomic Energy Commission issued Regulatory Guide 1.58–Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel. The regulatory position in this guide was that ANSI N45.2.6-1973 should be extended in scope to include pre-operational and startup testing and the operational phase of a nuclear power plant.

Accordingly, the N45-2.6 Work Group met to revise the Standard to satisfy Regulatory Guide 1.58 and to make other improvements in the Standard, especially with regard to education and experience considerations. The Standard contained herein was developed from these activities.

In 1975, the N45-2 Subcommittee was reorganized into the ASME Committee on Nuclear Quality Assurance and began operating under the accredited ASME Procedures for Nuclear Projects which received accreditation on January 15, 1976. The ASME Committee on Nuclear Quality Assurance was chartered to develop the overall nuclear quality assurance codes and standards for nuclear power plant design, construction, and operation.

Suggestions for improvement gained in the use of this Standard will be welcomed. They should be sent to the Secretary, Committee on Nuclear Quality Assurance, American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
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W. H. Traffas, Gilbert Associates, Inc., Reading, Pennsylvania
E. F. Trainor, Stone & Webster Engineer Corporation, Boston, Massachusetts
J. E. Vessely, Florida Power & Light Company, Miami, Florida
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R. J. Walker, CE Power Systems, Windsor, Connecticut
*H. B. *Winitsky*, Philadelphia Electric Company, Philadelphia, Pennsylvania
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Subcommittee on Personnel Qualifications

R. Wachniak, Chairman, Babcock & Wilcox Company, Barberton, Ohio
J. E. Vessely, Secretary, Florida Power & Light Company, Miami, Florida
J. N. Babcock, Jr., United Engineers & Constructors, Inc., Philadelphia, Pennsylvania
T. R. Colandrea, General Electric Company, San Diego, California
F. B. Hyland, Westinghouse Electric Corporation, Pensacola, Florida
F. J. Long, US NRC Region II, Atlanta, Georgia
B. K. Marguglio, Consumer Power Company, Jackson, Mississippi
E. F. Trainor, Stone & Webster Engineering Corp., Boston, Massachusetts

*Liaison Organization Members.

Work Group on N45-2.6

(The N45-2.6 Work Group included the following personnel during the development of this Standard.)

B. W. Marguglio, Chairman, Consumer Power Company, Jackson, Mississippi
L. H. Duff, General Electric Company, San Jose, California
E. S. Gaffney, Babcock & Wilcox Company, Barberton, Ohio
W. F. Griffith, Stone & Webster Engineering Corporation, Boston, Massachusetts
S. E. Kennedy, Peabody Testing Company, Foster City, California
A. E. Siebe, Florida Power & Light Company, Miami, Florida
D. L. Vanderpol, Bechtel Power Corporation, San Francisco, California

CONTENTS

AMERICAN NATIONAL STANDARD

QUALIFICATIONS OF INSPECTION, EXAMINATION AND TESTING PERSONNEL FOR NUCLEAR POWER PLANTS

1. INTRODUCTION

1.1 Scope

This Standard delineates the requirements for the qualification of personnel who perform inspection, examination, and testing to verify conformance to specified requirements of nuclear power plant items (structures, systems, and components of nuclear power plants) whose satisfactory performance is required to prevent postulated accidents which could cause undue risk to the health and safety of the public; or to mitigate the consequences of such accidents if they were to occur. The requirements may also be extended to other items of nuclear power plants when specified in contract documents.

1.2 Applicability

The requirements of this Standard apply to personnel who perform inspections, examinations, and tests during fabrication prior to and during receipt of items at the construction site, during construction, during preoperational and startup testing, and during operational phases of nuclear power plants. The requirements of this Standard do not apply to personnel who perform inspections for government or municipal authorities, or who perform as authorized inspectors in accordance with the ASME Boiler and Pressure Vessel Code.

The requirements of this Standard are not intended to apply to personnel who only perform inspection, examination, or testing in accordance with ASNT "Recommended Practice No. SNT-TC-1A", since these personnel are certified in accordance with the requirements of SNT-TC-1A and its applicable supplements. **The requirements of this Standard are optional, at the discretion of the employer, for application to personnel who perform calibration or to craftsmen who perform installation checkouts as part of their basic installation responsibility** to ready the installation for preoperational testing.

This Standard is to be used in conjunction with ANSI N45.2.

The requirements apply to personnel of the owners, architect-engineers, nuclear power plant system designers and system suppliers, plant designers and plant constructors, equipment suppliers, outside testing agencies, and consultants. The ASME Boiler and Pressure Vessel Code, as well as other ANSI Standards, have been considered in the development of the Standard, and this Standard is intended to be compatible with their requirements.

1.3 Responsibility

It is the responsibility of each organization participating in the project to assure that only those personnel within their respective organizations who meet the requirements of this Standard are permitted to perform inspection, examination, and testing activities covered by this Standard that verify conformance to quality requirements.

The organization or organizations responsible for establishing the applicable requirements for activities covered by this Standard shall be identified and the scope of their responsibility shall be documented. The work of establishing selection and training practices and qualification procedures and of providing the resources in terms of personnel, equipment, and services necessary to implement the requirements of this Standard, may be delegated to other qualified organizations and such delegations shall also be documented. It is the responsibility of each organization using personnel covered by this Standard to conform to the requirements of this Standard applicable to the organization's work.

It is the responsibility of the organization performing these activities to specify the detailed methods and procedures for meeting the requirements of this

Standard, unless they are specified in the contract documents.

1.4 Definitions

1.4.1 Inspection. A phase of quality control which by means of examination, observation, or measurement determines the conformance of materials, supplies, parts, components, appurtenances, systems, processes, or structures to predetermined quality requirements.

1.4.2 Examination. An element of inspection consisting of investigation of materials, supplies, parts, components, appurtenances, systems, processes, or structures to determine conformance to those specified requirements which can be determined by such investigation. Examination is usually nondestructive and includes simply physical manipulation, gaging, and measurement.

1.4.3 Testing. The determination or verification of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating conditions.

1.4.4 Refer to ANSI N45.2.10 for other definitions to be used in conjunction with this Standard.

1.5 Referenced Documents

Other documents that are required to be included as a part of this Standard are either identified at the point of reference or described in Section 6 of this Standard. The issue or edition of the referenced document that is required will be specified either at the point of reference or in Section 6 of this Standard.

2. GENERAL REQUIREMENTS

2.1 Planning

Plans shall be developed for staffing, indoctrination, and training of an adequate number of personnel to perform the required inspections, examinations, and tests and shall reflect the schedule of project activity so as to allow adequate time for assignment or selection and training of the required personnel.

2.1.1 Indoctrination. Provisions shall be made for the indoctrination of personnel as to the technical objectives of the project; the codes and standards that are to be used; and the quality assurance elements that are to be employed.

2.1.2 Training. The need for formal training programs shall be determined, and such training activities shall be conducted as required to qualify personnel who perform inspections, examinations, and tests. On-the-job participation shall also be included in the program, with emphasis on first-hand experience gained through actual performance of inspections, examinations, and tests. Records of training, when used as the basis for certification, shall be maintained.

2.2 Determination of Initial Capability

The capabilities of a candidate for certification shall be initially determined by a suitable evaluation of the candidate's education, experience, training, test results, or capability demonstration.

2.3 Evaluation of Performance

The job performance of inspection, examination, and testing personnel shall be reevaluated at periodic intervals not to exceed three years. Reevaluation shall be by evidence of continued satisfactory performance or redetermination of capability in accordance with Subsection 2.2. If, during this evaluation or at any other time, it is determined by the responsible organization that the capabilities of an individual are not in accordance with the qualifications specified for the job, that person shall be removed from that activity until such time as the required capability has been demonstrated.

Any person who has not performed inspection, examination, or testing activities in his qualified area for a period of one year shall be reevaluated by a redetermination of required capability in accordance with Subsection 2.2.

2.4 Written Certification of Qualification

The qualification of personnel shall be certified in writing in an appropriate form, including the following information:

(1) employer's name

(2) identification of person being certified

(3) level of capability

(4) activities certified to perform

(5) basis used for certification, including:

- (a) records of education, experience and training
- (b) test results, where applicable
- (c) results of capability demonstration

(6) results of periodic evaluations

(7) results of physical examinations, when required

(8) signature of employer's designated representative

(9) date of certification and date of certification expiration

2.5 Physical

The responsible organization shall identify any special physical characteristics needed in the performance of each activity. Personnel requiring these characteristics shall have them verified by examination at intervals not to exceed one year.

3. QUALIFICATIONS

3.1 General

The requirements contained within this Section define the minimum capabilities that qualify personnel to perform inspections, examinations, and tests which are within the scope of this Standard.

There are three levels of qualification. The requirements for each level are not limiting with regard to organizational position of professional status, but rather, are limiting with regard to functional activities which are within the scope of this Standard.

3.2 Level I Personnel Capabilities

A Level I person shall be capable of performing the inspections, examinations, and tests that are required to be performed in accordance with documented procedures and/or industry practices. The individual shall be familiar with the tools and equipment to be employed and shall have demonstrated proficiency in their use. The individual shall also be capable of determining that the calibration status of inspection and measuring equipment is current, that the measuring and test equipment is in proper condition for use, and that the inspection, examination, and test procedures are approved.

3.3 Level II Personnel Capabilities

A Level II person shall have all of the capabilities of a Level I person for the inspection, examination or test category or class in question. Additionally, a Level II person shall have demonstrated capabilities in planning inspections, examinations, and tests; in setting up tests including preparation and set-up of related equipment, as appropriate; in supervising or maintaining surveillance over the inspections, examinations, and tests; in supervising and certifying lower level personnel; in reporting inspection, examination, and testing results; and in evaluating the validity and acceptability of inspection, examination, and test results.

3.4 Level III Personnel Capabilities

A Level III person shall have all of the capabilities of a Level II person for the inspection, examination or test category or class in question. In addition, the individual shall also be capable of evaluating the adequacy of specific programs used to train and test inspection, examination, and test personnel whose qualifications are covered by this Standard.

3.5 Education and Experience—Recommendations

The following is the recommended personnel education and experience for each level. These education and experience recommendations should be treated to recognize that other factors may provide reasonable assurance that a person can competently perform a particular task. Other factors which may demonstrate capability in a given job are previous performance or satisfactory completion of capability testing.

3.5.1 Level I

(1) Two years of related experience in equivalent inspection, examination, or testing activities, or

(2) High school graduation and six months of related experience in equivalent inspection, examination, or testing activities, or

(3) Completion of college level work leading to an Associate Degree in a related discipline plus three months of related experience in equivalent inspection, examination, or testing activities.

3.5.2 Level II

(1) One year of satisfactory performance as Level I in the corresponding inspection, examination or test category or class, or

(2) High school graduation plus three years of related experience in equivalent inspection, examination, or testing activities, or

(3) Completion of college level work leading to an Associate Degree in a related discipline plus one year related experience in equivalent inspection, examination, or testing activities, or

(4) Four-year college graduation plus six months of related experience in equivalent inspection, examination, or testing activities.

3.5.3 Level III

(1) Six years of satisfactory performance as a Level II in the corresponding inspection, examination or test category or class, or

(2) High school graduation plus ten years of related experience in equivalent inspection, examination, or testing activities; or high school graduation plus eight years experience in equivalent inspection, examination, or testing activities, with at least two years as Level II, and with at least two years associated with nuclear facilities–or if not, at least sufficient training to be acquainted with the relevant quality assurance aspects of a nuclear facility, or

(3) Completion of college level work leading to an Associate Degree and seven years of related experience in equivalent inspection, examination, or testing activities, with at least two years of this experience associated with nuclear facilities–or if not, at least sufficient training to be acquainted with the relevant quality assurance aspects of a nuclear facility, or

(4) Four-year college graduation plus five years of related experience in equivalent inspection, examination, or testing activities, with at least two years of this experience associated with nuclear facilities–or if not, at least sufficient training to be acquainted with the relevant quality assurance aspects of a nuclear facility.

4. PERFORMANCE

Personnel who are assigned the responsibility and authority to perform functions covered by this Standard shall have, as a minimum, the level of capability shown in Table 1. When a single inspection or test requires implementation by a team or group, personnel not meeting the requirements of this Standard may be used in data-taking assignments or in plant or equipment operation provided they are supervised or overseen by a qualified individual participating in the inspection, examination, or test.

5. RECORDS

A file of records of personnel qualification shall be established and maintained by the employer. Collection, storage, and control of records required by this Standard shall be in accordance with ANSI N45.2.9.

6. REVISION OF ANSI STANDARDS REFERRED TO IN THIS DOCUMENT

When any of the Standards referred to in this document is superseded by a revision approved by ANSI, the revision is not mandatory until it has been incorporated as part of a contract.

Revisions to this Standard issued after the date of a specific contract invoking this Standard may be used by mutual consent of the purchaser and the supplier.

Table 1 Minimum Levels of Capability for Project Functions

Project Function	Level L-I	Level L-II	Level L-III
Recording inspection, examination, and testing data*	X	X	X
Implementing inspection, examination, and testing procedures	X	X	X
Planning inspections, evaluations, and tests; setting up tests including preparation and set-up of related equipment		X	X
Evaluating the validity and acceptability of inspection, examination, and testing results		X	X
Reporting inspection, examination, and testing results		X	X
Supervising equivalent or lower level personnel		X	X
Qualifying lower level personnel		X	X
Evaluating the adequacy of specific programs used to train and test inspection, examination and testing personnel			X
Qualifying same level personnel			X

*Except as exempted by Section 4 of this Standard.

Commonwealth Edison
One First National Plaza Chicago Illinois
Address Reply to Post Office Box 767
Chicago, Illinois 60690

May 6, 1985

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 Reports Nos.
50-456/85-006 and 50-457/85-006
NRC Docket Nos. 50-456 and 50-457

REFERENCE (a): R. F. Warnick letter to C. Reed
dated March 8, 1985

Dear Mr. Keppler:

This letter is in response to the inspection conducted by Mr. R. N. Gardner on February 4 through March 1, 1985, of activities at Braidwood Station. Reference (a) indicated that certain activities appeared to be in noncompliance with NRC requirements. The Commonwealth Edison Company disagrees with the items listed in the Notice of Violation. Our detailed discussion of the bases for our disagreement is provided in the enclosure.

Commonwealth Edison Company has initiated increased interface of the Project Licensing and Compliance group with the NRC BCAP resident inspector. It is our desire to assure that routine onsite communications with the NRC are clear and provide an appropriate level of attention to NRC concerns.

The delay in submitting this response was discussed with Mr. R. F. Warnick on April 8, 1985 and Mr. W. S. Little on April 22, 1985.

If you have any further questions on this matter, please direct them to this office.

Very truly yours,

Dennis Farrar

D. L. Farrar
Director of Nuclear Licensing

/klj
Enclosure
cc: NRC Resident Inspector - Braidwood

0082K

Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

May 6, 1985

Mr. James G. Keppler
Regional Administrator
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U. S. Nuclear Regulatory Commission
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cc: NRC Resident Inspector - Braidwood

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If you have any further questions on this matter, please direct them to this office.

Very truly yours,

D. L. Farrar
Director of Nuclear Licensing

/klj
Enclosure
cc: NRC Resident Inspector - Braidwood

0082K

N. KAUSHAL

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

JUN 27 1985

Docket No. 50-456
Docket No. 50-457

Commonwealth Edison Company
ATTN: Mr. Cordell Reed
Vice President
Post Office Box 767
Chicago, IL. 60690

Gentlemen:

Thank you for your letter dated May 6, 1985, informing us of the steps you have taken to correct the items of noncompliance which we brought to your attention in Inspection Report Nos. 50-456/85006 and 50-457/85006 forwarded by our letter dated March 8, 1985.

Your response to Item 1 of the Notice of Violation stated that you do not agree that this is a violation of your commitment to the requirements of ANSI N45.2.6-1978. We are referring this to NRC Headquarters for guidance on this matter and will contact you later as to our decision.

Regarding your response to Item 2.a of the Notice of Violation, we agree that this is not an example of noncompliance (and we will remove it from our records). The information presented in your response was not known to the NRC inspector at the time of the inspection.

Regarding your response to Item 2.b of the Notice of Violation, we have reviewed the information in your response and still believe this is an example of noncompliance. This matter was discussed with members of your staff during a meeting on May 17, 1985. During this meeting your staff stated that the following actions had been initiated in regards to invalidated observations/discrepancies:

1. BCAP QA has established mandatory Hold Points during the processing of invalidated observations/discrepancies to allow QA to review the justification for invalidation.

2. BCAP QA would review previously invalidated observations/discrepancies to ensure that sufficient justification for the invalidations exists.

Orlov Affidavit on Contention Item 12E
Exhibit C

JUL 2 1985

All of the above were discussed in a meeting with your Braidwood staff on May 17, 1985. Based on the actions described above and in your response no further response to this item of noncompliance is required. We will review these actions in a future inspection.

Your cooperation with us is appreciated.

Sincerely,

Edward G. Greenman /for

C. E. Norelius, Director
Division of Reactor Projects

cc: D. L. Farrar, Director
of Nuclear Licensing
M. Wallace, Project Manager
D. Shamblin, Construction
Superintendent
J. F. Gudac, Station
Superintendent
C. W. Schroeder, Licensing and
Compliance Superintendent
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
Braidwood
Resident Inspector, RIII Byron
Phyllis Dunton, Attorney
General's Office Environmental
Control Division
D. W. Cassel, Jr., Esq.
J. W. McCaffrey, Chief, Public
Utilities Division
H. S. Taylor, Quality Assurance
Division
E. Chan, ELD
J. Stevens, LPM

Rorem Contention Item 12F

Rorem Contention Item 12F states:

> 12. Contrary to Criterion XVI, "Corrective Action," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that measures were established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, and nonconformances are properly identified and corrected. And in the case of significant conditions adverse to quality, Applicant failed to ensure that the cause of the condition is determined and corrective action taken to preclude repetition.
>
> F. In addition, 37 BCAP observations were invalidated by S&L even though the documented basis for the invalidations of the observations did not support the invalidations. (Inspection Report 85-06, Exh. 11.)

MATERIAL FACTS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. A "redline drawing" is a blueprint of a piping isometric drawing on which field changes to piping dimenisions or routing are recorded, typically using a red pen. The purpose of a redline drawing is to document any potential differences between the piping configuration in the architect/engineer's initial design and that which is eventually installed. (Affidavit of George Orlov on Rorem QA Subcontention 12F (hereinafter, "Orlov Affidavit" at pp. 3-4)

2. QC verification of the information contained in redline drawings is required by 10 CFR Part 50 Appendix B and relevant CECo and Phillips Getschow Company (PGCo) procedures. (Orlov affidavit at p.4)

3. The BCAP Task Force initially interpreted the relevant PGCo procedure to require that there be a QA signature on each redline drawing, indicating that QC verification had taken place. (Orlov affidavit at pp. 5-6). The BCAP Task Force document reviewers quickly found 37 redline drawings for small bore piping with no such QC signature, and accordingly the BCAP Task Force issued 37 observations. (Id.)

4. In accordance with BCAP procedures, the architect/engineer Sargent & Lundy (S&L) reviewed the 37 BCAP observations. At the end of December 1984 S&L recommended that all these observations be invalidated on the basis that the redline drawings reviewed by the BCAP Task Force (which were called "red-lined record copy isometrics") were not required by the applicable S&L specifications or by the applicable PGCo procedures. (Orlov affidavit at pp. 5-7)

5. The BCAP Task Force never accepted S&L's recommendation that the 37 redline observations be invalidated. (Orlov affidavit at pp. 11, 13)

6. On January 14, 1985 the Independent Expert Overview Group (IEOG) identified a concern regarding this S&L recommendation. IEOG indicated that the S&L recommendation was based on a technicality as to the same of redline drawings, and that the 37 observations were not invalid. (Orlov affidavit at p. 7 and Exhibit B)

7. Also on January 14, 1985, a meeting was held allowing CECo's Project Construction Department, PGCo, and S&L to discuss the 37 observations with the BCAP Task Force that a QC signature on the redline drawing was not required because the QC signature signifying QC acceptance of the redline drawing appeared on another PGCo form, the so-called "Stop Work Order" or "SWO" form. (Orlov affidavit at p. 7 and Exhibit C)

8. Based on this explanation, the BCAP Task Force modified its instructions to its document reviewers to take into account the use of the SWO form as an acceptable means of documenting QC verification of piping as constructed dimensions and configurations. The BCAP Task Force reviewers were told to rereviews were told to rereview the PG&Co small bore piping documentation using these revised instructions. In addition, BCAP QA arranged to have CECo site QA perform a surveillance of PGCo to confirm that the SWO form was in fact used to document QC verification of piping configurations and dimensions as indicated by PGCo. (Orlov affidavit, at p. 8) The Assistant Director of the BCAP Task Force, Mr. Orlov, gave directions that 37 redline observations not be invalidated until the BCAP Task Force rereview of documentation and the site QA surveillance of PGCo confirmed PGCo assertions relative to the use of the SWO form. (Id.)

9. On January 25, 1985 the BCAP Task Force responded to the IEOG observations, that the 37 redline observations would be

reprocessed as invalid observations. The BCAP Task Force response did not refer to the site QA surveillance of PGCo's use of the SWO form, even though that surveillance had already started (Orlov affidavit at p. 10)

10. The IEOG concurred with the BCAP Task Force's proposed corrective actions. IEOG indicated that its observation would remain open until the BCAP's corrective actions were completed and subsequently verified by IEOG. (Orlov affidavit at p.9)

11. In February, 1985 the results of the BCAP re-review and the site Quality Assurance surveillance indicated that the SWO forms were not acceptable alternative documentation of QC verification of piping configurations and dimensions, because the signatures on the SWO forms were those of office QC technicians rather than field QC inspectors who performed the piping inspections. (Orlov affidavit at p. 10; Hansader affidavit at p. 2.) Based on these results, the 37 redline observations were not invalidated. (Orlov Affidavit at p. 11).

12. Also in February 1985, NRC Project Inspector Ron Gardner performed a follow-up review of the BCAP's response to the IEOG observation relating to the 37 redline drawings. At PGCo he determined that the SWO forms were not acceptable alternative documentation. He later informed BCAP Task Force personnel that the BCAP Task Force should have done this research prior

to submitting its January 25, 1985 response to the IEOG observation indicating that the 37 redline observations were invalid. (Orlov affidavit at p. 12) On March 8, 1985 the NRC Staff documented this inspection finding as an item of noncompliance. (Orlov affidavit, at p. 12)

13. In response to an NRC Staff recommendation, on March 22, 1985, BCAP QA established mandatory hold points which prohibited the BCAP Task Force from invalidating any BCAP observations or discrepancies without BCAP QA review and concurrence. In addition, BCAP QA reviewed previously invalidated BCAP observations and discrepancies to ensure that sufficient justification for the invalidations exists. (Affidavit of Neil P. Smith on Rorem QA Subcontention 12.F (here after "Smith Affidavit")

DISCUSSION

Contention Item 12F aserts that 37 BCAP observations were invalidated by S & L. That is untrue. S & recommended that 37 BCAP observations relating to the lack of QC signatures on "redline drawings" be invalidated, but that recommendation was never accepted. In fact, the 37 redline observations never were invalidated. (Orlov affidavit at pp. 11)

At one time, the BCAP Task Force intended to invalidate the 37 redline observations, but on a different basis from that suggested by S&L: namely that QC signatures on PGCo's "SWO" forms were an acceptable substitute for the missing QC signatures on the redline drawings. However, subsequent investigation by the BCAP Task Force and site QA (at the request of BCAP QA) showed that the "SWO" forms were not acceptable alternative documentation, so the 37 observations remained valid. The redline issue is described in the Report on the Braidwood Construction Assessment Program submitted to the NRC in November 1985. (Orlov affidavit at p. 13). It is being resolved by site QA as described in the affidavit of Steven Hunsader.

The facts relating to this contention item illustrate the extremely strict scrutiny to which the BCAP Task Force was subjected. The Independent Expert Overview Group issued an observation relating not to a BCAP Task Force action but to an S & L recommendation. Similarly, the NRC Staff issued an item of noncompliance to the BCAP Task Force for <u>proposing</u> to invalidate the 37 observations (without, in the NRC Staff's judgement, sufficient prior inquiry into the basis for the proposed invalidation). The NRC Staff maintained that this was an item of noncompliance even after being informed the the BCAP Task Force was awaiting the results of a QA surveillance prior to actual invalidation of the 37 observations. Subsequently, in response to a recommendation from the NRC Staff, BCAP QA committed to review 100% of all invalidated BCAP observations and discrepancies to ensure that sufficient justification for such invalidation exists. This improved the ability of the NRC Staff to monitor the BCAP even more closely. (Smith affidavit, p. 8)

In short, not only is contention item 12F based on a misstatement of fact, but the circumstances surrounding the issue increase, rather than diminish, confidence that all conditions adverse to quality identified by the BCAP have been appropriately addressed. Commonwealth Edison is entitled to summary disposition of contention item 12F as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF GEORGE ORLOV
(on Rorem Q.A. Subcontention 12F)

George Orlov, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

George M. Orlov
George Orlov

Subscribed and Sworn before me
this 19th day of December 1985

Nancy R. Coan
Notary Public

My Commission expires on MY COMMISSION EXPIRES OCTOBER 11,1986

0568H

TESTIMONY OF GEORGE ORLOV
(ON ROREM Q.A. SUBCONTENTION 12F)

Q.1. Mr. Orlov, by whom are you employed and in what capacity?

A.1. I am under a consulting contract to Commonwealth Edison Co. (CECo) through Science Applications International Corp (SAI) of McLean, Virginia. I currently hold the position of Assistant Director of the Braidwood Construction Assessment Program (BCAP) Task Force within the CECo organization.

Q.2. What are your responsibilities in this portion?

A.2. I am responsible for the implementation of two of the elements of BCAP. These are the Construction Sample Reinspection (CSR) and the Reverification of Procedures to Specification Requirements (RPSR) elements of the BCAP. I provide technical direction to the supervisors of these elements and provide management support to the BCAP Task Force Director, to whom I report.

Q.3. How long have you been employed as Assistant BCAP Task Force Director?

A.3. I have been in this position since June 1984.

Q.4. Please summarize your education and professional experience.

A.4. I have a BS in Physics and an MS in Nuclear Engineering, both from the Massauhusetts Institute of Technology. I designed experiments in nuclear reactors to study neutron and radiation physics from May 1977 to December 1978 for Simulation Physics Corp., Bedford Mass. I performed nuclear fuel cycle and safeguards research for SAI from January 1979 to May 1981. From May 1981 to

February 1984 I was seconded into Cincinnati Gas & Electric Co.'s organization at the Zimmer Nuclear Power Station. From May 1981 to October 1982 I held the position of Assistant Director, Quality Confirmation Program. From September 1983 to February 1984, I held the positions of Director, Quality Confirmation Program and Director, Program to Verify the Quality of Construction. I came to Braidwood in February 1984 and shortly thereafter, began work on BCAP.

Q.5. Mr. Orlov, Intervenors' amended quality assurance contention, item 12F states:

> 12. Contrary to Criterion XVI, "Corrective Action," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that measures were established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are properly identified and corrected. And in the case of significant conditions adverse to quality, Applicant failed to ensure that the cause of the condition is determined and corrective action taken to preclude repetition.
>
> F. In addition, 37 BCAP observations were invalidated by S&L even though the documented basis for the invalidations of the observations did not support the invalidations. (Inspection Report 85-06, Exh. 11.)

A.5. Yes, I am.

Q.6. What is the purpose of this affidavit?

A.6. The purpose of this affidavit is to show that, contrary to contention item 12F, the BCAP Task Force did not invalidate these 37 observations, which were related to lack of QC inspector's signature on "redline" drawings. It is true that at one time the BCAP Task Force intended to invalidate these observations based on the existance alternative quality documentation. However,

follow-up review by the BCAP Task Force and by site QA showed that this alternative quality documentation was not adequate. Therefore, the BCAP Task Force continued to treat the 37 observations as valid.

Q.7. Mr. Orlov, what was the inspection finding to which contention item 12F refers?

A.7. Contention item 12F refers to Inspection Report 50-456/85-006(DRP); 50-457/85-006(DRP), dated March 8, 1985 (hereinafter, IR 85-006), item 2a, which states:

> Thirty-seven BCAP observations, which dealt with the lack of QC verified "red-lined" record copy drawings, were invalidated by the BCAP task force even though the documented basis for the invalidation of the observations did not support the invalidations.

Q.8. Mr. Orlov, please explain what a "redline" record copy drawing is.

A.8. A "redline drawing" is a blueprint of a piping isometric drawing on which field changes to piping dimensions or routing are recorded, typically using a red pen. The purpose of a redline drawing is to document any potential differences between the architect/engineer's (A/E's) initial design and that which is eventually installed. These differences are due primarily to interferences encountered in the installation process and are

expected. This process is established to assure that these differences are documented and eventually reconciled with the A/E's design. The generation of the "redline drawing" is the first step in the overall process which transmits "as-constructed" piping information to the A/E. The redline drawing which is verified by a QC inspector as an accurate reflection of the "as-constructed" piping is termed the "redline record copy". The information contained on this redlined drawing is transferred to a new "mylar drawing" which is checked against the redlined record drawing by a Q.C. technician. Then an as-constructed drawing made from this mylar is forwarded to the A/E for reconcilation against their design and stress calculations.

Q.9. Why is QC verification for "redline" drawings required?

A.9. Piping routing and dimensions are attributes of construction which affect the overall quality of a piping system. In accordance with 10 CFR 50 Appendix 50, Edison's QA Manual, and PGCo's QA Manual, Quality Control involvement is required in activities of construction related to quality. This involvement may be in the form of audits, surveillance, monitoring or inspections. The PG procedure governing the verification of as constructed piping dimensions PGCP-40, requires QC verification of the "redline" drawings, thus satisfying the requirement for QC involvement.

Q.10. Mr. Orlov, please explain the system by which the BCAP Task Force documented and evaluated nonconforming conditions.

A.10. An observation is written by a BCAP inspector or document reviewer when a physical condition or documentation is at variance with requirements specified in the applicable BCAP checklist instruction. It is reviewed for validity by BCAP CSR Engineering. This process is adequately described in the Report on the Braidwood Construction Assessment Program, Section III.2.f at pages III-6 to III-7 (Exhibit A). The responsibility for the validity determination lies with the BCAP CSR Lead Engineer for the applicable discipline. A determination of invalidity must have the concurrence of the originating inspector/document reviewer and the CSR Supervisor (at this time, as the BCAP Task Force Assistant Director CSR/RPSR I was also required to approve invalid dispositions). Invalid observations, once requisite approvals were obtained, were filed; they required no further action. Valid observations became discrepancies and were sent to the Project Construction Department (PCD) for incorporation into CECo nonconformance reports (NCR's) and to the A/E, Sargent & Lundy (S&L) for evaluation of design significance. At this point, S&L and PCD could provide recommendations regarding the validity of BCAP discrepancies. PCD would do so by memo, and S&L would provide such information on Part 4 of the discrepancy report.

Q.11. How did BCAP come to write the 37 observations with respect to the lack of QC verified "redline" drawings?

A.11. During the review of documentation for population M-1, small bore piping configuration, by BCAP document reviewers using checklist instructions CSR-R-M-1 Rev. 1, it was observed, contrary to what

was required by these instructions, that redline drawings did not have QC inspectors' signatures. The instruction CSR-R-M-1 Rev. 1 required this Q.C. signature on the redline drawing based on an interpretation of requirements included in the contractor's governing procedure PGCP-40. That procedure states, in pertinent part:

"5.3 the Supervisor-Quality Control shall:

5.3.1 Dimensional verify installed piping

5.3.2 Compare the As-Constructed drawing to the As-Installed condition...

5.3.5 Return verified drawing and form PG/QA-5-33, Section 3(a) properly signed to the Project Engineer."

Paragraph 4.4 allows the delegation of authority to appropriately certified personnel.

Q.12. How were these 37 "redline" observations reviewed for validity?

A.12. They were determined by the BCAP Task Force to be valid. This determination was approved by the CSR Lead Engineer, the CSR Supervisor, and the BCAP Task Force Assistant Director (CSR/RPSR) (me). They were then forwarded to both S&L and PCD.

Q.13. What recommendations did you receive with respect to the validity of these observations?

A.13. S&L responded on 12/27/84 on part 4 to each of the 37 observations "there is no requirement for a 'red-lined record copy isometric', as per S&L specification F/L-2739, Article 301.11 and per Phillips Getschow Procedures QCP-B21, Rev. 6 and PGCP-40, Rev. 3". They recommended that the observation be processed as invalid.

Q.14. What happened next?

A.14. On January 14, 1985, the IEOG issued an observation report number BCAP-OBS-007 dated 1/14/85 which expressed concerns regarding S&L's recommendations for invalidating these 37 observations. A copy of this observation is attached as Exhibit B.

Q.15. What action did the BCAP Task Force take with respect to this issue?

A.15. Also on January 14, 1985, a meeting was held between PCD, S&L, PGCo, and the BCAP Task Force to discuss documentation requirements of PGCo procedures governing QC verification of piping as-constructed drawings. PGCo asserted that their procedures did not require signatures on the "redline" drawings, but rather required the inspectors' signature on Section 3(a) of the PG/QA-5-33 form referred to in the portion of PGCP-40 quoted in answer 11, above. This form is called the "Stop Work Order" (SWO) Form because it signifies that the hardware is complete and QC accepted and shouldn't be modified. The discussion and results of this meeting are documented in a letter to the BCAP Task Force from PCD (letter #BRD/PCD 85-43 dated 1/15/85) (Exhibit C). The BCAP Task Force's subsequent review of PGCP-40 determined that although ambiguities existed,

PGCP-40 could certainly be interpreted in the manner asserted by PGCo and PCD.

The BCAP Task Force planned the following actions to resolve the "redline issue". It would revise its checklist CSR-R-M-1 to take into account the use of the SWO form as an acceptable means of documenting Q.C. verification of piping as-constructed dimensions and rereview documentation to this revised instruction. After a discussion on the general issue between the BCAP Task Force and BCAP QA, BCAP QA arranged to have CECo site QA perform a timely surveillance on the contractor's activities with respect to QC's involvement in the verification of as-constructed piping dimensions and specifically with the use of the SWO form as a document which verifies Q.C. inspector involvement. Acceptable results from the above actions would provide a reasonable basis to then redisposition the 37 observations as invalid. At that time I gave directions to the CSR Lead Piping Engineer to not redisposition the valid determinations of these observations until the results of these reviews gave us an adequate basis; that is, confirmation of PCD and PGCo ascertions relative to the use of the SWO form.

Q.16. In your opinion, was this proposed resolution adequate?

A.16. I believe these actions were adequate.

Q.17. Why?

A.17. The combination of the BCAP Task Force's rereview of the documentation and site QA's surveillance of the contractor's activities related to QC verification to piping as-constructed dimensions would provide reasonable assurance that alternative documentation (i.e. SWO form) was or was not acceptable. In restrospect, both the BCAP Task Force rereview and the QA surveillance did identify, in a timely manner, that the SWO form was in fact not an acceptable alternative method of documenting QC inspector's verification of as-constructed piping dimensions.

Q.18. Did the BCAP Task Force respond to the IEOG observation?

A.18. the BCAP Task Force responded to the IEOG observation on January 25, 1985 (Exhibit B). In light of the time frame in which the response to the IEOG was desired, the response took the form of proposed future corrective actions. As such, on the date of the BCAP Task Force's response, none of the proposed actions had been implemented by BCAP.

Q.19. What was IEOG's position with respect to the BCAP's Task Force's January 25, 1985 response to BCAP-OBS-007?

A.19. The IEOG concurred with BCAP's proposed corrective actions. Their observation would remain open until the BCAP Task Force's corrective actions were completed and subsequently verified by them. This is documented in their letter BCAP-130 dated January 28, 1985 (Exhibit D).

Q.20. The January 25, 1985 the BCAP Task Force response to the IEOG (Exhibit B) states, "Based on [PCDs] clarification and a subsequent review of the PG&Co. procedures by BCAP, it has been determined that the referenced observations are invalid." Later, the letter states that "The Observation describing the lack of a QC signature on the red-line drawing previously processed as valid will be reprocessed as invalid Observations." Don't these statements indicate that as of January 25, 1985, the BCAP Task Force considered the 37 observations to be invalid?

A.20. As of January 25, 1985, BCAP Task Force believed that based on the information available at that time, the information identified on these 37 observation reports did not represent a valid discrepancy. However, the observation reports at that time were in fact processed to the point were they were valid observations. No formal actions which are required to invalidate an observation within the BCAP Task Force had been (or were ever subsequently) taken to invalidate these observations. It was my intent first to confirm that acceptable alternative documentation did in fact exist prior to actually invalidating these observation reports.

Q.21. The January 25, 1985 BCAP response to the IEOG (Exhibit B) does not refer to the site QA surveillance of PGCo. Why not?

A.21. In retrospect, I wish I had referred to it. The surveillance had already begun by January 25. Although identified in a draft of the response, I removed this reference because I viewed the response as the <u>Task Force's</u> response and did not want to describe other organizations involvements. We always regarded BCAP QA as a separate organization.

Q.22. What were the results of the BCAP Task Force and Site QA reviews referred to in answer 17?

A.22. The BCAP Task Force review of the SWO form under CSR-R-M-1 Rev. 2 identified that office QC Technicians were signing these forms, rather than field QC inspectors who performed the inspections. This was also identified in the site QA surveillance report #4151, dated February 14, 1985.

Q.23. When did the BCAP Task Force decide that the 37 "red-line" observations would remain valid?

