

U. S. ATOMIC ENERGY COMMISSION
REGION I
DIVISION OF COMPLIANCE

Report of Inspection

CO Report No. 286/69-9

Licensee: CONSOLIDATED EDISON COMPANY
Indian Point No. 3
Construction Permit No. CPPR-62
Category A

Dates of Inspection: November 17-20, 1969

Date of Previous Inspection: October 29, 1969

Inspected by: R. F. Heishman, Reactor Inspector, CO:I
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Branch, DRL
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(Part Time)
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Compiled by: R.T. Carlson for 12/31/69
R. F. Heishman, Reactor Inspector, CO:I Date

Reviewed by: R.T. Carlson 12/31/69
R. T. Carlson, Senior Reactor Inspector, CO:I Date

Proprietary Information: None

I. Summary

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The inspectors found that Consolidated Edison Company of New York, Inc. (Con Ed) has formulated and is implementing a quality assurance (QA) program which, with exceptions noted, conforms to the application for the Indian Point 3 nuclear project. (Section III)

Westinghouse Electric Corporation (Westinghouse) as "turnkey" contractor has the responsibility for the quality assurance program for the design, fabrication and construction; however, Con Ed as licensee, owner and operator retains prime responsibility and is deeply involved in the QA program. (Section III, Criterion I)

The inspection did not include the Westinghouse engineering offices as this had been accomplished during inspection of other projects.

Items identified by the inspectors which require followup are listed below:

- A. Monitor changeover of contractual changes between UE&C and Wedco. (Continuing) (Section III, Criteria II and III)
- B. Inspect procedures and instructions on site for implementation. (Section III, Criterion V)
- C. Inspection control of materials on site. (Section III, Criteria VIII, IX, X and XIII)
- D. Followup on implementation of test control on site. (Section III, Criteria XI and XII)
- E. Inspect procedures of Con Ed, when developed, for QA records for conformance with Criterion XVII. (Section III, Criterion XVII)

The Compliance findings of the inspection (Section III) will be discussed with the licensee in a meeting to be scheduled. The results of this meeting will be documented in a separate inspection report.

II. General

A. Background and Purpose

The quality assurance program inspection was conducted to meet the objectives outlined in the CO:HQ directive dated June 24, 1969.* The plan was adapted to correspond to conditions relating to the Indian Point No. 3 reactor project.

The purpose of the inspection was to determine the degree and manner in which the licensee is implementing the quality assurance commitments in the Indian Point No. 3 application and the proposed quality assurance criteria.

*Memorandum, O'Reilly to Senior Reactor Inspectors, QA Inspections.

The first day of the inspection was spent at the Con Ed engineering offices in New York City, the second day at the offices of U. S. Testing Company, Inc. (USTC) in Hoboken, New Jersey and the third and fourth days at the engineering offices of United Engineers and Constructors (UE&C) and Wedco Corporation (Wedco) in Philadelphia, Pennsylvania. Westinghouse Electric Corporation (Westinghouse) was not inspected as this had previously been accomplished for the D. C. Cook Nuclear Reactor Project by CO:III.*

B. Team Membership and Assignments

R. T. Carlson - Senior Reactor Inspector, CO:I
In charge and responsible for the coordination of the inspection. Responsible for inspection of organization and program conformance to QA plan and Criteria I and II.

R. F. Heishman - Responsible Reactor Inspector, CO:I, and
D. E. Whitesell - Reactor Inspector (Construction), CO:I
Responsible for inspection of on-site work conformance with QA plan and QA criteria III, IX, X, XI, XII, XIV and XV.

C. J. Hale - Project Leader, DRL
Responsible for inspection of the general area of design conformance with the QA plan and QA Criteria III, V, VI, XVI, XVII and XVIII.

F. J. Liederbach - Containment & Components Technology Br., DRL
Responsible for inspection of the general area of procurement conformance with the QA plan and Criteria IV, VII, VIII, X, XII and XIII.

J. B. Henderson - Senior Construction Engineer, CO:HQ
Accompanied the team members (part time) and participated in the QA program review.

C. Sequence of Events

10/29/69 - Meeting with Con Ed and principal contractors management in New York City to discuss QA inspection plans.**	Carlson Heishman Henderson Whitesell
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*CO Report Nos. 315/69-7 and 316/69-7
**CO Report No. 286/69-8.

- 11/12/69 - Pre-inspection conference, all team members, at Region I office. All Inspectors (Exc. Henderson)
- 11/17/69 - Inspection of IP-3 QA program at Con Ed engineering offices in New York City. Carlson
Hale
Heishman
Liederbach
Whitesell
- 11/18/69 - Inspection of IP-3 QA program at USTC offices in Hoboken, N. J. Hale
Heishman
Liederbach
(Part Time)
Whitesell
- 11/19- Inspection of IP-3 QA program at
20/69 - UE&C engineering offices in Philadelphia, Pa. Carlson
Hale
Heishman
Henderson
were also interviewed at this time. (Part Time)
Liederbach
Whitesell

D. Personnel Contacted During Inspection Activities*

Consolidated Edison Company

- J. Grob, Chief Mechanical Engineer
- G. Wasilenko, Assistant Division Engineer, Steam Division
- F. Flugger, Head Engineer, Nuclear Bureau
- O. Gluck, Engineer, Mechanical Plant Bureau
- G. Major, Associate Division Engineer, Turbine Division
- A. Parmet, Associate Division Engineer, Civil Engineering Department
- V. Gonnelli, Associate Division Engineer, Civil Engineering Department
- B. Barbalich, Engineer, Instrument and Controls Division
- H. Bremer, Engineer, Steam Equipment Division
- P. Szabados, Engineer, Inside Plant Bureau
- A. Scaturro, Engineer, Inside Plant Bureau
- E. Dadson, QA Engineer, Construction Division

Personnel contacted during initial management meeting listed in CO Report No. 286/69-8.