A.23. As of January 25, 1985, BCAP Task Force decided that the 37 "redline" observations would remain valid until a rereview and QA surveillance confirmed that alternate documentation existed and was acceptable. By the end of February 1985 the results of the BCAP rereview and the site QA surveillance indicated that acceptable alternative documentation did not exist, and I determined that the 37 observations would remain valid.

Q.24 Were any other BCAP observations written for the same issue?

A.24. In addition to the 37 observations previously discussed, a number of additional observations were written for the same problem in both large and small bore piping configuration populations (M-1 and M-4 population).

Q.25. Were they treated as valid or invalid?

A.25. They all remain valid and have always been valid.

A.26. What, if any, corrective action has been taken with respect to the "red-line" observations?

Q.26. The corrective actions being pursued in the respect to the redline observations are described in Mr. Hunsader's affidavit. I should point out that the BCAP Task Force does not have responsibility for the corrective actions for problems which it identifies. Rather, these corrective actions are addressed under the normal NCR process. In addition, there is the CECo site QA surveillance report #4151 which independently requires resolution of the concerns addressed therein related to "redline" drawings.

Q.27. Do you know why BCAP Task Force was cited for this item of noncompliance?

A.27. In February 1985, Mr. Gardner performed a followup review to BCAP Task Force's response to the IEOG observation related to the 37 "redline" observations. At Phillips Getschow, he determined that the Stop Work Order forms were signed by QC personnel who were different from those who performed the field dimensional verifications. He later told me that he had identified the problem without much difficulty and that he felt that the BCAP Task Force should have done this research prior to stating in our response to the IEOG observation that the 37 observations were invalid. My own opinion is that at least part of the reason why Mr. Gardner had little difficulty in identifying the problem was that he was following in the footsteps of the site QA personnel who performed their surveillance on January 22-24 and February 4-5. I think this item of noncompliance illustrates the strict oversight which Mr. Gardner gave to BCAP activities.

Q.28. When did BCAP QA begin reviewing the justifications for all invalidated observations and discrepancies?

A.28. The BCAP QA established its hold point for its review and concurrence of invalidity determinations for BCAP observations on March 25, 1985.

Q.29. Why?

A.29. It is my understanding that this hold point and the QA review were established as a result of discussions between Ron Gardner and CECo Quality Assurance. I agree with the discussion of this point which appears in Mr. Smith's affidavit.

Q.30. Mr. Orlov, do you view contention item 12F as an example of a failure to ensure that measures were established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected?

A.30. No, I do not view contention item 12F as an example of such a failure.

Q.31. Why not?

A.31. First and foremost, these 37 observations were initially validated by the BCAP Task Force and have always remained valid. The issue of QA acceptance of redline drawings is specifically addressed at pages B-11 to B-13 of the report on the Braidwood Construction Assessment Program submitted to the NRC on November 1985. I believe that BCAP Task Force approach to the situation was appropriate and in accordance with the program and procedures governing BCAP. This approach, utilizing both a review of

contractor documentation by the BCAP Task Force and the site QA surveillance to assure that the contractor was implementing his procedures with respect to use of the SWO form to document Q.C. verification of as-constructed piping dimensions, was expected to identify, and in fact did identify prior to Mr. Gardner's review, concerns related to this QC documentation of verification of piping dimensions.

Q.32. Mr. Orlov, do you believe that contention item 12F is an example of any failure to ensure that the cause of a significant condition adverse to quality is determined and corrective action taken to preclude repetition?

A.32. No. I do not.

Q.33. Why not?

A.33. Although not within the purview of the BCAP, the nonconformance reports generated as a result of the BCAP observations will be processed in accordance with site procedures. Within these procedures exist provisions to determine cause and specify corrective actions to preclude repetition of significant conditions adverse to quality.

Q.34. Does this complete your affidavit with respect to contention item 12F?

Q.34. Yes.

f. **Processing of Observations**

Each observation was evaluated to determine if it represented a valid construction discrepancy not previously identified. An observation was considered invalid if it pertained to a construction discrepancy previously identified and addressed by CECo or its contractors on an existing nonconformance report (NCR) or other controlled system. Conditions that were in accordance with design documents at the time of the original inspection were also considered as not valid. If the evaluation showed that the observation was not a valid construction discrepancy, the reason for this determination was documented and the observation was considered closed. Valid observations were considered to be discrepancies.

Discrepancies are processed as a CECo NCR in accordance with controlled procedures. All reinspection discrepancies and those documentation discrepancies which were directly related to possible physical defects in construction were forwarded to the architect-engineer for review and evaluation of design significance. Physical rework was put on hold until a determination was made of the discrepancy's design-significance.

Observations that did not pertain to the items included in the BCAP sample or identified conditions that did not relate to design-significant attributes as identified in the CSR checklists were considered outside the BCAP scope. In addition, because the objective of the CSR was to look for previously unidentified design-significant construction problems, observations which pertained to conditions addressed prior to the BCAP through existing procedures or other documented plans for future construction completion activities were also considered outside the BCAP scope. Although observations considered outside BCAP scope were not included in the BCAP assessment of results, they were documented for future tracking and disposition.

Orlov Affidavit on Contention Item 12F
Exhibit A
(From Report on the Braidwood Construction Assessment Program)

f. **Processing of Observations**

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Orlov Affidavit on Contention Item 12F
Exhibit A

(From Report on the Braidwood Construction Assessment Program)

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JAN 25 1985

EVALUATION RESEARCH CORPORATION

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CORPORATION

OBSERVATION REPORT

Observation No. BCAP-OBS-007

Date 1-14-85

To: N. Kaushal
BCAP Director

From: ERC Project Manager

R E Hamford Hamed 1/14/85

Signature Date

Observation: S & L has responded to several BCAP Observations (See next page) declaring them to be invalid because no "red lined record copy isometric" is required. However, Phillips, Getschow Co. Procedures QCP-B21, Revision 6 and PGCP-40, Revision 3 both require some form of verification drawing to be signed by QC. This is a copy of the installation drawing which has been marked in the field to show actual dimensions and configuration of work completed in the plant for that part of construction. Whether it is called a "red line" drawing, a verification drawing, or a field verified installation drawing is a technicality. The name of the drawing was not the subject of the observations listed below. At issue in these observations is the lack of a signature or initials of a certified QC inspector. For this reason, the following S & L responses to BCAP Observations invalidly have been marked "Invalid".

Signature of Originator: Wayne L Olson

Date: January 14, 1985

Response (Requested within 30 days of above date.):

See Attached

N. N. Kaushal

BCAP Director

Date: Jan 25, 1985

Response is ☐ Acceptable ☐ Unacceptable

RCA No. __________ Issued

Signature __________ Date __________

ERC Project Manager

CSR-R-M-1-002-2
CSR-R-M-1-003-2
CSR-R-M-1-004-2
CSR-R-M-1-005-2
CSR-R-M-1-006-1
CSR-R-M-1-007-1
CSR-R-M-1-009-1
CSR-R-M-1-010-1
CSR-R-M-1-014-1
CSR-R-M-1-018-2
CSR-R-M-1-019-1
CSR-R-M-1-020-1
CSR-R-M-1-021-1
CSR-R-M-1-022-1
CSR-R-M-1-023-2
CSR-R-M-1-024-2
CSR-R-M-1-025-2
CSR-R-M-1-027-1
CSR-R-M-1-028-1
CSR-R-M-1-030-1
CSR-R-M-1-031-1
CSR-R-M-1-032-1
CSR-R-M-1-033-1
CSR-R-M-1-034-1
CSR-R-M-1-035-2
CSR-R-M-1-040-1
CSR-R-M-1-041-1
CSR-R-M-1-046-1
CSR-R-M-1-047-2
CSR-R-M-1-050-1
CSR-R-M-1-051-1
CSR-R-M-1-052-1
CSR-R-M-1-053-1
CSR-R-M-1-054-1
CSR-R-M-1-057-1
CSR-R-M-1-058-1
CSR-R-M-1-059-1

Response to ERC Observation BCAP-OBS-007

DISCUSSION:

During the preparation phase of Documentation Review Checklist, CSR-R-M-1, Rev. 0, "Small Bore Piping Configuration", the PGCO Procedures, QCP-40, Rev. 3 and QCP-B21, Rev. 6, were reviewed and interpreted to require a "QC Signature" on the verification drawing ("Red-Line"). During the subsequent document review activites, several observations were written by the BCAP Inspectors and processed as valid. As a result of these observations, a meeting was held on January 14, 1985 between CECo PCD, S&L, PGCo, and BCAP in which PGCo provided a clarification of the documentation requirements of the above referenced procedures. A QC Signature on the verification drawing was not required. Rather, QC was to sign section 3(a) of the "Stop Work Order", signifying completion, and to sign the QC approval block on the mylar of "As-Constructed" drawing. PCD later issued a memorandum, BR/PCD 85-43, on January 15, 1985 confirming this clarification.
Based upon this clarification and a subsequent review of the PGCo procedures by BCAP, it has been determined that the referenced observations are invalid. The PGCo Procedures do not require that the verification drawings ("Red-Line") require a QC signature. The inspector performs the field verification, marking as necessary on the verification copy and signs the Stop Work Order to signify completion. The Engineering Department then revises the drawing mylar, as necessary, to reflect the marked-up verification copy. The mylar is then resubmitted to the QC organization for review and approval. These QC signatures on the "Stop Work Order" form and the mylar of the "as-constructed" drawing provide adequate quality documentation of Quality Control's Verification of the as-constructed dimensions.

CORRECTIVE ACTIONS:

The QC-signed "Stop Work Order" form is the document which signifies QC acceptance of the "red-line" drawing, and will therefore be the document reviewed by BCAP in lieu of the "red-line" drawing. The Small Bore Piping Configuration Documentation Review Checklist will be revised to reflect this change. Those portions of the document reviews performed to date affected by this revision will be redone using the revised checklist and instructions. The Observations describing the lack of a QC signature on the "red-line" drawing previously processed as valid will be reprocessed as invalid Observations.

Orlov Affidavit on Contention Item 12F
Exhibit C

January 15, 1985
BR/PCD 85-43

Subject: Braidwood Station - Units 1 & 2
BCAP Observations PCD Believes are Invalid
(Redlined Drawings)

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Jan 21 RECD
B.C.A.P.

Mr. N. N. Kaushal:

The BCAP Observations listed on the attachment are considered invalid by Project Construction Department (PCD). These observations address the lack of a certified quality inspector's signature on a PGCo verification drawing.

In a PCD/S&L/PGCo/BCAP meeting of January 14, 1985 it was explained that PGCo was following the requirements established by their approved procedures. The Q.C. signatures on the "Stop Work Order" (Reference PGCP-40, Revision 0) was a sufficient verification signature.

PGCo performed dimensional verification of as-constructed drawings in accordance with the applicable procedures approved at the time the work was performed. The applicable procedures in effect during the time frame of the subject BCAP Observations were QCP-B21, Rev. 4, S1, Rev. 2 and PGCP-40, Rev. 0.

QCP-B21, Rev. 4, S1 Rev. 2 States:

1) Paragraph 5.4.5: "The Supervisor - Quality Control shall dimensionally verify installed piping in accordance with Procedure PGCP-40 and Section 6 of this procedure."

2) Paragraph 6.3: "The Supervisor - Quality Control shall monitor "as-built" dimensional checks performed by the superintendent . . ."

QCP-B21 later revisions after revision 4 states:

Paragraph 11.6, Note 1: "Where installation was accomplished to Revision 4 of this procedure or prior approved revisions, as constructed verification shall be accomplished in accordance with procedure PGCP-40."

From this, it is apparent that PGCP-40, Rev. 0 is the controlling procedure for dimensional verification of as-constructed drawings during the time frame of those observations.

PGCP-40, Rev. 0 States:

1) Paragraph 4.2: "The Quality Control Supervisor shall be responsible for dimensional verification of installed piping . . ."

2) Paragraph 5.3.3: "Return verified drawing and form PGCP-40, Section 3(a) properly signed to the Field Engineer." (This form is the "Notification of Completed Work and Stop Work Order").

3) Stop Work Order, Section 3(a): "Obtain and field verify installation drawing, or subsystem drawing indicated. Upon completion of verification, sign and date drawing in appropriate QC approval box on the drawing, sign and return this notice to the Field Engineering Department."

This procedure specifically addresses that the "Stop Work Order" will be signed and accompany the verified drawing. The "Stop Work Order" refers to the as-constructed mylar drawing when it specifies that "the drawing will be signed and dated in the appropriate QC box". The QC Supervisor is responsible for the dimensional verification, and his signature indicates that the verification is complete and correct.

Later and current revisions to these procedures have additional requirements than the revisions referenced here. Therefore, when evaluating these observations, the applicable procedures approved at the time which the work was performed should be referenced.

Upon agreement with this letter please change the status of these observations from "Valid" to "Invalid". Contact Bruce Berglin (Ext. 2347) if further information is required.

Daniel L. Shamblin

D. L. Shamblin
Proj. Construction Superintendent
Braidwood Station

BB/kje
(1290a)

Attachments

cc: M. J. Wallace (1/0)
W. E. Vahle (1/0)
T. E. Quaka (1/0)
D. Fisher-S&L (1/0)
D. Vandergrift (1/0)
R. J. Farr/M. Gorski/B. Berglin (1/0)
File (1/0)

ATTACHMENT

BCAP Memo	Observation Number
405	CSR-R-M-1-046-2
405	CSR-R-M-1-047-2
405	CSR-R-M-1-049-2
405	CSR-R-M-1-050-1
405	CSR-R-M-1-051-1
405	CSR-R-M-1-052-1
405	CSR-R-M-1-053-1
405	CSR-R-M-1-054-1
405	CSR-R-M-1-057-1
405	CSR-R-M-1-058-1
405	CSR-R-M-1-059-1
386	CSR-R-M-1-033-1
386	CSR-R-M-1-034-1
386	CSR-R-M-1-035-1
386	CSR-R-M-1-040-1
371	CSR-R-M-1-002-2
371	CSR-R-M-1-003-2
397	CSR-R-M-1-041-1
385	CSR-R-M-1-025-2
385	CSR-R-M-1-027-1
385	CSR-R-M-1-028-1
385	CSR-R-M-1-030-2
385	CSR-R-M-1-031-1
385	CSR-R-M-1-032-1
377	CSR-R-M-1-004-1
377	CSR-R-M-1-005-1
377	CSR-R-M-1-006-1
377	CSR-R-M-1-007-1
377	CSR-R-M-1-009-1
377	CSR-R-M-1-010-1
377	CSR-R-M-1-014-1
377	CSR-R-M-1-018-2
377	CSR-R-M-1-019-1
377	CSR-R-M-1-020-1
377	CSR-R-M-1-021-1
377	CSR-R-M-1-022-1
377	CSR-R-M-1-023-2
377	CSR-R-M-1-024-2

(1290a)

46.69.80.5

ERC.

FIELD OPERATIONS

EVALUATION
RESEARCH
CORPORATION

800 Oak Ridge Turnpike
Suite 501
Oak Ridge, Tennessee 37830
(615) 482-7973

January 28, 1985
BCAP-130

Commonwealth Edison Company
Braidwood Station
R.R. #1, Box 81
Braceville, IL. 60407

ATTENTION: Mr. N. Kaushal

SUBJECT: ERC Observation Number BCAP-OBS-007

Gentlemen:

We have reviewed your response and proposed corrective action to the subject observation. We concur with your response and corrective action. However, this observation will remain open until the proposed corrective action has been completed and verified.

Should you have any further questions or comments, please call me on extension 2787.

Very truly yours,

RE Ham for
John L. Hansel
Project Manager

Enclosure
JLH:REH:WLC/dlt
cc: T. Maiman
R. L. Byers
N. Smith
IEOG Team
(2) Files
R. N. Gardner
J. G. Keppler

RECEIVED
JAN ~~24~~ 30 RECD
B.C.A.P.

Orlov Affidavit on Contention Item 12F
Exhibit D

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF STEVEN C. HUNSADER
(on Rorem Q.A. Subcontention 12F)

Steven C. Hunsader, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Steven C Hunsader

Steven C. Hunsader

Subscribed and Sworn before me
this 19th day of December 1985

Nancy R. Coon
Notary Public

MY COMMISSION EXPIRES
My Commission expires on OCTOBER 11, 1988
(3614A)

TESTIMONY OF STEVEN C. HUNSADER
(ON ROREM Q.A. SUBCONTENTION 12F)

Q.1. Please state your full name for the record.

A.1. My name is Steven C. Hunsader

Q.2. By whom are you employed and in what capacity?

A.2. I am employed by Commonwealth Edison Company as a Q.A. Supervisor.

Q.3. Please summarize your education and professional experience.

A.3. I received a BSME degree from the University of Wisconsin in May, 1974. I am an Associate Member of the ASME and a Registered Professional Engineer in the State of Illinois.

Q.4. What is the purpose of this affidavit?

A.4. The purpose of this affidavit is to explain that site Quality Assurance at the request of BCAP quality assurance, performed a surveillance which identified deficiencies in PGCo's program for verification of "redline" drawings. As stated in Mr. Orlov's affidavit, the concern identified in the site Quality Assurance surveillance precluded BCAP invalidation of the 37 observations referred to in contention item 12F. In addition, Site Quality Assurance is following up the BCAP observations and the concern identified in its own surveillance to ensure that appropriate corrective action is taken.

Q.5. Mr. Hunsader, when did site Quality Assurance perform surveillance #4151?

A.5. Surveillance 4151 was performed during the time periods of January 22-24, 1985 and February 4-5, 1985. The findings were documented on February 14, 1985.

Q.6. Why did site Quality Assurance perform this surveillance?

A.6. BCAP Q.A. requested on or about January 18, 1985 that site Quality Assurance investigate their concerns via a Q.A. surveillance.

Q.7. What did you find with respect to PGCo's use of the SWO form?

A.7. The surveillance found that:

> The Q.C. signature on the Stop Work Order (SWO) signifying that verification is complete is not provided by the inspector performing the actual verifications. In five (5) of ten (10) cases, the Q.C. verification drawing was signed by the inspector performing the verifications. In the remaining five (5) cases, the drawing was not signed.

Q.8. Were the results of this surveillance communicated to BCAP?

A.8. Yes, soon after the surveillance was issued on February 14, 1985.

(3614A)

Q.9. What responsibility, if any, does site Quality Assurance have for seeing to it that appropriate corrective action is taken for valid BCAP observations?

A.9. As part of site procedures, BCAP Observations are transferred to CECo Nonconformance Reports (NCR's) to effect corrective action. As a part of NCR closure, Site Q.A. verifies that the NCR corrective action has been properly taken. By doing this, site Q.A. verifies that valid BCAP Observations are corrected.

Q.10. What is the current status of the 37 observations referred to in contention item 12F?

A.10. The 37 observations written against "redline drawings" had final determination of "valid" and CECo NCRs are currently being processed. These NCRs are in the process of being resolved on the same bases as the related surveillance finding, namely that (1) the BCAP Construction Sample Reinspection results showed that the redline drawings accurately reflect the piping configuration and dimensions with only a small percentage of minor discrepancies; and (2) based on PGCo work assignment records, Q.A. has established that the personnel who created the redline drawings in the field were appropriately trained Q.C. inspectors, or were trainees participating in these activities and supervised by a Q.C. level II inspector. These records also show that each redline drawing was assigned to a Q.C. Foreman with appropriate Level II certification, who supervised the activity in the field.

Q.11. Does this conclude your affidavit?

A.11. Yes.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF NEIL P. SMITH

(on Rorem Q.A. Subcontention 12F)

Neil P. Smith, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Neil P. Smith

Neil P. Smith

Subscribed and Sworn before me
this 19th day of December, 1985

Carol J. McCoy

Notary Public

My commission expires on 10/31/89.

(0902B)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT OF NEIL P. SMITH

On Contention Item 12F

Q.1 Mr. Smith, by whom are you employed and in what capacity?

A.1 I am employed by Commonwealth Edison as the BCAP Site General Supervisor, Quality Assurance. Since BCAP has concluded I will be reassigned to Station Nuclear Engineering as the Reliability and Design Group Supervisor.

Q.2 What are your responsibilities, if any, with respect to BCAP?

A.2 I managed the function of BCAP Quality Assurance on a day to day basis. My responsibilities relative to BCAP were as follows:

Direct reviews, audits and surveillances of BCAP and BCAP plans, implementing procedures and checklists, personnel qualifications and training, independent confirmatory tests, inspections and document reviews.

Establish in-process witness/hold point, and audit and surveillance schedules.

Recommend Stop Work Orders, programmatic changes and direct unscneduled audits based on trends of deficiencies, design significant discrepancies, audit and surveillance findings, and identified areas of concern within the program.

Prepare Monthly Status Report and Final Program Overview Report.

Approve audit checklists, surveillances, element input for the Monthly Status Report and final element reports.

Q.3 How long have you been employed as Site General Supervisor, Quality Assurance?

A.3 I have been the Site General Supervisor, Quality Assurance since April 16, 1984. This was prior to the BCAP program document being fully developed thus allowing for my comments to be incorporated into the final document that was submitted to the NRC.

Q.4 Please summarize your education and professional experience.

A.4 I have a BSEE from the University of Illinois and a MBA from the University of Chicago. From January, 1968 through June, 1976 I was associated with Commonwealth Edison's Division Engineering Departments. In June, 1976, I was transferred to Quality Assurance as a Lead Electrical Inspector. In this capacity I was certified as an SNT TC-1A Level II Radiographic Interpreter, Magnetic Particle Test Observer and Liquid Penetrant Test Observer as well as being trained in other areas such as welding, codes and standards. I was also certified as a Lead Auditor. In November, 1977, I was transferred to the Station Nuclear Engineering Department (SNED) where I was assigned to the Dresden I engineering group, then later I was given special assignments. My final assignment in SNED was that of the Zion Project Engineer. In April, 1984, I was again transferred to Quality Assurance as Site General Supervisor, Quality Assurance. I have been re-certified as an Auditor and as a Level II Q.A. Inspector.

In addition to the above employment experience I am a Registered Professional Engineer and a member of the IEEE and the associated Power Society and Industrial Applications Groups. Also, I have been a member of a number of industry owners groups.

For additional details concerning my professional experience attached is a copy of my resume.

Q.5 Mr. Smith, what is the purpose of this affidavit?

A.5 This affidavit has two purposes. First, this affidavit explains BCAP Q.A.'s involvement in the identification of the deficiency in PG & Co's program for Q.C. verification of "red-lined" drawings. Second, this affidavit describes the 100% overview performed by BCAP Q.A. of BCAP's justifications for invalidating observations.

Q.6 What was BCAP Q.A.'s involvement in the "red-lined" drawing issue?

A.6 BCAP Q.A. became aware of the problem at about the same time as the IEOG. Since the IEOG documented the deficiency we did not. Subsequently BCAP Q.A. interfaced with the Task Force, NRC Staff, the IEOG, and Site Q.A. to assure a proper resolution was reached.

Q.7 Why didn't BCAP Q.A. perform site Q.A. surveillance #4151 rather than asking site Q.A. to do it?

A.7 The charter of BCAP Q.A. was to provide the Quality Assurance function for the BCAP project. We could conduct audits and surveillances of the site contractors as long as they were specifically related to the BCAP project. When BCAP Q.A. had a concern about the internal workings of a site contractor we would ask Site Q.A. to investigate tne specific concern for us. They would then perform and document a surveillance which addressed the concern. In the case of the red line issue we felt the issue was primarily an internal PGCo problem that should be addressed by Site Q.A.

Q.8 Did BCAP Q.A. have any involvement in Site Q.A. surveillance #4151?

A.8 BCAP Q.A. worked with the Site Q.A. to assure our concern was adequately addressed.

Q.9 Mr. Smith, describe the overview performed by BCAP Q.A. of BCAP's justifications for invalidating observation.

A.9 All observations declared invalid by BCAP Task Force were reviewed for concurrence by BCAP Quality Assurance. All questions raised concerning the disposition of the observations were formally documented and resolved. The review of all observations the Task Force desired to invalidate was accomplished via a series of hold points which were established to have the observations reviewed after the engineers decided to invalidate the observations but prior to the supervisor signing the observations making it invalid.

Q.10 Please describe the results of the 100% overview.

A.10 We performed approximately 4200 invalid observation reviews. Approximately 80 percent of the reviews showed the Task Force provided sufficient justification for invalidation the first time the observation was submitted to Q.A. for review. The Task Force provided additional justification for approximately 18 percent of the observations as a result of Q.A. comments. Approximately 2 percent of the submitted observations remained valid. In all cases, where BCAP Q.A. made comments, they were resolved to our satisfaction by the Task Force or the observation remained valid.

Q.11 Did BCAP Q.A. originally intend to perform a 100% overview of BCAP justifications for invaliding observations?

A.11 BCAP Q.A. did not originally intend to perform a 100% overview of BCAP justification for invaliding observations. We planned on reviewing the invalidation process through our audit and surveillance programs. This would have entailed a sampling of the observations not a 100% overview. If the sampling had not produced satisfactory results additional samples would have been taken.

Q.12 Why did BCAP Q.A. decide to perform the 100% overview?

A.12 The NRC requested BCAP Q.A. to perform a 100% overview of all the BCAP Task Force invalid justification. As a result BCAP Q.A. committed to perform the requested overview.

Q.13 Was the BCAP Q.A. 100% overview of these justifications a part of the corrective action for the item of noncompliance referred to in contention item 12F?

A.13 No. BCAP Q.A. considered the request to be a method by which the NRC Staff could have increased confidence that each and every observation the Task Force proposed to invalidate was throughly reviewed and that the invalidation was proper. The NRC Staff itself checked on the observations BCAP Q.A. was permitting to be invalidated. I believe the fact that BCAP Q.A. performed a 100% review allowed the NRC Staff to check selected observations after BCAP Q.A. had performed its review in greater detail as opposed to checking a greater quantity of observations to a lesser level of detail. BCAP Q.A. didn't view this 100% overview as part of a corrective action item for a specific noncompliance but rather as a management tool to ensure that the invalidation process functioned properly, and that the NRC Staff was satisfied with the BCAP.

Q.14 Does this complete your affidavit?

A.14 Yes.

RESUME

PERSONAL:

Name: Neil P. Smith
Social Security No.: 361-38-8104
Employe No.: 769-190
Birth Date: June 24, 1945
Address: 9859 S. Bell
Chicago, IL 60643
Phone: (312) 233-3327

EDUCATION:

Lane Technical High School, Chicago, IL
College Preparatory Program, Graduated June 1963

University of Illinois, Urbana, IL
Graduated January 1968 with BSEE

University of Chicago
Graduate May 1977 with MBA

MILITARY SERVICE:

None

EMPLOYMENT EXPERIENCE:

January 1968 - August 1968

Commonwealth Edison - General Office Industrial Relations Dept. Job Title: Engineer. Primary Duties: Observe the activities and functions of departments within Commonwealth Edison.

August 1968 - January 1970

Commonwealth Edison Company - Division Engineering, Chicago North Division. Job Title: Engineer. Primary Duties: Field Engineering relating to the design of distribution facilities

January 1970 - March 1974

Commonwealth Edison Company - Distribution Engineering, General Office. Job Title: General Engineer. Primary Duties: Worked on special studies concerning the distribution system addition, Planning Section, planning for large distribution capacity additions.

March 1974 - September 1974

Commonwealth Edison Company - Division Engineering, Northern Division. Job Title: General Engineer. Primary Duties: Supervised the field design work for new business distribution facilities.

September 1974 - June 1976

Commonwealth Edison Company - Area Engineering Northwest Area. Job Title: Area Engineer. Primary Duties: Supervisor of Area Engineering Department.

June 1976 - November 1977

Commonwealth Edison Company - Quality Assurance, General Office. Job Title: Senior Engineer. Primary Duties: Lead Electrical Inspector, Braidwood Station.

November 1977 - April 1984

Commonwealth Edison Company - Station Nuclear Engineering Department, General Office. Job Title: Supervising Design Engineer. Primary Duties: Various assignments which include but not limited to the following:

1. Responsible for the Dresden 1 Reactor Protection System and Post Accident Monitoring System Upgrade.

2. Managed the Systematic Evaluation Program (SEP) for Dresden 1 and 2. Represented Commonwealth Edison at the SEP Owner's Group and was Group Chairman during 1981.

3. Managed the Operating plants (D, QC, and Z) environmental qualification (EQ) program for electrical equipment. Represented CECo at the EQ legal group meetings and was a member of the steering group.

4. Managed CECo's efforts for installing the Emergency Off-Site Facilities for the operating plants and LaSalle.

5. Coordinated some of CECo long term TMI activities such as SPDS for operating plants and LaSalle, response to Reg. Guide 1.97 and NUREG 0737.

6. Member of INPO's NUTAC's for SPDS, Reg. Guide 1.97, and Emergency Response Facilities.

7. Zion Project Engineer - Responsible for all major and safety-related engineering projects for the Zion Nuclear Power Plant.

8. CECo Technical Advisory Committee representative to the EPRI Seismic Hazards program and limited stand-in to the Executive committee for the program.

April - Present

Commonwealth Edison Company - Quality Assurance, General Office. Job Title: General Supervisor Q.A. Primary Duties: Review of BCAP program results and interfacing with NRC and IE OG.

OTHER EMPLOYMENT EXPERIENCE:

1981 - Present

CE representative to the Seismic Qualification Utility Group. Chairman of the group since formation.

1983 - Present

CE representative to EPRI Advisory Committee on seismic equipment qualification. Chairman of the group since formation.

December 1984 - Present

CE representative to EPRI Seismic Center working group.

Professional Development	Certification (ANSI N45.2.6 ANSI N45.2.23)
8 Hour Auditor Training, Quality Assurance, May 1984	Auditor, 8-24-84
8 Hour Codes and Standards Seminar Quality Assurance, Sept. 1984	Level II Q.A. Inspector 10-21-85

PROFESSIONAL CERTIFICATION:

Professional Engineer State of Illinois Cert #62-30650

Professional Societies

IEEE (member)
Power Society
Industrial Applications Group

COMMONWEALTH EDISON COMPANY COURSES:

a. Review of Engineering Practices and Calculations
b. Fundamentals of Digital Computers
c. Introduction to Conversational Programming
d. Engineering Economics
e. Law of the Layman
f. Commonwealth Edison in Perspective
g. Basic Supervision Program
h. Instructor Training Course
i. Westinghouse Surge Protection of Power Systems
j. Utiliterains
k. Management Coaching
l. Zion Systems Course

Neil P. Smith, 12/16/85
Name Date

Rorem Contention Item 12J

Rorem Contention Item 12J states:

> 12. Contrary to Criterion XVI, "Corrective Action," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that measures were established to assure that condition adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. And in the case of significant conditions adverse to quality, Applicant failed to ensure that the cause of the condition is determined and corrective action taken to preclude repetition.
>
> J. In two areas, supports/restraints and piping runs, deficiencies were identified by the NRC CAT that were not identified by the BCAP inspectors. On the basis of the limited sample overinspected, it appears that BCAP inspection effort needs to be improved in areas of supports/restraints and piping runs.

1. As documented in Inspection Report 50-456/84-44, 50-457/84-40, an NRC Construction Assessment Team (CAT) inspection was performed on December 10-20, 1984 and January 7-18, 1985 at the Braidwood site. The schedule for the Braidwood Construction Assessment Program (BCAP) inspections was such that only limited hardware samples were available for NRC CAT overinspection. It was possible to overinspect a very small sample of hardware in the areas of pipe supports/restraints, piping runs, HVAC supports and ducts for welding, HVAC ducts for configuration and conduit runs. In four of the six areas that were overinspected there was general agreement between BCAP and NRC CAT findings; in two areas, pipe supports/restraints and piping runs, deficiencies were identified by the NRC CAT that were not identified by the BCAP inspectors. (Id., p. A-1)

2. The BCAP Task Force inspectors who performed inspections of piping runs and pipe supports/restraints were all certified to ANSI N45.2.6-1978, Level II or Level III. Their average quality control experience was approximately nine years. None of them had any prior involvement with Braidwood. (Shevlin Affidavit at pp. 3-6)

3. With respect to piping runs, the BCAP inspections overinspected by the NRC CAT were associated with four isometric drawings. Two differences in findings were identified, both involving the same isometric drawing and the same BCAP Task Force inspector. In one case, the BCAP inspector had failed to add to her measurement a "take-out" dimension (a dimension taken from a table when measuring a curved section of pipe). In the other case, a mistake in the isometric drawing contributed to the BCAP inspector's error. (Shevlin Affidavit at pp. 10-13)

4. The BCAP Task Force Lead Mechanical/Welding Inspector, Ed Shevlin, (who is certified to ANSI N45.2.6-1978 Level III) discussed these errors in detail with the BCAP Task Force inspector involved and with all of the BCAP Task Force inspectors, reviewing measurement techniques and the use of "take-out" dimensions, as well as reminding them to take the time necessary to do each inspection correctly. He also directed two BCAP Certified Lead Inspectors separately to overinspect portions of the work of the BCAP Task Force inspector who made the errors. These overinspections identified no further problems. Based on his evaluation of the circumstances, Mr. Shevlin advised the BCAP Task Force Director that the errors were an isolated incident, and that no further

reverification of piping run inspections was necessary. (Shevlin Affidavit at pp. 14-15) The BCAP Task Force Director accepted this advice and allowed BCAP Task Force piping run inspections to continue. (Kaushal Affidavit at p. 4)

5. The NRC CAT overinspected six pipe supports and restraints which had undergone previous inspections by the BCAP Task Force. The NRC CAT found that three of the pipe supports or restraints had discrepant conditions not identified by the BCAP Task Force inspectors. (Shevlin Affidavit at pp. 17-19)

6. Upon investigation of the CAT findings, the BCAP Task Force Lead Mechanical/Welding Inspector, Mr. Shevlin, found two items which he attributed to inspector errors. He also found one item (relating to attachment location along supplementary steel) where the instructions given to BCAP Task Force inspectors required clarification. Finally, one item (relating to verification of vendor fabrication dimensions) had not hitherto been treated as within the scope of the BCAP Task Force inspections. (Shevlin Affidavit at pp. 19-22)

7. In January 1985, soon after learning of the CAT findings, the BCAP Task Force Director suspended BCAP Task Force inspection activities for pipe supports/restraints and initiated a plan to reverify those aspects of previous BCAP Task Force pipe support/restraint inspections called into question by the CAT findings. (Kaushal Affidavit at pp. 2, 5-6)

8. The reverification program covered all 160 BCAP Task Force pipe support/restraint inspections which had been performed through January 18, 1985. The BCAP Task Force inspectors who performed the reverification were not aware of the identities of the original BCAP Task Force inspectors or the results of the original BCAP Task Force inspections. No BCAP Task Force inspector reinspected his own work. The reverification program resulted in only 20 new observations. (Kaushal Affidavit at p. 6, Shevlin Affidavit at pp. 26-27)

9. Following evaluation of the new observations and "feedback" training sessions with the BCAP Task Force inspectors, inspections of supports/restraints resumed on February 1, 1985. (Kaushal Affidavit at p. 6)

10. After the CAT inspection, the Independent Overview Group and the NRC Staff performed numerous reviews and overinspections of BCAP Task Force inspections in the mechanical/welding area. Neither IEOG nor the NRC Staff ever issued any other observation or item of noncompliance with respect to BCAP Task Force inspections of pipe runs or of pipe supports or restraints. (Kaushal Affidavit at p. 7; Shevlin Affidavit at p. 28)

11. In addition to reviewing the qualifications, training of the BCAP Task Force inspectors and the instructions and checklists which they followed, BCAP QA also performed overinspections of the BCAP Task Force inspections. Those BCAP QA overinspections were just beginning at the time of the NRC CAT inspection and had not taken place with respect to any of the items overinspected by the CAT. (Smith Affidavit at pp. 7-11, Kaushal Affidavit at p. 2)

12. For the five pipe run and pipe support/restraint construction categories, the percentage of BCAP Task Force inspections overinspected by BCAP QA ranged from 16% to 23%. The acceptance criteria for agreement between the BCAP QA overinspectors and the BCAP Task Force inspectors were established at 95% for objective attributes and 90% for subjective attributes. For each pipe run and support/restraint construction category, the BCAP Task Force inspections met these acceptance criteria. (Smith Affidavit at pp. 12-15)

DISCUSSION

Rorem Contention Item 12J is based on an NRC Construction Assessment Team (CAT) finding that "on the basis of the limited sample overinspected, it appears that the BCAP inspection effort needs to be improved in the areas of supports/restraints and piping runs." Inspection Report 50-456/84-44, 50-457/84-40 (p. A-1)

The CAT inspection took place in December 1984 and January 1985, early in the period of BCAP Task Force inspections, when only a limited number of hardware items had been inspected by the BCAP Task Force. In four of the six areas overinspected by the CAT there was general agreement between BCAP and CAT findings. (Id.) The affidavit of Ed Shevlin, the BCAP Task Force Lead Mechanical/Welding Inspector, explains in detail the deficiencies in piping runs and pipe supports/restraints which were found by the CAT but which were not identified by the BCAP Task Force inspectors working under his supervision. By his count, there were three mistakes made by a BCAP Task Force inspector in inspecting pipe runs and two BCAP Task Force inspector mistakes in inspecting supports/restraints. Other differences between the BCAP Task Force and the CAT were attributable to the instructions given to the BCAP Task Force inspectors (for example, the BCAP Task Force inspectors were not initially told to verify dimensions of vendor fabrication dimensions) or a different inspection technique (a BCAP Task Force inspector noted that he could not verify the presence of stiffeners because they were not visible - the NRC CAT inspector "fished" for them with a tape rule). (Shevlin Affidavit at p. 20)

Even the best inspectors make mistakes occasionally. It is unrealistic to expect perfection in QC inspection activities, any more than in any other field of human endeavor. Mr. Shevlin's affidavit explains the reasons why he concluded that the errors made by the BCAP Task Force inspector with respect to the piping run were an isolated incident. (Shevlin Affidavit at pp. 11-13) The BCAP Task Force Director, Dr. Kaushal, concurred in this judgment. After discussing the errors with the BCAP Task Force inspectors and giving them appropriate instructions, the BCAP Task Force inspections were allowed to continue. (Kaushal Affidavit at pp. 3-4; Shevlin Affidavit at pp. 14-15)

In the area of pipe supports/restraints, the BCAP Task Force reverified all attributes called into question by the CAT findings on all previously inspected pipe supports/restraints. Prior to the reverification, appropriate additional were made to the inspectors' training and instructions to take into account the CAT findings. In the reverification program, no BCAP Task Force inspector reinspected his own work. None of the BCAP Task Force inspectors knew the identity of the initial BCAP Task Force inspector or the results of the first BCAP Task Force inspection. The reverification program for supports/restraints resulted in only 20 new observations of which only 8 were attributable to inspector error. The initial BCAP Task Force inspections for these attributes were determined to be greater than 98 per cent accurate. (Shevlin Affidavit at p. 27) After evaluation of the results and a "feedback" session with the BCAP Task Force inspectors, BCAP Task Force inspections of pipe supports/restraints were allowed to resume.

In addition to the actions taken by the BCAP Task Force in response to the CAT findings, BCAP QA carried out an aggressive overinspection program in which from 16% to 23% of the BCAP Task Force inspections in the pipe run and pipe support/restraint construction categories were overinspected by BCAP QA inspectors. (This program was just beginning for pipe runs and had not yet begun for pipe supports/restraints when the CAT inspection took place.) The acceptance criteria for agreement between BCAP Task Force inspections and BCAP QA inspections was set at 95% for objective attributes and 90% for subjective attributes. The BCAP Task Force inspectors were not penalized for being more conservative than the BCAP QA inspectors (i.e., rejecting items that the BCAP QA inspectors found acceptable). The BCAP Task Force inspections exceeded these acceptance criteria in each piping run and pipe support/restraint construction category. (Smith Affidavit at p. 15)

In fact, the BCAP Task Force inspectors performing inspections of pipe runs and pipe supports/restraints constantly had people looking over their shoulders. BCAP QA, the Independent Expert Overview Group, and the NRC Staff all monitored their activities and overinspected their work. This extraordinary degree of oversight, together with the high degree of qualification, training and professionalism of the BCAP Task Force inspectors, ensured that the BCAP Task Force inspection activities for piping runs and pipe supports/restraints complied with Criterion XVI of 10 CFR Part 50 Appendix B.

Pursuant to the duty of full disclosure as articulated by the Appeal Board in Duke Power Company (William B. McGuire Nuclear Station, Units 1 and 2), ALAB-143, 6 AEC 623 (1973) and subsequent cases, Commonwealth

Edison informs the Licensing Board that there were three other cases in which the BCAP Task Force carried out reverification programs to eliminate any doubt as to the adequacy of its inspections. These were in the construction categories of concrete placement, electrical hangers and supports, and conduit hangers. (Two of these are referred to in the Kaushal Affidavit at pp. 7-8) These are not related to the CAT inspection report findings. (See Kaushal Affidavit at pp. 6-7; Shevlin Affidavit at p. 28) Therefore, these other incidents are not within the scope of Contention Item 12J, which is limited to pipe runs and pipe supports and restraints in accordance with the Licensing Board's Memorandum and Order Admitting Rorem et al Amended Quality Assurance Contention, LBP-85-20, ___ NRC ___, (June 21, 1985)*

The affidavits submitted in support of this motion show that there is no genuine issue of material fact to be heard with respect to the adequacy of BCAP Task Force inspections of pipe runs and pipe supports/restraints. Commonwealth Edison is entitled to summary disposition of Contention Item 12J as a matter of law.

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* In that Memorandum and Order, the Licensing Board stated, "We do not approve of the Intervenors' approach and will not allow them to pursue a course of attempting to demonstrate patterns of inadequacies beyond the specific instances set forth under each alleged pattern in the contention as it now stands. LBP-85-20, ___ NRC ___, ___ (slip opinion at 12 n.6). See also ID., (slip opinion at 7 n.3)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF NARINDER N. KAUSHAL
(on Rorem Q.A. Subcontention 12J)

Narinder N. Kaushal, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Narinder N. Kaushal
Narinder N. Kaushal

Subscribed and Sworn before me
this 17th day of December 1985

Carol J. McCoy
Notary Public

My Commission expires on 10/3/89.

0583H

TESTIMONY OF NARINDER N. KAUSHAL
(ON ROREM Q.A. SUBCONTENTION 12J)

Q.1. Please state your full name for the record.

A.2. Narinder Nath Kaushal

Q.2. By whom are you employed and in what capacity?

A.2. I am currently employed by Commonwealth Edison as Project Field Engineering Manager for Braidwood Nuclear Power Station.

Q.3. What was your job immediately prior to your current job?

A.3. Prior to my current position, I was the Director of the Braidwood Construction Assessment Program (BCAP) throughout the period when the BCAP was being implemented.

Q.4. What were your responsibilities as BCAP Director?

A.4. I was responsible for managing and directing the activities of the BCAP Task Force in accordance with the BCAP Program Document submitted to the NRC in June 1984.

Q.5. Please summarize your educational background and professional experience.

A.5. I received my doctorate in Nuclear Physics from Rensselaer Polytechnic Institute, Troy, N.Y. in 1967. Subsequently, I was Research Associate in the Nuclear Engineering Department at Rensselaer Polytechnic Institute from 1967 to 1974. In 1974, I joined Commonwealth Edison and was assigned to the Clinch River Breeder Project on which I held a series of engineering management positions. Starting as a cognizant engineer for several

instrumentation and control systems, I served successively as Chief of the Instrumentation Control and Electrical Branch, Chief of the Systems Branch, Chief of the Reactor and Plant Systems Branch, and finally Deputy Assistant Director for Engineering. During these assignements, I was responsible for managing and directing engineering activities of reactor manufacturers and the architect engineer.

Q.6. Dr. Kaushal, when did you first learn that the NRC CAT had identified discrepancies in two areas, piping runs and supports/restraints, which had not been identified by BCAP Task Force inspectors?

A.6. Sometime in early January while CAT was on-site, I was advised that in two areas, (i.e., piping configuration and piping supports/restraints) the BCAP Task Force inspectors had not identified certain construction discrepancies that the CAT inspectors had observed.

Q.7. What was the status of the BCAP at the time?

A.7. The BCAP Task Force inspections were started in early October, 1984. Only a limited number of inspections had been completed. Independent overinspections by BCAP QA which had been planned as a part of the overall program had, as yet, not been initiated in the support/restraint areas and had only just begun in the pipe run area. The purpose of these overinspections was to provide a feedback on the quality of inspections by the BCAP Task Force inspectors so that corrective actions could be implemented, if necessary.

Q.8. What was your reaction to the news that the CAT had found deficiencies not identified by the BCAP Task Force inspectors?

A.8. I did not conclude from the nature or the quantity of the BCAP inspector errors identified by the CAT that there was a problem with the overall program. I was also aware that the errors identified by the CAT would be investigated by my staff, as was our normal practice, to determine if any corrective actions were necessary. However, given the high visibility that the CAT findings receive, I was somewhat concerned about the CAT identified "deficiencies" not identified by the BCAP Task Force inspectors.

Q.9. What, if anything, did you do to identify and correct any errors in past BCAP Task Force inspections of piping runs and supports/restraints?

A.9. I discussed the matter with my staff, in particular with Bob Byers, the cognizant Assistant Director, and satisfied myself that appropriate actions were underway to investigate the inspection errors identified by the CAT. Based on the results of these investigations it was later on concluded that where the CAT finding represented an error on the part of the BCAP Task Force inspectors, the inspectors would be made aware of the error, advised of the need to take the necessary time and care to do the work and the specific errors would be corrected. No additional actions were considered necessary in the area of the piping runs. In the area of piping support/restraints, the investigation

indicated the desirability of providng additional instructions to the inspectors and to reverify four attributes which were the subject of the CAT findings on BCAP.

Q.10. Why didn't you perform a reverification of BCAP Task Force piping run inspections?

A.10. Based on discussions with my staff (the cognizant Assistant Director Bob Byers and the Lead Mechanical/Welding Inspector, Ed Shevlin) and the results of their investigation, I was satisfied that the inspection errors identified by CAT did not indicate a generic concern regarding the quality of inspections in this area. While each error was taken seriously, it was also recognized that no human being can consistently perform perfectly. I was also aware that the overall program provided for overinspections on each construction category by BCAP QA. If the results of these overinspections in the area of piping runs were less than acceptable, corrective actions would be taken. As it turned out, the BCAP QA overinspections confirmed the quality of BCAP Task Force inspections in the area of piping runs to be acceptable.

Q.11. What, if anything, did you do to improve future BCAP Task Force inspection efforts in the areas of piping runs and support/restraints?

A.11. As I indicated in my answer to Q.10, the responsible inspectors were made aware of their errors and advised of the need to take the necessary time and care to do the inspections. No "generic" concerns were noted in the area of piping runs. Therefore, no

other actions were considered necessary. In the area of piping supports/ restraints, additional instructions were given to the inspectors. In addition, all inspectors were reminded of the need for taking the necessary time and care in executing the inspections.

Q.12. Did you consider taking any other action, such as disciplining or replacing the BCAP Task Force inspectors involved, to improve the quality of future BCAP Task Force inspections of piping runs and support/restraints?

A.12. It was my judgement that the inspectors were diligent in their work, and that while the kinds of errors that were observed through CAT findings must be taken seriously and avoided, nevertheless, they are understandably human errors. There were no valid grounds for disciplining or replacing the BCAP Task Force inspectors involved.

Q.13. Please describe the reverification program which was undertaken for BCAP Task Force inspections of supports/restraints.

A.13. The reverification program basically consisted of reverifying four attributes on all supports/restraints that had been previously reinspected by the BCAP Task Force inspectors. These four attributes encompassed all CAT concerns regarding BCAP reinspections of supports/restraints. The reverifications were performed by inspectors other than the ones who performed the original reinspection.

Q.14. What is your evaluation of the results?

A.14. As discussed in Mr. Shevlin's affidavit, the reverification of 160 supports identified 20 new observatons. Only eight of these 20 new observations were attributed to inspector error. This represents an accuracy of better than 98 percent. I believe that demonstrates that the overall inspector performance was good.

Q.15. What was your basis for allowing BCAP Task Force inspections of supports/restraints to resume on February 1, 1985?

A.15. By February 1, we had taken a general look at the manner in which our overall inspection process was proceeding. We did not discover any generic problems. The reverification action in the area of piping supports/restraints had been completed. The results of the reverification action had been discussed with the inspectors. We also arranged a joint session between BCAP Task Force engineers and the BCAP Task Force inspectors to assure that there was good communication between the two groups on how the inspections were to be done. Inasmuch as all of the aspects of our assessment of the situation had been completed and the results did not show any reason for continued suspension of the inspections in the piping support/restraint area, I decided to allow resumption of inspections in this area.

Q.16. Other than the CAT inspection, was there ever any other NRC inspection finding relating to the adequacy of BCAP inspections of piping runs or supports/restraints?

A.16. No such inspection finding was ever communicated to me.

Q.17. Before or after the CAT inspection, was there ever any Independent Expert Overview Group (IEOG) Observation relating to the adequacy of BCAP Task Force inspections of piping runs or supports/restraints?

A.17. No.

Q.18. Did you ever consider whether the CAT findings with respect to the need for improvement of BCAP Task Force inspections of piping runs and support/restraints might be applicable to BCAP Task Force inspections of other construction categories?

A.18. In assessing the quality of BCAP Task Force inspections, I strove to take into account all relevant information available to me at that time. This was a continual mental process. At the time the CAT findings were announced, I believed that the BCAP inspection errors, while they should be fully assessed, did not point to any concern regarding the overall quality of BCAP Task Force inspections. Nevertheless, as indicated earlier, we undertook specific actions to fully understand and assess the quality of inspections in the area of piping supports/restraints.

Later in January, it came to my attention that BCAP Task Force inspector errors had been identified by IEOG overinspections in the areas of concrete placements and in the area of electrical hangers. With this additional information on top of the CAT findings and also considering that we had completed enough reinspections to provide a data base to assess how the overall process was working, I decided to call for a "midpoint look" on January 20, 1985. The purpose was to check whether given the data available at that time, there was a basis for a generic concern regarding the overall inspection process that would affect the quality of inspections in other construction categories. [The

term "midpoint" is not intended to imply that half of the inspections had been completed but rather that enough work had been completed so that a meaningful assessment could be made as to how the process was working.]

There was no a priori reason to believe that a generic concern would exist but rather the "midpoint look" was taken as a prudent measure to assure that no such generic concern existed. It was my intent to undertake such a look at some point regardless of CAT or IEOG findings. CAT and IEOG observations only prompted it at an earlier point in time. We concluded from the midpoint look that there was no generic concern regarding the overall inspection process and that concerns in individual construction categories could be handled individually. Based on this assessment, the BCAP Task Force inspections in the pipe run area were allowed to continue and inspection of piping supports/restraints were resumed when the piping/restraints reverification actions were completed.

Q.19. In his deposition on October 31, 1985 NRC Staff Project Inspector Ron Gardner stated that he would have to speculate as to the cause of the deficiencies in BCAP Task Force inspections of piping runs and supports/restraints identified by the CAT, but that "it was probably due to going too fast". (Tr. 158) He also said, "it was sloppiness as much as anything". (Tr. 159) What comments do you have regarding this response by Mr. Gardner?

A.19. I believe Mr. Gardner's response pertains to the specific inspector errors in the inspection of piping runs and supports/restraints. Whereas it can't be said that Mr. Gardner is incorrect in his speculation, I don't believe his characterization

of the reasons for the errors was intended to be a general statement about the quality of the BCAP Task Force inspections in these areas.

Anytime an inspector makes an error, he or she is almost by definition being "sloppy". Yet it is a well known fact that the inspectors are not perfect. This is true of both subjective and objective attributes. Whereas most people can easily understand and accept error on subjective attributes, the errors on objective attributes are much harder to understand. After the fact, many such errors seem like "dumb" mistakes. Even the inspector making such an error on an objective attribute will many times admit that the error was "dumb". Yet is is understood by almost everyone that such errors do occur. A good inspection program would strive to reduce the number of such errors by continual feedback and would also maintain a running check on the overall error rate to assure acceptable level of performance. BCAP included both these features.

With respect to the inspections being done too fast, once again if the inspector made an error it automatically means he or she didn't take enough time to do it right. However, no pressure was put by BCAP management on the inspection force to complete a minimum number of inspections in a given time. Repeated instructions were given to the inspectors to take as much time as is needed to do a good job. The fact that the initial BCAP schedule expected the work to be completed in January may have

contributed to Mr. Gardner's impression. However, I personally communicated to the Task Force on many occasions, and repeated at several briefings to the NRC Staff in open public meetings, that the schedule was not an overriding factor and that we would take as long as was necessary. The actual history of BCAP shows that we did not constrain ourselves by the schedule and took as much time as was necessary. This is one reason why the inspections weren't completed until summer 1985.

Thus I don't agree that the inspectors were generally sloppy, or that the inspections were generally being carried out "too fast". I believe that the kinds of inspector errors reflected in the CAT findings on pipe runs or pipe support/restraints are not uncommon especially in the early parts of a program. The overall quality of BCAP Task Force inspections as monitored through BCAP QA overinspection, was acceptable.

Q.20. Dr. Kaushal, what is your opinion concerning the overall adequacy of the inspections of piping runs and supports/restraints during the BCAP?

A.20. In my view, the overall quality of inspections in the piping runs and supports/restraints during the BCAP was certainly adequate.

Q.21. What is the basis for this opinion?

A.21. My basis for the confidence in the adequacy of the BCAP Task Force inspections stems from the manner in which the totality of the BCAP was implemented. This includes selection of highly qualified inspectors, their training to the specific program requirements,

preparation of detailed checklists and instructions by the BCAP engineers for use by the inspectors, constant communication between BCAP engineers and inspectors, internal overview by BCAP Task Force Level III inspectors and management staff, overview by BCAP QA, overview by IEOG inspectors, presence of a full time NRC resident inspector, and not the least, the dedication and professionalism of the BCAP Task Force personnel. I believe that given the many checks and overchecks that were built into the program, the quality of inspections under BCAP was certainly adequate.

Q.22. Does this complete your affidavit?

A.22. Yes.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF EDWARD MICHAEL SHEVLIN
(on Rorem Q.A. Subcontention 12.J)

Edward Michael Shevlin, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Edward Michael Shevlin
Edward Michael Shevlin

Subscribed and Sworn before me
this [illegible] day of December 1985

Carol J. McCoy
Notary Public

My Commission expires on 10/3/89.

0567H

TESTIMONY OF EDWARD MICHAEL SHEVLIN
(ON ROREM Q.A. SUBCONTENTION 12J)

Q.1. Please state your full name for the record.

A.1. Edward Michael Shevlin

Q.2. By whom are you employed and in what capacity?

A.2. I am employed by Daniel International Corp., Greenville, South Carolina. My position title is quality Supervisor III. I am currently assigned in a consultant capacity as a Construction Quality Engineer for Phillips, Getschow Mechanical and Nuclear Contractors at Braidwood Station.

Q.3. What was your previous assignment for Daniel?

A.3. I was assigned in a consultant capacity as Lead Mechanical/Welding Inspector and Project Level III Inspector for the Braidwood Construction Assessment Program at Braidwood Station.

Q.4. What were your responsibilities in that position?

A.4. My responsibilities were to supervise all mechanical/welding quality inspection activities by the BCAP Task Force. My responsibilities included selection, training, evaluation and testing, and certification of mechanical/welding inspectors. The BCAP Task Force inspection activities included reinspection of samples of all mechanical/welding populations, and audit of associated documentation. I also assisted in the development and review of procedures, checklists and instructions.

Q.5. Please summarize your education and professional experience.

A.5. I am a high school graduate. I am currently pursuing a degree in Mechanical Engineering. My technical education includes a fifty-two (52) week academic and on-the-job Mechanical/Welding Inspector Training Program, a six month academic and on-the-job Liquid Penetrant Examiner Training Program, and an off duty preparatory course for the American Welding Society Certification Examinations. I have spent 20 years in Army Aviation. My rank at retirement was Master Sargent, and I was an Aircraft Maintenance Chief. I have completed four Aircraft repair and inspection course which related directly to construction Mechanical/Welding Inspection. I have completed a six week training program in Gas-Tungsten Arc and Shielding Metal Arc Welding, the two primary welding processes used in nuclear power construction. I have also completed leadership, supervision and methods of instruction courses.

I have twenty-eight (28) years experience in Mechanical and Welding inspection, maintenance, repair and training, progressing to third line supervision. Eight (8) of these years involved mechanical and welding inspection, supervision and training in nuclear power plant construction. My assignment prior to Braidwood was Senior Mechanical/Welding Quality Supervisor on a 1250 MW Nuclear Unit, responsible for all mechanical and welding inspection and associated activities for the entire project. I am a member of the Daniel Corporate Committee for development of inspector training and certification testing materials. I am certified as American Welding Society Certified Welding

Inspector. The CWI is an internationally recognized technical certification. My Daniel insp:ction certifications include the following:

Mechanical - Level III Hangers, Instrumentation, Equipment Installation, Piping, Maintenance

Welding - Level III, Piping Welding, Structural Welding, Material Control, Welder Qualification.

Nondestructive Examination - Level III Visual Testing for ASME Section III, Subsection NF; Level II Liquid Penetrant Examiner.

Q.6. Mr. Shevlin, what is the purpose of this affidavit?

A.6. The purpose of this affidavit is to describe the discrepancies identified by the NRC Construction Assessment Team ("CAT") which had not been identified by the BCAP inspectors, to describe CECo's response to this CAT inspection finding, and to show that the BCAP inspections of supports/restraints and piping runs were done carefully and competently.

Q.7. Who were the BCAP inspectors who performed inspections of supports/restraints and piping runs?

A.7. A peak force of sixteen inspectors was assigned to the BCAP Task Force. All inspection personnel were employed by Daniel International Corporation, Greenville, Sourth Carolina. All were Daniel employees for at least one year prior to assignment to BCAP. None of the inspection force had any prior involvement with Braidwood Station.

Q.8. How were they selected?

A.8. I personally knew the capabilities and work habits of twelve of the sixteen inspectors prior to their selection for the BCAP team. Two were recommended by the Daniel Quality Assurance Technical Support Director, who was my immediate supervisor, and

the remaining two were recommended by other Daniel supervisors qualified in my field. I personally trained five of the sixteen BCAP inspectors from entry level to fully certified inspectors on a previous assignment.

A.8. The selection process was unusually rigorous. In addition to ensuring that candiates had the required technical credentials, I satisfied myself as to each candidate's work habits and work ethics, dependability, consistency and ability to function normally under the pressure of a multi-tiered overinspection program. As previously stated, either I or another supervisor whose judgement I accepted had such knowledge of each inspector selected. All selected individuals were known to be willing to discuss problems they encountered or errors they made in group training sessions for the benefit of the other inspectors. All were known to have a habit of stopping their work then when confronted with a problem, and assuring themselves of the correct solution prior to proceeding with the inspection.

Due to the diversity of the BCAP inspection effort, each candidate was required to be competent in more than one area. Ten of the inspectors were fully certified in both mechanical and welding inspection. The remainder were certified in more than one sub-discipline, and had sufficient experience to assist certified inspectors in areas outside their own disciplines.

In evaluating credentials, a very conservative approach was taken to assure strict compliance with ANSI Standard N45.2.6-1978, the standard for inspector certification. Also considered was USNRC Regulatory Guide 1.58, Rev. 1 which supplements the ANSI standard. The credentials of each selected candidate were approved by myself, my supervisor, BCAP management and Commonwealth Edison Quality Assurance.

As an additional measure, Commonwealth Edison performed an audit of Daniel Training and certification practices at a Daniel constructed nuclear station which was nearing completion.

The Quality experience of the selected inspectors ranged from slightly over three years to over twenty years. The group's average experience was approximately nine years.

Of the sixteen inspectors, all were certified by Daniel to ANSI Level II in their respective disciplines. During their tenure in BCAP, two were certified to ANSI Level III by Daniel and accepted as ANSI Level III by CECo. Four were AWS CWI. (CWI is explained in A.5 above). Five inspectors were actually Lead Quality Inspectors and one was a Quality Superivsor. These titles indicate that these individuals were not only qualified inspectors, but on prior assignments had demonstrated capability to supervise inspection activities. One of the inspectors, in addition to holding the prestigious CWI, was also certified Level III in two areas by the American Society for Nondestructive

Testing. Attaining certification by AWS or ASNT is a very difficult and time consuming undertaking.

Q.9. How were they trained?

Q.9. Training was conducted in four general areas:

Site familiarization: All inspectors were involved in "accessibility walkdowns". This activity required that the BCAP sample items be located, determined to be accessible, and examined for paint, rust, or other obstructions which would impede the actual inspection process. This proved to be an excellent vehicle to thoroughly familiarize the inspectors with the plant layout. It also made the inspectors familiar with the various drawings issued by the designer and the contractor.

BCAP Plan: All inspectors read and received training on the BCAP Plan and the CSR (Construction Sample Reinspection) Plan. These plans outlined the purpose and general approach of BCAP. This effort also included reading and training on the applicable BCAP Procedures. As a result of this training, each inspector was aware of the intent of the program and the general approach to be taken by CSR. The BCAP organization was explained, to assure that all personnel knew with whom they would interface for each population. (A population was defined to include all like items subject to BCAP inspection).

Skills Refresher: During the lead time prior to site certification, a large amount of time was spent reviewing basic skills, including use of special tools, measurement techniques, shop mathematics, blueprint reading and visual recognition of weld defects. This was done to assure that all requisite skills were refreshed in the minds of those who may not have recently performed some inspection tasks (e.g., an inspector may have spent recent months working on hangers, and would therefore benefit from refreshment of piping inspection skills).

Specific BCAP inspection requirements: Prior to beginning inspection of a population, a training session for that specific population was conducted. Each inspection attribute was explained in detail. Included was the method of inspection, application of measuring devices, acceptance criteria, method of documentation, and specific requirements for reporting observations.

Prior to site certification, each inspector was required to pass both a written and a practical examination in each major discipline of certification. These examinations were at a higher than normal difficulty level.

In addition to the four general areas outlined above, at least once weekly an informal "lessons learned" session was held to discuss any problems encountered or errors made. The inspectors discussed problems or errors with the group and how they should be avoided by others.

During the BCAP, ten of the inspectors participated in an off-duty study program in preparation for the AWS CWI examinations. One other prepared for the CWI examination by self study. This study program was not required for CECo, Daniel or BCAP purposes; the fact that so many of the BCAP Task Force Inspectors sacrificed their personal time to take this course shows their dedication and professionalism.

Q.10. What instructions were they given in performing BCAP inspections of supports.restraints and piping runs?

A.10. As stated above, prior to beginning inspection of any population the specific instructions and acceptance criteria were discussed in detail. Where necessary, on the job training (hands on practice) was conducted.

During all of these sessions, the responsible BCAP Task Force engineer for the construction discipline involved was either present or immediately available to answer questions and discuss any unique reporting requirements.

In many instances, reference material such as formulas, tables, charts, standard dimensions or sketches depicting an applied technique were provided for inclusion in the inspectors' notebooks.

This specific population training resulted in a clear and uniform understanding of the requirements before the work began.

Instruction in performing BCAP inspections of support/restraints and piping runs were provided prior to beginning work, consistent with the methods outlined above.

Q.11. Please describe what was involved in performing a typical BCAP inspection of a piping run.

A.11. I believe performing a piping run inspection is a more complicated task than most people would imagine. For example, performing the inspection of the piping shown on one isometric drawing, 1A-AF-8, (this is the isometric drawing discussed in question and answer 13 below) required 203 separate judgements on the inspector's part (as described below). This was not a particularly large configuration relative to the other large bore pipe runs we inspected. It consisted of approximately 153 linear feet, and is a typical example.

The requirements were: Assure that pipe runs are in the correct nominal direction; verify that the physical dimensions agree with the drawing; verify that the nominal pipe size is correct; verify that the configuration is completely assembled, with all connections made and located correctly; verify valve type, identification, orientation and flow direction; verify correct slope on certain pipes; verify proper drainage on certain pipes; verify fittings to be of the correct type.

Inspection of the configuration shown on drawing 1A-AF-8 required the inspector to make the following Judgments:

Linear Dimensions	37
Utilizing a table of industry standards determine the "take out" (i.e. Linear displacement of 45 and 90 degree fittings)	42
Angular measurement correct within 5 degrees	1
Correct pipe size	1
Nominal direction of pipe run	26
Nominal direction of branch connections	5
Valve identification	3
Valve type	3
Valve orientation	3
Valve flow direction	1
Fitting type	27
All connections made	54
Total:	203 judgements

Q.12. Are you familiar with the NRC CAT finding relating to BCAP inspections of piping runs?

A.12. Yes.

Q.13. What was that finding?

A.13. According to Inspection Report 50-456/84-44, 50-457/84-40, the BCAP Task Force inspections overinspected by the CAT were associated with four isometric drawings (three for large bore piping, one for small bore piping). Two differences in findings

were detected. Both conditions were on piping included in Drawing 1A-AF-8 (large bore piping). In one case, the BCAP Task Force inspector did not detect the 3-inch dimensional difference noted by the NRC CAT. In the other case, the BCAP Task Force reported a 10-inch dimensional difference from the bottom of a slab (floor) to the bottom of a riser (vertical pipe) which penetrates that slab. The NRC CAT inspection verified the original dimension to be correct within 0.5 inches.

Q.14. Did you ever have occasion to review this piping run for yourself?

Q.14. I learned of the discrepancy between the BCAP and CAT findings in a meeting held in January, 1985. The BCAP and CAT results were compared. Where a difference was noted I initiated an investigation to identify any BCAP inspection error. Corrective action was taken for each identified error.

I assigned the physical reverification of the dimensions in question to a Certified Lead Quality Inspector. The original BCAP Task Force inspector accompained him. I then reviewed the results by comparing the CAT findings, the original BCAP findings and the new BCAP findings.

Q.15. What did you find?

A.15. The ten inch dimensional difference noted by the CAT was a simple error on the inspector's part. She measured from the bottom of the slab to the weld at the lower end of the riser. At this point

she should have added the "take-out" for the 90 degree elbow to the measured dimension, and failed to do so. (An explanation of "take-out" measurements is provided in Exhibit A).

The three inch dimensional difference identified by the CAT was a combination of errors in the isometric drawing, and on the part of the BCAP Task Force inspector. (In addition there was a measurement error by the CAT Inspector).

As illustrated in Exhibit B the isometric drawing was improperly prepared in that the dimensions shown on the drawing were overlapping. In other words, the drawing referenced lengths from the wrong places on the pipe run, so that flange thicknesses were counted twice. (The left hand dimension, 1'-10 1/4", shown at the top of Exhibit B is drawn from the correct places on the pipe run. The other two dimensions, 0'-11 3/4" and 0'-7 1/4", are drawn from incorrect locations.)

The BCAP Task Force inspector followed the checklist instructions literally and reverified the improperly presented dimensions shown on the drawing. These dimensions, taken singly, could be duplicated with no discrepancy noted. If one tried to add the three dimensions and then measure the overall dimension, as the CAT inspector did, the discrepancy would be apparent. I found that the BCAP inspector did precisely what the checklist required of her. I found her in error, in that she should have noticed

that in duplicating the drawing dimensions, she was not using a proper measuring technique. I counted this as two errors because there were two erroneous dimensions in the drawing.

(The CAT inspector apparently made a simple measurement error of one inch. The true overall dimension differed from the sum of the dimensions shown in the drawing by two rather than three inches).

Q.16. What did you conclude with respect to the adequacy of the BCAP inspectors' work?

A.16. This is a highly competent inspector. She is skilled, conciencious and has excellent work habits.

In this case she made three improper judgements. While we cannot say that mistakes are acceptable, we must recognize that even the best worker cannot be consistently perfect. We make every effort to minimize error. When the occassional mistake is identified, it is corrected and the person responsible is made aware of the mistake. The inspector in this case made two hundred correct decisions and three incorrect decisions. This implies that configuration 1A-AF-8 was inspected with 98.5% accuracy. Industry studies suggest that this is a high degree of accuracy for such inspection activities (See Quality Control Handbook; Juran, Gryna & Bingham 3rd edition, p. 12-53).

It is a rare individual who can truthfully claim such a degree of accuracy with any consistency. I concluded that this inspector's work was adequate. To confirm this judgment, I had certain follow-up inspections performed as described in answer 19.

Q.17. What corrective action, if any, did you take with respect to BCAP Task Force inspections of piping runs?

A.17. Three actions were indicated. First, I had the BCAP inspection documents corrected to show the true condition of the subject piping configuration.

The inspector responsible for these errors, the Certified Lead Inspector and myself went over each error in detail. We made sure that the inspector thoroughly understood the errors, the causes, and the methods to preclude their recurrence. She was also reminded to take the necessary time to assure that each inspection was performed completely and correctly.

A group meeting with all the BCAP Task Force mechanical/welding inspectors was conducted to explore these errors. Measurement techniques and the use of "take-out" dimensions were reviewed. Vendor fabrication dimensions for fittings were reissued to each inspector to be used in establishing "take-outs". Taking the time to do each inspection correctly was emphasized. The inspectors were also reminded to work in pairs when dimensioning long runs of pipe.

Q.18. How did the BCAP Task Force inspectors respond to your actions?

A.18. The group responded positively to this session, as they generally did to any instruction or training.

Q.19. Did you consider reverifying all BCAP Task Force inspections of piping runs?

A.19. This is a necessary consideration any time an error is identified. In this case it was evident by the discussions with the individual and in group meetings that a problem did not exist with the pipe configuration inspection program. Rather, an isolated instance of inspector error occurred, was identified, and was corrected.

My recommendation to my supervisor was that a thorough review of the facts surrounding this CAT finding did not indicate further re-verification.

However, as a follow-up measure, I directed two Certified Lead Inspectors to separately overinspect portions of the work of the inspector who made the error. These overinspections identified no further problems.

Q.20. To your knowledge, subsequent to the CAT inspection report did the Independent Expert Overview Group (IEOG) or the NRC Staff ever issue any Observations or items of noncompliance with respect to BCAP Task Force inspections of piping runs?

A..20. No.

Q.21. Please describe what was involved in performing a typical BCAP inspection of a support or restraint.

A.21. Pipe support inspection is probably the most complex activity performed by a construction inspector. Each large bore support is uniquely designed for specific loads and movements. In effect, no pipe support is typical.

In example, 1CS03029V, one of the supports addressed by the CAT findings, required approximately two hundred separate judgements on the inspector's part. This is a large bore non-rigid support.

The requirements were: Identify the support; verify location and orientation; verify the support configuration; verify all component dimensions; verify that all bolted connections were correctly made; verify load settings on variable support assembly; inspect all welded connections; verify traceability markings on each piece.

Support 1CS03029V consisted of one variable support spring can, six structural steel shapes, one piece of flat plate, one clamp assembly, one threaded rod, one six piece rod assembly, one eye nut, and eleven pieces of small hardware. It was assembled with eleven mechanical and seven welded connections.

On this support one of the welds was governed by the ASME (American Society of Mechanical Engineers) Code. The ASME places its emphasis on nondestructive testing rather than visual examination. This weld was inspected to a six attribute checklist. The other six welds were governed by the AWS (American Welding Society) Structural Welding Code. The AWS places a greater emphasis on visual inspection. The six AWS welds were inspected to a seventeen attribute checklist.

There were eleven mechanical connections, seven linear and two angular dimensions to be verified. Each of twnety seven (27) parts required at least three judgements to be made (length, width and thickness), in addition to the adequacy of its connection to the adjoining part.

Additionally, the checklist instructions for pipe support inspections made numerous references to a complex set of general notes and tolerances.

Q.22. Are you familiar with the NRC CAT finding relating to BCAP Task Force inspections of supports/restraints?

A.22. Yes.

Q.23. What was that finding?

A.23. Inspection Report 50-456/84-44; 50-457/84-40 states at p. III-7:

Of the six supports/restraints that had undergone a previous inspection by the BCAP program, two were found to be installed as designed by both the NRC CAT and BCAP and one had deficiencies that were identified by both the NRC CAT and BCAP. Three of the supports/restraints were found to be installed with discrepant

conditions not identified by the BCAP inspection. On 1SX0602BR, BCAP did not note that the attachment to existing steel was approximately three inches out of tolerance. In addition, the BCAP inspection did not note that an undersize pipe clamp and load bolt had been installed on this support. The BCAP inspector did note on a material listed that the clamp was marked N3H rather than the 3HN marking indicated in the drawing Bill of Materials. It is doubtful if a review of this discrepancy in marking of the catalog number would have revealed that a wrong size clamp had been installed. On 1CS04002S, beam stiffeners shown on the latest design drawing were not installed. The BCAP inspector did note, in the remarks column of the inspection report, that he was unable to identify if the stiffener was installed. This may have been identified as a problem during the BCAP Engineering review of the inspection report. On 1CS03029S, the BCAP inspection did not note that the attachment location along the supplementary steel was out of tolerance by 2 1/2 inches and that four clip angles were smaller in size than specified on the drawing.

Q.24. Did you ever have occasion to review these inspection differences for yourself?

A.24. Yes. In January 1985, a meeting with the NRC Staff was held, during which the BCAP Task Force and CAT findings were compared for a number of supports. The findings appeared to differ for three supports.

I assigned BCAP Task Force Certified Lead Inspectors to investigate the items where differences were noted. I then compared the original BCAP Task Force findings, the new information submitted by the Lead Inspectors, and the CAT findings to identify any inspector errors.

During this investigation, the original BCAP Task Force inspectors accompanied the Certified Lead Inspectors. This served to assure that each error was not only identified, but also that the person

making the error would see the error and the correct inspection method. Thus, the investigation into specific CAT findings was also the first step in taking corrective action.

Q.25. What did you find?

A.25. I found two errors on the part of the BCAP Task Force inspectors. I also identified one area where further clarification of the inspection attribute was required. In addition, the CAT addressed fabrication dimensions on parts of vendor supplied assemblies, which at that point was not a BCAP inspection item. In short, some of the identified differences between BCAP and CAT findings were not attributable to inspector error and some were.

Q.26. Please describe your evaluation of the specific CAT findings.

A.26. On support 1SX0602BR, the CAT inspector identified an attachment to in place (building) steel located improperly. This finding was correct, and I attributed it to error on the BCAP Task Force inspector's part. The CAT also noted an undersized pipe clamp. This clamp is part of a larger vendor supplied assembly. The assembly is shipped, received and issued as a unit. Occasionally, a clamp is lost or damaged, or a different size clamp is substituted during the installation process. It was neither the letter or the intent of the checklist instructions to reverify vendor fabrication dimensions. This is not something which is normally done in QC inspections of mechanical/welding

installations. Therefore, I do not attribute this finding to inspector error. It should be noted that as a result of the CAT finding and the findings of a subsequent reverification of 160 supports (described below), verifying vendor fabrication dimensions later became a BCAP requirement.