U. S. Testing Company, Inc.

- I. Fuchs, Vice President, Engineering
- L. Lazar, Manager, Engineering
- C. McDonnell, Project Manager, Indian Point
- A. Rapetti, Nuclear Engineer

United Engineers & Constructors

- G. A. Heckscher, Administration Vice President (Part Time)
- F. A. Cook, Manager Power Division
- R. J. Vurpillat, Assistant Manager - Reliability and Quality Control
- R. F. Duerr, Supervising Engineer
- D. H. Rhoads, Asst. S.E./ Nuclear Engineer
- W. C. Keiter, Assistant to Supervising Engineer
- W. P. Robinson, Electrical Engineer
- J. R. Slotterback, Structural Engineer
- A. S. Bocchino, Mechanical Services Engineer
- D. S. Peikin, Instrument Engineer
- G. E. Sarsten, Power Engineer
- G. C. Duerr, Piping Engineer
- H. E. Vann, Vice President - Power (Part Time)
- J. B. Silverwood, Manager, Reliability and Quality Assurance

Westinghouse Electric Corporation

- A. A. Simmons, Engineering Manager
- R. F. Devine, Project Manager
- J. Knight, Quality Assurance, Power Systems Division

Wedco Corporation

- R. G. Jones, Purchasing Agent - Engineered Components
- M. L. Snow, Manager, Reliability and Quality Assurance

III. Significant Inspection Findings

The significant findings during the inspection are summarized on the following pages, tabulated by criteria. The supporting details are retained in the CO:I files and are available if required.

Criterion I - OrganizationA. Discussion1. Consolidated Edison Company

Con Ed's QA organization is based upon the premise that as owner and operator of the facility, they are ultimately responsible for the safety and reliability of the facility. Indian Point No. 3 being a "turnkey" project, the direct responsibility for engineering, design and construction has been delegated to the prime contractor, Westinghouse. Con Ed has retained the responsibilities for monitoring and auditing all site contractors and subcontractors; and off-site vendors, subtier vendors, and suppliers. Westinghouse, in turn, with Con Ed approval, has delegated UE&C to act as architect-engineer and Wedco* (Westinghouse wholly owned subsidiary) to be the constructor.

The organization as outlined in the QA Supplement to the application showed UE&C as A-E and constructor. Westinghouse as "turnkey" contractor has modified their contract with UE&C to delete the portions pertaining to construction and procurement. These functions are now being assumed by Wedco. UE&C is being retained as A-E and field quality control coordinator. Wedco has a Manager of Reliability and Quality Assurance on site who is in the process of hiring personnel to man the Wedco QC effort which is to be in addition to that outlined in the QA supplement. Con Ed has not yet formally approved the reorganization but according to Mr. Cahill, Vice President, Engineering, they have no real objections. A formal change will be submitted to DRL upon approval by Con Ed.

2. U. S. Testing Company

The USTC organization is as outlined in the QA Supplement. As QC Surveillance Agent for Con Ed, USTC provides the expertize in the areas established in the scope of work portion of their contract with Con Ed. This scope is also outlined in Supplement 5 to the IP-3 application.

*Not approved by Con Ed at time of inspection.

3. Southern Nuclear Engineering, Inc. (SNE)

SNE functions as consultant for Con Ed in two capacities: (a) to review the conceptual design and advise Con Ed as to the safety in terms of present technology and current AEC regulations and (b) to perform specific tasks as required in the areas of reactor design, construction and operation. These functions are as outlined in the QA supplement and procedures listed in Appendix E of QA supplement to application. SNE was not audited during this inspection; however, a check of reports submitted to Con Ed showed limited participation in the field of Quality Assurance.

4. Westinghouse Electric Corporation

Westinghouse as "turnkey" contractor has the overall responsibility for all phases of the design, construction and testing of the IP-3 project. The organization of Westinghouse is as outlined in the QA supplement except for the changes outlined in paragraph A.1 above regarding Wedco. Westinghouse was not inspected during this audit as initial QA inspection efforts for other projects, i.e., D. C. Cook Units 1 and 2 have provided the required audits of the QA program in use by Westinghouse.

5. Wedco Corporation

Wedco is a wholly owned subsidiary of Westinghouse that functions as a service organization to WAPD in managing the construction work for Indian Point 3, (IP-3), under the turnkey contract. Mr. Cahill, Vice President, Con Ed, stated that Westinghouse establishment of Wedco as Construction Manager, had not been accepted as yet by Con Ed, and if they do approve this change in the participating organizations, Con Ed will file a revision to their application reflecting this change.

Mr. Mel Snow has been appointed as Wedco's Manager of Reliability and Quality Assurance. Mr. Snow is presently at the site, participating in the QA program implemented at the site by Westinghouse. Wedco also has Mr. R. G. Jones, Purchasing Agent (PA), in UE&C's offices in Philadelphia, Pennsylvania, for the procurement of components in accordance with the engineering specifications developed by UE&C as the A-E.

Wedco is proceeding with the formation of a quality assurance organization under their Manager of Reliability and Quality, and are developing written procedures to be implemented if, and when, they are approved as Construction Managers by Con Ed.

6. United Engineers and Constructors

UE&C has been delegated by Westinghouse as A-E and has first-level responsibility for quality assurance and quality control covering "balance of plant" design, construction, erection and installation of equipment, materials and structures. The UE&C organization was found to be as described in the QA supplement except for deleting the procurement and construction aspects which have been assumed by Wedco.

B. Findings

1. Con Ed, USTC and SNE

The inspectors found the organization to comply with their understanding of Criterion I and the application.

2. Westinghouse and Wedco

Westinghouse was not inspected during this inspection. The Wedco organization was not well enough implemented to make a determination of compliance with the criteria and is not yet described in the application.

3. UE&C

The organization of UE&C complies with the inspectors' understanding of Criterion I and the application. The organizational changes involved with contractual modifications between Westinghouse and UE&C to transfer responsibilities for procurement and construction management appear to strengthen the QA program of the project.