On support 1CS04002S, the CAT inspector noted that beam stiffeners were not installed, which was true. He also noted that the installed cover plate was not shown on the drawing. The cover plate was in fact shown on the drawing. Please refer to the sketch shown in Exhibit C. The BCAP inspector noted on the checklist that he could not verify the stiffeners. This was appropriate, since the BCAP was a program of visual inspections and as indicated in Exhibit C, the stiffener was not visible. The CAT inspector "fished" for the stiffener with a tape rule, and found nothing. The BCAP inspector was not instructed to do this. He was only supposed to do visual inspections. Even if the BCAP inspector had done what the CAT inspector did he would have made the same note. He could not have verified dimensions, shape or welding. This was a non-recreatable, (i.e, inaccessible) attribute, and as such not subject to BCAP inspection. In this case, I believe the BCAP Task Force inspector performed as instructed, with no error.

On support 1CS03029S, the CAT inspector noted that the attachment location along the supplementary steel was out of tolerance by 0'-2 1/2". (See dimensions (B) and (C) on Exhibit D). (It was, in fact out of location tolerance by approximately 0'-0 3/8".) This

CAT finding indicated the need for clarification of the instructions given to BCAP Task Force inspectors. The instructions required that the support be located along the pipe run by "chain dimension". That is, the BCAP Inspectors were told to verify Dimension (A) shown in Exhibit D. The BCAP inspectors were not instructed to verify dimensions (B) or (C), the attachment location alor· the Supplementary Steel. This item was not attributed to inspector error. It should be noted that as a result of this finding, BCAP Engineering directed that the location along supplementary steel be verified, and a tolerance was provided. The CAT also noted that four clip angles were smaller in size than specified on the drawing. This finding was correct and attributed to BCAP Task Force inspector error. Notes on the drawing indicated that the BCAP Task Force inspector identified the problem and failed to transcribe the information to his checklist.

Q.27. What did you conclude with respect to the adequacy of BCAP Task Force inspections of supports/restraints?

A.27. After investigating the CAT findings on support/restraints, I was of the opinion that we did not have sufficient data to support a factual conclusion. Only six supports were observed by both the BCAP Task Force and CAT. Three had agreement. The remaining three had two BCAP errors, two CAT errors, one attribute requiring clarification for all BCAP Task Force inspectors, and one item which had previously been considered to be outside the BCAP scope of interest. There were reasons to believe that a significant

problem did not exist. The written and practical examinations for site certification included supports. Each inspector who worked on supports had been overinspected shortly after site certification, either by a Certified Lead Inspector, or myself, with satisfactory results.

The two items which had been attributed to inspector error were identified and corrected. No other indication of an inspector problem had surfaced. The inspectors had at this point been overinspected internally. The NRC Staff BCAP inspector, Mr. Gardner, had observed several inspectors at work, and IEOG was beginning its overinspection program. No adverse findings relating to inspections of supports/restraints had been brought to my attention prior to the January meeting with the CAT inspectors.

Again, while mistakes can not be considered acceptable, it is totally unrealistic to expect consistently perfect performance from any individual or group.

There was an apparent need to address the location of attachments to supplementary steel. Also, by this time Mr. Orlov, the Assistant BCAP Director, was considering the question of vendor fabrication dimensions.

Q.28. Did you agree with the decision to suspend BCAP Task Force inspections of supports/restraints and reverify all previous BCAP Task Force inspections of supports/restraints?

A.28. Yes, my supervisor and I were already discussing the need for a reverification when the Director of the BCAP Task Force, Dr. Kaushal, announced his decision. The question of the supplementary steel attachments required attention. Mr. Orlov was leaning toward verification of the vendor dimensions. Errors had been made by two inspectors. Questions had now been raised, and an insufficient data base was available to support a factual conclusion. The prudent decision was to reverify all attributes in question on all previously inspected supports. Had Dr. Kaushal not taken the action at the Director level, we would have at the Supervision level.

Q.29. What responsiblilities, if any, did you have for carrying out the reverification program for supports/restraints?

A.29. I developed and implemented the reverification plan. The inspection criteria were based on the questions raised by the CAT findings. I developed special checklists and instructions, trained the inspectors in the applicable areas, supervised the reverification, and evaluated and reported the results. Finally, I conducted individual and group training sessions based on the results of the reverification.

Q.30. Mr. Shevlin, what were the inspection criteria for the reverification program?

A.30. Four attributes were included: Configuration, two component dimension attributes and location of attachments to supplementary steel. These attributes addressed all areas of concern.

Configuration: Verify that all items of the installed support are the same as those indicated on the bill of materials. This included both assuring that the correct item was installed, and that its relationship to adjacent items was as shown on the drawings.

Component dimensions: Verify the physical dimensions of each item on the support against both the bill of materials and the standard to which the item was manufactured. In example, a piece of structural steel might be identified on the bill of material as L 3x3x1/4. (Angle iron, each side three inches wide, 1/4 inch thick (nominal). The physical dimensions would then be compared with the American Insitute of Steel Construction Manual specific dimensions. In some structural shapes, the nominal and specific dimensions are the same, in others they are not. This attribute also included vendor fabrication dimensions for parts of assemblies, verified against the vendor's load capacity data sheets.

Component dimensions: Verify installation tolerances. This item required that the relative location of each item, including linear and angular dimensions, was as shown on the drawing or within the tolerances outlined in the General Notes and Tolerances (Sargent and Lundy drawing M-919).

Location of attachment to supplementary steel: Verify that if dimensioned on the drawing, the support attachment to supplementary steel is as dimensioned or within tolerance.

Q.31. How were these criteria developed?

A.31. The CAT findings were studied and compared with the BCAP Task Force findings. An attribute was selected to address each area of question or concern. Gu .dance was received from the Engineering Group and from Mr. Orlov. The criteria addressed all attributes not only identical to, but similar in any way to each question raised.

Q.32. What additional training and instructions were given to the BCAP Task Force inspectors for the reverification program?

A.32. A general review of hanger inspection requirements was presented. The specific reverification attributes, both letter and intent, were outlined in detail. The use of the vendor load capacity data sheets was discussed, and the inspectors were instructed to inspect every dimension shown for all parts of all assemblies. The inspectors were instructed to reverify everything on a support which fell into the special reverification criteria. The administrative aspects of the reverification plan were explained. This included controls to assure that no inspector reverified his or her own work.

Q.33. In your opinion, were the reverification inspections adequately performed?

A.33. Yes.

Q.34. Why?

A.34. The nature of the new observations in many cases reflected an ultra conservative approach. A number of new findings reported dimensional deviations of 1/16" or less.

A substantial number of observations were identical to those previously reported. The reverification inspectors were not made aware of the original findings.

The reverification plan assured that no inspector reverified his/her own work or knew who the original inspector was. Therefore, personal bias was not a factor in these reverifications.

Most of the BCAP inspectors had prior experience with a CAT, and were well aware of the need to completely resolve any open items.

The inspectors made use of the engineers, specially designated lead inspectors and myself in obtaining answers to questions. This was especially noticeable in determining allowable substitutions of vendor supplied parts.

I was then and am now confident in the skills of this team of inspectors.

Q.35. What were the results of the reverification program for supports/restraints?

A.35. Twenty new observations were issued against a population of 160 supports.

Q.36. What was your evalution of these results?

A.36. My detailed evaluation of the new observations is shown in Exhibit E, "Pipe Support Reverification Plan Analysis of New Observations," which is taken from the BCAP files. I attributed a total of eight new findings to inspector error on the original inspections. This equates to an accuracy rate of over 98 percent for the original BCAP Task Force inspections, in that four attributes were reverified on each of 160 supports:

4 attributes x 160 supports = 640 attributes.

$\frac{8}{640}$ = 1.25 percent error in original inspection

Therefore, the original inspections, relative to the attributes in question were greater than 98 percent accurate.

My evaluation of the reverification results, taking into account the number and nature of the new observations, was that no significant deficiency existed in the BCAP Task Force inspections of supports/restraints.

Q.37. What further corrective actions, if any, were taken prior to the time that BCAP Task Force inspections of supports/ restraints resumed?

A.37. As in the case of piping configuration, three actions were indicated. First, the appropriate documentation was initiated and/or corrected to include the new findings.

Each error was discussed in detail with the responsible inspector. It was assured that each inspector understood his/her error, the cause, and the methods to be use. to prevent recurrence.

A group meeting was conducted, during which all new findings were discussed, including those not attributed to inspector error. The inspection criteria and correct methods of verifying those criteria were discussed. At this time, based on the fact that seven of the new observations related to vendor fabrication dimensions, Mr. Orlov directed me to continue measurements based on load capacity data sheets. The inspectors were instructed accordingly.

Q.38. To your knowledge, subsequent to the CAT inspections, did the IEOG or the NRC Staff ever issue any observations or items of noncompliance with respect to BCAP inspections of supports/restraints?

A.38. No. It should also be noted that the Quality Assurance Overinspection of BCAP resulted in more than a 98 percent agreement in the pipe support/restraint areas. This parallels the results of the reverification of 160 supports/restraints previously discussed.

Q.39. In his deposition on October 31, 1985 NRC Staff Project Inspector Ron Gardner stated that he would have to speculate as to the cause of the deficencies in BCAP inspections of piping runs and supports/restraints identified by the CAT, but that "it was probably due to going too fast." (Tr. 158) He also said, "it was sloppiness as mush as anything." (Tr 159). Do you agree or disagree with Mr. Gardner?

A.39. I agree that whenever an inspector makes an error, it is natural to speculate that the error may have been due to going too fast or sloppiness. However I am satisfied that the overall BCAP Task Force inspection effort in piping runs and supports/restraints was thorough and careful. Therefore I am sure Mr. Gardner's comments refer to the cause of the individual errors identified by the CAT, rather then the overall BCAP Task Force inspection effort.

Q.40. Mr. Shevlin, what is your opinion concerning the overall adequacy of the inspections of piping runs and supports/restraints during the BCAP?

A.40. The BCAP Task Force inspections on piping runs and supports/restraints were performed completely and correctly. The result was more than "adequate".

Q.41. What is the basis for this opinion?

A.41. This opinion is based on a number of factors. First, and probably most significant is the high level of skill and motivation to perform well on the part of the BCAP Task Force inspectors.

The checklists and instructions used by the inspectors were skillfully prepared. In addition to the acceptance criteria, specific instructions were provided in how to perform the inspection for all but the most elementary steps.

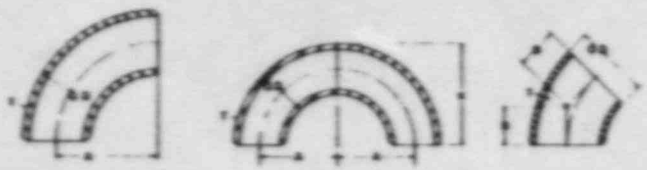
The inspectors received excellent support from the responsible engineers.

Training was continous throughout the life of the project.

The overinspection process was extensive. Collectively, the CAT, NRC Staff, Evaluation Research Corporation on behalf of IEOG, BCAP QA, and BCAP Task Force internal overinspections identified very few questions or inspector errors. Those mistakes which were identified were corrected and action to prevent recurrence was promptly taken.

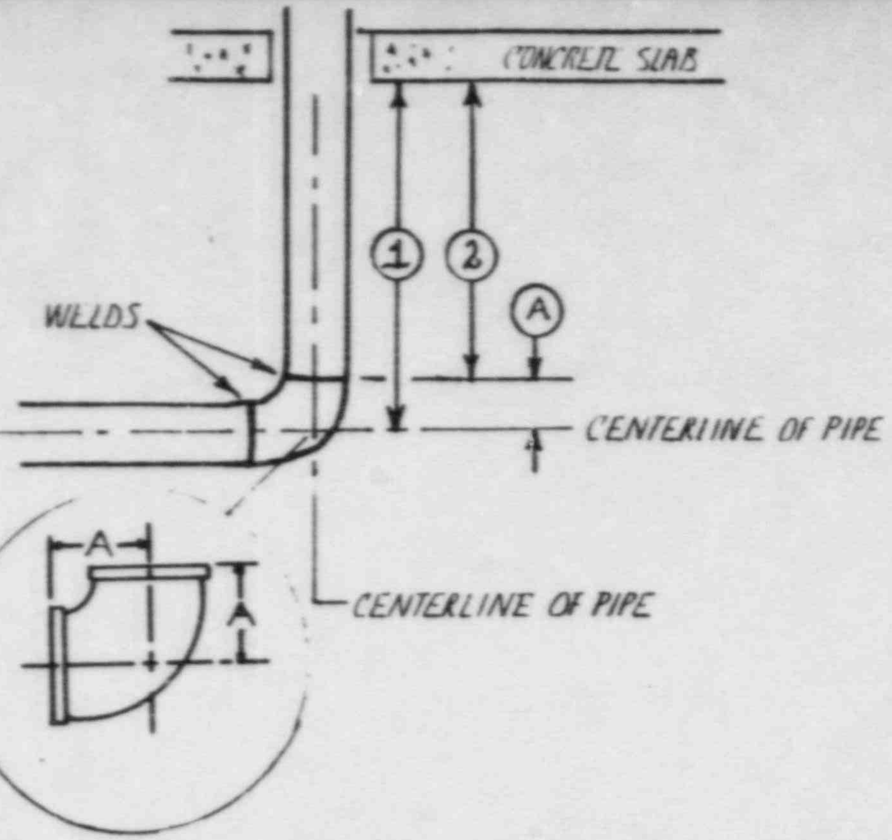
Q.42. Does this complete your affidavit?

A.42. Yes.



NOM PIPE SIZE	OD	WALL THICKNESS T				90° ELBOWS	
		STD.	XS	160	XX	LONG R A	SHORT R A
½	.840	.109	.147	—	—	1½	—
¾	1.050	.113	.154	—	.308	1⅛	—
1	1.315	.133	.179	.250	.358	1½	1
1¼	1.660	.140	.191	.250	.382	1⅞	1¼
1½	1.900	.145	.200	.281	.400	2¼	1½
2	2.375	.154	.218	.344	.436	3	2
2½	2.875	.203	.276	.375	.552	3¾	2½
3	3.500	.216	.300	.438	.600	4½	3
3½	4.000	.226	.318	—	.636	5¼	3½
4	4.500	.237	.337	.531	.674	6	4
5	5.563	.258	.375	.625	.750	7½	5
6	6.625	.280	.432	.719	.864	9	6
8	8.625	.322	.500	.906	.875	12	8
10	10.750	.365	.500	1.125	1.000	15	10
12	12.750	.375	.500	1.312	1.000	18	12
14	14.000	.375	.500	—	—	21	14
16	16.000	.375	.500	—	—	24	16
18	18.000	.375	.500	—	—	27	18
20	20.000	.375	.500	—	—	30	20
22	22.000	.375	.500	—	—	33	—
24	24.000	.375	.500	—	—	36	24
26	26.000	.375	.500	—	—	39	—
30	30.000	.375	.500	—	—	45	30
34	34.000	.375	.500	—	—	51	—
36	36.000	.375	.500	—	—	54	36
42	42.000	.375	.500	—	—	63	48

SHEVLIN AFFIDAVIT
EXHIBIT A



SEE INSET. NOTE THAT THE PIPE CENTERLINES DO NOT INTERSECT AT THE APPARENT CENTER OF THE FITTING. THEREFORE, THE PREFERRED METHOD OF MEASUREMENT IS:

(1) IS THE DIMENSION SHOWN ON THE DRAWING.

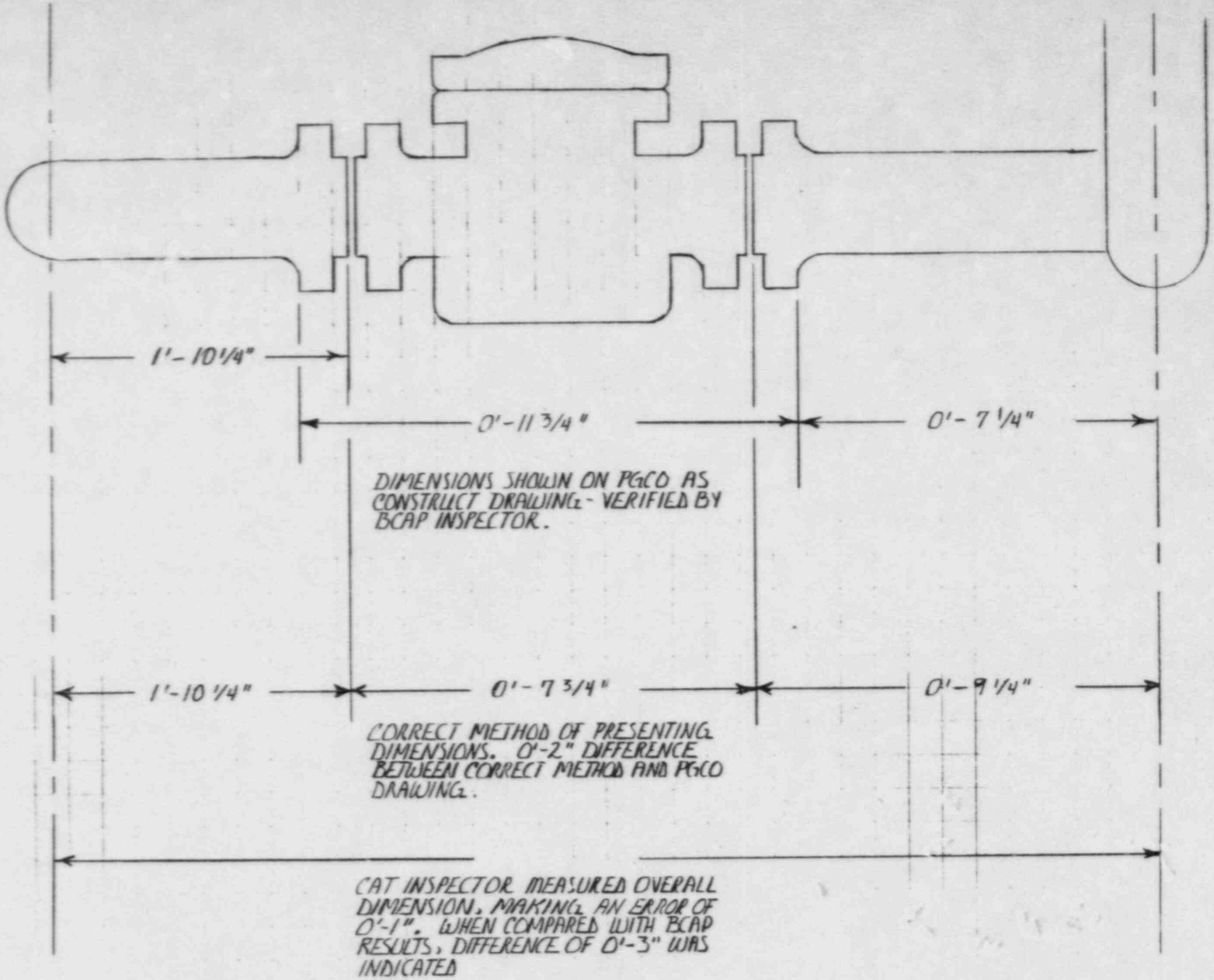
(2) THE INSPECTOR MEASURES THE DISTANCE FROM THE BOTTOM OF THE SLAB TO THE MIDDLE OF THE WELD.

(A) DIMENSION A IS OBTAINED FOR THE APPROPRIATE SIZE AND TYPE FITTING FROM THE TABLE.

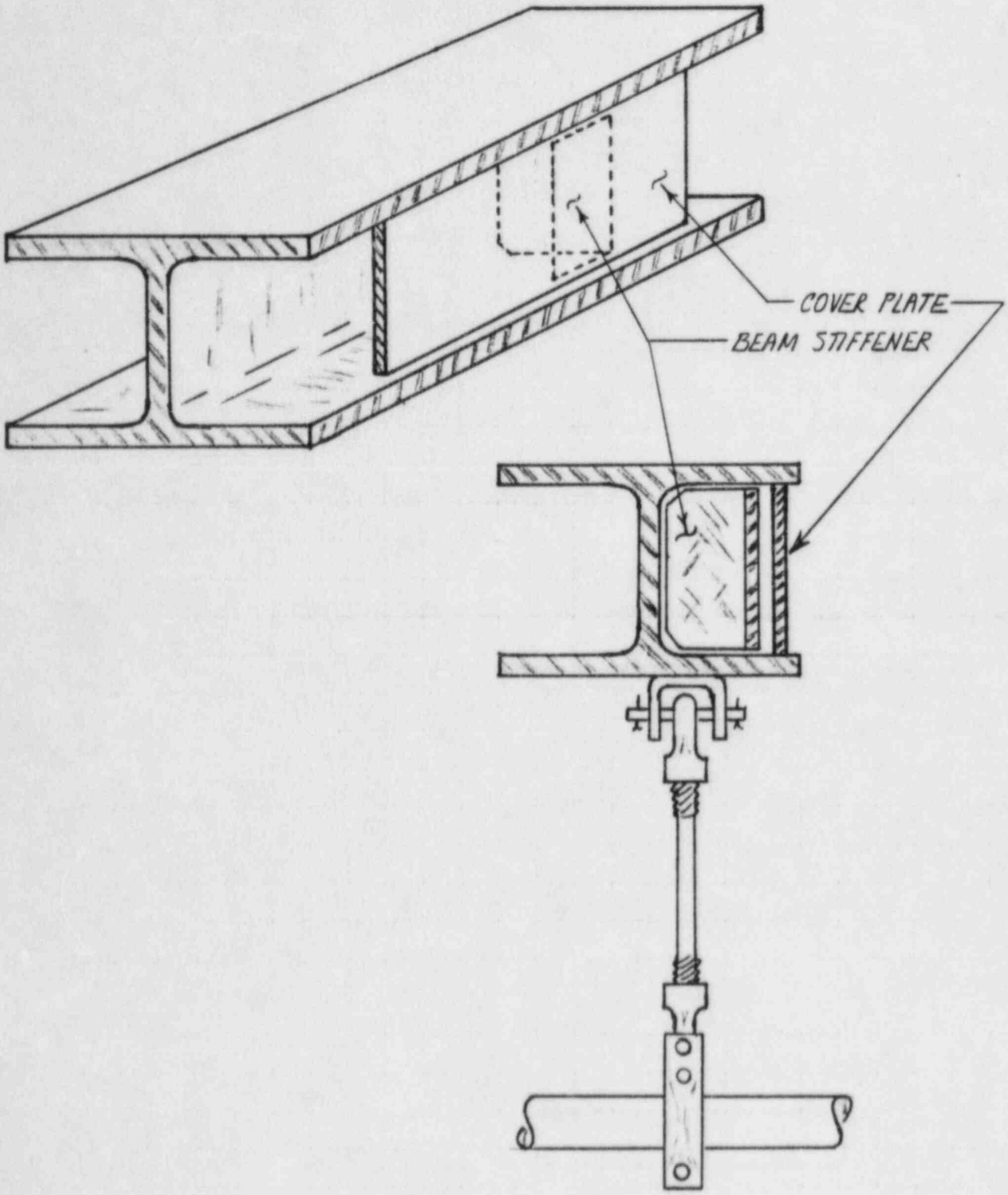
DECISION: THE CONDITION IS ACCEPTABLE IF THE SUM OF DIMENSION 2 AND DIMENSION A EQUAL, WITHIN TOLERANCE, DIMENSION 1.

THIS METHOD OVERCOMES THE DIFFICULTY FACED IN LOCATING THE CENTERLINE OF THE FITTING.

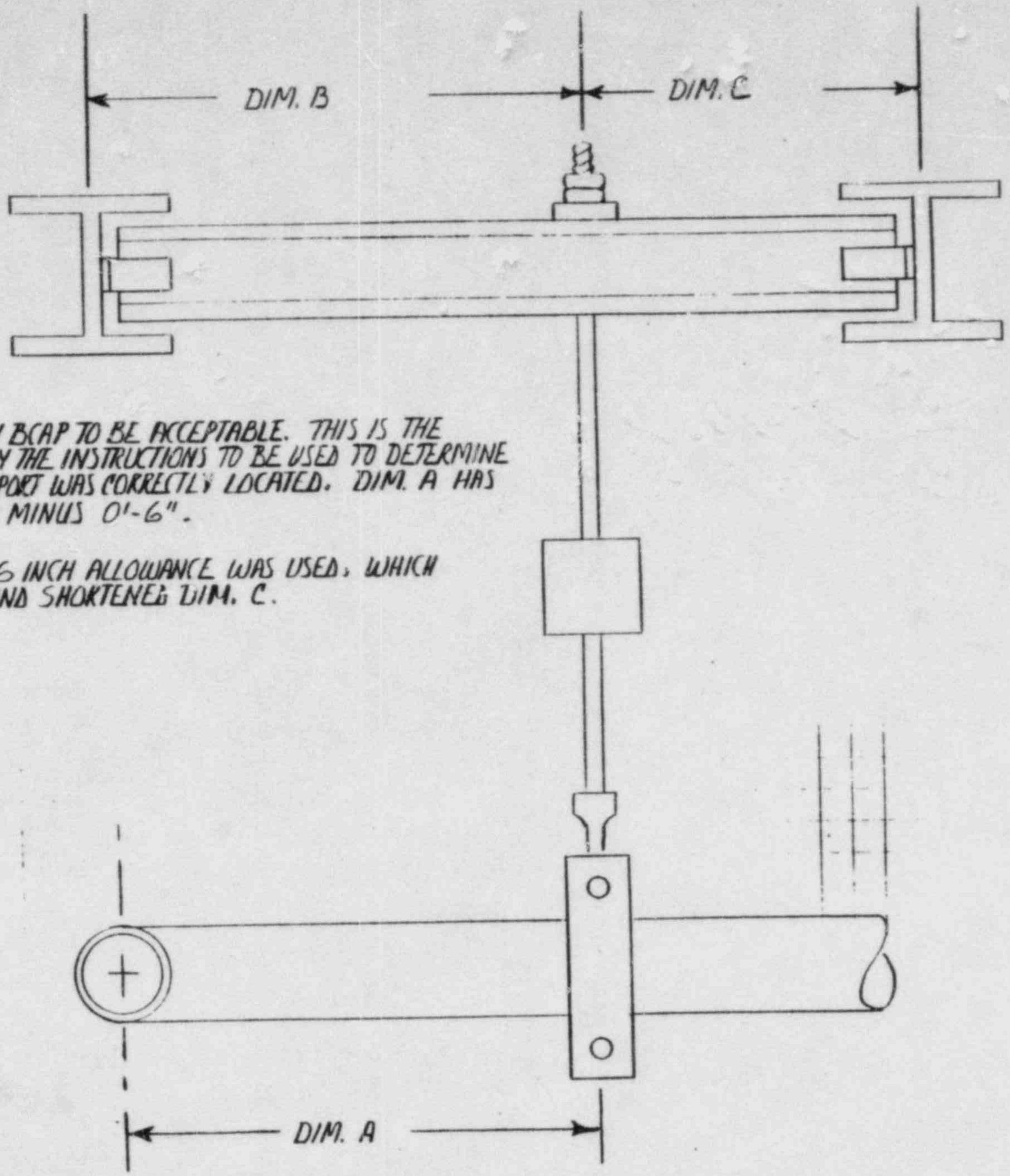
EXAMPLE: FOR A SIX INCH NOMINAL PIPE DIAMETER, 90 DEGREE LONG RADIUS ELBOW, THE "TAKE-OUT", OR DIMENSION A, IS NINE INCHES. IF DIMENSION 1 FROM THE DRAWING IS 1 FOOT-NINE INCHES, DIMENSION 2 SHOULD BE 1 FOOT.



SHEVLIN AFFIDAVIT
EXHIBIT B



SHEVLIN AFFIDAVIT
EXHIBIT C



DIM. A WAS VERIFIED BY BCAP TO BE ACCEPTABLE. THIS IS THE DIMENSION REQUIRED BY THE INSTRUCTIONS TO BE USED TO DETERMINE WHETHER OR NOT THE SUPPORT WAS CORRECTLY LOCATED. DIM. A HAS A TOLERANCE OF PLUS OR MINUS 0'-6".

5 1/8 INCHES OF THE 6 INCH ALLOWANCE WAS USED, WHICH LENGTHENED DIM. B AND SHORTENED DIM. C.

SHEVLIN AFFIDAVIT
EXHIBIT D

REVERIFICATION ATTRIBUTES	ATTRIBUTABLE TO INSPECTOR TECHNIQUE	ATTRIBUTABLE TO FACTORS OTHER THAN TECHNIQUE
ATTRIBUTE #1 (CONFIGURATION)	5	7
ATTRIBUTE #2 (COMPONENT DIMENSIONS VERIFIED TO SUPPORT DRAWINGS AND BILL OF MATERIAL)	2	0
ATTRIBUTE #3 (COMPONENT DIMENSIONS VERIFIED TO INSTALLATION TOLERANCES	1	3
ATTRIBUTE #4 LOCATION OF ATTACHMENTS TO SUPPLEMENTARY STEEL	0	2
TOTAL	8	12

(1687J)

SHEVLIN AFFIDAVIT
EXHIBIT E

PIPE SUPPORT REVERIFICATION PLAN
ANALYSIS OF NEW OBSERVATIONS

ATTRIBUTE, INSTRUCTION	DESCRIPTION OF NEW OBSERVATION	COMMENT
Configuration - Verify that all items of the installed support are the same as those indicated on the bill of materials.	B.O.M. specified a W6X15.5. W6X16 installed.	While the instruction attachments do not describe the W6x15.5, the inspectors have been provided with copies of the dimensions for detailing for the commonly used structural shapes from both the seventh and eighth editions of the AISC Manual. This is a site fabricated piece, and there are significant differences between the W6X15.5 and W6X16. The difference in flange width is readily apparent. Level III Mechanical Inspector recommends that this item be treated as attributable to inspector technique.
	Stiffener clamps installed where B.O.M. indicated use of standard clamps. (Two instances.)	While it was not the intent of the CSR Engineer that vendor fabrication dimensions be reverified. The difference between a standard clamp and a stiffener clamp is readily apparent. Level III Mechanical Inspector recommends that these items be treated as attributable to inspector technique.
	Incorrect parts installed in vendor supplied pre-engineered support assemblies. (Three instances.)	Two clamps and one rear bracket. Detailed verification o vendor fabrication dimensions is not normally associated with installation inspections. The bill of materials specifies items by size and vendor part number. Only those dimensions necessary to erect the assembly are normally given on the B.O.M. and the drawing. The vendor drawings are provided to the inspectors only to enable them to verify that the correct assembly was installed, b part number and size. It was not intended that stock sizes of subassemblies be reverified. Level III Mechanical Inspector recommends that these items not be treated as attributable to inspector technique.

E0000515

PIPE SUPPORT REVERIFICATION PLAN
ANALYSIS OF NEW OBSERVATIONS

ATTRIBUTE, INSTRUCTION	DESCRIPTION OF NEW OBSERVATION	COMMENT
Configuration - Verify that all items of the installed support are the same as those indicated c the bill of materials	Rod couplings installed with two jam nuts where bill of materials calls for one jam nut. (Two instances.)	Hardware is correctly installed. The checklist instructions refer to S&L Drawing M-919 for authorized additions, substitutions and tolerances. M-919 specifies that two jam nuts be used with the rod coupling. The inspectors interpreted the use of the extra nut as an approved tolerance. Level III Mechanical Inspector recommends that these items not be treated as attributable to inspector technique.
	B.O.M. specified rod couplings can not be dimensionally verified to approved vendor catalogs. (Two instances.)	Visual examination of these couplings shows them to apparently be ITT Grinnell Fig. 79. Size is determined by rid diameter, which is correct. Normal installation inspection does not include dimensional verification of vendor fabricated parts. Level III Mechanical Inspector recommends that these items not be treated as attributable to inspector technique.
	B.O.M. specified an ITT Grinnell Fig. H.S. 45 assembly. Locations of welded washer plates on the assembly do not agree with vendor fabrication dimensions.	Visual examination of this assembly shows it to apparently be an ITT Grinnell Fig. H.S. 45. Length and depth of C shapes is correct. Normal installation inspection does no include verification of vendor fabrication dimensions. Level III Mechanical Inspector recommends that this item not be treated as attributable to inspector technique.
	B.O.M. specified a 307N snubber. A 306N snubber is installed.	The 306N and 307N snubbers are identical, except that the 307N is fitted with an extension piece. In this case, it would not be possible to install the specified 307N, there is either a detailing error on the drawing or a clerical error on the B.O.M. The difference between a snubber with or without the extension piece, is readily apparent. Level III Mechanical Inspector recommends that this item be treated as attributable to inspector technique.

E0000516

PIPE SUPPORT REVERIFICATION PLAN
ANALYSIS OF NEW OBSERVATIONS

ATTRIBUTE, INSTRUCTION	DESCRIPTION OF NEW OBSERVATION	COMMENT
Configuration - Verify that all items of the installed support are the same as those indicated on the bill of materials.	B.O.M. specified a W8X17. A W8X21 is installed. Attachment to beam is not located as shown on drawing.	While the instruction attachments do not describe the W8X17, the inspectors have been provided with copies of the dimensions for detailing for the commonly used structural shapes from both the seventh and eighth editions of the AISC manual. The dimension given for locating the attachment to this beam was unworkable with W8X21, and apparently would not have worked with the specified W8X17. While the differences between the installed and the specified item may not have been readily apparent the attachment discrepancy should have been. Level III Mechanical Inspector recommends that this item be treated as attributable to inspector technique.

E0005517

PIPE SUPPORT REVERIFICATION PLAN
ANALYSIS OF NEW OBSERVATIONS

ATTRIBUTE, INSTRUCTION	DESCRIPTION OF NEW OBSERVATION	COMMENT
Component dimensions - Verify the component dimensions to the bill of materials and the support sketch.	B.O.M. specified $\angle$ 4" x 4" x 1/2" x 0'-6". $\angle$ 3 1/2" x 3 1/2" x 3/8" x 0'-6" installed. B.O.M. specified $\angle$ 3" x 3" x 3/8" x 0'-1 3/4". $\angle$ 3" x 3" x 1/4" x 0'-1 3/4" installed.	Hard dimensions for these $\angle$ shapes were shown on the B.O.M. The inspector identified the discrepancy and faile to transcribe the information from his notes to the inspection documents. Level III Mechanical Inspector recommends that this item be treated as attributable to inspector technique.
	B.O.M. specified a 1/2" x 0'-9" x 0'-9" C.S. 3/4" x 0'-9" x 0'-10" C.S. installed.	The increase from 1/2" to 3/4" in thickness of the is acceptable. The increase form 0'-9" to 0'-10" exceeds allowable tolerances by 0'-1/2". This information was available to the inspector. Level III Mechanical Inspector recommends that this item be treated as attributable to inspector technique.
Component dimensions - Verify that the installation tolerances for components comply with CSR checklist instructions.	Drawing specified 1/16" typ. clearance pipe is in hard contact on one side with 5/32" clearance on opposite side.	The hard contact on one side is acceptable. The cumulative clearance on the opposite side exceeds allowabl tolerance by 1/32". Small bore piping moves about relatively freely within this type support. It is likely that the original inspector did not have contact on either side, with the excess 1/32" distributed on both sides. Measurements of less than 1/32" taken from both side of a moveable object can easily contribute to minor errors. Level III Mechanical Inspector recommends that this item not be considered attributable to inspector technique.

E0000518

PIPE SUPPORT REVERIFICATION PLAN
ANALYSIS OF NEW OBSERVATIONS

ATTRIBUTE, INSTRUCTION	DESCRIPTION OF NEW OBSERVATION	COMMENT
Component dimensions - Verify that the installation tolerances for components comply with CSR checklist instructions.	"C" dimension on clamp by vendor fabrication dimensions should be 1 7/16". "C" dimension on installed clamp is 1".	"C" dimensions is a vendor fabrication dimension for a spacer between the clamp ears. This is not a dimension which is normally associated with installation inspection. The clamp is part of a higher vendor supplie assembly, and by type visually appears to be correct. Level III Mechanical Inspector recommends that this item not be treated as attributable to inspector technique.
	"A" dimensions from centerline U-Bolt to end of hanger member is 1/16" out of tolerance.	This dimension was specified as 1 3/4", with a ± 1/2" tolerance. (Min. dim. 1 5/16".) Installed at 1 1/4". B design, the bolt holes are larger than the U-Bolt. The U-Bolt is not centered in the holes. If it were, the tolerance would be met. Note that the only tightness inspection is "hand tight." It is not unlikely that at the time of the original inspection, there was no discrepancy. Level III Mechanical Inspector recommends that this item not be treated as attributable to inspecto technique.
	Rear Bracket installed out of location tolerance.	This rear bracket is welded in place, out of specified location. Hard dimensions are shown on the drawing, and tolerances are provided as attachments to the instructions. Level III Mechanical Inspector recommends that this item be treated as attributable to inspector technique.

E0000519

PIPE SUPPORT REVERIFICATION PLAN
ANALYSIS OF NEW OBSERVATIONS

ATTRIBUTE, INSTRUCTION	DESCRIPTION OF NEW OBSERVATION	COMMENT
Location of Attachment to supplemental steel - where the support attaches to supplementary steel, verify that the location of the attachment does not deviate from that specified on on the design drawing.	Location of Attachment of support to supplementary steel out of allowable tolerances. (Two instances.)	This item was not a specific step in the original inspections. The dimension is not normally shown on the drawing. It is secondary to the specified centerline location of the support relative to the pipe. The CSR checklist instructions and S&L drawings specifically state that location is relative to the pipe. subsequent to the original inspections, clarification was requested and received from CSR engineering. Application of the new, correct interpretation of the instructions resulted in these items becoming observations. Level III Mechanical Inspector recommends that these items not be treated as attributable to inspector technique.

E0000520

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF NEIL P. SMITH
(on Rorem Q.A. Subcontention 12J)

Neil P. Smith, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Neil P. Smith

Neil P. Smith

Subscribed and Sworn before me
this 16th day of December 1985

Carol J. McCoy

Notary Public

My Commission expires on 10/31/89.