Criterion II - Quality Assurance Program

A. Discussion

1. Consolidated Edison Company

Con Ed has developed an overall quality assurance program basically as outlined in the QA supplement to the application. This plan outlines the responsibilities of Con Ed and their principal contractors. The plan is supplemented by QA procedures which are developed as required by their Quality Assurance Task Force (QATF) made up of representatives of various concerned departments and bureaus. This task force has been organized and functions as the "clearing house" for all quality assurance procedures. The chairman is the Chief Mechanical Engineer and signs all QA procedures as the approving authority. The inspection revealed that the QATF is a functional group although not all the procedures listed in Appendix E of the QA supplement have been approved. Those not yet approved (QAP-4, QAP-6, QAP-7 and QAP-8) are in varying stages of completion and are to be utilized pending final approval.

2. U. S. Testing Company

An established program is being carried out as evidenced by the records reviewed at USTC. Over 100 reports of inspection/audit have been filed with Con Ed as the result of actions taken by USTC.

The policies of the company which are followed by individual inspectors are documented in procedures, internal operating procedures and the contract documents, and evidence reveals they are being followed. Examples are the extensive library of codes and standard specifications which are maintained and available to the inspectors. No detailed procedures for individual discipline inspectors were available; however, a review of the background, experience and knowledge of codes seems to insure accomplishment of the required inspection and testing.

The master file includes a schedule for accomplishment of required inspections/audits which is used by project personnel to schedule visits to vendors and/or site. This file is subject to revision as required by construction and fabrication scheduling.

Written procedures for indoctrination and training of personnel do not exist but the company policy as related by Mr. Fuchs is to determine on an individual basis, considering the individual's background, experience and prior training, what additional training is required and to accomplish whatever is necessary to qualify the individual to the level of qualification required for the performance of his assigned duties. Methods employed include on-the-job experience with qualified personnel, reading assignments and in some cases formal training courses.

3. Westinghouse Electric Corporation

The Westinghouse QA program was not inspected during this inspection as previously described except for the Wedco portion of procurement activities being carried out at the UE&C offices in Philadelphia.

4. Wedco Corporation

Wedco does not as yet have separate QA procedures but the inspectors were informed by Westinghouse that applicable Westinghouse and UE&C procedures were being utilized during the transition period. The Wedco Manager of Reliability and Quality Assurance informed the inspectors the procedures would be developed as personnel become available and experience dictates the necessity. UE&C QA personnel and procedures are being utilized by the Wedco procurement section to insure that quality products are being procured for the project.

5. United Engineers and Constructors

The UE&C QA program was found to be as described in the QA supplement except for the changes in responsibilities discussed in Criterion I regarding procurement and construction.

Detailed procedures have been developed to provide the detailed guidance regarding quality assurance and quality control for their areas of responsibility. Although these procedures were only recently approved, evidence was found to show that the intent of the procedures was accomplished during the work which preceded the approval of these procedures. Examples are the QA-QC portions of technical specifications and construction drawings.

B. Findings

1. Con Ed and USTC

The inspectors found the QA program being implemented by Con Ed and USTC conforms to the application and their understanding of the intent of Criterion II.

2. Westinghouse and Wedco

Westinghouse was not inspected during this inspection. Wedco's QA program has not been documented in the application and no determination of compliance was made. Followup action will be required when documentation is available.

3. UE&C

The inspectors found the QA program being implemented by UE&C conforms to the application and their understanding of the intent of Criterion II. The procedures being used have only recently been approved and additions may be dictated as determined by experience.

Criterion III - Design Control

A. Discussion

1. Consolidated Edison Company

No design is accomplished by Con Ed. Completed designs and drawings are, however, forwarded to Con Ed where they are distributed to the respective engineering groups for review.

The review of design is conducted after specifications and construction drawings are submitted by Westinghouse. This being a "turnkey" project, formal approval is not required or given by Con Ed prior to the start of work. Con Ed procedures QAP-2 and QAP-3 establish the methods for reviewing specifications and drawings respectively.

Procedure QAP-3, developed specifically for the review of the drawings generated by Westinghouse or their subtier contractors, stipulates the responsibility for the review, provides a review guide, provides for the review documentation with comments, assigns responsibility for reviewing such comments, provides a target date for review completion, and establishes the liaison with the originating contractor for resolution.

A review of various drawing records revealed that the design review consisted principally of a check for good engineering practices and conformance to PSAR criteria.

The transmittal record serves as a status log relative to such drawing reviews.

Con Ed only reviews those designs forwarded to them by Westinghouse. They are, however, exceeding that which they committed themselves to do in the PSAR which was to review only system diagrams. As changes are made in the design, they are forwarded to Con Ed and the review of such changes follows the same review procedure as the original review. Con Ed has established a QATF with representation from each of the engineering disciplines. This group, chaired by the Mechanical Plant Engineer, meets periodically to discuss quality assurance related matters, with minutes of these meetings being distributed to upper management.

No formal procedure exists for keeping the PSAR (internally) up to date. The inspectors were informed by Con Ed that this is accomplished within the Nuclear Engineering Bureau when formalizing the draft of the FSAR. Documents available to accomplish this include drawing and specification review comments and nonconformance reports.

2. U. S. Testing Company

USTC generally does not accomplish design review as part of its function for Con Ed. Any deviations from PSAR, codes or other design criteria which are found during the course of performing the auditing function by USTC are pointed out to Con Ed in the USTC report for action by Con Ed as necessary.

3. United Engineers and Constructors

The methods of control of design and design review was presented orally by the head of one of the design disciplines. This program contained all the essential elements required by a quality assurance criterion:
Example:

A project team develops applicable criteria and preliminary specifications. These are reviewed independently and sent to Westinghouse for review and approval. They are then finalized and checked again by UE&C, then sent to the procurement section.

UE&C procedure QA-1 "Quality Assurance Organization and Administration" defines the responsibility for the review of engineering specifications for material, equipment, and construction. The review pertains to the quality control requirements, the number and types of tests required, and validity and feasibility of the test methods stipulated therein. The review ensures that the applicable codes and standards are called out and suitable documentation and records are specified. Revisions of such documents receive the same review as the original documents.

No evidence was found of written procedures for the review of design calculations and drawings relative to stress analysis, size, compatibility of materials, and application commitments, or review and approval of revisions originating in the field.