0564H

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT OF NEIL P. SMITH

On Contention Item 12J

Q.1 Mr. Smith, by whom are you employed and in what capacity?

A.1 I am employed by Commonwealth Edison as the BCAP Site General Supervisor, Quality Assurance. The BCAP has now been completed, and I have been informed that I will be assigned in the near future to Commonwealth Edison's Station Nuclear Engineering Department as Reliability and Design Group Supervisor.

Q.2 What were your responsibilities with respect to the BCAP?

A.2 I managed the BCAP Quality Assurance group on a day to day basis.

Q.3 How long were you the BCAP Site General Supervisor, Quality Assurance?

A.3 I have been the Site General Supervisor, Quality Assurance since April 16, 1984. This was prior to the BCAP program document being fully developed thus allowing for my comments to be incorporated into the final document that was submitted to and approved by the NRC Staff.

Q.4 Please summarize your education and professional experience.

A.4 I have a BSEE from the University of Illinois and a MBA from the University of Chicago. From January, 1968 through June, 1976 I was associated with Commonwealth Edison's Division Engineering Departments. In June, 1976, I was transferred to Quality Assurance as a Lead Electrical Inspector. In this capacity I was certified as an SNT TC-1A Level II Radiographic Interpreter, Magnetic Particle Test Observer and Liquid Penetrant Test Observer as well as being trained in other areas such as welding, codes and standards. I was also certified as a Lead Auditor. In November, 1977, I was transferred to the Station Nuclear Engineering Department (SNED) where I was assigned to the Dresden I engineering group, then later I was given special assignments. My final assignment in SNED was that of the Zion Project Engineer. In April, 1984, I was again transferred to Quality Assurance as Site General Supervisor, Quality Assurance. I have been re-certified as an Auditor and a Level II Q.A. Inspector.

In addition to the above employment experience I am a Registered Professional Engineer and a member of the IEEE and the associated Power Society and Industrial Applications Groups. Also, I have been a member of a number of industry owners groups.

For additional details concerning my professional experience attached is a copy of my resume.

Q.5 Mr. Smith what is the purpose of this affidavit?

A.5 The purpose of this affidavit is to explain why BCAP Q.A. is confident that the BCAP Task Force inspectors who inspected piping supports/restraints and piping runs performed their work carefully and competently.

Q.6 Mr. Smith, what is the basis for that confidence?

A.6 First, BCAP Q.A. overviewed the qualifications and training of the BCAP Task Force Inspectors to assure their compentence.

Second, BCAP Q.A. reviewed all the BCAP inspection checklists and instructions in detail to assure they met the program commitments and adequately addressed the subject.

Finally, BCAP Q.A. performed overinspections of the reinspections performed by the BCAP Task Force personnel. The BCAP Q.A. inspectors were qualified and certified in the same manner as the Task Force inspectors. The results of the overinspections were within the acceptance criteria which we established.

Q.7 Please describe BCAP Q.A.'s overview of BCAP Task Force inspectors' qualifications and training.

A.7 BCAP Q.A. reviewed the training of BCAP Task Force inspectors in a three step approach. The first step was the review of each BCAP Task Force inspector's individual qualification/ certification package. The second step was BCAP Q.A.'s scheduled and unscheduled surveillances of the training and the maintenance of training of the BCAP Task Force inspectors. Finally we performed comprehensive audits in which we explored in depth the training given to the BCAP Task Force inspectors.

In addition, BCAP Q.A. required the BCAP Task Force Level III inspector for each discipline to overinspect a 20% sample of the first 40 hours of each Task Force Level II inspector's work to assure that the Level II inspector was performing satisfactorily.

Q.8 What was BCAP Q.A.'s conclusion with respect to the qualifications and training of the BCAP Task Force inspectors?

A.8 We found that the BCAP Task Force inspectors were highly experienced in their respective discipline(s). In addition, all qualification and certification requirements were satisfactorily completed indicating that each inspector had the proper understanding and knowledge of the BCAP program.

Q.9 Please describe BCAP Q.A. overview of BCAP Task Force inspection checklists and instructions.

A.9 Before reinspections could begin, the BCAP Task Force had to develop checklists and instructions to guide the BCAP Task Force inspectors. All checklists and instructions were reviewed and concurred with by BCAP Quality Assurance. Moreover, BCAP Quality Assurance confirmed by surveillance that the checklists and instructions for each population had been appropriately reviewed by Sargent and Lundy, concurred with by BCAP Quality Assurance, and approved for use by the BCAP Task Force Director.

BCAP Quality Assurance performed a surveillance of the reinspection and documentation review verification packages assembled by the BCAP Task Force before each population was released for reinspection. The surveillance included examining a minimum of 10% of the packages for each reinspection sample category. Such examination assured that the appropriate index, references, checklists, instructions, drawings, and documents were included.

The results of reviews were documented. Additionally, quality assurance guidance was provided to BCAP Task Force continuously during the development and evaluation of checklists, and instructions.

Q.10 Do you believe there were any inadequacies in the inspection checklists and instructions used for supports/restraints or piping runs prior to the CAT inspection?

A.10 The CAT findings led to a decision to verify dimensions of vendor supplied catalog items, such as clamps, which constitute parts of hanger assemblies. The BCAP was designed to look at field construction not vendor supplied equipment. While I do not disagree with this change, I would characterize it as an expansion in the scope of the program rather than an inadequacy in the construction and checklists. Similarly, the CAT findings let to a decision to verify attachment location to supplementary steel. I have no quarrel with this change, but I don't think it was essential since the instructions previously called for verification of the location of the support along the piping run.

Q.11 Please describe the BCAP QA overinspection program for piping supports/restraints and piping runs.

A.11 The BCAP Quality Assurance Overinspection/Overview Group performed a minimum of 10% overinspections of the BCAP Task Force inspections in each construction category sample. Individual inspection verification packages were randomly selected by computer for each construction category. The sample selected was kept confidential until the BCAP Task Force completed its inspections in the particular construction category being overviewed. Upon BCAP Task Force completion of reinspections BCAP QA requested copies of the BCAP Task Force inspection results. In addition to the 10% random sample of BCAP Task Force reinspections, one inspection package for each BCAP Task Force inspector not covered by the random sample was overinspected. This process resulted in each BCAP Task Force inspector being overinspected at least once for each construction category that he or she inspected.

The overinspection effort verified the competence of the individual BCAP Task Force inspectors and validated the quality of the entire BCAP Task Force reinspection effort as described later in this affidavit.

Q.12 Describe the qualifications and training of the BCAP QA overinspectors who performed these overinspections.

A.12 The BCAP overinspectors completed required training prior to the time they were certified as inspectors for BCAP Q.A. This training was detailed in applicable procedures and included general orientation and indoctrination, site specific procedure and on-the-job training under actual field conditions. After the BCAP inspectors were certified, their training was maintained current by being updated to applicable procedures as they were revised and issued for use.

The qualification/certification of BCAP Q.A. overinspectors was accomplished by the completion of site qualification requirements relative to the applicable area or areas of certification for individual inspectors. These requirements included applicable training, requisite related experience, general and practical (field) testing, and satisfactory eye examinations. It should be noted that after completion of initial certification, the BCAP Q.A. overinspectors were retested to upgrade them to a new revision of the site qualification/certification procedure. This was accomplished prior to their performance of actual overinspections in the field. The decision to delay overinspections until after the satisfactory completion of retesting, as described in the revised site procedure, was made to assure consistency and continuity for the overall overinspection activity. The overinspectors satisfactorily passed the retesting as described in the revised qualification/certification procedure, including overinspectors who were not employed at the time when the earlier revision of the site qualification/certification procedure was in effect.

BCAP Q.A. inspectors were selected that were highly qualified by virtue of their previous experience in related inspection areas. The average experience of BCAP Q.A. overinspectors was 12.33 years. This experience integrated with site specific training and testing provided a high degree of confidence in the qualifications of the BCAP Q.A. inspectors.

Q.13 When did the BCAP Q.A. overinspections for piping supports/ restraints and piping runs start?

A.13 Overinspection on small and large bore piping runs started on 12/26/84 and 1/9/85 respectively. Overinspections on large bore rigid and non-rigid piping supports/restraints started on 2/1/85 and 2/9/85 respectively. Overinspections on small bore pipe supports started on 2/10/85.

Q.13A Why didn't the support/restraint overinspections start sooner?

A.13A As stated in the answer to question 12 it was decided to upgrade the certifications of the overinspectors prior to their start of work. This decision was made recognizing the Task Force had already started inspection. However, it was felt that having the overinspectors certified to the new upgraded site standard for certification and associated revised implementing procedure would result in having all the inspections performed by the overinspectors above reproach.

Q.14 What was the acceptance criteria for the BCAP QA overinspection effort?

A.14 Agreement percentages of 95% for objective attributes and 90% for subjective attributes were established by BCAP management as acceptable.

The basis for these acceptance criteria was the Byron QC Inspector Reinspection Program which was addressed and accepted by the Licensing Board in the Byron Supplemental Initial Decision, LBP-84-41, 20 NRC 1203 (1984).

Q.15 How were BCAP inspectors' findings compared with the BCAP Q.A. overinspectors' findings?

A.15 The Task Force inspection results were compared with the overinspection results on a checklist attribute level not an individual inspection point basis. That is, an attribute such as bolting which requires verification of a number of sub-attributes, would be considered to be in disagreement of even a single sub-attribute were missed. The sub-attributes for bolting are as follows:

1. Verify that the surfaces of bolted parts in contact with the bolt head and nut do not have a slope of more than 1:20 with respect to a plane normal to the bolt axis.

2. Verify that, when installed, all u-bolts are double nutted unless otherwise noted on the support drawing.

3. Verify that, when installed, all threaded fasteners have locknuts, jamnuts or upset threads.

4. Verify that all bolts or studs are engaged for the full length of the thread in the nut and are tight (check for finger tightness).

A single miss on a single bolt would have caused the entire attribute to be considered in disagreement. Comparisons of BCAP Quality Assurance results were then made against the BCAP Task Force results and the number of agreements/disagreements recorded.

Acceptable checklist attribute combinations were:

BCAP Task Force	BCAP Quality Assurance Overinspection/Overview Group
Accept	Accept
Reject	Reject
*Reject	Accept

Unacceptable checklist attribute combination:

Accept	Reject

*Task Force is in the conservative direction

Q.16 What were the results of the BCAP Q.A. overinspections for piping support restraints and piping runs?

A.16 The results for the piping runs (configurations) and for pipe supports/restraints are as follows:

Construction Category	Packages Overinspected (%)	Objective (%)	Subjective (%)
Acceptance Criteria		95	90
Small bore pipe configuration	17	100	N/A
Large bore pipe supports (rigid)	18	99	100
Large bore pipe supports (non-rigid)	23	98	96
Large bore pipe configuration	23	100	N/A
Small bore pipe supports	16	99	100

Q.17 Were there any individual BCAP inspectors who did not meet the 95/90 acceptance criteria?

A.17 The 95% objective 90% subjective acceptance criteria were intended to apply to the summation of all the BCAP Task Force inspectors' work in each construction category. They were not intended to apply to an individual inspector's work. However, to answer the question, there were two inspectors who performed a limited amount of inspections in the large bore pipe support (non-rigid) construction category and one inspector who performed a limited amount of inspection in the small bore pipe support construction category who did not perform at the 95 objective 90 subjective criteria for this category. Inspector PJT, whose overall inspection rate was 96.6% objective and 99.5% subjective, missed 1 out of 13 objective calls and 1 out of 5 subjective calls on the single pipe support package. An S & L evaluation of these disagreements showed negligible reduction in design capacity. These conditions were not considered significant.

Inspector RJA, whose overall inspection rate was 94.1% objective and 98% subjective, missed 1 out of 1 objective call and 1 out of 5 subjective calls. Both attributes were related to the same pipe support package and were of the welding type. S & L evaluation of these disagreements showed negligible reduction in design capacity. Therefore this condition was not considered significant. Inspector PSJ, whose overall inspection rate was 97.1% objective and 99.6% subjective, missed 1 out of 10 objective attributes in the small bore pipe support construction category. S & L evaluation of this disagreement showed negligible reduction in design capacity. Therefore this condition was not considered significant.

Q.18 What is your opinion of the quality of these inspector's work?

A.18 I believe these inspectors performed quite well.

Q.19 Why?

A.19 The items missed viewed against their total record of inspections is acceptable. It appears the items missed were isolated events and do not represent problems.

Q.20 What basis is there for believing that the BCAP QA overinspectors' results are an appropriate yardstick with which to measure the BCAP Task Force inspectors performance?

A.20 In addition to the above described experience training and certification programs, an overinspection validity review was conducted. This review was undertaken in order to ensure the overall effectiveness of the overinspection program. In particular, proven methodologies often used in industrial psychology and human factors engineering to examine and improve the effectiveness of workers were used.

As part of the overinspection validity review a performance evaluation program was conducted in accordance with guidance provided by an industrial psychologist. The Performance Evaluation Program (PEP) was initiated to determine the extent to which an overinspector would agree or disagree with the initial inspection results of the original inspector.

Within the PEP, inspection packages which contained inspection rejects which had been altered to inspection accepts were provided to the BCAP QA overinspectors as part of their normal work. During the preparation of the PEP package, the original observation was removed, all references to the observation were eliminated and the applicable attribute(s) on the checklist were altered from reject to accept. Copies of the altered inspection packages were then produced and put into the overinspection file drawer from which they were assigned to overinspectors. As far as the BCAP QA overinspectors were concerned, they were receiving a regular BCAP Task Force inspection package. Once the overinspection had been completed, the overinspector prepared the paperwork documenting the overinspection results.

Overall, 13 PEP packages containing 25 altered attributes were overinspected. Of these 25 altered attributes, the overinspectors accurately identified the correct state of 24 of the altered attributes. Additionally, beyond the scope of the performance evaluation program, the overinspectors identified 10 originally accepted attributes that the overinspectors then rejected. Such a high level of concordance with the actual results suggests that the overinspectors did not demonstrate a bias to accept the findings of the original BCAP Task Force inspectors. In fact, the overinspectors were extremely effective in being able to identify and reject any attribute that should have been rejected by the BCAP Task Force.

Q.21 Mr. Smith, are you familiar with the NRC Construction Assessment Team ("CAT") Finding that the BCAP inspection effort needed to be improved in the areas of supports/ restraints and piping runs?

A.21 Yes, I am familiar with the NRC Construction Assessment Team Findings regarding the need to improve the BCAP Task Force inspections in the area of supports/restraints and piping runs.

Q.22 What, if anything did BCAP QA do in response to their inspection Finding?

A.22 BCAP QA pursued its previously planned overinspection activity as stated in answer 13. The overinspection process is described in answer 11.

Q.23 In his deposition on October 31, 1985 NRC Staff Project Inspector Ron Gardner stated that he would have to speculate as to the cause of the deficiencies identified by the CAT, but that "it was probably due to going too fast." (TR 158) He also said, "it was sloppiness as much as anything", (TR 159). Please comment on these statements.

A.23 I believe Mr. Gardner was talking about the cause of the BCAP Task Force inspection errors identified in the CAT report. I don't think he was talking about the BCAP Task Force inspection activities as a whole. Whenever a QC inspector makes a mistake, it is reasonable to speculate that the inspector may have been going too fast or was just sloppy in making such a mistake. I think the BCAP Task Force inspectors initially wanted to do a good job fast. In the beginning this project was estimated for completion by December, 1984 which is when the BCAP Task Force inspections really were getting started in a meaningful way. The BCAP Task Force inspectors were aware of the schedule. Prior to the CAT inspection, I don't think they were as aware as they later became of the intense review they were going to be subjected to. The combination of the Construction Assessment Team review along with IEOG's, NRC's and BCAP QA's reviews caused the BCAP Task Force inspectors to make sure all of their inspections were as good as they could possibly be.

Q.24 Please summarize BCAP QA's conclusion with respect to the adequacy of BCAP inspections of piping supports/restraints and piping runs.

A.24 I believe the BCAP Task Force inspectors did a very professional job in inspecting the piping supports/restraints and piping runs. My belief is based on discussions with the BCAP QA overinspectors who overinspected the Task Force work and on the analytical results previously described.

Q.26 Does this complete your affidavit?

A.26 Yes.

RESUME

PERSONAL:

Name: Neil P. Smith
Social Security No.: 361-38-8104
Employe No.: 769-190
Birth Date: June 24, 1945
Address: 9859 S. Bell
Chicago, IL 60643
Phone: (312) 233-3327

EDUCATION:

Lane Technical High School, Chicago, IL
College Preparatory Program, Graduated June 1963

University of Illinois, Urbana, IL
Graduated January 1968 with BSEE

University of Chicago
Graduate May 1977 with MBA

MILITARY SERVICE:

None

EMPLOYMENT EXPERIENCE:

January 1968 - August 1968

Commonwealth Edison - General Office Industrial Relations Dept. Job Title: Engineer. Primary Duties: Observe the activities and functions of departments within Commonwealth Edison.

August 1968 - January 1970

Commonwealth Edison Company - Division Engineering, Chicago North Division. Job Title: Engineer. Primary Duties: Field Engineering relating to the design of distribution facilities

January 1970 - March 1974

Commonwealth Edison Company - Distribution Engineering, General Office. Job Title: General Engineer. Primary Duties: Worked on special studies concerning the distribution system addition. Planning Section, planning for large distribution capacity additions.

March 1974 - September 1974

Commonwealth Edison Company - Division Engineering, Northern Division. Job Title: General Engineer. Primary Duties: Supervised the field design work for new business distribution facilities.

September 1974 - June 1976

Commonwealth Edison Company - Area Engineering Northwest Area. Job Title: Area Engineer. Primary Duties: Supervisor of Area Engineering Department.

June 1976 - November 1977

Commonwealth Edison Company - Quality Assurance, General Office. Job Title: Senior Engineer. Primary Duties: Lead Electrical Inspector, Braidwood Station.

November 1977 - April 1984

Commonwealth Edison Company - Station Nuclear Engineering Department, General Office. Job Title: Supervising Design Engineer. Primary Duties: Various assignments which include but not limited to the following:

1. Responsible for the Dresden 1 Reactor Protection System and Post Accident Monitoring System Upgrade.

2. Managed the Systematic Evaluation Program (SEP) for Dresden 1 and 2. Represented Commonwealth Edison at the SEP Owner's Group and was Group Chairman during 1981.

3. Managed the Operating plants (D, QC, and Z) environmental qualification (EQ) program for electrical equipment. Represented CECo at the EQ legal group meetings and was a member of the steering group.

4. Managed CECo's efforts for installing the Emergency Off-Site Facilities for the operating plants and LaSalle.

5. Coordinated some of CECo long term TMI activities such as SPDS for operating plants and LaSalle, response to Reg. Guide 1.97 and NUREG 0737.

6. Member of INPO's NUTAC's for SPDS, Reg. Guide 1.97, and Emergency Response Facilities.

7. Zion Project Engineer - Responsible for all major and safety-related engineering projects for the Zion Nuclear Power Plant.

8. CECo Technical Advisory Committee representative to the EPRI Seismic Hazards program and limited stand-in to the Executive committee for the program.

April - Present

Commonwealth Edison Company - Quality Assurance, General Office. Job Title: General Supervisor Q.A. Primary Duties: Review of BCAP program results and interfacing with NRC and IE OG.

OTHER EMPLOYMENT EXPERIENCE:

1981 - Present

CE representative to the Seismic Qualification Utility Group. Chairman of the group since formation.

1983 - Present

CE representative to EPRI Advisory Committee on seismic equipment qualification. Chairman of the group since formation.

December 1984 - Present

CE representative to EPRI Seismic Center working group.

Professional Development	Certification (ANSI N45.2.6 ANSI N45.2.23)
8 Hour Auditor Training, Quality Assurance, May 1984	Auditor, 8-24-84
8 Hour Codes and Standards Seminar Quality Assurance, Sept. 1984	Level II Q.A. Inspector 10-21-85

PROFESSIONAL CERTIFICATION:

Professional Engineer State of Illinois Cert #62-30650

Professional Societies

IEEE (member)
Power Society
Industrial Applications Group

COMMONWEALTH EDISON COMPANY COURSES:

a. Review of Engineering Practices and Calculations
b. Fundamentals of Digital Computers
c. Introduction to Conversational Programming
d. Engineering Economics
e. Law of the Layman
f. Commonwealth Edison in Perspective
g. Basic Supervision Program
h. Instructor Training Course
i. Westinghouse Surge Protection of Power Systems
j. Utiliterains
k. Management Coaching
l. Zion Systems Course

Neil P. Smith, 12/16/85
Name Date

Q.A. CONTENTION ITEM 13.B

13. Contrary to Criterion XVII, "Quality Assurance Records," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that sufficient records were maintained to furnish evidence of activities affecting quality. The records are to include at least the following: results of reviews, inspections, tests, audits, monitoring of work performance, and materials analyses. Applicant has failed to make such records identifiable and retrievable.

B. Sargent & Lundy Engineers calculations which provided the original justification for the factor design methodology and magnitude were not retrievable. (Inspection Report 84-43/39, Exh. 19.)

MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. The supporting structural steel members for pipe hangers must be custom designed to meet a very large variety of design and installation conditions. There is a standard set of engineering equations for determining allowable stresses which is used in such custom design. [Affidavit of Kenneth T. Kostal, pp. 2-3 (hereafter "Kostal Affidavit, p. _____")]

2. When the original piping system design approach was being developed, it was impracticable to rely on detailed engineering calculations for each hanger because of the time consuming nature of the process. (Kostal, p. 1.)

3. S&L developed an abbreviated process for the design of pipe hangers which made the design calculation for each hanger easy and short. This method, called the phi factor method, utilized a derating factor, namely the phi factor for use with code allowable stress in the design process. The phi factor depended on various design and installation parameters. (Kostal, pp. 1-2.)

4. Each individual pipe hanger support will have unique design and installation constraints, such as static and dynamic design loads, type and configuration of structural member, installation geometry, and location. S&L's phi factor method grouped pipe hangers into a small number of sets by similarity or relatedness of constraints. Within each group, a set of worst case constraints were chosen and allowable stresses calculated for that set of constraints. The allowable stresses calculated for such worst case conditions established lower bounds on the code allowable stresses for supports within the particular group. The ratio of the lower bound allowable to the allowable for an idealized installation, for which calculations were easy, was called the phi factor. The designer of each individual hanger merely looked in S&L Design Standard SDS-E37, determined which group his hanger fell into, did the idealized simple calculation, and derated it by the phi factor. (Kostal, pp. 1-3.)

5. As a result of the NRC inspection reported in Inspection Report 84-43/39, S&L determined that the controlled documented calculation book supporting the phi factor could not be found. Photocopies of individual sections were, however, retrieved from the files of individual designers, but these did not reconstitute the entire book. (Kostal p. 3.)

6. Supporting documentation and calculations for all other structural design standards could be retrieved. (Kostal p. 3.)

7. S&L recreated the phi factor supporting calculations. This effort verified the validity of the original phi factors. Associated calculations extended the range of validity. These calculations showed that the existing phi factors were valid for all as-built conditions at Braidwood. (Kostal, pp. 3-4.)

8. The results of the new calculations were incorporated into a revised design standard. All installed supports were reviewed for compliance with the revised standard. No hardware modifications were required. (kostal, p. 3.)

9. Because of advances in computer technology, S&L no longer uses the phi factor methodology except for occasional preliminary sizing of supports. (Kostal, p.4.)

10. The absence of the calculations was not significant. S&L verified that the phi factor methodology was sound and that installed hanger supports were properly designed. (Kostal, p. 5.)

11. S&L is microfilming all technical support documentation for all structural engineering design standards to assure retrievability. (Kostal, p.5.)

12. Inspection Report Nos. 50-456/85-40 (DRS) and 50-457/85-39 (DRS) issued on Novembe 22, 1985 docuemnt that the NRC closed this discrepancy. The reprts found that all supports designed using the phi factor methodology were either reviewed for compliance with new

parameters or were verified through performance of design calculations. It also found that the results of a review of other technical support documentation to assure design basis retrievability were acceptable. (Kostal, p.3.)

DISCUSSION

Rorem QA Contention Item 13.B alleges in substance that Edison violated Appendix B, Criterion XVII, "Quality Assurance Records" by failing to maintain in a retrievable state records evidencing activities affecting quality. As an example, Rorem cites the failure of S&L to be able to retrieve original calculations supporting the phi factor design methodology.

There is no doubt that the originals of the calculations supporting the phi factors were important records. Nevertheless, various excerpts from these records were found in the files of individual design engineers, leaving no room for doubt that the original controlled calculations book had been in place but had been lost.

The phi factors were derating factors for code allowables for strength and sizing calculations for hanger support members. They were derived from worst case limiting conditions for each of several groupings of design and installation constraints for hanger supports. The factor was used to calculate an applicable code allowable stress for design and installation conditions which fell within the parameters of a grouping.

S&L redid the calculations to assure that the phi factors were valid. These calculations, plus some additional case by case exact calculations for unusual configurations, showed not only that the phi factors were valid, but that in fact their applicability could be

extended to cases not encompassed by the original grouping. S&L modified its standards to reflect these new results, but no hanger support modification resulted.

S&L was unable to determine why the controlled calculation book supporting the phi factor methodology was not retrievable. However, S&L determined that all calculations and support documentation for all other structural design standards were retrievable. Thus, the lack of retrievability of the phi factor calculations was an isolated instance. Further, re-creation of the calculations produced no hardware modifications. Nevertheless, S&L is microfilming all technical support documentation for structural design standards to preclude any possibility of further problems with retrievability.

The lack of retrievability of phi factor support calculations was an isolated case. There was no suggestion of a widespread problem with respect to retrievability of technical support documentation in general. The problem had no safety or hardware implications. Moreover the NRC has closed this item. The NRC found that all supports designed using the phi factor methodology were either reviewed for compliance with new parameters or were verified through performance of specific detailed design calculations. It also found that th results of a review of other technical support documentation to assure design basis retrievability were acceptable. Under these circumstances, this situation constituted an isolated minor failure not indicative of any problem with Quality Assurance. Edison is therefore entitled to summary disposition on this issue as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF KENNETH T. KOSTAL
(on Rorem Q.A. Subcontention 13.B)

Kenneth T. Kostal, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Kenneth T. Kostal

Kenneth T. Kostal

Subscribed and Sworn before me
this 19th day of December 1985

Karen Kalafatis
Notary Public

My Commission expires on 9/17/89

0592H

TESTIMONY OF KENNETH T. KOSTAL
(ON ROREM Q.A. SUBCONTENTION 13.B)

Q.1. To which contention item is this testimony item addressed?

A.1. QA Contention Item 13.B. The text of this contention item is as follows:

Sargent & Lundy Engineers calculations which provided the original justification for the phi factor design methodology and magnitude were not retrievable. (Inspection Report 84-43/39, Ex. 19.)

Q.2. What is the factor design methodology?

A.2. The phi factor design methodology is a shorthand approximate calculation method which was used in designing structural steel support members for pipe hangers. Sargent & Lundy developed this method to allow rapid calculation of conservative lower bounds for code allowable stresses in supports based on sets of limiting installation or design conditions. Use of this lower bound methodology avoided the necessity of making a detailed engineering analysis of the allowable stress for each hanger. The phi factor is a derating factor for an allowable stress to account for the worst limiting conditions in a given design and installation category. S&L Design Standard SDS-E37 sets forth the phi factor methodology.

Each individual pipe hanger may have unique design and installation considerations such as design loads, both static and dynamic, type of structural member, whether I beam, channel, or other, pipe configuration, location, orientation to support member, and others, all of which must be considered to determine

allowable stresses on supporting members. There is a standard set of engineering equations for determining allowable stresses. Using these equations, unique members are designed to comply with the code allowable stresses.

The S&L structural engineering department developed a standardized method of sizing support members using the method of comparison to allowables but which did not require detailed analysis for each support. First, the designers chose an ideal hanger support configuration for which the allowables equation was worked out. Then actual design and installation conditions were grouped by similarities. For each of about a dozen major groups, a set of limiting design inputs and installation conditions was chosen which was thought to give a worst case situation for that group. From the worst case conditions the engineer calculated a worst case dimensionless derating factor, a number less than one called a phi factor, which could be used to reduce the idealized code allowable stress for a set of design conditions which fell into the specific group

The designer for each individual hanger support would then review SDS-E37 and determine which group of design and installation conditions the particular hanger fell into. For his calculation of required dimensions, he simply multiplied the phi factor for the particular group by the allowable stress for the idealized design and installation conditions to determine a new derated

allowable stress. He then sized the support member accordingly for the required strength.

Q.3. What was the problem with phi factor documentation to which Inspection Report 84-43/39 referred?

A.3. In the course of routine review of S&L's design documentation, NRC inspectors requested the original calculations deriving the phi factors. Photocopies of various segments of the calculations were retrieved from individual designers' files. However, the controlled documented calculation book was not retrievable.

Inspection Report Nos. 50-456/85-40 (DRS) and 50-457/85-39 (DRS) issued on November 22, 1985 document that the NRC has closed this item. The reports found that all supports designed using the phi factor methodology were either reviewed for compliance with new parameters or were verified through performance of specific detailed design calculations. It also found that the results of a review of other technical support documentation to assure design basis retrievability were acceptable.

Q.4. Was S&L ever able to determine why the complete original calculations could not be produced?

A.4. No.

Q.5. Were any other calculations missing?

A.5. S&L performed a review of all other documentation supporting structural design standards. Adequate documentation was retrievable for all other standards.

Q.6. What action did S&L take as a result of discovering that the complete phi factor calculations could not be retrieved?

A.6. After it became clear that the complete phi factor documentation could not be produced, S&L recreated the phi factor support calculations to assure that the validity of design of all installed hangers could be demonstrated. For a few installed hangers there were minor ambiguities as to whether the support fell into one of the groups of upper bound conditions. For these few individual hanger supports S&L also did exact calculations. The recreated calculations verified the validity of the original phi factors. The isolated exact calculations showed that the ambiguities about the applicability of the phi factors were resolved and that the conditions under which the phi factors could be applied were broader than had been understood and encompassed all as built configurations at Braidwood. As a result of these calculations S&L made minor modifications to standard E37 to incorporate explicitly the upper bound conditions applicable for each phi factor.

Q.7. Did the revision of SDS-E37 have any impact on installed supports at Braidwood?

A.7. No. All supports were reviewed for compliance with the revised standard. No modifications of any support resulted from any of the reanalysis or modifications to design standards.

Q.8. Does S&L still use the phi factor methodology for pipe hanger support member design?

A.8. No. S&L has in operation a computer design program which takes into account all design parameters when determining the capacity of each hanger component, assuring that they meet code allowable stresses. Thus, use of the phi factor methodology is no longer necessary. However, S&L occasionally uses the phi factor methodology for preliminary sizing of supports/members.

Q.9. Was the instance of missing support calculations reported in Inspection Report 84-43/39 significant?

A.9. No. As I have previously indicated, S&L verified that the methodology was sound and that all hanger supports are properly designed. In addition, S&L has verified that the absence of the supporting calculations was an isolated instance by checking for the presence of supporting documentation in all other design standards.

Q.10. What corrective action has been taken to assure that the problem of missing documentation for structural design standards does not recur?

A.10. Technical support documentation for all Structural Engineering Design Standards has been reviewed for adequacy and has been microfilmed or is currently scheduled for microfilming.

Rorem QA Contention Item 14B

Rorem QA Contention Item 14B states in tis entirety:

14. Contrary to Criterion XVIII, "Audits," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that a comprehensive system of planned and periodic audits is carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program. The Applicant also failed to ensure follow-up action, including readuit of deficient areas.

B. A special NRC QA inspection reported May 7, 1984 that:

* Mechanical contractor Phillips, Getschow, Co. has not established and executed a plan for auditing the implementing procedures of the quality assurance program on a period (sic) basis to determine the effectiveness of the program in accordance with the Phillips, Getschow QA Manual.

* Electrical contractor L.K. Comstock Co./L.K. Comstock Engineering Company auditing activities neither conformed with the comprehensive annual schedule of planned and periodic audits established as required by QA Program Manual Section 4.14.1, nor did they verify compliance with all aspects of the Quality Assurance Program.

* HVAC contractor Pullman Construction Industries, Inc. did not meet their yearly schedule for audit activities required by their QA Manual, Section 18, in that the following implementing procedure 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

* Edison'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.

(Inspection Report 83-09, Exhibit 5.)

STATEMENT OF MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE

1. The four examples of non-compliance listed in Rorem QA Contention Item 14B can only be regarded as representing one violation of Criteria XVIII of 10 CFR Part 50, App. B. (Affidavit of Thomas E. Quaka on 14B, "Quaka Affidavit on 14B at p. 10).

2. During the summer of 1983, the NRC Staff identified one item of non-compliance based on four examples of violations of Criterion XVIII of 10 CFR Part 50, App. B. by the mechanical contractor Phillips Getschow ("PGCo"), the electrical contractor L.K. Comstock Company and the HVAC contractor Pullman Sheet Metal. The item of non-compliance documented in Inspection Report Nos. 50-456/83-09; 50-457/83-09 was that none of the above contractors was scheduling or auditing applicable elements of their Quality Assurance Programs, including Manual Sections and active implementing procedures on an annual basis. In addition, the L.K. Comstock site Quality Assurance organization was not meeting its annual audit schedule. The foregoing constituted three of the four examples cited in the item of noncompliance (Quaka Affidavit on 14B at pp. 3 and 10.)

3. The NRC Staff based this aspect of the item of non-compliance on its interpretation of the implementing guidance for 10 C.F.R. Part 50, Appendix B found in Regulatory Guide 1.144-1980. Regulatory Guide 1.144-1980 requires that "applicable elements of an organization's QA Program should be audited at least annually." (Quaka Affidavit on 14B at pp. 3 and 4)

4. Commonwealth Edison did not share the NRC Staff's interpretation of Regulatory Guide 1.144-1980 at the time the Staff identified the item of non-compliance. This differing interpretation had been passed on to the three Braidwood site contractors and was the basis for the first three examples cited in the item of non-compliance listed in Rorem Contention 14B. It is the root cause for the three examples of the violation of Criterion XVIII set forth in Subcontention Items 14.B.1, 14.B.2 and 14.B.3. (Quaka Affidavit on 14B at p. 4.)

5. At the time the item of non-compliance was identified, Commonwealth Edison deemed it appropriate to adopt the NRC Staff's interpretation of Regulatory Guide 1.144-1980 and directed PGCo, L.K. Comstock and Pullman to take corrective actions to comply with this newly adopted interpretation. The effectiveness of the corrective actions taken by these contractors to resolve their respective aspect of the item of non-compliance has been independantly verified by Commonwealth Edison Quality Assurance and the NRC Staff which has closed out each example constituting the respective portion of the item of non-compliance. (Quaka Affidavit on 14B at pp. 4-8; Affidavit of Scot F. Forbes at p. 5-6; Affidavit of Thomas E. Quaka on 14B.2 at p. 7-9; Affidavit of Conrad L. Holt at pp. 6-7.)

6. No similar items of non-compliance have been issued against Commonwealth Edison or its site contractors at Braidwood since the identification of this one item of non-compliance in the summer of 1983. (Quaka Affidavit on 14B at p. 11)

7. Three examples of a violation of Criterion XVIII which were identified at one time, which have a single, common root cause and which have subsequently been satisfactorily resolved do not represent a trend c^f recurrent violations. (Quaka Affidavit on 14B at pp. 10-11)

8. The remaining example of an asserted violation of Criterion XVIII listed in Rorem Subcontention 14.B.4, relating to inadequate Commonwealth Edison audits of PGCo small bore instrumentation and piping support selection activities is not a violation. Rather, it is established that Site Quality Assurance began its audit activities in a time frame consistent with the start of the activity, performed comprehensive audits on a planned and periodic basis, identified support calculation deficiencies and instituted timely follow-up to verify corrective action. The NRC Staff inspector responsible for this aspect of the item of noncompliance was simply mistaken regarding the dates on which audits of those activities began. The NRC Staff has never responded to Commonwealth Edison's assertion that its audits of PGCo small bore instrumentation and piping support selection should not be deemed a violation of Criterion XVIII. This example of the item of non-compliance can not be counted in the assessment of whether a pattern of violations exists. (Quaka Affidavit on 14B at p. 11)

DISCUSSION

Rorem Contention Item 14B lists four separate examples of a single item of non-compliance which was identified by the NRC Staff and documented in Inspection Report Nos. 50-456/83-09 and 50-457/83-09. These four instances are alleged to collectively demonstrate a failure on the part of Commonwealth Edison to comply with the requirements of Criterion XVIII of Appendix B to 10 C.F.R. Part 50 which requires 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.

As the attached affidavits of Messrs. Quaka, Forbes and Holt amply demonstrate, the three examples of the one item of non-compliance listed in parts one, two and three of Subcontention 14B properly constitute only one violation of Criterion XVIII. With regard to these items, the NRC Staff identified the same violation during the same inspection for the three contractors involved. Moreover, as the affidavit of Thomas E. Quaka on Contention Item 14B establishes, at the time the three examples of this one violation were identified by the Staff, Commonwealth Edison Quality Assurance had not adopted the Staff's interpretation of Regulatory Guide 1.144-1980 to achieve compliance with Criterion XVIII. This Commonwealth Edison interpretation was passed on to its Braidwood site contractors, thus resulting in the now acknowledged violations of Criterion XVIII. Each violation had the same root cause. However, once Commonwealth Edison adopted the NRC Staff's interpretation and the contractors involved undertook effective corrective actions, as independently verified by both Commonwealth Edison and the NRC Staff, the

violation was resolved. This isolated occurrence of a violation of Criterion XVIII which has been subsequently resolved does not represent a trend of recurrent violations merely because the cause of the violation affected more than one contractor.

The item of non-compliance listed in Rorem Subcontention 14.B.4, relating to inadequate Commonwealth Edison audits of PGCo small bore instrumentation and piping support selection activities is not a bona fide item of non-compliance. Rather, Commonwealth Edison began its audit activities in a time frame consistent with the start of the activity, Site Quality Assurance performed comprehensive audits on a planned and periodic basis, identified support calculation deficiencies and instituted timely follow-up to verify corrective action. The NRC Staff has never required Edison to take any action as a result of the non-compliance listed in 14B.4, suggesting that it agrees this is not an item of non-compliance. Accordingly, this asserted violation of Criterion XVIII can not be counted in the assessment of whether a pattern of violations exists.

Finally, no similar items of non-compliance have been issued against Commonwealth Edison or its site contractors at Braidwood since the identification of the four alleged violations of Criterion XVIII listed in Contention Item 14B. The undisputed facts demonstrate that the one acknowledged violation of Criterion XVIII identified in the NRC inspection report referenced in Contention Item 14B has been proven to be an isolated occurance for which Edison and its site contractors have taken effective corrective action to prevent recurrence of similar

non-compliance. This isolated instance cannot represent an adverse trend in the conduct of comprehensive audits by Edison or its site contractors at Braidwood. Edison is therefore entitled to summary disposition in its favor on Contention Item 14B in its entirety as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF THOMAS E. QUAKA
(on Rorem Q.A. Subcontention 14B)

Thomas E. Qu ca, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Thomas E. Quaka
Thomas E. Quaka

Subscribed and Sworn before me
this 20th day of December 1985

Dilene L. Loma
Notary Public

My Commission Expires April 19, 1988

My Commission expires on______.

0576H

TESTIMONY OF THOMAS E. QUAKA
(ON ROREM Q.A. SUBCONTENTION 14B)

Q.1. Please state your full name and business address for the record.

A.1. Thomas E. Quaka, Braidwood Nuclear Station, Braceville, Illinois 60407.

Q.2. By whom are you employed and in what capacity?

A.2. I am employed by Commonwealth Edison Company as Site Quality Assurance (Q.A.) Superintendent at the Braidwood Nuclear Station. In this capacity, I am responsible for assuring that Commonwealth Edison's Quality Assurance Program is properly implemented at the Braidwood site. As such, I have knowledge of Commonwealth Edison's comprehensive program of planned and periodic auditing for verifying Commonwealth Edison and site contractor compliance with their respective Quality Assurance Programs and for determining the effectiveness of all aspects of those Quality Assurance Programs at the Braidwood site. I am also familiar with the Braidwood site contractor's Quality Assurance Programs and audit programs.

Q.3. Please describe your educational background and work experience.

A.3. I have been employed by Commonwealth Edison since August 1972. Since March 1984, I have been assigned to Braidwood as Site Q.A. Superintendent. From December 1978 through March 1984, I was assigned to the LaSalle County Nuclear Station also as Site Q.A. Supervisor/Superintendent. At LaSalle, I also was responsible for assuring proper compliance with the implementation of the Commonwealth Edison and site contractor Quality Assurance

Programs. Prior to that, from June 1978 through November 1978, I was assigned to Braidwood as Site Q.A. Supervisor. Prior to that, I was a part of Commonwealth Edison's Station Nuclear Engineering Department, assigned to the Dresden and Quad Cities Nuclear Stations engineering group. I have a Bachelor of Science degree in Mechanical Engineering from the University of Illinois and a Masters degree in Business Administration from the University of Chicago.

Q.4. What is the purpose of your testimony?

A.4. The purpose of my testimony is to support Commonwealth Edison's Motion for Summary Disposition of Rorem Q.A. Subcontention 14B. Specifically, in this testimony I will address the background of Commonwealth Edison's involvement in verifying and ensuring the effectiveness of those aspects of the Braidwood site contractors' audit programs which have been challenged in Rorem Q.A. Subcontention 14B, parts one, two, and three. My testimony will also address whether the four aspects of the items of non-compliance listed in Rorem Q.A. Subcontention 14B, when viewed together, are indicative of an adverse pattern of similar recurrent violations in the conduct of comprehensive audits by Commonwealth Edison or its contractors at Braidwood. In a separate piece of testimony, I have addressed the corrective actions L.K. Comstock took as a result of the NRC Staff example of the item of non-compliance contained in Rorem Q.A. Subcontention 14B, part 2.

Q.5. Mr. Quaka, please describe the basis of the concerns identified in Rorem Q.A. Subcontention 14B, parts one, two, and three.

A.5. The NRC Staff identified the concerns referred to in these parts of Subcontention 14B during an inspection conducted in the summer of 1983 and documented in Inspection Report Nos. 50-456/83-09 and 50-457/83-09. During their inspections, NRC Inspectors noted that (1) PGCo's Braidwood site internal audit schedule did not specifically establish a plan for auditing the implementing procedures of the PGCo Braidwood site Quality Assurance Program on a periodic basis to determine the effectiveness of the Program in accordance with PGCo's Quality Assurance Manual; (2) that electrical contractor, L. K. Comstock Company/L. K. Comstock Engineering Company's ("L.K. Comstock's") auditing activities neither conformed with its established comprehensive annual schedule of planned and periodic audits as required by its Q.A. Program Manual Section 4.14.1, nor did L.K. Comstock verify compliance with all aspects of its Quality Assurance Program; and (3) that HVAC contractor, Pullman Construction Industries, Inc. ("PCI") did not meet its yearly schedule for audit activities required by its Q.A. Manual, Section 18, in that four specific Braidwood site implementing procedures were not audited. The NRC Staff considered these three items to constitute separate examples of one severity Level 4 item of noncompliance and a violation of 10 CFR 50 Appendix B, Criterion XVIII and the implementing guidance for Criterion XVIII contained in Regulatory Guide 1.144-1980. Regulatory Guide 1.144-1980 requires that "applicable elements of an organization's Q.A. Program should be audited at least annually". The NRC Staff believes that in order to comply

with Criterion XVIII both the Braidwood contractors' Quality Assurance Manuals and their active Braidwood site implementing procedures should be scheduled and audited annually under this guidance.

Q.6. Mr. Quaka, do you agree that this item of non-compliance was properly assessed?

A.6. Yes, I believe the NRC Staff's interpretation of Criterion XVIII implemented by Regulatory Guide 1.144-1980 justifies the item of non-compliance in each instance.

However, prior to the issuance of this item of non-compliance, Commonwealth Edison's Quality Assurance organization interpreted Criterion XVIII of 10 C.F.R. 50, Appendix B, as implemented by Regulatory Guide 1.144-1980, to require its Braidwood site contractors to annually schedule and audit their applicable Quality Assurance Manual sections along with selected contractor implementing procedures in use at the Braidwood site. Typically, the implementing procedures which were most actively used by a contractor were chosen for audit. At the time, this was believed to be a valid interpretation. However, after the matter was brought to Commonwealth Edison's attention at the time of the NRC Staff's inspection and identification of the non-compliance, Commonwealth Edison deemed it appropriate to adopt the NRC Staff's interpretation of Regulatory Guide 1.144-1980, that its Braidwood site contractors are required to annually schedule and audit all applicable elements of their Quality Assurance Programs, including all active Manual Sections and active Braidwood site implementing

procedures. Given the NRC Staff's interpretation of Regulatory Guide 1.144-1980 and its adoption by Commonwealth Edison, the facts indicate the following.

With regard to PGCo, the PGCo Braidwood site internal audit schedule for 1983/1984 did not expressly provide for the audit of all active PGCo implementing procedures. However, despite the lack of formal audit schedule documentation, most active PGCo site implementing procedures were being audited concurrently with scheduled audits of the PGCo Braidwood Quality Assurance Manual Sections to which they were related. Since PGCo's scheduled audit of each Manual section by its nature included an audit of the active implementing procedure or procedures under that section, there was in fact an on-going annual review of active PGCo implementing procedures at Braidwood at the time of the NRC Staff's inspection. The NRC's inspection finding was based on the fact that no formal written PGCo document existing at the time specifically listed or scheduled these procedures for audit. As a result, PGCo could not document that all procedures were being audited on an annual basis.

With regard to L.K. Comstock, L. K. Comstock Corporate Quality Assurance failed to cover all eighteen Criteria of 10 C.F.R. 50, Appendix B as encompassed in the audit of Q.A. Manual Sections and Procedures, from mid-year 1982 through mid-year 1983. Further, the 1983 L. K. Comstock Corporate audit schedule did not provide for annual audit coverage of all eighteen Criteria of 10 C.F.R. 50, Appendix B, as was required by L.K. Comstock Procedure

3.1.4. In addition, although L.K. Comstock site Quality Assurance was operating under a 1983 audit schedule which incorporated audit requirements for active L.K. Comstock Braidwood site implementing procedures, L. K. Comstock site auditors had performed only five of the seventeen 1983 scheduled audits at the time of the NRC Staff's inspection and were not complying with the established 1983 site audit schedule.

With regard to PCI, at the time of the NRC Staff's inspection, internal audits of Pullman Sheet Metal ("Pullman") site activities at Braidwood were conducted by PCI's Corporate Quality Assurance Department. Internal audits were conducted by PCI at Braidwood on April 28-29, 1982 and April 4, 1983. These audits assessed the Pullman Braidwood site Quality Assurance Program against the eighteen Criteria of 10 C.F.R. 50 Appendix B, as required by Pullman Quality Assurance Manual, Section 18. Section 18 did not specifically require that all active Pullman site implementing procedures be audited on an annual basis. As a result, the implementing procedures noted by the NRC Inspector were not included by PCI Quality Assurance in its 1982 or 1983 Braidwood site audits. It should be noted with regard to PCI, that the NRC did not include one of the five procedures originally identified as not audited, B.9.4.F "Installation Procedure," in its actual notice of violation on the PCI item of non-compliance.

Q.7. What corrective action was taken by Commonwealth Edison to remedy the acknowledged item of non-compliance?

A.7. Commonwealth Edison took both immediate and long-term steps to remedy the item of non-compliance and to bring its Quality Assurance Program at Braidwood into compliance with agreed upon NRC requirements. Initially, Commonwealth Edison Site Quality Assurance directed the contractors involved to take steps to perform 1983 audits of the specific areas noted by the NRC Staff as unaudited in the item of non-compliance. Second and more encompassing, Site Quality Assurance directed PGCo, L.K. Comstock and Pullman to take lasting procedural steps to annually schedule and audit all aspects of their Quality Assurance Programs, including all applicable Manual sections and active Braidwood site implementing procedures. I should point out, that the way the L.K. Comstock Quality Assurance Manual is structured, this entails auditing the 18 Criteria of 10 C.F.R. 50, Appendix B, annually.

Q.8. Mr. Quaka, have the contractors involved in the item of non-compliance taken the requisite corrective action?

A.8. Yes, the testimony of Messrs. Forbes and Holt as well as my separate testimony with regard to L. K. Comstock describe the actions that were taken by PGCo, L. K. Comstock, and Pullman at the direction of Commonwealth Edison to remedy the NRC Staff's item of non-compliance. In each case, as required by Commonwealth Edison's newly acknowledged agreement with the NRC Staff's interpretation of Regulatory Guide 1.144-1980, the contractor involved undertook immediate corrective action in the form of audits and revised audit schedules and also revised its Quality Assurance procedures to annually schedule and audit all

elements of its Quality Assurance Program, including applicable Manual Sections and active Braidwood site implementing procedures.

Q.9. Do you agree with the conclusions made in those testimonies regarding the adequacy of actions taken by each contractor to remedy the item of non-compliance identified by the NRC Staff?

A.9. Yes, I do. When the item of non-compliance was identified by the NRC Staff, the corrective actions PGCo, L.K. Comstock and Pullman intended to take for the item of non-compliance were reviewed by Commonwealth Edison Site Quality Assurance, in consultation with Corporate Quality Assurance, and submitted in response to the NRC Staff. Subsequent to this, Site Quality Assurance has performed follow-up audits and surveillances on the acknowledged item of non-compliance to verify that corrective actions and actions to prevent recurrence have been accomplished. The testimony of Messrs. Forbes and Holt as well as my separate testimony presented on L. K. Comstock accurately sets forth the corrective actions taken by each contractor, the fact that Commonwealth Edison Quality Assurance as well as the NRC Staff have concurred in the effectiveness of the corrective action and that the NRC Staff has closed its inspection on the item of non-compliance.

Q.10. Mr. Quaka, has Site Quality Assurance evaluated the impact of the failure of PGCo, L. K. Comstock, and Pullman to annually schedule and/or audit all elements of their Quality Assurance Programs, including active implementing procedures, during the time prior to the time of the NRC Staff's inspection?

A.10. Yes, it has. In the case of L. K. Comstock, a follow-up Surveillance, No. 4852, performed by Site Quality Assurance specifically on the item on non-compliance in September 1985 has confirmed that when the L. K. Comstock Corporate and site audits are examined in combination with Commonwealth Edison Site Quality Assurance audits conducted at Braidwood during the 1983/1984 time frame, all applicable elements of L.K. Comstock's Quality Assurance Program, including active Braidwood site implementing procedures, were effectively being audited. In addition, the NRC electrical Inspector stated in his inspection report that he had reviewed site Quality Assurance audits and surveillances of L.K. Comstock performed prior to his inspection and concluded that these audits provided acceptable coverage of L.K. Comstock Braidwood site activities.

In the case of PGCo and Pullman activities, Site Quality Assurance under my supervision has performed a comprehensive review of Commonwealth Edison audits in combination with audits performed by PGCo or Pullman prior to each identified aspect of the item of non-compliance. The results of the PGCo review indicate that this combination of audits has adequately assured that PGCo Manual Sections and active Braidwood site implementing procedures were effectively audited during the time prior to the identification of the non-compliance. The results of the Pullman review indicate that the combination of Commonwealth Edison audits and Pullman audits have assured that the four Pullman site procedures the Staff identified as not audited solely by PCI were effectively

audited during the time prior to identification of the non-compliance. The NRC Inspector who closed both the PGCo and Pullman aspect of the item of non-compliance also assessed this Site Quality Assurance review and concluded that it was satisfactory for resolving the question of PGCo and Pullman past auditing activities in relation to programatic and regulatory compliance.

Q.11. Mr. Quaka, when all four examples contained in the referenced item of non-compliance listed in Rorem Q.A. Subcontention 14B are viewed together, are they indicative of an adverse trend in the conduct of comprehensive audits by Commonwealth Edison or its contractors at Braidwood?

A.11. No, it is Commonwealth Edison's position that the four examples of the item of non-compliance represent only one acknowledged non-compliance and they do not demonstrate any trend of non-compliances with respect to the program of comprehensive planned and periodic audits implemented at Braidwood by Commonwealth Edison or its site contractors.

With regard to the items contained in Subcontention 14B parts one, two and three, the NRC Staff identified the same violation during the same inspection with regard to the three contractors involved. At the time the three examples of this one item of noncompliance were identified by the Staff, Commonwealth Edison Quality Assurance was not operating under the Staff's interpretation of Regulatory Guide 1.144-1980 to achieve compliance with Criterion XVIII. This Commonwealth Edison interpretation was passed on to its Braidwood site contractors, resulting in the now acknowledged non-compliance. Thus, there is

a common root cause to the three examples of the item of noncompliance set forth in Subcontention 14B, parts one, two and three. However, once Commonwealth Edison adopted the NRC Staff's interpretation and the contractors involved undertook effective corrective actions, as independently verified by both Commonwealth Edison and the NRC Staff, the item of non-compliance was resolved. The isolated issuance of one violation which has been subsequently resolved does not represent a trend of recurrent violations. No similar items of non-compliance have been issued against Commonwealth Edison or its site contractors at Braidwood since the identification of the three examples of this particular item of non-compliance and Commonwealth Edison's correction of the root cause of the violation of Criterion XVIII.

Moreover, as the testimony of Mr. Hunsader set forth, the item of non-compliance listed in Rorem Subcontention 14.B, part four, relating to inadequate Commonwealth Edison audits of PGCo small bore instrumentation and process piping support selection activities is not a bona fide item of non-compliance. Rather, it is a case where Site Quality Assurance performed comprehensive audits on a planned and periodic basis, identified support calculation deficiencies and instituted timely follow-up to institute and verify corrective action. The NRC inspector who assessed this item of noncompliance was simply mistaken regarding the dates on which Commonwealth Edison audit activities actually began. Thus, this item of non-compliance can not be counted in

the assessment of whether a pattern of violations exists. No similar item of non-compliance has been subsequently identified by the NRC Staff.

RORFM QA SUBCONTENTION ITEM 14B, PARTS ONE, TWO AND THREE

Rorem QA Subcontention Item 14B, Parts one, two and three state:

> 14. Contrary to Criterion XVIII, "Audits," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that a comprehensive system of planned and periodic audits is carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program. The Applicant also failed to ensure follow-up action, including readuit of deficient areas.
>
> B. A special NRC QA inspection reported May 7, 1984 that:
>
> * Mechanical contractor Phillips, Getschow Co. has not established and executed a plan for auditing the implementing procedures of the quality assurance program on a period (sic) basis to determine the effectiveness of the program in accordance with the Phillips, Getschow QA Manual.
>
> Electrical contractor L.K. Comstock Co./L.K. Comstock Engineering Company auditing activities neither conformed with the comprehensive annual schedule of planned and periodic audits established as required by QA Program Manual Section 4.14.1, nor did they verify compliance with all aspects of the Quality Assurance Program.
>
> * HVAC contractor Pullman Construction Industries, Inc., did not meet their yearly schedule for audit activities required by their QA 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

The material facts related to the three examples of one Severity 4 NRC Staff item of non-compliance as listed in Rorem QA Subcontention 14B, parts one, two and three are substantially similar. All of the examples of involve an identified deficiency in the audit schedules and auditing practices of the Braidwood site mechanical contractor, Phillips Getschow Company ("PGCo"), electrical contractor, L.K. Comstock Co./ L.K. Comstock Engineering Company ("L.K. Comstock") and HVAC contractor, Pullman

Construction Industries/Pullman Sheet Metal. Given these similarities, the following "Statement of Material Fact as to Which There Is No Genuine Issue to Be Heard" and the following "Discussion" is provided, for all three contractor items listed in Subcontention 14B. The part of the "Statement of Material Fact" and "Discussion" which relates to an individual contractor under a specific part of Subcontention 14B is clearly identified.

STATEMENT OF MATERIAL FACT AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. The NRC Staff identified the violations of Criterion XVIII of 10 CFR Part 50, App. B listed in Rorem QA Subcontention Item 14B, parts one, two and three during an inspection conducted at Braidwood in the summer of 1983 and documented in Inspection Report Nos. 50-456/83-09; 50-457/83-09. These violations comprised three of the four examples used to support one Severity Level 4 item of noncompliance. (The fourth example is cited in Subcontention Item 14.B., part Four.) (Affidavit of Thomas E. Quaka on Rorem Contention Item 14B ("Quaka Affidavit on 14B") at p. 3.)
2. The NRC Staff considered these items to be a violation of 10 Criterion XVIII and the implementing guidance for Criterion XVIII contained in Regulatory Guide 1.144-1980. Regulatory Guide 1.144-1980 requires that "applicable elements of an organization's Q.A. Program should be audited at least annually." (Quaka Affidavit on 14B at p. 3.)

3. Prior to the issuance of the item of non-compliance, Commonwealth Edison's Quality Assurance organization believed a valid interpretation of Criterion XVIII of 10 C.F.R. Part 50, Appendix B, as implemented by Regulatory Guide 1.144-1980, required its Braidwood site contractors to annually schedule and audit its applicable Quality Assurance Manual Sections along with only selected procedures used at the Braidwood site. Typically, the implementing procedures which were most actively used by a contractor were scheduled for audit (Quaka Affidavit on 14B at pp. 3 and 4)

4. After the Staff's inspection, Commonwealth Edison Quality Assurance adopted the Staff's interpretation of Regulatory Guide 1.144-1980 that the three involved contractors annually schedule and audit all elements of their Quality Assurance Programs, including all applicable Manual Sections and active Braidwood site implementing procedures. (Quaka Affidavit on 14B at p. 4.)

<u>SUBCONTENTION 14B, PART ONE - PHILLIPS GETSCHOW COMPANY</u>

5. The PGCO Braidwood site internal audit schedule for 1983/1984 did not provide for the audit of all active PGCo site implementing procedures, although most of the active implementing procedures were being audited concurrently with scheduled audits of the PGCo Quality Assurance Manual Section to which they related. However, no existing formal written

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document specifically scheduled these procedures for audit and no documentation existed to prove that they were audited on an annual basis. (Quaka Affidavit on 14B at p. 5.)

6. Commonwealth Edison directed PGCo to take immediate steps to schedule and perform audits of its active Braidwood site implementing procedures during the remainder of 1983 and to take procedural steps necessary to annually schedule and audit all elements of its Quality Assurance Program, including all applicable Manual Sections and active Braidwood site implementing procedures. (Quaka Affidavit on 14B at p. 7; Affidavit of Scot T. Forbes ("Forbes Affidavit") at p. 3.)

7. PGCo revised Section 16 of its Quality Assurance Manual in August 1983 to require that an annual audit schedule covering each applicable section of the Manual and all active implementing procedures be prepared. PGCo's internal audit Procedure QAP 12.1 was also revised. (Forbes Affidavit at p. 3.)

8. The PGCo Quality Assurance Coordinator, Scot T. Forbes, revised the existing PGCo 1983/1984 internal audit schedule in August 1983 to specifically include audits of all active PGCo Braidwood site implementing procedures on an annual basis. The 1984 and 1985 PGCo internal audit schedules for Braidwood also provided for the annual audit of all active PGCo implementing procedures at Braidwood. This requirement is also provided for on the 1986 PGCo internal audit schedule currently being developed. (Quaka Affidavit at p. 7; Forbes Affidavit at pp. 4 and 5.)

9. The audit of all scheduled procedures was performed under the 1983/1984, 1984 and 1985 PGCo Braidwood site internal audit schedules as planned. PGCo Corporate Quality Assurance conducts audits of those procedures which must be implemented by the PGCo site Quality Assurance organization. (Forbes Affidavit at p. 4.)

10. Commonwealth Edison Braidwood site and Corporate Quality Assurance organizations have conducted independant audits of PGCo's Braidwood site internal and Corporate audit schedules since August 1983 and have found that the PGCo Quality Assurance organization is performing audits at Braidwood in conformance with an established annual audit schedule which addresses all elements of the PGCo Quality Assurance Program, including all applicable Manual sections and active implementing procedures. (Quaka Affidavit at p. 8; Forbes Affidavit at p. 5.)

11. A comprehensive review of Commonwealth Edison audits in combination with audits performed by PGCo indicates that applicable PGCo Manual Sections and active Braidwood site implementing procedures were effectively audited during the time prior to the identification of the NRC Staff's item of non-compliance. (Quaka Affidavit at p. 9.)

12. The NRC Staff has closed the PGCo part of the item of non-compliance by verifying that after August 1983 annual audits of all active PGCo implementing procedures have been performed in accordance with the established PGCo Braidwood site audit schedule and that, based on the Commonwealth Edison

retrospective review, the adequacy of past PGCO auditing activities is assured. (Quaka Affidavit at pp. 9 and 10; Forbes Affidavit at pp. 5 and 6.)

SUBCONTENTION 14B, PART 2 - L.K. COMSTOCK

13. The L. K. Comstock Corporate Quality Assurance organization failed to audit all 18 Criteria of 10 C.F.R. 50, Appendix B from mid-year 1982 through mid-year 1983 and its 1983 audit schedule did not provide for annual coverage of all 18 Criteria as required by L. K. Comstock procedure 3.1.4. Further, L. K. Comstock site auditors were not complying with the established 1983 site audit schedule which required the audit of all active procedures. Only five of seventeen 1983 scheduled audits had been performed. (Quaka Affidavit on 14B at pp. 5 and 6.)

14. Commonwealth Edison directed L. K. Comstock to perform 1983 audits of the specific areas noted by the NRC Staff as not audited and to take necessary procedural steps to annually schedule and audit all elements of its Quality Assurance Program, including all applicable Manual sections and active Braidwood site implementing procedures. Given the structure of the Comstock Quality Assurance Manual, this entails annually auditing the applicable Criteria of Appendix B to 10 C.F.R. Part 50 and active implementing procedures. (Quaka Affidavit on 14B at p. 7.)

15. The L. K. Comstock Corporate Quality Assurance organization, with the aid of L. K. Comstock Braidwood Quality Assurance, audited all applicable Criteria of 10 C.F.R. 50, Appendix B during the remainder of 1983. Criteria IV, VII, and IX are not specifically applicable to work activities performed by L. K. Comstock at Braidwood and as such were not audited. (Affidavit of Thomas E. Quaka on Contention Item 14B.2 ("Quaka Affidavit on 14B.2") at p.3.)

16. The L. K. Comstock Braidwood site Quality Assurance organization performed a total of 14 audits during the remainder of 1983. To ensure future audit schedule compliance, L. K. Comstock placed a certified lead auditor on site full-time in September 1983 and a second Q.A. Engineer, placed on site full-time in November 1983, was subsequently certified to perform auditing functions. (Quaka Affidavit on 14B.2 at p.3)

17. L. K. Comstock revised its "Internal Audit Program" Procedure 4.14.1, in October 1983 to include the requirement to annually schedule and audit, within a 12-month period, all elements of its Quality Assurance Program at Braidwood, including all applicable Criteria of 10 C.F.R. 50, Appendix B and active Braidwood site implementing procedures. (Quaka Affidavit on 14B.2 at p. 4.)

18. The L. K. Comstock Braidwood site Quality Assurance organization issued a revised 1983 internal audit schedule and audit schedules for 1984 and 1985 based on the revised procedural requirement of Procedure 4.14.1. The 1986

L.K. Comstock Braidwood site internal audit schedule, currently being developed, will also provide for the the annual audit of active L. K. Comstock implementing procedures at Braidwood. (Quaka Affidavit on 14B.2 at p.5)

19. The L. K. Comstock Corporate Quality Assurance organization issued 1984 and 1985 audit schedules for Braidwood which provided for quarterly audits to assure the programmatic review of all Criteria of 10 C.F.R. 50, Appendix B, applicable to work activities performed by L. K. Comstock at Braidwood. These schedules omitted from audit only Criteria IV, VII, and XI. (Quaka Affidavit on 14B.2 at p.5)

20. The L. K. Comstock Corporate Quality Assurance organization conducted audits as scheduled under its 1984 and 1985 audit schedules for the Braidwood site with one minor exception. The fourth corporate audit scheduled under the 1984 audit schedule was actually performed in January 1985, but was not counted as part of the 1985 audit schedule requirements. Five corporate audits were performed in 1985. (Quaka Affidavit on 14B.2 at p.5).

21. Although it experienced some audit schedule slippage in 1984 and 1985, L. K. Comstock Site Quality Assurance completed all audits originally scheduled in 1984 by the end of 1984 and all audits originally scheduled in 1985 are expected to be completed by the end of 1985. (Quaka Affidavit on 14B.2 at p.6)

22. To prevent continued audit schedule slippage, L. K. Comstock provided a third individual to perform audits for its Braidwood

Site Quality Assurance organization in August 1985. This individual was granted his auditor's certification on November 2, 1985. (Quaka Affidavit on 14B.2 at p.7)

23. Commonwealth Edison Site Quality Assurance has conducted independent audits of the L. K. Comstock audit program for 1984 and 1985 which have verified that L. K. Comstock is performing audits of all applicable elements of its Quality Assurance program in accordance with internal audit Procedure 4.14.1 and that the L. K. Comstock Corporate and Braidwood site Quality Assurance organizations are complying with the commitments of their annual audit schedules. Commonwealth Edison's Site Quality Assurance audits from mid-1983 through 1984 also adequately covered major L. K. Comstock activities at Braidwood. (Quaka Affidavit on 14B at pp. 8-9, Quaka Affidavit on 14B.2 at p. 7)

24. The NRC Inspector who issued the item of noncompliance stated in his inspection report that he had reviewed Site Quality Assurance audits and Surveillances of L. K. Comstock performed prior to his inspection and concluded that these audits had covered all applicable L. K. Comstock Braidwood site activities during this time. (Quaka Affidavit on 14B. at p.9)

25. In August 1985, Site Quality Assurance instituted a more formally documented on-going review of the L. K. Comstock Braidwood site internal and corporate audit schedules and audit reports. Reviews performed to date have verified that all applicable elements of the L. K. Comstock Quality Assurance program are currently

being addressed on the annual Comstock Corporate and site audit schedules for Braidwood and that the schedules are being met. (Quaka Affidavit on 14B.2 at p.8)

26. Language in L.K. Comstock Procedure 4.14.1 which allows limited activity procedures to be placed on a 24 month audit schedule and which is used by L. K. Comstock to maintain non-active procedures in its audit program, but to not audit them in any year they are not in use, will be changed to make clear that those procedures actually in use at the site in any given year, i.e., all active implementing procedures, be audited annually. (Quaka Affidavit on 14B.2 at p.9.)

27. The NRC Staff closed its item of noncompliance in Inspection Report Nos. 50-456/85-49; 50-457/85-51, based on its conclusions that the L. K. Comstock Corporate and site Quality Assurance organizations were meeting their audit schedules for Braidwood and were annually sheduling and auditing all applicable elements of their Quality Assurance Program. (Quaka Affidavit on 14B at P.8; Quaka Affidavit on 14B.2 at PP.8 and 9.)

SUBCONTENTION, 14B, PART 3 - PULLMAN SHEET METAL

28. At the time of the NRC Staff's inspection, Pullman Sheet Metal's ("Pullman's") Braidwood site activities were audited by Pullman Construction Industries' ("PCI") PCI's Corporate Quality Assurance Department. Two audits conducted by PCI at Braidwood between April 1982 and April 1983 did not include four specific procedures identified by the NRC

Staff in its item of non-compliance as not audited. (Quaka Affidavit on 14B at p. 6.)

29. Commonwealth Edison directed PCI to schedule and perform audits of all its active Braidwood site implementing procedures, including those four procedures the NRC Staff identified as not audited, and to annually schedule and audit all elements of its QA Program, including all applicable Manual sections and active Braidwood site implementing procedures. (Quaka Affidavit on 14B at p. 7; Affidavit of Conrad L. Holt ("Holt Affidavit") at p. 3.)

30. PCI Quality Assurance issued a revised form of annual audit schedule matrix for the Braidwood site in August 1983, listing for audit all Appendix B Criteria, Pullman Quality Assurance Manual sections and active Pullman Braidwood site implementing procedures. (Holt Affidavit at p. 3.)

31. PCI Quality Assurance performed two internal audits at Braidwood in August and December 1983 under the revised 1983 PCI audit schedule matrix. The audits covered all Quality Assurance Manual sections and assessed compliance with all of Pullman's active Braidwood site implementing procedures, including those procedures the NRC Staff identified as not audited. (Holt Affidavit at p. 4.)

32. The 1984 PCI audit schedule matrix for the Braidwood site continued this practice. Three internal audits were conducted at Braidwood in 1984 to cover all sections of the Quality Assurance Manual and all active Pullman site implementing procedures, including those procedures the NRC Staff identified as not audited. (Holt Affidavit at p. 4.)

33. This practice was repeated in 1985, but, at the request of Commonwealth Edison, the audits were performed by the Pullman Braidwood site quality assurance organization under a newly developed 1985 internal audit schedule matrix. Pullman "Internal Audit" Procedure, B18.1.F, was written to incorporate the requirement that all active Pullman implementing procedures be scheduled and audited annually. The Pullman Braidwood site Quality Assurance organization successfully performed all audits under the 1985 audit schedule matrix, including the procedures identified by the NRC Staff as not audited. A similar internal audit schedule matrix for 1986 is currently being developed by Pullman site Quality Assurance. (Holt Affidavit at pp. 4, 5, and 6.)

34. Commonwealth Edison Site Quality Assurance has conducted an independent audit and a surveillance of PCI's 1984 Braidwood audit program and Pullman's 1985 internal audit program for Braidwood. These have found that both the PCI and the Pullman Braidwood site Quality Assurance organizations have performed internal audits at Braidwood in conformance with an established audit schedule which covers all active implementing procedures, including the procedures noted by the NRC Staff as not audited. (Quaka Affidavit at p. 8; Holt Affidavit at pp. 6 & 7.)

35. A comprehensive review of Commonwealth Edison audits in combination with audits performed by PCI prior to the identification of the Pullman example in the NRC Staff's item

of non-compliance indicates that the four site procedures the NRC Staff identified as not audited solely by Pullman were effectively audited during this time. (Quaka Affidavit at p. 9)

36. The adequacy of Pullman's corretive action to prevent recurrence of the item of non-compliance is assured since it encompasses the overal requirement to schedule and audit all applicable Manual Sections and active Braidwood site implementing procedures, not merely those four procedures the NRC Staff identified as not audited. (Holt Affidavit at pp.6-7.)

37. The NRC Staff closed this item of non compliance by verifying that subsequent to the identification of the item of non-compliance all active Pullman implementing procedures at Braidwood, including those identified as not audited, have been scheduled and audited and that, based on the Commonwealth Edison review, the adequacy of past Pullman auditing activities with regard to these procedures is assured. The closure is identified in Inspection Report Nos. 50-456/85-52; 50-457/85-50, dated December 6, 1985. (Quaka Affidavit at pp. 9 & 10; Holt Affidavit at p. 7.)

DISCUSSION

Rorem QA Subcontention 14 asserts generally that, contrary to Criterion XVIII of Appendix B to 10 C.F.R. Part 50, Commonwealth Edison has failed to ensure that a comprehensive program of planned and periodic audits, including follow-up, is carried out to verify compliance with all aspects of the Quality Assurance Program and to determine the effectiveness of the Program. With regard to Subcontention 14B Parts one, two and three, Intervenors contend that the three violations of Criterion XVII identified by the NRC Staff in one inspection during the summer of 1983, as documented in Inspection Report Nos. 50-456/83-09 and 50-457/83-09, represent separate instances where Braidwood site contractor's failed to formally schedule and audit all aspects of their Quality Assurance Programs, thereby indicating a widespread quality assurance auditing deficiency by Commonwealth Edison.

Implementing Guidance for Criterion XVIII is contained in Regulatory Guide 1.144-1980 which requires that "applicable elements of an organization's Q.A. Program should be audited at least annually." Commonwealth Edison, through its Quality Assurance Manual, Q.P. 2.0, is committed to Regulatory Guide 1.144-1980. The NRC Staff interprets the implementing guidance of Regulatory Guide 1.144-1978 to require that all applicable Quality Assurance Manual Section and active implementing procedures of a contractor's Quality Assurance Program be scheduled and audited annually. At the time of the identification of this non-compliance, Commonwealth Edison believed that it was a valid interpretation of Regulatory Guide 1.144-1980 to only require its

contractors to annually schedule and audit applicable Manual Sections and selected implementing procedures. This was the basis on which PGCo, L.K. Comstock and Pullman had not audited all implementing procedures. Typically the implementing procedures most actively used by a contractor were choosen for audit. However, subsequent to the identification of the non-compliance, Commonwealth Edison deemed it appropriate to adopt the Staff's interpretation and it thus acknowledged the items of non-compliance.

Given this background, the following discussion is provided for each contractor involved.

PHILLIPS GETSCHOW COMPANY - SUBCONTENTION 14B.1

At the time of the NRC Staff's identification of the non-compliance contained in Subcontention 14B, part one, the 1983/1984 PGCo Braidwood site audit schedule did not specifically provide for the audit of all active PGCo Braidwood site implementing procedures. Thus, although active implementing procedures were being audited in connection with the planned audit of PGCo Manual Sections under this schedule, Edison now acknowledges the validity of the violation of Criterion XVIII insofar as PGCo is concerned. However, as the attached Affidavits of Thomas E. Quaka on Contention Item 14B and Scot T. Forbes establish, this acknowledged non-compliance was isolated in time and was based on Edison's differing interpretation of Regulatory Guide 1.144-1980. Once Edison acknowledged the NRC's interpretation, directed PGCo to take

the NRC's interpretation, directed PGCo to take corrective action to prevent recurrence and PCGo complied with those instructions, the non-compliance was effectively corrected and no other similar instances of non-compliance have since been identified.

As Mr. Forbes' testimony amply demonstrates, beginning with his revision to the PGCo Braidwood site internal audit schedule for 1983/1984 in August 1983 and including the 1984 and 1985 PGCo internal audit schedules for Braidwood, the PGCo site Quality Assurance organization has scheduled and completed the annual audit of all active Braidwood site implementing procedures along with applicable Quality Assurance Manual Sections. To assure that all active implementing procedures continue to be scheduled and audited annually in the future, PGCo has incorporated the requirements of Regulatory Guide 1.144-1980 into its Quality Assurance Manual, Section 16, and its internal audit procedure QAP 12.1 for the Braidwood site. Thus, PGCo has effectively assured that the item of non-compliance will not recurr. These actions alone effectively moot Intervenor Rorem's contention that a comprehensive system of planned and periodic audits is not being conducted by Commonwealth Edison, through PGCo, at the Braidwood site.

Moreover, as explained by Mr. Forbes and corrobrated by Mr. Quaka, Commonwealth Edison Corporate and Site Quality Assurance organizations have verified the effectiveness of corrective actions taken by PGCo to comply with the now acknowledged interpretation of Regulatory Guide 1.144-1980. Site Quality Assurance audits Nos. 20-83-110, dated October

17, 1983; 20-84-542, dated October 22, 1984; 20-85-546, dated September 6, 1985; and Corporate Quality Assurance audit No. 20-85-B, dated July 18, 1985; have found that the PGCo Braidwood site Quality Assurance organization is performing internal Braidwood site audits in conformance with an established annual audit schedule which addresses all elements of its Program, including all applicable Manual Sections and active implementing procedures.