B. Findings

1. Con Ed and USTC

The inspectors found a system of design review at Con Ed and USTC that conforms to the application. This review plus the system utilized by Westinghouse and UE&C conforms to the inspectors' understanding of the intent of Criterion III except for those items identified in Paragraph B.2. below.

2. UE&C

The inspectors found a system of design review being implemented at UE&C which does not conform to the inspectors' understanding of Criterion III. Lacking were written procedures specifying the degree of design calculations checking required and the persons responsible for these checks.

Criterion IV, Procurement Document Control

A. Discussion

1. Consolidated Edison Company

Con Ed reviews and evaluates the adequacy of engineering specifications which become a part of procurement for many important safety-related systems and components. Where there is disagreement, Con Ed does not approve these documents but maintains control by correspondence with Westinghouse to obtain a satisfactory solution.

2. United Engineers & Constructors and Wedco Corporation

UE&C has had responsibility for procurement of "balance of plant" equipment not assigned to others and for general materials of construction. This arrangement is changing with the advent of Wedco. Wedco, under a new arrangement with UE&C, is taking over all procurement in the areas where UE&C had former responsibility.

Written directives on policy and procedures are rapidly evolving to assure that new hires as well as transferred UE&C procurement people will understand and follow the Wedco policy and procedures. Under the new arrangement, Wedco will procure those items which were formerly procured out of the UE&C procurement offices in Philadelphia. Since additional equipment is sometimes procured at the site, Wedco is establishing a procurement group at the site which is taking over UE&C site procurement efforts.

UE&C is required to submit all principal engineering drawings and specifications to Westinghouse for approval. UE&C is also required to submit to Westinghouse all procurement documents and requisitions sent to UE&C procurement agent for processing. (This same procedure will apply with Wedco.) Under the above arrangement, Con Ed's comments must be resolved prior to placing orders. UE&C must submit to Westinghouse, for written approval, any changes to previously approved specifications, drawings, or procurement documents. Con Ed also receives copies of documentation relative to proposed changes.

Any items which are procured by UE&C must be purchased from a list of bidders previously approved by Westinghouse. Under the new arrangement with Wedco, any items to be procured by Wedco must also be approved by the Westinghouse organization responsible for the Nuclear Steam Supply System. Final versions of procurement documents are reviewed by cognizant engineers, their supervisors and quality assurance personnel. Proper sign-off of these groups are required by each company before a specification can be issued, either for obtaining bids, or for actual placement of a purchase order.

B. Findings

1. Con Ed

The inspectors found a system for review of procurement, documents generated by Westinghouse, and UE&C which is functioning. This exceeds the commitments of the PSAR and conforms to the inspectors' understanding of the intent of Criterion IV.

2. UE&C and Wedco

The inspectors found a working system of procurement document control being followed by UE&C and Wedco which conforms to the application.

Followup action may be required when the complete transfer of responsibility is made from UE&C to Wedco.

No determination can be made regarding conformance with the QA criterion at this time.

Criterion V - Instructions, Procedures, and Drawings

A. Discussion

1. Consolidated Edison Company

The following is a list of Con Ed's quality assurance procedures:

- QAP-1 Initiating, Preparing, Reviewing, Approving and Revising Quality Assurance Procedure.
- QAP-2 Review of Contractor's Specifications.
- QAP-3 Review of Contractor's Drawings.
- QAP-4 Surveillance Agency Report Review.
- QAP-5 Monitoring of Construction Onsite.
- QAP-6 Witnessing Performance Tests at Manufacturer's Site.
- QAP-7 Reporting, Reviewing and Documentation of Non-conformances.
- QAP-8 QA and QC Record Retention (Not Yet Written).

These procedures were established according to the procedures in QAP-1 which is essentially a function of the QATF. Since these procedures have only recently been approved, little

documented evidence of their use was found. However, review of certain drawings and specifications indicates that the intent of procedures QAP-2 and 3 were being used before the formal procedures were approved.

Formal procedures are lacking in the areas of document control and control of quality assurance records. This includes procedures and a program for the retention of quality assurance documents. Con Ed informed the inspectors that QAP-8 will address itself to these areas and is being drafted at this time.

2. U. S. Testing Company

The following is a list of USTC's quality assurance procedures for this project:

- a. Procedure for Conducting and Reporting a Quality Control or Quality Assurance Audit.
- b. Procedure for Reviewing Quality Control and Quality Assurance Audits.

Procedure a. is a detailed written description of the approach and method used in conducting a QC surveillance and QA audits. The procedure stipulates what QA records and documents are to be audited and their traceability. It also provides for surveillance for adherence to drawings, specifications, test and inspection requirements, and outlines the required written report of the findings.

Procedure b. has also been implemented describing the operational method for reviewing QC-QA audits, both off site and on site. This review provides specific instructions for determining that proper documentation exists for the various components and installed systems to which the QA program applies. Such documentation shall show the traceability of the materials used, and that approved and qualified procedures were used in the fabrication and installation. Documentation and records relative to all inspection and test requirements are also provided for.

3. Westinghouse Electric Corporation & Wedco Corporation

No Westinghouse procedures were inspected. The inspectors were informed by Westinghouse and Wedco (M. Snow) that procedures, instruction and drawings required for activities on site are available from the organization having the design responsibility or subcontractors as a part of the procurement documents. All of these documents must be approved by Westinghouse. These documents were not inspected by CO.

4. United Engineers and Constructors

UE&C has prepared the following procedures for the implementation of their quality assurance program:

- QA-1 Quality Assurance Organization and Administration
- QA-2 Records and Filing System
- QA-3 Vendor Surveillance
- QA-4 Drawings, Specification and Document Control
- QA-5 Field Quality Control
- QA-6 Nonconforming Materials
- QA-7 Work Stoppage
- QA-8 Internal Audits

The procedures define their purpose and in general provide instructions, assign responsibilities, provide guidance and stipulate the required documentation and records that must be retained in the QA files. About half of these procedures were approved for use (and possibly only just written) in November 1969, with the rest having just been revised. As a result only a limited amount of documented evidence of their being used was found.