Further, as established by Mr. Quaka, a specific Site Quality Assurance review has shown that the combination of Commonwealth Edison audits of PGCo and PGCo's own internal audits performed prior to the NRC Staff's identification of the this part of the item of non-compliance have effectively covered all active PGCo Braidwood site implementing procedures during this time. The NRC Staff has closed the PGCo part of the item of non-compliance by verifying both the effectiveness of PGCo's prospective corrective actions and the adequacy of Commonwealth Edison's retrospective review for resolving the question of PGCo past auditing activities for regulatory compliance. This closure is documented in Inspection Report Nos. 50-456/85-32 dated October 4, 1985 and 50-457/85-52, dated December 5, 1985.

It is without dispute that the PGCo aspect of the item of non-compliance identified in the NRC Staff Inspection Report referenced in Rorem QA Subcontention Item 14B, part 1 has been determined to be an isolated occurrence which resulted from the differing, but valid, views of Commonwealth Edison and the NRC Staff over the interpretation of

Regulatory Guide 1.144-1980 to satisfy the requirements of 10 C.F.R. 50, Appendix B, Criterion XVIII. As Mr. Forbes has shown, PGCo has taken effective action to remedy the non-compliance and to prevent recurrence of similar non-compliances and none have been identified. These facts prove that pursuant to the requirements of Criterion XVIII, PCCo is auditing all applicable elements of its Quality Assurance Program on an annual basis, including all active Braidwood site implementing procedures. Thus, Intervenor Rorem's assertion that the PGCo example in the item of non-compliance as listed in Subcontention 14B contributes to a larger failure of Commonwealth Edison to comply with Criterion XVIII is without merit.

L. K. COMSTOCK SUBCONTENTION 14B, PART 2

At the time of the NRC Staff's identification of the non-compliance contained in Subcontention 14B, part 2, L. K. Comstock's Corporate Quality Assurance organization was not completely scheduling or auditing all elements of its Quality Assurance Program at Braidwood. Given the structure of the L. K. Comstock Quality Assurance Manual, this meant that scheduled audits did not cover all 18 Criteria of Appendix B to 10 C.F.R. Part 50 as required by L.K. Comstock procedure 3.14. In addition, although L. K. Comstock's Braidwood Site Quality Assurance organization was operating under an annual audit schedule that encompassed audits of active implementing procedures, L. K. Comstock was not meeting this schedule. Thus, L. K. Comstock was not satisfying the requirements of Criteria XVIII as implemented by Regulatory Guide 1.144-1980 and interpreted by the NRC Staff.

Commonwealth Edison now acknowledges that this violation of Criterion XVIII is valid. However, as the attached affidavits of Thomas E. Quaka on Subcontention 14B and Subcontention 14B.2 establish, the non-compliance was isolated in time and was based on Edison's differing interpretation of Regulatory Guide 1.144-1980 held at the time. Once Commonwealth Edison acknowledged the NRC's interpretation, directed L. K. Comstock to take corrective action to prevent recurrence and such corrective action was instituted, the noncompliance was corrected and both Commonwealth Edison and the NRC Staff have not since identified any other similar instance of noncompliance.

Mr. Quaka's testimony amply demonstrates that L. K. Comstock has taken necessary actions to remedy the non-compliance listed in Subcontention 14B, part 2. These actions effectively moot Intervenor Rorem's assertion that this non-compliance contributes to a failure of Commonwealth Edison to comply with comprehensive auditing requirements of Criterion XVIII. The L. K. Comstock Corporate and Site Quality Assurance organizations took immediate action during the remainder of 1983 to remedy the identified item of non-compliance by scheduling and auditing all Criteria of 10 C.F.R.50, Appendix B applicable to L. K. Comstock work activities performed at Braidwood. To ensure that it would meet its annual audit schedule once established, L. K. Comstock Site Quality Assurance added sufficient man-power at Braidwood to meet audit schedule commitments. In addition, by incorporating the requirements of Regulatory Guide 1.144-1980 into its internal audit Procedure 4.14.1, L. K. Comstock assured that the non-compliance would not recurr. In

recurr. In accordance with the requirements of revised procedure 4.14.1, the L. K. Comstock Corporate and Braidwood Site internal audit schedules for 1984 and 1985 have provided for the annual schedule and audit of all elements of the L. K. Comstock Quality Assurance Program at Braidwood, including all applicable Criteria of Appendix B to 10 C.F.R. Part 50 and all active implementing procedures.

With minor exceptions, L. K. Comstock has complied with these annual audit schedules and has thus corrected the item of non-compliance. As Mr. Quaka explains, any audit schedule slippages which have occurred have had no lasting impact on L. K. Comstock's Quality Assurance Program at Braidwood. The addition of another auditor assigned to the L. K. Comstock Braidwood site Quality Assurance organization provides further assurance that L. K. Comstock will meet commitments contained its Braidwood site internal audit schedules. L. K. Comstock's 1986 Braidwood site audit schedule currently being developed, also requires the annual audit of all Criteria of Appendix B to 10 C.F.R. Part 50 and active site implementing procedures applicable to work activities being performed by the L. K. Comstock at Braidwood. Further, the statement in L. K. Comstock Procedure 4.14.1 which allowed limited work activities not to be audited annually is being changed to clarify that only non-active procedures need not be audited annually and that all active implementing procedures be scheduled and audited on an annual basis.

Moreover, as explained by Mr. Quaka, Commonwealth Edison Site Quality Assurance has been actively involved in the follow-up of L. K.

Comstock corrective actions taken to remedy the now-acknowledged violation of Criterion XVIII. Site Quality Assurance audit No. 20-84-545, performed in 1984 and No. 20-85-540, performed in 1985 have found that L. K. Comstock is performing scheduled audits of all applicable elements of its Quality Assurance Program in accordance with its internal audit Procedure 4.14.1. Site Quality Assurance Surveillance, No. 4852, conducted in September 1985 also confirms that the corrective actions taken by L. K. Comstock to remedy the non-compliance have been adequate. The surveillance concluded that "in addition to the L. K. Comstock audit coverage, Commonwealth Edison Site Quality Assurance Audits from mid-1983 through 1984 adequately covered the major activities of L. K. Comstock at Braidwood." The newly instituted more formally documented review of the L. K. Comstock Braidwood site internal and Corporate audit schedules and audit reports, provides an added level of confidence that L. K. Comstock is fully meeting the requirements of Regulatory Guide 1.144-1980.

Further, the NRC Inspector who identifed the item of non-compliance indicated that Commonwealth Edison Quality Assurance audits adequately covered applicable elements of the L. K. Comstock Quality Assurance Program prior to the time the non-compliance was identified. The NRC Staff close this item of non-compliance by verifying the adequacy of Commonwealth Edison's retrospective audit coverage for L. K. Comstock and by concluding that the L. K. Comstock was meeting its audit schedules for Braidwood and was auditing all applicable elements of its Quality Assurance Program on an annual basis. This closure is documented in Inspection Reports Nos. 50-456/85-49 and 50-457/85-51.

Thus, it is without dispute that the L. K. Comstock violation of Criterion XVIII identified in the NRC Staff Inspection Report referenced in Rorem QA Subcontention 14B, part 2 has been determined to be an isolated occurrence which resulted from the differing, but valid, views of Commonwealth Edison and the NRC Staff over the interpretation of Regulatory Guide 1.144-1980. As Mr. Quaka has shown L.K. Comstock has taken effective action to remedy the non-compliance and to prevent recurrence of similar non-compliances and none have been identified. These facts prove that L.K. Comstock is now meeting the requirements of Criterion XVIII. Thus, Intervenor Rorem's assertion that the L.K. Comstock example of the non-compliance listed in Subcontention 14B.2 contributes to a larger failure of Commonwealth Edison to comply with Criterion XVIII is without merit.

PULLMAN SHEET METAL SUBCONTENTION ITEM 14B PART 3

At the time of the NRC Staff's identification of the non-compliance contained in Subcontention 14B, part three, internal audits of Pullman's site activities at Braidwood were conducted by PCI's Corporate Quality Assurance Department. The internal audit conducted by PCI at Braidwood on April 28-29, 1982 and April 4, 1983 did not include the four implementing procedures identified by the NRC Staff in the Inspection Report referenced in Subcontention 14B. Thus, although PCI was auditing Pullman Braidwood site implementing procedures in connection with their scheduled Braidwood site audits, all active implementing procedures were not being audited on an annual basis. Accordingly, Edison now

basis. Accordingly, Edison now acknowledges that the violation of Criterion XVIII is valid. However, as the attached affidavits of Thomas E. Quaka on Contention Item 14B and Conrad L. Holt establish, the non-compliance was isolated in time and was based on Edison's differing interpretation of Regulatory Guide 1.144-1980 held at the time. Once Commonwealth Edison acknowledged the NRC's interpretation, directed Pullman to take corrective action to prevent recurrence and Pullman instituted corrective action as directed, the noncompliance was corrected and no other similar instances of noncompliance have since been identified.

Mr. Holt's testimony demonstrates the actions taken by Pullman to effectively resolve the Pullman aspect of the item of non-compliance listed in Subcontention 14B. Beginning with the issuance of a revised form of annual audit schedule matrix for Braidwood by PCI Quality Assurance in August 1983, all Pullman Quality Assurance Manual sections and active site implementing procedures, including the four implementing procedures identified by the NRC Staff as not audited, have been scheduled and audited on an annual basis. Subsequent to the identification of the item of non-compliance in the summer of 1983, PCI Quality Assurance performed two internal audits at Braidwood in August and December of 1983 under a revised 1983 audit schedule matrix. These audits covered all Quality Assurance Manual sections and Pullman's active Braidwood site implementing procedures, including those procedures the NRC Staff identified as not audited. The 1984 PCI audit schedule matrix

for the Braidwood site continued this practice and PCI Quality Assurance conducted three internal audits at Braidwood during 1984 pursuant to this schedule.

As further established by Mr. Holt, the requirement that Pullman annually schedule and audit all Appendix B Criteria, applicable Pullman Quality Assurance Manual Sections and active Pullman Braidwood site implementing procedures has carried over to 1985 and is now applicable to the Pullman site Quality Assurance organization which currently has the responsibility for performing internal Pullman audits at Braidwood. As Mr. Holt explains, the 1985 Pulman internal audit schedule matrix developed by the Pullman Braidwood site Quality Assurance organization scheduled for annual audit all Appendix B Criteria, Pullman Quality Assurance Manual Sections and active Pullman Braidwood site implementing procedures, including the procedures identified by the NRC Staff as not audited. The Pullman Braidwood site Quality Assurance organization has completed all internal audits under this schedule as planned. Moreover, the development of Pullman Internal Audit Procedure B18.1.F, which incorporates for Pullman's internal audits at Braidwood the now acknowledged interpretation of Regulatory Guide 1.144 that all active Pullman Braidwood site implementing procedures be scheduled and audited annually, assures that the commitments contained in the Pullman 1985 internal audit schedule matrix for Braidwood will be continued. Pullman site Quality Assurance is currently developing its 1986 internal audit schedule matrix which will also provide for the audit of all active Pullman implementing procedures at Braidwood.

Moreover, as explained by Mr. Holt and corroborated by Mr. Quaka, Commonwealth Edison site Quality Assurance has been actively involved in the follow-up of Pullman corrective actions taken to remedy the now-acknowledged violation of Criterion XVIII and to verify their effectiveness under Regulatory Guide 1.144-1980. Site Quality Assurance audit No. 20-85-549, dated August 29, 1985, and Surveillance, No. 433, dated May 13, 1985 have found that both the PCI and Pullman Quality Assurance organizations have performed internal audits at Braidwood in conformance with an established audit schedule which covers all active areas and site procedures.

Further, as established by Mr. Quaka, a specific Site Quality Assurance review of Pullman's failure to schedule and audit the four specific implementing procedures identified in the summer of 1983 by the NRC Staff in its non-compliance has shown that the combination of Commonwealth Edison audits of Pullman and Pullman's own internal audits performed prior to this time have effectively covered the four Pullman site procedures the NRC Staff identified as not audited. The NRC Staff has also verified both the effectiveness of Pullman's prospective corrective actions and the adequacy of Commonwealth Edison's retrospective review for resolving the question of Pullman past-auditing activities for regulatory compliance in its review and closure of the Pullman aspect of its non-compliance documented in Inspection Report Nos. 50-456/85-32 and 50-457/85-52.

It is without dispute that the Pullman item of non-compliance identified in the NRC Staff Inspection Report referenced in Rorem QA

Subcontention 14B, part 3 has been determined to be an isolated occurrence which resulted from the differing, but valid views of Commonwealth Edison and the NRC Staff over the interpretation of Regulatory Guide 1.144-1980 to satisfy the requirements of Criterion XVIII. As Mr. Holt has shown, Pullman has taken effective action to remedy the non-compliance and to prevent recurrence of similar non-complanices and none have been identified. As Mr. Holt sucinctly states, the adequacy of Pullman's corrective action is further assured because the action has encompassed the entire scope of active Pullman site implementing procedures at Braidwood, not just those procedures identified by the NRC Staff as unaudited. These facts prove that the requirements of Criterion XVIII that Pullman audit all applicable elements of its Quality Assurance Program on an annual basis, including all active Braidwood site implementing procedures, are now being met. Thus, Intervenor Rorem's assertion that the Pullman aspect of the item of non-compliance listed in Subcontention 14B contributes to a larger failure of Commonwealth Edison to comply with Criterion XVIII is without merit.

CONCLUSION

There is no genuine issue of material fact with respect to Q.A. Subcontention 14B, parts one, two and three. Accordingly, Commonwealth Edison Company is entitled to summary disposition of those parts of Subcontention 14B as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF SCOT T. FORBES
(on Rorem Q.A. Subcontention 14B.1)

Scot T. Forbes, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Scot T. Forbes
Scot T. Forbes

Subscribed and Sworn before me
this 20th day of December 1985

Delene L. Lamb
Notary Public

My Commission Expires April 19, 1988
My Commission expires on __________.

0560H

TESTIMONY OF SCOT T. FORBES
(ON ROREM SUBCONTENTION 14B.1)

Q.1. Please state your full name and business address for the record.

A.1. Scot T. Forbes, Braidwood Nuclear Power Station, Braceville, Illinois 60407.

Q.2. By whom are you employed and in what capacity?

A.2. I am employed by the Phillips, Getschow Company ("PGCo") as Quality Assurance Coordinator at Commonwealth Edison Comp ny's Braidwood Station. In this position, I am responsible i scheduling and conducting PGCo internal audits and surveill s at the Braidwood site to verify proper implementation of the PGCo Quality Assurance Program.

Q.3. Please summarize your educational background ar professional experience.

A.3. I have been employed by PGCo since January 8, 1981. Since September 13, 1982, I have been assigned to the Braidwood Station. Prior to being assigned to the Braidwood Station, I was PGCo's Corporate Assistant Manager of Quality Assurance, responsible for assisting in the development and administration of the Company's Quality Assurance/Cont ol programs for both operating nuclear power plants and new nuclear construction projects. Prior to working for PGCo, I was employed for five years as Quality Assurance Manager at John Mohr & Sons, Inc., a fabricator and erector of nuclear pressure vessels and heavy steel products for both the nuclear and fossil fuel generating industries. I also executed the duties of Assistant Quality

Assurance Manager for one of Mohr's Subsidiaries, Universal Power Piping, Inc. At Mohr, I was responsible, in part, for the development and administration of the Company's Quality Assurance programs for fabrication and installation of nuclear piping, parts, and components. Prior to that, I was employed as a nondestructive examination technician and Quality Control inspector for Graver Tank & Manufacturing Co., a designer, manufacturer and erector of nuclear containment systems, parts and appurtenances. I have approximately twelve years experience in the nuclear field, over nine and a half years of which are in Quality Assurance/Control program development and administration. I graduated from High School in 1973.

Q.4. What is the purpose of your testimony?

A.4. The purpose of my testimony is to explain the corrective actions Commonwealth Edison Company directed PGCo to take as a result of the NRC Staff item of non-compliance contained in the following aspect of Rorem Quality Assurance Subcontention 14:

> B. A special NRC QA inspection reported May 7, 1984 that:
>
> * Mechanical contractor Phillips Getschow Co. 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 Phillips Getschow QA Manual.

Q.5. What is your understanding of the words "plan for auditing" as used in this aspect of the Subcontention?

A.5. The words "plan for auditing" were originally used in the NRC Inspection report which forms the basis of this part of Subcontention 14. Based on my discussions with the NRC Inspector, I understand the use of these words by the Inspector to mean an audit schedule.

Q.6. What corrective actions did PGCo take to address the NRC Staff's item of non-compliance?

A.6. To remedy this item of non-compliance, Commonwealth Edison directed PGCo to take corrective actions to ensure that all PGCo active implementing procedures for the Braidwood site are scheduled and audited on an annual basis.

Q.7. Please describe how these corrective actions were achieved.

A.7. In August 1983, Section 16 of the PGCo Braidwood site Quality Assurance Manual was revised to require that on an annual basis "an audit schedule of each applicable section of the [PGCo Quality Assurance] manual and procedures be prepared." In addition, PGCo's internal audit procedure QAP 12.1 was revised to require that the scope of all PGCo Braidwood site audits encompass "the specific written policies, procedures or instructions against which the audited activity is being evaluated for compliance or non-compliance". Based on these revised Manual and audit procedure requirements, I revised the existing PGCo 1983/1984 internal audit schedule in August 1983 to specifically include audits of all active PGCo Braidwood site implementing procedures on an annual basis.

Q.8. What was the revised form of the PGCo 1983/1984 internal audit schedule intended to accomplish?

A.8. The revised form of the 1983/1984 internal audit schedule assured that future PGCo internal audits covered the entire population of active PGCo implementing procedures in use at the Braidwood site on an annual basis.

Q.9. Did you meet the commitments contained in the revised 1983/1984 internal audit schedule to annually audit PGCo implementing procedures?

A.9. Yes, the audit of all scheduled procedures was performed under the 1983/1984 schedule as planned.

Q.10. Has PGCo continued to schedule and audit its active Braidwood site implementing procedures on an annual basis after 1983?

A.10. Yes, the 1984 and 1985 PGCo internal audit schedules provided for and the PGCo Site Quality Assurance Department actually audited the PGCo Braidwood site Quality Assurance Program, including all active implementing procedures. The 1986 PGCo internal audit schedule, currently being developed, will also provide for the annual audit of active PGCo implementing procedures at Braidwood.

Q.11. Are there any implementing procedures which are not included on the PGCo internal audit schedule?

A.11. No, all PGCo implementing procedures which are required to be audited by the PGCo Braidwood site Quality Assurance Organization are scheduled and audited in accordance with the PGCo Braidwood site internal audit schedule. It should be pointed out that

PGCo's Corporate Quality Assurance Department is required to conduct Braidwood site internal audits of those procedures which must be implemented by the PGCo Braidwood site Quality Assurance Organization under my supervision. The audit of these procedures is included on the annual PGCo Corporate audit schedule for Braidwood.

Q.12. Has there been independent verification that PGCo is scheduling and auditing its implementing procedures on an annual basis as directed by Commonwealth Edison?

A.12. Yes. Commonwealth Edison Company Braidwood Site and Corporate Quality Assurance organizations have conducted independent audits of PGCo's Braidwood site internal and coprorate audit schedules on several occasions since August 1983. Audit Nos. 20-83-110, dated October, 17, 1983; 20-84-542, dated October 22, 1984; 20-85-546, dated September 6, 1985 and 20-85-B, dated July 18, 1985 have found that the PGCo Quality Assurance organization is performing audits at the Braidwood site in conformance with an established annual audit schedule which addresses all applicable sections of the PGCo Quality Assurance Program, including all active implementing procedures. In addition, the NRC Staff reviewed the revised PGCo audit schedules for 1983/1984, 1984 and 1985 in Inspection Report Nos. 50-456/85-32 and 50/457/85-32, issued October 4, 1985. The NRC Staff verified that after August 1983 annual audits of all active PGCo implementing procedures have been performed in accordance with the established PGCo audit schedule.

Q.13. Has the NRC Staff closed-out this aspect of the item of non-compliance?

A.13. Yes, the NRC violation was closed-out during a formal NRC Inspection Exit Meeting on November 27, 1985 and the close-out is documented in NRC Inspection Report Nos. 50-456/85-52; 50-457/85-50, dated December 6, 1985.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF THOMAS E. QUAKA
(on Rorem Q.A. Subcontention 14.B.2)

Thomas E. Quaka being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Thomas E. Quaka
Thomas E. Quaka

Subscribed and Sworn before me
this 20th day of December 1985

Delene L Lama
Notary Public

My Commission Expires April 19, 1988

My Commission expires on ________.

(0575H)

TESTIMONY OF THOMAS E. QUAKA
(ON ROREM Q.A. CONTENTION 14.B.2)

Q.1. Please state your full name and business address for the record.

A.1. Thomas E. Quaka, Braidwood Nuclear Station, Braceville, Illinois 60407.

Q.2. By whom are you employed and in what capacity?

A.2 I am employed by Commonwealth Edison Company as Site Quality Assurance Superintendent at the Braidwood Nuclear Station. In this capacity, I am responsible for assuring that Commonwealth Edison's Quality Assurance Program is properly implemented at the Braidwood site. As such, I have knowledge of Commonwealth Edison's comprehensive program of planned and periodic auditing for verifying Commonwealth Edison and site contractor compliance with their respective Quality Assurance Programs and for determining the effectiveness of all aspects of those Quality Assurance Programs at the Braidwood site. I am also familiar with the Braidwood site contractors' Quality Assurance Programs and audit programs.

Q.3. Please describe your educational background and work experience.

A.3 I have been employed by Commonwealth Edison since August 1972. Since March 1984, I have been assigned to Braidwood as Site Quality Assurance Superintendent. From December 1978 through March 1984, I was assigned to the LaSalle County Nuclear Station also as Site Quality Assurance Supervisor/Superintendant. At LaSalle, I also was responsible for assuring proper compliance

(0575H)

with the implementation of the Commonwealth Edison and site contractor Quality Assurance Programs. Prior to that, from June 1978 through November 1978, I was assigned to Braidwood as Site Quality Assurance Supervisor. Prior to that, I was part of Commonwealth Edison's Station Nuclear Engineering Department assigned to the Dresden and Quad Cities Nuclear Stations' engineering group. I have a Bachelor of Science degree in Mechanical Engineering from the University of Illinois and a Masters degree in Business Administration from the University of Chicago.

Q.4. What is the purpose of your testimony?

A.4. The purpose of my testimony is to explain the corrective actions Commonwealth Edison Company directed L.K. Comstock to take as a result of the NRC Staff's item of non-compliance contained in the following aspect of Rorem Quality Assurance Subcontention 14:

> Electrical contractor 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.

In a separate piece of testimony, I have addressed (1) Commonwealth Edison's involvement in verifying and ensuring the effectiveness of those aspects of the Braidwood site contractors' audit programs which have been challenged in Rorem Q.A. Subcontention 14B, parts one, two, and three; and (2) whether the four separate examples of the one severity Level 4 item of non-compliance listed in Rorem Q.A. Subcontention 14B, when viewed

together, are indicative of an adverse trend of similar recurrent violations in the conduct of comprehensive audits by Commonwealth Edison or its contractors at Braidwood.

Q.5. What immediate corrective actions did L.K. Comstock take to address the NRC Staff's item of non-compliance.

A.5. To remedy the item of non-compliance, the L.K. Comstock Corporate Quality Assurance organization together with the aid of the L.K. Comstock Braidwood Quality Assurance organization took action during the remainder of 1983 to schedule and audit all applicable Criteria of 10 C.F.R. 50 Appendix B. Of the 18 Criteria of Appendix B 10 CFR 50, Criteria IV, VII and XI are not specifically applicable to work activities performed by the L.K. Comstock at Braidwood and as such were not audited.

In addition, L.K. Comstock site Quality Assurance took immediate action to re-emphasize completing audits as planned under its annual internal audit schedule for Braidwood. The L.K. Comstock Site Quality Assurance Organization performed a total 14 audits during the remainder of 1983. To ensure audit schedule compliance, L.K. Comstock placed a certified lead auditor on site fulltime in September 1983 to fill a vacant QA Engineer position. A second QA Engineer was placed on site fulltime in November 1983 and was subsequently certified to perform auditing functions.

Q.6. What long term corrective actions did L.K. Comstock take to address the NRC Staff's item of non-compliance?

A.6 Both L.K. Comstock Corporate and Braidwood Quality Assurance organizations had, in the past, established audit schedules which together were required to provide for the audit of all applicable Appendix B Criteria and active Braidwood site implementing procedures. As correctly recognized by the NRC Staff, all applicable elements of the L.K. Comstock Program were not always contained on these audit schedules for Braidwood and, in the case of the L.K. Comstock Braidwood Site Quality Assurance organization, not all audits were performed as scheduled.

To provide programmatic resolution for these deficiencies, L.K. Comstock revised Procedure 4.14.1 "Internal Audit Program" in October 1983 to specifically include the requirement to annually schedule and audit its Quality Assurance Program, including applicable Criteria of 10 C.F.R. 50, Appendix B and active implementing procedures. Procedure 4.14.1 now requires that audits "shall be planned, documented and conducted so that the QA/QC program is audited every twelve (12) months or less. A 'Proposed Internal Audit Schedule' will be developed listing the applicable procedures and the time period in which they shall be audited. Those procedures addressing the major scope of work shall be audited a minimum of once every twelve (12) months."

Q.7. Mr. Quaka, did L.K. Comstock issue audit schedules as required by revised Procedure 4.14.1?

A.7. Yes, the site Quality Assurance organization issued a revised 1983 internal audit schedule for Braidwood in August 1983. The audits identified above were conducted under this schedule. A 1984 internal audit schedule was issued on December 13, 1983, based on the revised procedural requirement of Procedure 4.14.1. The 1985 L.K. Comstock Braidwood site internal audit schedule continued this practice and the 1986 Braidwood site internal audit schedule, currently being developed, will also provide for the annual audit of active L.K. Comstock implementing procedures at Braidwood.

With regard to the L.K. Comstock Corporate audit schedule, quarterly audits were scheduled in 1984 and 1985 to assure a programmatic review of all Criteria of 10 CFR 50, Appendix B which are applicable to work activities performed by L.K. Comstock at Braidwood. As previously noted, the 1984 and 1985 Corporate audit schedules for Braidwood did not include Criteria IV, VII and XI.

Q.8. Mr. Quaka, has the L.K. Comstock Corporate Quality Assurance organization conducted audits as scheduled under its 1984 and 1985 internal audit schedule for the Braidwood site?

A.8. Yes, with one minor exception. Although L.K. Comstock Manual Section 1.0.1 requires the conduct of quarterly Corporate audits, only three Corporate audits were performed in 1984. However, the required fourth audit, scheduled for 1984, was actually performed in January 1985, but was not counted as part of the 1985 audit schedule requirements. Five additional Corporate audits

have been scheduled and performed in 1985, including a special audit to review the qualification and training of L.K. Comstock Braidwood Site QC personnel. These audits have reviewed the L.K. Comstock Quality Assurance Program to all applicable Criteria of 10 CFR 50, Appendix B, with the exception of Criteria IV, VII and XI as previously noted.

Q.9. Mr. Quaka has L.K. Comstock site Quality Assurance conducted audits as scheduled under its 1984 and 1985 internal audit schedule for Braidwood?

A.9. Yes. L.K. Comstock site Quality Assurance scheduled and conducted 33 internal and audits at Braidwood in 1984 and a total of 37 internal audits are scheduled for 1985, 35 of which are completed and two of which are currently in progress. These audits have adequately covered applicable elements of the L.K. Comstock Quality Assurance Program on an annual basis, including active Braidwood site implementing procedures. L.K. Comstock Corporate Quality Assurance conducts audits of Braidwood site procedures in the areas of audits and auditor qualification and certification which must be implemented by the L.K. Comstock Braidwood site Quality Assurance organization. It should be pointed out, that within both the 1984 and 1985 audit schedule period, L.K. Comstock experienced some internal audit schedule slippage and not all audits were performed as originally scheduled. In some cases, this included not auditing an individual procedure within the confines of a strict 12-month cycle as is technically required by the language of Procedure 4.14.1. However, all audits scheduled on the 1984 annual audit schedule were completed by the end of

1984 and all audits scheduled on the 1985 annual audit schedule are expected to be completed by the end of 1985. In addition, all audit schedule slippages were approved by appropriate L.K. Comstock Quality Assurance management personnel. A revision to L.K. Comstock Procedure 4.14.1 in June 1985 proceduralized the requirement that the L.K. Comstock Braidwood site Quality Assurance Manager issue a justification statement and a schedule adjustment whenever the existing audit schedule cannot be met.

Q.10. Has L.K. Comstock taken any action to prevent continued audit schedule slippage?

A.10. Yes, the problem was one of increasing work load and Quality Assurance personnel shortage. Accordingly, in August 1985, L.K. Comstock provided a third individual to perform audits for its Braidwood site Quality Assurance organization. This individual was granted his auditor's certification on November 2, 1985.

Q.11. Has there been independent verification that L.K. Comstock is annually scheduling and auditing applicable elements of its Quality Assurance Program at Braidwood, including applicable Criteria of Appendix B and active implementing procedures, as directed by Commonwealth Edison?

A.11. Yes, Commonwealth Edison's Quality Assurance audits of the L.K. Comstock audit program in 1984, No. 20-84-545, and 1985, No. 20-85-540, indicate that L.K. Comstock is performing audits of all applicable elements of its Quality Assurance Program in accordance with its internal audit Procedure 4.14.1. These audits have also

verified that L.K. Comstock is complying with the commitments of its annual audit schedule. In addition, Site Quality Assurance conducted Surveillance No. 4852 in September 1985 specifically to assess the corrective actions taken by L.K. Comstock with respect to the NRC Staff's item of non-compliance and the effectiveness of these actions. This Surveillance concluded that the corrective actions taken by L.K. Comstock to remedy the non-compliance have been adequate. It also concluded that "in addition to the L.K. Comstock audit coverage, Commonwealth Edison Site Quality Assurance Audits from mid-1983 through 1984 adequately covered the major activities of L.K. Comstock at Braidwood."

Further, in August 1985, Commonwealth Edison Site Quality Assurance instituted a more formally documented review of the L.K. Comstock Braidwood site internal and Corporate audit schedules and audit reports. The review of the L.K. Comstock audit schedules examines, on an on-going basis, any schedule changes which occur while also verifying that all applicable procedures are being scheduled and audited as planned. L.K. Comstock audits are also reviewed to verify that areas scheduled to be audited have been performed in accordance with the approved L.K. Comstock audit schedules. Site Quality Assurance documents concurrence or issues comments relative to these documents. Comments generated as a result of the Site Quality Assurance reviews have required response from L.K. Comstock and several adjustments by L.K. Comstock in order to maintain audit

schedule commitments to address all applicable aspects of its Quality Assurance Program. As a result of this activity, the four reviews performed to date by Site Quality Assurance have verified that all aspects of the L.K. Comstock Quality Assurance Program are currently being addressed on the annual Comstock Corporate and site audit schedules for Braidwood and that the schedules are being met.

Q.12. Has the NRC closed this aspect of the item of non-compliance?

A.12. Yes, the NRC Staff closed its item of non-compliance in Inspection Report Nos. 50-456/85-49; 50-457/85-51, dated November 20, 1985, based on its investigation of the L.K. Comstock audit program and its conclusion that the L.K. Comstock Corporate and site Quality Assurance organizations were meeting their audit schedules for Braidwood and that L.K. Comstock was auditing all applicable elements of its Quality Assurance Program on an annual basis. However, the NRC Inspector noted, in an unresolved item, that contrary to Regulatory Guide 1.144-1980, L.K. Comstock Procedure 4.14.1 allowed limited activity procedures to be placed on a 24 month audit schedule. L.K. Comstock used this statement in Procedure 4.14.1 to maintain non-active procedures in its audit program, but not to audit them in any year they were not in use. In response to the NRC open item, Commonwealth Edison has directed L.K. Comstock to change the wording of Procedure 4.14.1 to make clear that those procedures actually in use at the site in any given year, i.e., all active implementing procedures, be audited annually.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF CONRAD L. HOLT
(on Rorem Q.A. Subcontention 14B.3)

Conrad L. Holt, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

C. L. Holt
Conrad L. Holt

Subscribed and Sworn before me
this 20th day of December 1985

Carol J. McCoy
Notary Public

My Commission expires on 10/20/85

0562H

TESTIMONY OF CONRAD L. HOLT
(ON ROREM Q.A. SUBCONTENTION 14B.3)

Q.1. Please state your full name and business address for the record.

A.1. Conrad L. Holt, Braidwood Nuclear Station, Braceville, Illinois 60407

Q.2. By whom are you employed and in what capacity?

A.2. I am employed by Pullman Sheet Metal Works, Inc. ("Pullman") as Site Quality Assurance Supervisor at Commonwealth Edison Company's Braidwood Station. I am responsible for the technical implementation of the Pullman site Quality Assurance Program at Braidwood including the management and supervision of Pullman site Quality Assurance personnel, QA/QC training and certification, procedure development and implementation, QA records collection and management, deviation reporting, and corrective action program implementation. I also interface with Commonwealth Edison Company, the NRC and design consultants to resolve their quality concerns with regard to Pullman.

Q.3. Please summarize your educational background and professional experience.

A.3. I have been employed by Pullman, a subsidary of Pullman Construction Industries, Inc. ("PCI"), since October 16, 1984. Since this time, I have been assigned to the Braidwood Station. Prior to working for Pullman, I was employed by Baldwin Associates as site Assistant Quality Engineering Supervisor at the Clinton Nuclear Power Station and prior to that by Pullman Construction Industries, Inc. (HVAC) as the site Quality Administration

Supervisor at the Marble Hill Nuclear Generating Station. I began my experience in the nuclear quality field in 1981 with University Nuclear Systems Inc., stationed at the Washington Public Power Supply Systems Units 1 and 4, first as a Quality Assurance Document Supervisor, then as a Quality Assurance Engineer and finally as the site Assistant QA/QC Manager. From 1961 through 1980, I was enlisted in the United States Navy where I supervised the quality assurance and quality control inspection of aircraft systems, operations and maintenance activities. I have over 25 years of experience in the quality assurance field, the last five of which are nuclear related. I obtained a three year technical diploma in electronics in 1976 from De Vry Institute of Technology, Chicago, Illinois. I graduated from high school in 1962.

Q.4. What is the purpose of your testimony?

A.4. The purpose of my testimony is to explain the corrective actions Commonwealth Edison Company directed Pullman to take as a result of the NRC Staff's item of non-compliance contained in the following aspect of Rorem Quality Assurance Subcontention 14:

B. A special NRC QA inspection reported May 7, 1984 that:

* HVAC contractor Pullman Construction Industries, Inc., did not meet their yearly schedule for audit activities required by their QA Manual, Section 18, in that the following implementing procedures were not audited:

- B 3.1.F, Design Control
- B 5.1.F, HVAC Adjustment and Repair
- B 9.3.F, Expansion Anchor Installation
- B 10.2.F, Visual Weld Inspection

Q.5. What corrective actions did Pullman take to address the NRC Staff's item of non-compliance?

A.5. To address the NRC's Staff's item of non-compliance, Commonwealth Edison directed the Pullman Construction Industry ("PCI") Corporate Quality Assurance Department, which at the time was responsible for conducting Pullman's Braidwood site audits, to audit all active Pullman implementing procedures used at Braidwood, including those noted by the NRC Staff as unaudited, on an annual basis. Accordingly, PCI Quality Assurance issued a revised form of annual audit schedule matrix for Braidwood in August 1983, listing Appendix B Criteria, Pullman Quality Assurance Manual Sections and Pullman site implementing procedures to be audited. This form of annual schedule required that future PCI audits cover the entire population of active Pullman implementing procedures in use at Braidwood. The revised 1983 PCI audit schedule matrix for Braidwood actually listed for audit all Pullman Quality Assurance Manual sections and active site implementing procedures, including those implementing procedures documented in the NRC Staff's item of noncompliance and listed in this part of Rorem Q.A. Subcontention 14 as not audited. In addition, the PCI Quality Assurance audit staff was expanded at this time to ensure the availability of a full-time lead auditor to meet the revised PCI 1983 audit schedule matrix commitments for Braidwood.

Q.6. Were these audit commitments met in accordance with the revised PCI 1983 audit schedule matrix for Braidwood?

A.6. Yes, as Commonwealth Edison directed, PCI Quality Assurance performed two internal audits at Braidwood in August and December of 1983 under the revised 1983 PCI audit schedule matrix. These audits covered all Quality Assurance Manual sections and assessed compliance with all of Pullman's active Braidwood site implementing procedures, including those procedures the NRC Staff identified as not audited.

Q.7. Did PCI continue to schedule and audit its active Braidwood site implementing procedures annually after 1983?

A.7. Yes, The 1984 PCI audit schedule matrix for the Braidwood site continued this practice. PCI Quality Assurance conducted three internal audits at Braidwood in February, August and December 1984 which covered all sections of the Quality Assurance Program and all active Pullman site implementing procedures, including those procedures the NRC Staff identified as not audited.

Q.8. What about 1985?

A.8. The same holds true for 1985. However, there were certain corporate changes in the last quarter of 1984 which must first be described.

Q.9. Please describe these changes.