The procedure relating specifically to Field Quality Control, QA-5, is a generalized description of the responsibilities, and qualification of the field personnel. Detailed methods and acceptance standards are not included.

B. Findings

The inspectors did not find evidence of a complete system of instructions, procedures and drawings which conforms to their understanding of the QA criteria.

1. Con Ed and USTC

The inspectors found a system of instructions, procedures and drawings that was being implemented that was in conformance with the application. The system has not been completed and no estimate of final completion was given.

2. Westinghouse and Wedco

Westinghouse was not inspected during this inspection. Wedco has not developed a system of instructions, procedures and drawings but are utilizing those developed by Westinghouse and UE&C.

3. UE&C

The inspectors found a system of instructions, procedures, and drawings being implemented which conform with the application except for document control and acceptance standards. CO:I will review this item on site during subsequent inspections.

Criterion VI - Document Control

A. Discussion

1. Consolidated Edison Company

The control of quality assurance documents is the responsibility of the Quality Assurance Task Force secretary.

Con Ed's procedures QAP-1, 2 and 3, provide specific instructions for the review and comment of all drawings, specifications and QC procedures developed by the principal and subtier contractors and vendors for IP-3. These procedures provide a guide for the review. The transmittal and comment documents provide a status log of the latest documents being reviewed.

The system for the distribution of documents is being revised. Previously all bureaus got copies of all transmittals from Westinghouse. The revised system will direct documents to the cognizant bureaus only. Internal quality assurance documents receive distribution to all bureaus and departments through the respective Quality Assurance Task Force representatives.

QAP-5, "Continuous Monitoring of Construction On-Site", stipulates that the field surveillance and inspection will include the review of the drawings and specifications being used in the field.

2. U. S. Testing Company

USTC's procedures provide for the review of all contract drawings, specifications, and required QC procedures and their respective numbers and latest revisions to be noted, in connection with a vendor audit.

3. United Engineers & Contractors

The program for document control is established by the quality assurance procedure QA-4. This procedure provides methods for assuring that the latest revision of specifications and drawings and relevant instructions are available and are being followed under the UE&C scope of work. This procedure is directed solely to activities at the site and treats the area of document control quite comprehensively.

The field supervisor of quality control is charged with the implementation of this procedure. It is his responsibility to assure that the latest revision of specifications and drawings are available in the field, and that these instructions are being followed. Deficiency reports are filed if he finds any documents other than the latest revisions being used in the field. These deficiency reports are filed with the home office quality control engineer and the UE&C supervising engineer. Through this channel the construction manager is advised of the deficiency.

A comparable system of document control is not available for use in the UE&C engineering offices. A drawing schedule is published monthly listing the latest revisions of all

drawings prepared by UE&C. With this schedule and normal office procedures each engineer has the responsibility of using the most current documents available.

B. Findings

1. Con Ed and USTC

The inspectors found a system of document control at Con Ed and USTC which conforms to the application and their understanding of the intent of Criterion VI.

2. UE&C

The inspectors found a system of document control at UE&C which conforms to the application and their understanding of the intent of Criterion VI except for in-house document control in the engineering offices.

Criterion VII, Control of Purchased Material, etc.

A. Discussion

1. Consolidated Edison Company

Con Ed does not participate in vendor evaluation other than review the vendor's QA program proposed in response to the QC requirements stipulated in the procurement documents. Con Ed/USTC audits the vendor or supplier during manufacture or fabrication of the component or equipment.

2. United Engineers & Constructors & Wedco Corporation

UE&C's procedure QA-3 "Vendor Surveillance", provides written instructions, assigns the responsibility and provides a check list for conducting a Quality Control Manufacturer's Facilities Survey as part of their vendor's pre-award evaluation. In the case of UE&C or Wedco procured material, equipment, and services, Westinghouse participates directly in the evaluation of important bids, and in the selection of the successful bidders. Both Westinghouse and UE&C require that their principal subcontractors conduct explicit reviews of quality records associated with the work of interest.

B. Findings

1. Con Ed and USTC

The inspectors found a system of review and/or audit for control of purchased material. This exceeds the commitments in the PSAR and their understanding of the intent of Criterion VII.

2. UE&C and Wedco

The UE&C-Wedco system for control of purchased materials conforms to the inspectors' understanding of Criterion VII and the application.

Criterion VIII, Identification and Control of Material, Parts, and Components

A. Discussion

1. Consolidated Edison Company and U. S. Testing Company

Con Ed reviews the specifications for adequate quality control requirements, in accordance with their procedure QAP-2. In addition, in Appendix C of their supplement to summary of application, under section 4.2 it is stipulated that Westinghouse generic quality control specification No. QCS-1 requires the subtier contractors, vendors and suppliers to provide a QA program that meets the intent of Appendix 9 of Section III of the ASME code.

USTC stipulates in their procedure for vendor inspections that the vendors method of identifying materials and components being processed through the plant shall be reviewed.

2. United Engineers & Constructors

A review of several examples of procurement documents issued by Westinghouse and by UE&C provided objective evidence that the requirements of Criterion VIII are appropriately imposed on vendors and suppliers insofar as shop fabricated items

are concerned. However, at the time of the inspection, there was no objective evidence that these requirements are being extended to adequately cover items which are either fabricated on site or to cover items after they are delivered to the site.

This matter will be followed up by Compliance as part of its continuing Compliance effort for Indian Point 3.

It was noted that the requirements of ASME Code Section III, Appendix 9 with regard to the marking of components are being covered, where applicable, by the specifications observed.

B. Findings

1. Con Ed and USTC

The inspectors found a system for review of identification and control of materials documents generated by Westinghouse and UE&C which is functioning. This exceeds the commitments of the PSAR and conforms to the inspectors' understanding of the intent of Criterion VIII.

2. UE&C

The inspectors found a working system of identification and control of materials being imposed on the vendors and suppliers by UE&C and Westinghouse. Followup action is required for items fabricated on site. This conforms to the inspectors' understanding of the intent of Criterion VIII except for the above item.