A.10. In October 1984 at the request of Commonwealth Edison Company, the conduct of all internal audits at Braidwood by PCI was transferred to the Pullman Braidwood site Quality Assurance organization. I was hired by Pullman as site Quality Assurance Supervisor at this time. In early 1985, I developed Pullman Internal Audit Procedure B18.1.F specifically for the conduct of Pullman's Braidwood site internal audits. Procedure B18.1.F, Section 5.1, incorporated for Pullman's internal audits at Braidwood the requirement that "the 18 criteria of 10 CFR 50, Appendix 'B' and processes that control activities affecting quality," i.e., all active implementing procedures, be scheduled and audited annually. Also in January 1985, PCI transferred a full-time lead auditor to the Pullman Braidwood site Quality Assurance organization. Under the direction of Pullman's Braidwood site Quality Assurance Manager, the auditor's first assignment was the establishment of a 1985 site internal audit schedule matrix for Pullman. The Pullman 1985 internal audit schedule matrix scheduled for annual audit all Appendix B Criteria, Pullman Quality Assurance Manual Sections and active Pullman Braidwood site implementing procedures, including the procedures identified by the NRC Staff as not audited.

Q.11. Have the commitments of the 1985 Pullman internal audit schedule matrix for Braidwood been met?

A.11. Yes, in conformance with Commonwealth Edison's directive, the Pullman Braidwood site Quality Assurance organization has completed all scheduled internal audits of all active implementing procedures, including the procedures identified by the NRC Staff

as not audited, in full comformance with the established 1985 Pullman internal audit schedule matrix. A similar internal audit schedule matrix for 1986 is currently being developed.

Q.12. Are there any implementing procedures which are not included on the 1985 Pullman internal audit schedule matrix?

A.12. No, all implementing procedures now required to be audited by the Pullman Braidwood site Quality Assurance organization are scheduled and audited in accordance with the Pullman internal audit schedule matrix. It should be pointed out that PCI Quality Assurance is still required to conduct Braidwood site internal audits of Pullman implementing procedures in the areas of audits and auditor qualification and certification, Procedures B2.4.F and B18.1.F. Audits of these procedures are included on the annual PCI audit schedule matrix for Braidwood.

Q.13. Has there been independent verification that Pullman is scheduling and auditing the implementing procedures listed in this part of Subcontention 14 on an annual basis as directed by Commonwealth Edison?

A.13. Yes, Commonwealth Edison Company Site Quality Assurance Department has conducted an independant audit, No. 20-85-549, dated August 29, 1985 and a surveillance, No. 4433, dated May 14, 1985, of PCI's 1984 Braidwood audit program and Pullman's 1985 internal audit program for Braidwood. Site Quality Assurance has found that both the PCI and Pullman Quality Assurance organizations have performed internal audits at Braidwood in conformance with an

established audit schedule which covers all active areas and site procedures, including the procedures noted by the NRC Staff in its item of non-compliance as not audited. In addition, the NRC Staff reviewed the Pullman internal audit program in Inspection Report Nos. 50-456/85-032 and 50-457/85-031, issued October 4, 1985, and noted that after August 1983, Pullman has implemented annual audit schedules that provide for auditing its entire population of Braidwood site implementing procedures.

Q.14. Do you have anything further to add concerning the effectiveness of the corrective actions taken to address the NRC Staff's item of non-compliance?

A.14. Yes, I believe the effectiveness of the corrective actions for guaranteeing that Pullman continues to meet its yearly audit schedule for audit activities is assured since the corrective actions taken encompass the requirement that the entire population of Pullman implementing procedures be scheduled and audited annually, not just the specific procedures identified by the NRC Staff and listed in this part of Rorem Subcontention 14 as not audited.

Q.15. Has the NRC Staff closed-out this aspect of the item of non-compliance?

A.15. Yes, the NRC violation was closed during a formal NRC Inspection Exit Meeting on November 27, 1985 and the closure is documented in NRC Inspection Report Nos. 50-456/85-52; 50-457/85-50, dated December 6, 1985.

RORBM QA CONTENTION ITEM 14B.4

Rorem QA Contention Item 14B, Part 4 states:

Contrary to Criterion XVIII, "Audits," of 10 C.F.R. Part 50, Appendix B, Commonwealth Edison Company has failed to ensure that a comprehensive system of planned and periodic audits is carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program. The Applicant also failed to ensure followup action, including reaudit of deficient areas.

B. A special NRC QA inspection reported May 7, 1984 that:

* Edison'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. (Inspection Report 83.09, Exh. 5.)

MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

1. In October 1983, during a Braidwood site inspection, an NRC inspector noted that because the site installation of small bore instrumentation piping began before March 1981 and small bore process piping began before July 1981, two years had passed prior to Site Quality Assurance identification of hanger design ("support selection") calculation problems in audit No. 20-83-33, dated July 15, 1983. The Inspector concluded that Site Quality Assurance's audits of small bore instrumentation and process piping were inadequate because support selection and design deficiencies had not been identified and corrected in a timely manner. (Affidavit of Steven C. Hunsader "Hunsader Affidavit" at pp. 2 and 3.)

2. PGCo simultaneously began safety related small bore instrumentation piping and support selection at Braidwood in July 1981, not before March 1981, after the approval of PGCo Procedure PGCP-22 and the

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first safety related instrumentation installation package was issued to the field in February 1982 (Hunsader Affidavit at 4.)

3. Site Quality Assurance conducted its first audit of PGCo safety related small bore instrumentation support selection, No. 20-81-30, in October 1981, after the approval of PGCo Procedure PGCP-22, identifying 7 findings of support selection calculation errors or related deficiencies. The time lag between the start of safety related small bore instrumentation support selection in July 1981 and audit No. 20-81-30 is reasonable because a certain amount of time is necessary to obtain a representative sample of work for audit. (Hunsader Affidavit at p 5.)

4. A stop-work order was placed on PGCo safety related small bore instrumentation installation activity from October 1981 to February 1982 as a result of the findings of audit No. 20-81-30. Through timely follow-up Surveillances, Commonwealth Edison Site Quality Assurance verified that appropriate corrective action for the seven identified deficiencies of audit No. 20-81-30 was sufficiently completed prior to the lifting of the stop-work order in February 1982. (Hunsader Affidavit at pp. 5 and 6.)

5. Site Quality Assurance specifically re-checked PGCo's safety related small bore instrumentation support selection in follow-up audit No. 20-82-15, in July 1982. No deficiencies were identified, indicating that PGCo safety related small bore instrumentation support selection work was being acceptably performed. (Hunsader Affidavit at pp. 6-7.)

6. Audit No. 20-83-33, was performed in July 1983, in part to assess PGCo's safety related small bore instrumentation support selection activity. The NRC Inspector indicated this was the first audit to identify safety related small bore instrumentation and process piping support selection calculation errors in two years of work activity. Errors were identified similar to those subsequently identified by the NRC Inspectors. (Hunsader Affidavit p. 7.)

7. PGCo began safety related small bore process piping installation at Braidwood in March 1982, not before July 1981. However, safety related small bore process piping support selection work was not begun until January 1983 after the addition of requirements for this activity in PGCP-22 . (Hunsader Affidavit at p. 4.)

8. Site Quality Assurance's first audit of PGCo safety related small bore process piping support selection was audit No. 20-83-33 which took place in July 1983, as noted by the NRC Inspector. However, the time lag between this audit and the actual start of this work in January 1983 was reasonable to allow for a representative sample of completed work to be examined. This audit identified support selection calculation errors similar to those identified by the NRC Inspector. (Hunsader Affidavit at p. 7.)

9. Audit No. 20-83-33 was closed on November 17, 1983, based on two timely follow-up Surveillances, also performed, in November which verified the effectiveness of corrective actions taken to remedy the

deficiencies identified in the audit for both safety related small bore instrumentation and process piping. (Hunsader Affidavit at pp. 7 and 8.)

10. Commonwealth Edison denied the existence of this aspect of the item of non-compliance, based on the documented history of Site Quality Assurance involvement in the timely conduct and follow-up of audits performed to monitor PGCo's safety related small bore instrumentation and process piping support selection activity. Commonwealth Edison committed to no additional action as a result of the alleged non-compliance. The NRC Staff has never responded to Commonwealth Edison's non-compliance disclaimer. (Hunsader Affidavit at p. 8.)

11. Commonwealth Edison Site Quality Assurance has conducted four major audits of PGCo safety related small bore instrumentation and process piping support selection activity subsequent to the NRC Staff's identification of this item of non-compliance. (Hunsader Affidavit at p. 9.)

12. Audit No. 20-83-49, dated October 20, 1983 identified additional support selection calculation errors and resulted in a second stop-work order on all PGCo safety related small bore support selection work. The stop-work order was lifted on December 19, 1983, in part, based on the verification of effective corrective action implementation for the deficiencies identified in Audit No. 20-83-49 and, in part, based on the findings of audit No. 20-83-62, performed in early December 1983, which examined 55 small bore

supports and identified no calculation errors. Audit Nos. 20-84-518 dated May 4, 1984 and 20-85-538 conducted in August 1985 identified only minor support selection deficiencies. (Hunsader Affidavit at pp. 9 and 10.)

13. The NRC Staff has never required Site Quality Assurance to take corrective action to resolve the aspect of its item of non-compliance on inadequate auditing of PGCo safety related small bore instrumentation and process piping support selection. The NRC Staff has agreed on two separate occasions subsequent to the identification of this aspect of the non-compliance, as documented in the NRC Staff's CAT Team Inspection Report No. 84/44 and a subsequent Staff Inspection Report No. 50-456/85-49, that Commonwealth Edison Quality Assurance is conducting a comprehensive audit program at Braidwood, including the conduct of audits, preparation of audit reports and timely scheduled follow-up to audit findings to identify the lack of implementation and programmatic problems. (Hunsader Affidavit at pp. 12-13.)

DISCUSSION

Rorem QA Subcontention Item 14.B, part 4 incorporates one example of an NRC Staff Severity Level IV item of non-compliance identified in October 1983 and documented on Inspection Report Nos. 50-456/83-09, 50-457/83-09. The example under the item of non-compliance states that Commonwealth Edison's audits of the installation of small bore instrumentation and process piping were inadequate in that they failed to identify contractor hanger design ("support selection") calculation problems for more than two years.

The standard for the conduct of Quality Assurance audits is found at 10 C.F.R. 50, Appendix B, Criterion XVIII which 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." Guidance for the implementation of Criterion XVIII is found in Regulatory Guide 1.144-1980 "Auditing of Quality Assurance Programs for Nuclear Power Plants" which incorporates the philosophy of ANSI N45.2.12-1977 "Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants." Section 3.2 of ANSI N45.2.12 establishes the objectives for a comprehensive audit system:

1. To determine that a quality assurance program has been developed and documented in accordance with specified requirements;

2. To verify by examination and evaluation of objective evidence that the documented quality assurance program has been implemented;

3. To assess the effectiveness of the quality assurance program;

4. To identify nonconformances and quality assurance program deficiencies; and

5. To verify correction of identified quality assurance program deficiencies.

The affidavit of Steven C. Hunsader details the program of comprehensive audits Commonwealth Edison's Braidwood Site Quality Assurance organization performed to examine PGCo's safety related small bore instrumentation and process piping support selection work. As described by Mr. Hunsader, these audits and the timely follow-up actions that were taken as a result of the support selection deficiencies that were identified, performed from the inception of PGCo support selection work, satisfied the objectives of ANSI N45.2.12. As Mr. Hunsader's affidavit amply demonstrates, the audits conducted examined in detail PGCo's small bore support selection work activity, identified support selection calculation errors and broader PGCo support selection program deficiencies and verified that corrective actions were implemented for the identified deficiencies through timely audit follow-up.

Moreover, as Mr. Hunsader's affidavit establishes, it is apparent that the basis for this example under the NRC Staff's item of non-compliance, and thus this aspect of Intervenor Rorem's Subcontention 14B, is that the NRC Inspector who identified this as an example of the item of non-compliance incorrectly identified the dates when safety related small bore instrumentation and process piping support selection began at Braidwood. As a result, the inspector improperly concluded that two years had passed prior to Commonwealth Edison's identification of support selection deficiencies. Once the actual start dates for PGCo's safety related support selection activities are identified for both instrumentation and process piping, the history of Site Quality

Assurance's involvement in this area demonstrates that adequate audits and follow-up actions were conducted. Contrary to Intervenor Rorem's Contention, these audits identified hanger design calculation and related support selection deficiencies in a timely fashion and timely follow-up audits and surveillances were initiated to track corrective action implementation and verify correction of identified audit deficiencies well before the two year period cited by the NRC Inspector under this example of the item of non-compliance.

PGCo began safety related small bore instrumentation piping installation and support selection at Braidwood simultaneously in July 1981, not before March 1981 as the NRC Inspector indicated, and the first safety related instrument installation package was not issued to the field until February 1982. In October 1981, after a reasonable time lag to provide for completion of a representative sample of work, Site Quality Assurance conducted its first audit of this activity. Audit No. 20-81-30 identified seven findings, with regard to safety related instrument support selection calculations and related deficiencies and, as a result of these findings work was stopped from October 1981 to February 1982. Site Quality Assurance performed seven follow-up Surveillances within this period to track audit closure. Corrective actions included correction of the deficient calculations as well as revision and implementation of PGCo installation procedure PGCP-22 to more clearly delineated the performance of support selection activity. Follow-up audit No. 20-82-15 specifically rechecked 20 instrumentation support selection calculations all of which were found to be

correctly performed. From these audits it appeared that PGCo instrument support selection work was being performed in an acceptable manner.

PGCo did not begin safety related small bore process piping support selection until January 1983, although installation work was started in March 1982. After a representative amount of work was completed, Site Quality Assurance Department conducted its first audit, No. 20-83-33, in July 1983, as the NRC Inspector noted. This audit also examined instrumentation support selection work and identified calculation deficiencies similar to those the NRC Inspector identified. However, as the affidavit of Mr. Hunsader establishes this was by no means the first audit to identify instrumentation support selection calculation errors. In addition, although it was the first audit to identify process support selection calculation errors, it was performed within six months of the start of process piping support selection. Audit 20-83-33 was closed on November 17, 1983 based on Site Quality Assurance's timely verification of corrective action implementation, including the revision of PGCo Procedure PGCP-22, Revision 8, to more specifically define the methodology for performing support selection calculations for both safety related small bore process and instrumentation piping.

As Mr. Hunsader explains, Commonwealth Edison took no additional action as a result of the identification of this example under the item of non-compliance, based on the documented history of Site Quality Assurance's involvement in the conduct and follow-up of comprehensive audits performed to monitor PGCo's small bore instrumentation and process piping support selection activity. The NRC has never responded to this position.

In addition, Site Quality Assurance continued to audit this area subsequent to the identification of the alleged example of non-compliance. Specifically, four detailed audits were performed between October 1983 and the present. The first of these audits, No. 20-83-49, identified additional support selection deficiencies and resulted in a second work stoppage until December 19, 1983. The second 1983 audit in December, No. 20-83-62, found no support selection deficiencies in fifty-five supports .viewed and was, in part, the basis for lifting the stop work order. Audits in 1984, No. 20-84-518, and 1985 No. 20-85-538, have identified only minor support selection calculation errors.

The NRC Staff has never required that Commonwealth Edison Site Quality Assurence take any corrective action to resolve this example of the item of non-compliance documented in Inspection Report 83-09 , suggesting that it considers Edison's overall auditing of to be adequate. On two occassions since the identification of this aspect of the item of non-compliance, in the 1984 NRC Staff CAT Team Report and in a September 1985 NRC staff inspection documented in Report Nos. 50-456/85-49, the NRC Staff indicated it found the Site Quality Assurance audit program to be comprehensive, adequate and in conformance with Criterion XVIII. In addition, the NRC Inspector who identified this as an example under the item of non-compliance has testified that, at the time, he did not review the sequence of audits performed by Commonwealth Edison and that he based his finding that Commonwealth Edison's auditing was inadequate merely on the fact that any audits performed failed to identify, "if not all, most of the problems he had identified." (Deposition of Isa T. Yin, December 3, 1985, pp. 126-131, Attachment A

hereto.) However, this statement provides no basis for the finding that the audits Commonwealth Edison actually did perform violated the requirements of 10 C.F.R. 50, Appendix B, Criterion XVIII as implemented by the objectives for comprehensive auditing contained in ANSI N45.2.12-1977.

Thus, as Mr. Hunsader's affidavit explains, history shows that, contrary to the aspect of the NRC Staff's item of non-compliance adopted by Intervenor Rorem in QA Contention Item 14B, part 4, deficiencies concerning safety related small bore instrumentation and process piping support selection activities were initially identified within a reasonable time after PGCo support selection activity began at Braidwood. The fact that these audits were performed is beyond dispute. In addition, through the process of follow-up surveillances and subsequent audits, originally identified problem areas regarding support selection calculations were then specifically emphasized for re-audit. The subsequent audits that were conducted were then able to take larger samples to verify the correctness of previously identified support selection calculations errors, and, in addition, to assess the broader generic implications, if any, of such errors. As a result of this process, the problems identified in subsequent audits of support calculation errors, such as those identified in the 1984 and 1985 Site Quality Assurance Audits, were much narrower than those identified in earlier audits. This clearly indicates that Intervenor's claim that these audits were inadequate is without basis. Instead, it is clear that a problem area was effectively being addressed by Site Quality Assurance at Braidwood and that in accordance with the requirements of 10 C.F.R. 50, Appendix B, Criterion XVIII, as defined by ANSI N45.2.12-177, the

audit process in place to identify and correct in a timely fashion safety related small bore instrumentation and process piping support selection problems satisfied the objectives of Criterion XVIII for a comprehensive audit system.

No factual issues have been raised by Intervenor Rorem which controverts the facts established in the affidavit of Mr. Hunsader. Accordingly, there is no genuine issue of material fact with respect to Rorem QA Contention Item 14B, part 4 and Commonwealth Edison is entitled to summary disposition of that part of the Subcontention as a matter of law.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT OF STEVEN C. HUNSADER
(on Rorem Q.A. Subcontention 14B.4)

Steven C. Hunsader, being duly sworn, deposes and states:

The following answers to questions posed by counsel for Commonwealth Edison Company constitute my testimony in the above-captioned proceeding. The testimony is true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Steven C Hunsader
Steven C. Hunsader

Subscribed and Sworn before me
this 19th day of December 1985

Nancy R. Coan
Notary Public

My Commission expires on MY COMMISSION EXPIRES OCTOBER 11, 19[illegible]

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TESTIMONY OF STEVEN C. HUNSADER
(ON ROREM Q.A. SUBCONTENTION 14B.4)

Q.1. Please state your full name and business address for the record.

A.1. Steven C. Hunsader, Braidwood Nuclear Station, Braceville, Illinois 60407.

Q.2. By whom are you employed and in what capacity?

A.2. I am employed by Commonwealth Edison Company as a Site Quality Assurance Supervisor at the Braidwood Nuclear Station. In this capacity, I am currently supervising the activities of the Site Quality Assurance Department special activities group which includes, in part, responsibility for Q.A. coverage of Corrective Action Programs at Braidwood. Prior to this assignment, I was responsible for supervising the activities of the Site Quality Assurance Department mechanical group which is responsible for Q.A. coverage, by audit and/or surveillance, of Phillips, Getschow Company ("PGCo"), the Braidwood site mechanical contractor. As the supervisor of the mechanical group, I was responsible for the conduct of audits and surveillances of PGCo's installation of small bore instrumentation and process piping, including support selection activities.

Q.3. Please describe your educational background and work experience.

A.3. I have been assigned as a Site Quality Assurance Supervisor at Braidwood since March 1981. Prior to that, I was assigned to the Commonwealth Edison Station Nuclear Engineering Department as a staff mechanical engineer for Dresden Nuclear Station, Unit 1.

From January 1976 through March 1978, I was assigned as a Quality Assurance Engineer in the Site Quality Assurance Department of Commonwealth Edison's Byron Nuclear Station and from November 1974 through January 1976, I was assigned as a Quality Assurance Engineer in the LaSalle County Nuclear Station Quality Assurance Department. I began my employment with Commonwealth Edison in July 1974. I received a Bachelor of Science degree in Mechanical Engineering in May 1974 from the University of Wisconsin at Madison. I am currently as associate member of the American Society of Mechanical Engineers and a registered professional engineer in the state of Illinois.

Q.4. What is the purpose of your testimony?

A.4. The purpose of my testimony is to support Commonwealth Edison's Motion for Summary Disposition of that aspect of Rorem Quality Assurance Subcontention 14 which states:

B. A special NRC QA inspection reported May 7, 1984 that:

> Edison'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. (Inspection Report 83.09, Exh 5.)

Q.5. Please describe the basis for the concern identified in this part of Rorem Q.A. Subcontention 14.

A.5. The NRC Staff identified the concern cited in this part of Rorem Q.A. Subcontention 14 during an inspection conducted in October 1983 and documented in Inspection Reports Nos. 50-456/83-09 and 50-457/83-09, dated May 7, 1984. During his

inspection, the NRC Inspector noted that a Site Quality Assurance audit, No. 20-83-33, performed in July 1983 had identified support selection and design calculation problems similar to the problems he was identifying. After noting that the site installation of small bore instrumentation piping had begun before March 1981 and that the site installation of small bore process piping had begun before July 1981, the NRC Inspector concluded that two years of work activity had passed prior to Commonwealth Edison Quality Assurance identifying support selection calculation errors in audit No. 20-83-33. The NRC Inspector issued this as one example of a severity Level 4 item of non-compliance on his belief that site Quality Assurance's audits of small bore instrumentation and process piping were inadequate because hanger selection and design calculation deficiencies had not been identified and corrected in a timely manner in violation of the requirement of 10 C.F.R. 50, Appendix B, Criterion XVIII.

Q.6. Do you agree with this aspect of the item of non-compliance?

A.6. No, I do not. I believe that the NRC Inspector who identified this example as part of a non-compliance incorrectly identified the dates when safety related small bore instrumentation and process piping support selection began at Braidwood and, as a result, improperly concluded that Commonwealth Edison Site Quality Assurance had waited for over two years to conduct audits of those activities and consequently identify deficiencies. Once the actual start dates for PGCo's safety related support selection activities are identified for both instrumentation and process piping, the history of the Site Quality Assurance involvement in this area

demonstrates that adequate and timely audits were conducted. These audits identified hanger design calculation and related support selection deficiencies in a timely fashion and timely follow-up audits and surveillances were initiated well before the two year period cited by the NRC Inspector in this example of the item of non-compliance.

Q.7. When did PGCo begin safety related small bore instrumentation and process piping support selection at Braidwood?

A.7. PGCo simultaneously began safety related small bore instrumentation piping installation and support selection at Braidwood in July 1981, not before March 1981 as the NRC Inspector indicated, after approval of PGCP-22, PGCo's procedure for safety related small bore line support work. The first safety related instrument installation package was not issued to the field until February 1982. PGCo began safety related related small bore process piping installation work in March 1982, not before July 1981 as the NRC Inspector indicated. However, support selection activity for process piping did not begin until January 1983, after requirements for safety related small bore process support work were added to PGCP-22. The NRC Inspector apparently associated the start of process piping installation work with the initiation of support selection activities and, in any event, was still incorrect as to his dates. I have confidence in these dates because work activity is not allowed to begin until an approved procedure has been issued for use in the field.

Q.8. When did Site Quality Assurance begin to audit small bore instrumentation support selection?

A.8 Site Quality Assurance conducted its first audit of this activity, No. 20-81-30, in October 1981. This is a reasonable time lag for conducting an audit with respect to the start of instrumentation support selection work in July 1981 because a certain amount of time is necessary to obtain a representative sample of work for audit. Audit No. 20-81-30 identified seven (7) findings with regard to safety related instrument support selection calculations and related deficiencies.

1. Four instances of incorrect support calculations for instrumentation line supports.

2. Improper reviews of the four instance of support selection calculations violations by an independent reviewer.

3. Three dimensional restraints were not used at the root valve ends of instrument lines as required by S & L Engineering Change Notice ("ECN") 2194 "Installation and Support Selection Guidelines For Process Piping, Instrument Piping and Tubing In Category I Buildings".

4. PGCo failed to include weights from piping adjacent to instrument supports when calculating the instrument support loads in contravention of conservative engineering practice.

5. Calculation sheets for instrument isometric drawings did not reflect the appropriate revision of the drawing to which they applied.

6. PGCo used weight values for instrument support diagrams that were measured with an uncalibrated scale.

7. No mechanism existed for PGCo to monitor its instrumentation group.

As a result of these audit findings, a stop-work order was placed on PGCo small bore instrumentation installation activity from October 1981 until February 1982.

Q.9. Were timely corrective actions taken to resolve each identified instrumentation support selection deficiency identified in audit No. 20-81-30?

A.9. Quality Assurance can not undertake corrective actions for an audit deficiency it can only verify appropriate corrective action completion through timely audit follow-up. I authorized a specific follow-up Surveillance for each of the seven identified deficiencies in audit 20-81-30 to follow corrective action until completion and closure of the finding. Corrective actions reviewed under these Surveillances included correcting the deficient support calculations and the other procedural errors identified by the audit and revising PGCo procedure PGCP-22 to more clearly delineate the performance of support selection activity. All corrective action was considered to be sufficiently completed prior to the lifting of the PGCo stop-work order in February 1982.

Q.10. Were other audits performed subsequent to Audit No. 20-81-30, but prior to the NRC Staff's item of non-compliance?

A.10. Yes, Site Quality Assurance performed a follow-up to its October 1981 audit in July 1982. Audit 20-82-15 specifically re-checked instrumentation support selection in approved audit checklist questions 1, 2, 3, 4, 5, 10, 11, 12, 14, 15, 16, and 17. Twenty calculations were checked and all were found correctly performed. All checklist question areas were found acceptable and the revisions to PGCP-22 were found to be properly implemented. Based on the closure of the October 1981 audit and the July 1982 audit, it appeared that PGCo instrument support selection work was being

performed in an acceptable manner and that PGCo was implementing its procedures in this area. However, in July 1983 Site Quality Assurance performed audit No. 20-83-33 on both safety related instrumentation and process piping support selection which identified calculation errors similar to those subsequently identified by the NRC Inspector. Audit 20-83-33 was the audit incorrectly identified by the NRC Inspector as the first audit to identify instrumentation and process piping support selection and design calculations for more than two years.

Q.11. When did Site Quality Assurance begin to audit safety related small bore process piping support selection?

A.11. Site Quality Assurance conducted its first audit of this activity, No. 20-83-33, in July 1983 as noted by the NRC Inspector. However, contrary to the Inspector's belief, the time lag between the actual start of work in January 1983 and the audit was reasonable in order to allow for a representative sample of completed work to be examined. The audit was prior to the first safety related small bore process pipe installation package being issued to the field. Audit No. 20-83-33 noted one (1) finding and two (2) observations with regard to PGCo's safety related small bore process piping support selection activities. Deficiencies identifed were similar to those identified by the NRC Inspector during his inspections. Specifically, the audit identified that PGCo procedure PGCP-22 did not give the step-by-step method for performing small bore process piping support selection calculations; that the procedure did not incorporate or reference

the current applicable Sargent and Lundy ECN (4566) for small bore support selection activity; and that drawings from which rated loads were being obtained were not referenced on the support calculation sheets, leaving them unclear or incomplete. Audit 20-83-33 also identified that small bore pipe and instrumentation line support selection personnel training files were incomplete. Despite these deficiencies, no cases were identified where calculations were being incorrectly performed or where undersized pipe supports were being selected.

Q.12. Did Commonwealth Edison Site Quality Assurance institute timely follow-up actions as a result of the deficiencies identified in audit No. 20-83-33?

A.12. Yes, I authorized three Site Quality Assurance Surveillances, two issued in November 1983 and one issued in January 1984, to track the implementation of corrective action and eventual close-out of the small bore process pipe support calculation deficiencies identified in audit No. 20-83-33. Corrective actions reviewed under these Surveillances included the revision of PGCo's procedure PGCP-22, Revision 8, to more specifically define the methodology for performing support selection calculations for both safety related small bore process and instrumentation piping. Site Quality Assurance Surveillance No. 3192, specifically noted that PGCP-22, Revision 8, referenced the most current ECN for the selection support work and satisfactorily included a step-by-step method of performing support calculations and that calculation

sheets contained appropriate references. Audit No. 20-83-33 was closed on November 17, 1983, based on the results of the first two follow-up Surveillances.

Q.13. Mr. Hunsader, what actions did Commonwealth Edison take as a result of the NRC Staff's issuance of the aspect of the item of non-compliance?

A.13. Commonwealth Edison specifically denied the existence of the item of non-compliance, based on the documented history of this aspect of Site Quality Assurance involvement in the conduct and follow-up of audits performed to monitor PGCo's small bore instrumentation and process piping support selection activity. Accordingly, no additional action was committed to as a result of this alleged aspect of the non-compliance. The NRC Staff has never responded to Commonwealth Edison's non-compliance disclaimer.

Q.14. Mr. Hunsader, did Commonwealth Edison Site Quality Assurance continue to audit PGCo safety related small bore instrumentation and process piping support selection subsequent to the identification of this aspect of the NRC Staff's item of non-compliance?

A.14. Yes, a total of four (4) major audits of PGCo support selection activity have been conducted since the time the NRC Staff identified this aspect of its item of this aspect of non-compliance in October 1983.

During the remainder of 1983, Site Quality Assurance conducted two audits specifically of PGCo support selection activities and design document controls related to support selection work. Audit No. 20-83-49, dated October 20, 1983, identified three findings 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.

A stop work was issued for both instrumentation and process piping support selection work. Five follow-up Surveillances were performed between November 1983 and March 1984 to define and verify implementation and completion of the established corrective actions taken to remedy the deficiencies noted in Audit 20-83-49 and the audit was closed on March 16, 1984.

In early December 1983 during the stop work period, site Quality Assurance audit No. 20-83-62 checked the implementation of PGCo Procedure PGCP-22, Rev. 8. 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. The stop work order was lifted on December 19, 1983, in part, as a result of the positive results of this audit.

During 1984, support selection was again checked by Site Quality Assurance in audit No. 20-84-518, dated May 4, 1984. One observation identified minor support calculation errors. Part of the observation was resolved at the time of the audit and part was resolved in a follow-up Surveillance which was closed, based on Quality Assurance verification of established corrective action completion, in October 1984.

Finally. Site Quality Assurance Audit No. 20-85-538, conducted in August 1985, again checked PGCo support selection activities for small bore process piping and small bore instrument piping. Three minor observations were identified:

1. failure to control various forms used to document support selection calculations;

2. lack of adherence to procedures for changes to design documents;

3. failure to obtain S&L approval for a support calculation change prior to implementing the change;

The first two observations were closed during the course of the audit. The remaining observation was a case where a more conservative method of calculation was used instead of that approved by S&L; and discussions with S&L have indicated that this approach is technically acceptable. The auditor noted that while the deficiencies point to a need for tighter control over PGCo support selection activities, none of the items reflect serious concerns regarding hardware design adequacy.

Q.15. Mr Hunsader, notwithstanding the fact that the NRC Inspector mistook the dates when PGCo support selection activities began, do you consider the audits conducted by Site Quality Assurance prior to the NRC Staff's identification of this aspect of the non-compliance to be inadequate based on the failure of these audits to verify that support selection calculation deficiencies were resolved in a timely manner?

A.15. No, I do not. Deficiencies concerning safety related small bore instrumentation process piping support selection activities were initially identified within a reasonable time after PGCo support selection activity began at Braidwood. Through the process of follow-up Surveillances and subsequent audits, originally identified problem areas regarding support selection calculations

were then specifically emphasized for re-audit. The subsequent audits that were conducted were then able to take larger samples to verify the correctness of previously identified support selection calculations errors and, in addition, to assess the broader generic implications, if any, of such errors. As a result of this process, the problems identified in subsequent audits of support calculation errors were much narrower than those identified in earlier audits. This indicates that a problem area was effectively being addressed by Site Quality Assurance at Braidwood and that the audit process was working exactly as it should have been.

Q.16. Mr. Hunsader, has the NRC Staff closed out this aspect of the item of non-compliance?

A.16. No, it has not. However, the NRC Staff has never required that Commonwealth Edison Site Quality Assurance take any corrective action to resolve this aspect of the item of non-compliance, suggesting that it considers Commonwealth Edison's overall auditing of this area to be adequate. I believe that my testimony presents an adequate basis for the Staff to close-out this example of non-compliance and, in fact, to rescind example of the non-compliance altogether.

In addition, the NRC staff has agreed on two occassions since the identification of the item of non-compliance listed in Rorem Q.A. Subcontention 14B that Commonwealth Edison Quality Assurance is conducting a comprehensive audit program at Braidwood. The NRC Staff report of February 20, 1985 describing the results of the

NRC Braidwood Construction Appraisal Team (CAT) Inspection 50-456/84-44; 50-457/84-40 conducted in December 1984 and January 1985 stated that "The elements of the applicants' audit program which included audit reports and scheduled follow-ups to audit findings, were reviewed and determined to be comprehensive. These audits are identifying not only the lack of implementation, but also programmatic problems". Moreover, in September 1985, the NRC again examined the Commonwealth Edison Site Quality Assurance audit program including its audit schedule for auditing contractor activity, audit performance, and corrective action follow-up. The results of the NRC Inspector's review, documented in Inspection Report Nos. 50-456/85-046; 50-457/85-045, identified no violations or deviations from the requirements of 10 C.F.R. 50, Appendix B and the Inspector concluded that his review demonstrated that "the Site QA organization had sufficient authority and organizational freedom to identify quality problems; to initiate, recommend, and provide solutions; and to verify implementation of solutions". This information further supports that my testimony presents an adequate basis for close-out of this aspect of the non-compliance.

with the results of that review?

A No, I am not.

Q One other item on 83-09 is with regard to the auditing issue. It is 83-09-08-D. Did you identify that item, Mr. Yin? It is the last page of the whole document. It's 14.

A Yes.

Q Did you review any audits in the areas where you had been inspecting?

A After this particular inspection or during the inspection?

Q During the inspection.

A Yes. I requested all the audits performed by CECo to be presented to me for my review. The report document and everything was presented to me during the inspection.

Q What did you find in reviewing those audits?

A I found the audits performed by CECo to be inadequate, based on the fact that in so many different areas, a problem has been identified. During my rather short duration on inspection and based on the fact that the installation of small bore piping -- during my inspection, it started July 1981 -- the piping system in March of 1981, for

the instrumentation system, and from July 1981 and March 1981 to the time I performed my inspection, it is at least two years passed.

I was quite surprised to see so many various issues raised during my inspection.

Q I am looking at Edison's January 12, 1984 response to this item. It appears at page 27 and following.

MR. MILLER: January 12th?

MR. GUILD: Yes.

BY MR. GUILD:

Q I am also looking at the July 1984 response. I have not tried to line them up line for line, but they appear to be substantially the same, if not identical.

You didn't see the July 1984 response, but you did see the January response, did you not?

A That's correct.

Q Is there anything that Edison stated in their January 1984 response that caused you to alter your conclusion or your inspection findings on that item?

A No. It didn't change my mind at all.

Q Were you aware of that sequence of audits at the time you reached the conclusion that you did? Had they

presented those audits to you?

A I didn't go through it in detail, as I said, during my inspection. I made it clear to present everything that related to the subject matter. Subsequently, if they take out additional information, I may have to review it again. Since I was not assigned to follow up on this item, I just let it go, you know, somebody else will eventually take good care of it.

Q You did see the January response, did you not?

A Yes, I did.

Q You evaluated that?

A I evaluated that, not to the extent that I would say that I'm ready to concur with it or disagree with it. In general, I still believe that the quality of the audit at that time was inadequate. It shouldn't result in my inspection having so many issues identified.

Q Is it fair to say that the proof is in the pudding, in essence, that for the problems you found, the auditing couldn't have been adequate or the problems would have been corrected?

A That's the motive, but still you need substantiation. The motive is the fact, how come I identified

so many items.

Q Are you aware of who is handling the follow-up on this item?

A I don't know who is handling this.

Q Do you know if Mr. Muffett is?

A I'm not too sure.

Q Do you know if anyone else within the NRC followed up on the item regarding audits?

A I have no idea.

MR. GUILD: That's all I have. Thank you very much.

I do want to pursue this matter of the clearance issue, to the extent that you identified reviews at Byron that are applicable to Braidwood, but that's all I have for now.

EXAMINATION

BY MR. MILLER:

Q Mr. Yin, let me just follow up on the last line of inquiry by Mr. Guild.

Do you recall whether you reviewed an audit report that is identified as Audit Report 20-81-30? That is a Commonwealth Edison audit that occurred in October 1981 of the support selection process by Phillips-Getschow.

A Will you repeat the specific number?

Q The specific number is 20-81-30. When I asked whether you reviewed it, when you asked Commonwealth Edison to give you everything they had that dealt with the issue at the site, do you recall whether that report was among them?

A Right. I reviewed it and I documented such in my report.

Q Could you direct me to --

A Page 29.

MS. CHAN: Last item under --

MR. MILLER: I see it. Thank you.

BY MR. MILLER:

Q Assume with me that audit report identified incorrect calculations as one of the audit findings. Was the

basis for the item of noncompliance that you identified with respect to audits, the failure to take timely and effective corrective action as a result of the audit finding?

Was there some other inadequacy with respect to the audits that you identified?

A It's been so long I don't quite remember. I think, if I do remember correctly, I think the system layout of activities is a little bit different from the scope of my inspection at the time. I even mentioned there were seven findings and three observations in the report, so it must be substantial.

You also noticed I didn't quote any of the findings which is different from what I did for the 83-33 Report. The intent was to identify the findings similar to my same scope of work and have a comparison, what you have identified and what I have identified, and was there any difference. Based on that evaluation, I draw the conclusion that the QA audit was not adequate as it should be.

Q In that it failed to identify problems that you subsequently identified in your inspection; correct?

A It failed to identify, if not all, most of the problems I have identified.