Criterion IX, Control of Special Processes

A. Discussion

1. Consolidated Edison Company

Con Ed's procedure QAP-1, assigns the responsibility for determining the need for a specific procedure, to their Quality Assurance Task Force. This procedure also provides for the review and comment of any procedure or special process developed by any of the participating organizations.

The QATF may assign the review of such processes or procedures to any discipline within the Con Ed organization, including their specialists, such as metallurgists, welding engineers, etc. Any comments are then resolved with the originating organization.

In Appendix C of their application supplement, a stipulation is made that Westinghouse specification QCS-1, obligates the vendors and suppliers to implement controls for their special processes such as heat treating, stress relieving, annealing, normalizing, quenching, welding and NDT procedures. Further, the vendor is obligated to submit all such procedures to Westinghouse for review and approval.

2. U. S. Testing Company

USTC, as part of their auditing function, reviews all special processes and procedures for compliance with the applicable codes, standards, specifications and application commitments. Such procedures, and their required qualifications, documentation and QC records, are reviewed for approval requirements and adequacy, both on and off the site.

3. United Engineers and Constructors

All engineering and purchasing documents are reviewed by UE&C to assure adequate tests, inspections, and QC requirements have been provided for. All such documents relative to the procurement of critical components, systems, and equipment are reviewed and approved by Westinghouse.

Special processes and procedures are audited during vendor surveillance. The vendor's control and adherence to such procedures are monitored and reported.

There was no evidence that written procedures and special processes had been developed for implementation at the site. In response to the inspector's question relative to such procedures, UE&C responded that each subcontractor developed their own and submitted them to Westinghouse through UE&C for review, comment and approval in accordance with specifications. The implementation and adherence to these procedures are then audited by UE&C, Westinghouse, Wedco, UST and Con Ed. These procedures will be reviewed by CO during subsequent visits to the site.

B. Findings

1. Con Ed and USTC

The inspectors found a Con Ed and USTC system for control of special processes which complies with the application and their understanding of the intent of Criterion IX.

2. UE&C

The inspectors found a system for control of special processes for vendor surveillance but no evidence that written procedures and special processes had been developed for implementation at the site. CO will review this item during subsequent visits to the site. When satisfactorily completed, the above will represent conformance with the application and the inspector's understanding of the intent of Criterion IX.

Criterion X, Inspection

A. Discussion

1. Consolidated Edison Company

Con Ed maintains a full time construction group at the site. This group is composed of approximately six engineers in various disciplines such as structural, mechanical, welding, electrical, etc. This group is charged with the responsibility for continuous monitoring of construction on the site, in accordance with QAP-5 "Procedures for Continuous Monitoring of Construction on Site."

The field organization is assisted periodically or as needed on special occasions by USTC. Specific instructions relative to auditing for adherence to the applicable inspection and test program, together with the required documentation for auditing all deficiencies and/or deviations are provided for in procedure No. QAP-5. The deficiency report classifies and describes the deficiency or deviation, provides for corrective action recommended, correction action review and acceptance by both Con Ed's Engineering Department and Construction Department.

2. United Engineers & Constructors

UE&C's engineering and procurement specifications obligates the subcontractors and vendors to implement procedures for inspections consistent with the applicable codes, standards and application commitments.

QA-5 "Field Quality Control" stipulates under part III-A that certain inspections are required to be made in the field, but is noticeably lacking in specific instructions and establishing acceptance standards. When questioned on these apparent weaknesses, UE&C responded that specific instructions together with acceptance standards were covered in several ways, such as procedures for weld rod control and welding inspection and NDT requirements and acceptance standards are established by codes, standards and procedures developed by subcontractors. Others are established by inspection and shipping requirements in the purchase orders. Special inspection and followup maintenance inspections are developed in the field by UE&C's site QC.

These specifications and special procedures will be reviewed by CO on subsequent visits to the site.

B. Findings

1. Con Ed

The inspectors found a system of inspection by Con Ed which is in conformance with the application and the inspectors' understanding of Criterion X.

2. UE&C

Documents examined by the inspectors showed that UE&C has an organized functioning system of inspection. The apparent lack of specific instructions and acceptance standards for certain inspections will be examined and followed by CO during subsequent visits to the site. Upon satisfactory completion of the above, the system will conform to the application and the inspectors' understanding of the intent of Criterion X.

Criterion XI, Test Control

A. Discussion

1. Consolidated Edison Company

Con Ed is only involved to the extent that they review and comment on the adequacy of any test program developed by the contractor and his subtier contractors, vendors and suppliers. Such a test program is reviewed by Con Ed for compliance with their SAR commitments, applicable codes and standards. QAP-6 is a procedure for witnessing performance tests at vendors plants.

2. U. S. Testing Company

Test programs are evaluated by USTC for adequacy, number and type of tests required, validity and feasibility of test methods required, documentation requirements, and applicable code requirements, during the audit of any participating organization.

3. United Engineers & Constructors

UE&C obligates the contractors and vendors to implement an acceptable test program under the terms of the specifications, and purchase documents. Such test procedures are reviewed by UE&C, Westinghouse, and Con Ed. All test procedures must be approved by Westinghouse.

UE&C's QA-5 "Field Quality Control" stipulates that a test program is required, but fails to stipulate the codes and standards to which such tests must conform. UE&C again stated that the details of the various tests together with the applicable codes, standards and acceptance criteria were contained in contractor's procedures, concrete specifications, and other engineering specification, and purchase orders. In some cases the field QC organization might develop detailed test procedures.

These specifications and procedures will be reviewed by CO during subsequent visits to the site.

B. Findings

1. Con Ed and USTC

The inspectors found a system of review of test control requirements established by Westinghouse and UE&C in effect at Con Ed which conforms to the application and their understanding of Criterion XI.

2. UE&C

The inspectors found that UE&C requires subcontractors and vendors to implement an acceptable test control program. UE&C does not provide details regarding the applicable codes and standards in test control documents. Upon satisfactory correction of the above item the system of test control will conform to the application and the inspectors' understanding of the intent of Criterion XI.

Criterion XII, Calibration of Measurement and Test Equipment

A. Discussion

1. Consolidated Edison Company and U. S. Testing Company

Con Ed reviews all QA-QC procedures, purchasing specifications and can assure provisions for calibrating such tools and gauges by their comments to the originating organization. Westinghouse's QCS-1 specifically requires all of their vendors and suppliers to incorporate such a procedure in their QA program. USTC, during audit functions, check for proper calibration of test equipment.

2. United Engineers & Constructors

UE&C are involved in assuring that all their vendors and subtier contractors have an adequate and acceptable procedure for the calibration of tools, gauges, scales and other testing equipment, under the terms of the specifications. Their procedure QA-5 "Field Quality Control" stipulates that all electrical and mechanical measuring devices used for inspection shall be calibrated against a master standard traceable to NBS. However, this procedure

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fails to establish frequencies and assign responsibility for such calibrations. UE&C stated that frequencies for specific instruments and responsibilities were stipulated in specific specifications, e.g., concrete specifications would establish the frequency for calibrating the scales on the batch plant.

These specific specifications will be reviewed on subsequent site visits.

B. Findings

1. Con Ed and USTC

The inspectors found a system for calibration of measurement and test equipment which exceeds the commitments of the PSAR and conforms with their understanding of the intent of Criterion XII.

2. UE&C

An implemented system of calibration of measurement and test equipment was found by the inspectors. The procedures did not specify required frequencies of calibration but UE&C informed the inspectors that this was covered by documents in the field which will be checked during subsequent visits. With the above exception the system complies with the inspectors' understanding of Criterion XII and the application.

Criterion XIII, Handling, Storage, Shipping and Preservation

A. Discussion

1. Consolidated Edison Company

Con Ed has recognized the possible degradation of materials, components and equipment through mishandling and improper or poor storage conditions and environment. To minimize these conditions that are adverse to quality, Con Ed has, in their procedure QAP-5 provided a storage area review record to document the results of their periodic monitoring of the storage area. Also a "Storage Area Review" file has

been established in which all documents relative to component shipping and receiving schedules are filed. Their storage area review record will also be accumulated in this file. This record is a report showing the date, area inspected, remarks relative to storage conditions. Any unsatisfactory or substandard conditions are noted on this review record, and a deficiency report is prepared and processed through the prescribed channels for resolution and corrective action.

2. United Engineers and Constructors

UE&C's QA-5 provides generally for receiving inspection, and auditing for material control and storage. It also stipulates that for items requiring special handling, protection or storage, the field quality control group will assure that special conditions are in effect as required by the engineering specifications, manufacturer's recommendation, warranty or guarantee requirements, etc. There was no evidence of a written procedure that provides guidance or instructions, or assigned the responsibility for handling and storage. UE&C stated that Wedco was responsible for this procedure, but Mel Snow responded that Wedco was only responsible for auditing the storage and handling requirements. Westinghouse stated that they issued storage and handling instructions and requirements for their components, and insisted that the construction contractor was responsible for the handling, storage and protection of such components and equipment. Wedco reiterated that they were only responsible for auditing.

The inspectors concluded that the only way to determine this responsibility is to follow a component from receiving to storage, on the next visit to the site, to determine who is doing the work and if they are following a written procedure relative thereto.

B. Findings

1. Con Ed

The inspectors found a system for handling, storage, shipping and preservation which conforms with the application and their understanding of the intent of Criterion XIII.

2. UE&C

No evidence of written procedures covering all aspects of the inspectors' understanding of Criterion XIII or the application were found. Evidence of upgrading the handling, storage, shipping and preservation procedures will be checked during subsequent visits to the site.

Criterion XIV, Inspection, Test and Operating Status

A. Discussion

1. Consolidated Edison Company

In their supplement to summary of application, Con Ed lists all the structures, systems, components and equipment to which their QA program applies. In their QAP-5 procedure, they have established a monitoring plan and provide a master index form that provides a history record for each structure, system, component and equipment listed in their supplement. This index provides a ready reference log as to the status, at any given time, of the structure, system, component or equipment listed thereon.

2. United Engineers & Constructors

UE&C by their procedure No. QA-2 "Records and Filing System" require that all QC documents are to be accumulated in files by systems. This file is stipulated to contain the specifications, purchase orders (with changes), vendor surveillance check lists and reports, required shop documentation, receiving inspection reports, field installation reports (including tests), deficiency reports, pre-operational and startup test reports, all correspondence, notes, special instructions, operation and maintenance hand books as required. This file together with the system's isometric drawing constitutes an adequate status log for any given system, at any given time.

The inspectors were informed by Mr. A. A. Simmons, Engineering Manager for Westinghouse, that they also maintained an inspection and test status log, but did not explain the details.

B. Findings

1. Con Ed and UE&C

The inspectors found a system for inspection, test and operating status being implemented which conforms to their understanding of Criterion XIV and the application.

Criterion XV, Nonconforming Material, Parts or Components

A. Discussion

1. Consolidated Edison Company

Con Ed has implemented QAP-7 "Procedure for Reporting, Review and Documentation of Nonconformances". The procedure defines the policy and mechanics of handling non-conformances as detected by its personnel or reported by its contractors. The procedure applies to both on and off site work and establishes the required documentation of the deficiency, the recommended corrective action, the review by Con Ed's Engineering, and acceptance of the final corrective action, by both Engineering and Construction Departments in Con Ed.

2. United Engineers & Constructors

UE&C's procedure QA-6 "Control of Nonconforming Materials" provides written instructions for noting, resolving and documenting substandard work, material and equipment. It provides a method of tagging and marking the deficiency until corrective action has been completed. The procedure assigns the responsibility for implementation to the field quality control group. The procedure stipulates the report and waiver request forms that are to be used in documenting nonconforming items. The procedure provides the means for review, recommended corrective action, and final acceptance of the corrected deficiency; and release of the material, component, and/or equipment for disposition.

B. Findings XV

1. Con Ed and UE&C

The inspectors found a system for nonconforming material, parts or components being implemented which conforms to their understanding of Criterion XV and the application.

Criterion XVI, Corrective Action

A. Discussion

1. Consolidated Edison Company

Consolidated Edison's activity in this area is limited by nature of the contract with Westinghouse. QAP-5 provides the instructions and stipulates the required documentation for reporting all substandard conditions and deficiencies. The routing of such deficiency reports for the purpose of obtaining recommended corrective action, review and approvals, and final acceptance and sign-off of the corrected deficiency, are provided for. The routing of the reports provides Engineering the opportunity to evaluate the deficiency, and to determine the probability of recurrence. All deficiency reports are filed by system and are subject to audit by Con Ed's management or their agent.

QAP-4 "Procedure for Surveillance Agency Report Review" provides the mechanics for the receiving, routing, review and evaluating all deficiencies noted in the surveillance agency's reports. The procedure defines major and minor deficiencies, and assigns the responsibility for their review and evaluation for recommended corrective action.

2. U. S. Testing Company

USTC describes all deficiencies in their trip report relative to their audits both on and off site. These reports are transmitted to Con Ed's Construction Department and their Mechanical Engineering Department. USTC may make recommendations relative to corrective action, but they are not authorized to initiate corrective action.

3. United Engineers & Constructors

UE&C's procedure QA-3 "Vendor Surveillance" provides for the documentation of deficiencies and stipulates the distribution of these reports. The vendor is informed of all unacceptable items found, and the vendor's response, and/or corrective action proposed, will be made a part of the report.

UE&C's procedure QA-5 "Field Quality Control" stipulates that all deficiency reports, generated by receiving inspection, are to be distributed to Engineering and Purchasing and handled as outlined in QA-3 and QA-6.

UE&C's procedure QA-6 "Control of Nonconforming Materials" stipulates deficiency reports are to be made and circulated for evaluation as to proper corrective action. The vendor is also notified of any degradation of an item as the result of shipping damage.

B. Findings

1. Con Ed, USTC and UE&C

The inspectors found a system for corrective action being implemented which conforms to their understanding of Criterion XVI and the application.

Criterion XVII, Quality Assurance Records

A. Discussion

1. Consolidated Edison Company

Each of Con Ed's QA procedures stipulates the required documentation of the inspection, test, surveillance or auditing activities prescribed therein. Their procedure QA-5, provides instructions as to how these documents are to be filed.

In their supplement to summary of application, Con Ed lists the QA-QC documents that will be available throughout the construction period. Following this list is a commitment

by Con Ed that they will develop a procedure which will set forth their record retention policy subsequent to plant operation. QAP-8, which is being drafted will outline what documents will be retained and the detailed procedures for accomplishing the records retention program.

The inspection revealed that some confusion and difference of opinion within Con Ed exists and should be corrected by the detailed procedure when published.

2. United Engineers & Constructors

Quality assurance procedure QA-2 establishes the minimum pieces of documentation to be retained at the site. Record files are set up by "critical item" and would contain items such as specifications, purchase orders, vendor check list, surveillance reports, etc. This file would be retained in the engineering offices and when completed would be forwarded to the site. In some cases, duplicate documents are retained in the engineering offices, but in all cases the site would ultimately have a complete set of documents generated by or through UE&C for the project. A monitor is assigned at the site who is responsible for maintaining the site records. All these records are ultimately turned over to Consolidated Edison. Objective evidence reviewed in the UE&C offices indicate this program is being implemented.

B. Findings

1. Con Ed

The inspectors did not find a complete system of quality assurance records which conforms to their understanding of Criterion XVII. Plans are being drafted but no estimated completion date was given by Con Ed.

2. UE&C

The inspectors found a system being implemented which conforms to the application and their understanding of the intent of Criterion XVII.

Criterion XVIII, Audits

A. Discussion

1. Consolidated Edison Company

Con Ed's total involvement in the control of the work at IP-3 is by review, surveillance and audits. Each of their QAP procedures provides the mechanics for reviewing, monitoring and auditing. The procedures include forms and check lists and provides written instructions for auditing, documenting and filing the reports. Followup actions for the correction of deficiencies are provided.

In their supplement to summary of application, Con Ed stipulates that Westinghouse, UE&C, site contractors, vendors and suppliers will be audited periodically by them or their designated agents. This summary also stipulates the auditing responsibilities of Westinghouse and UE&C relative to their subcontractors, vendors and suppliers. Audit reports are reviewed by Con Ed and become a part of the quality assurance records.

Con Ed does not have a written program for internal audit of their quality assurance program. Each member of the Quality Assurance Task Force is responsible for the implementation of the quality assurance program of his bureau. This responsibility is, however, an unwritten one.

2. U. S. Testing Company

USTC assists Con Ed in performing audits of participating organizations both off and on site. The results of such audits are documented by reports which are transmitted to Con Ed for initiating any required corrective action. Con Ed's reviews of these reports are accomplished in accordance with QAP-4 "Procedure for Surveillance Agency Report Review." Followup audits are made as required to assure that any required corrective action has been performed.

3. United Engineers & Constructors

UE&C procedure QA-8 "Internal Audits" provides written instructions, assigns the responsibilities and provides the documentation for internal audits of their own field. QA program to evaluate its effectiveness and adequacy. The procedure provides for both scheduled and unscheduled audits. A list of audit categories, together with the distribution of the audit results are stipulated in this procedure.

UE&C procedure QA-3 "Vendor Surveillance" provides the instructions, check list and documentation for reporting and distributing the results of a vendor, subcontractor, or site audits. The objective evidence reviewed of this program indicates it is being used effectively. UE&C does not have a comparable audit of their office procedures.

B. Findings

The inspectors did not find a system of audits which conforms to their understanding of Criterion XVIII and the application.

1. Con Ed and USTC

The inspectors found a system being implemented for audit of parts of the project. No documented system of self audit was found.

2. UE&C

The inspectors found a system being implemented for audit of subcontractors and vendors and audit of field quality control, however, no procedures for internal audit of home office QA activities were found.