

QUALITY ASSURANCE
ADMINISTRATIVE AND SYSTEM REQUIREMENTS
FOR NUCLEAR SAFETY CLASS ITEMS

NO. 9763-QAS-1

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

SEABROOK STATION

UNITED ENGINEERS & CONSTRUCTORS INC.

PHILADELPHIA, PENNSYLVANIA

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United Engineers Procedure

Quality Assurance Administrative & System Requirements,
9763-QAS-1

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QUALITY ASSURANCE PROJECT STANDARD 9763-OAS-1

IDENTIFICATION OF CHANGES

This Standard has been revised as listed below for the reasons given:

<u>Section</u>	<u>Page</u>	<u>Reason</u>
2.1	2	ECA 10/0076A provide direction concerning Regulatory Guide Definitions
2.1.9	3	ECA 10/0078A specify use of Nonconformance Reports
4.10	14	Included damaged and missing equipment
4.16	18	ECA 10/0047A Incorporate Reg. Guides 1.144 & 1.146 and ANSI N45.2.12 & N45.2.23
5.2	19	ECA 10/0070A clarify intent of requirement

ECA's Incorporated in Revision 8:

ECA 100047A
ECA 100070A
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1.0

SCOPE

This section provides requirements for the Quality Assurance/Control programs to be maintained by Contractors supplying Seismic Category I and Safety Class 1, 2 & 3 items and services.

2.0

GENERAL

2.1

Definitions

Definitions shall be in accordance with Regulatory Guide 1.74 (ANSI N45.2.10) unless modified in the following paragraphs.

2.1.1

Quality Assurance

All those planned and systematic actions necessary to provide adequate confidence that an item or a facility will perform satisfactorily in service.

2.1.2

Quality Control

Those quality assurance actions which provide a means to control and measure the characteristics of an item, or process or facility to established requirements.

2.1.3

Quality Assurance Program

The Contractor's written program describing the actions implemented for the control of the quality of the specific items which he proposes to manufacture or for any other work or services that he proposes to perform.

2.1.4

Contractor

Whenever the term Contractor, Vendor or Manufacturer is used in this document, it is understood to refer to the "Seller".

2.1.5

Subcontractor

Any Supplier who is under contract to the "Seller" to furnish items or services; a lower tier contractor who is not directly under contract with the Owner or Engineer.

2.1.6

Owner

The organization responsible for the operation, maintenance, safety, and power generation of Seabrook Station - Public Service of New Hampshire.

2.1.7

Engineer

The organization responsible for the design, engineering and procurement of equipment for the Balance of Plant of the Seabrook Power Station and for the coordination of all contractor design interfaces - United Engineers & Constructors, Inc.

2.1.8

Engineer Supervisor

The organization responsible for administering and directing the engineering and construction of the project - The Nuclear Services Division of Yankee Atomic Electric Company.

2.1.9

Nonconformance

A nonconformance is an item, activity or document which is incorrect, indeterminate or unacceptable after the final acceptance inspection.

The following clarifications apply:

- o Final Acceptance Inspection is a phase of construction/fabrication during which items, activities, or documents are in the completion stages of a specific portion of work.
- o A nonconforming item, activity or document found during routine inprocess surveillance or inspection shall be documented on an inspection or surveillance report. Trend analysis of such nonconforming items, activities or documents shall be performed. Engineering approved standard repair procedures shall be used to correct these items, activities or documents.
- o Nonconformance Reports shall be generated for:
 1. Repairs when no approved procedure is available.
 2. All nonconformances after final acceptance inspection.
 3. All nonconforming items, activities or documents where engineering is requested to "accept as is".

2.2

Quality Assurance Surveillance

All fabrication, inspection, and test operations performed by Contractors and their subcontractors or suppliers are subject to quality assurance surveillance by UE&C and/or the Owner. Surveillance by UE&C or the Owner shall not relieve the Contractor of any responsibility for the requirements of his contract and shall not be considered as waiver of warranty or other rights. Compliance to the requirements of this document does not relieve the Contractor of his responsibility to assure that the requirements of other ordering data (codes, specifications, drawings, etc.) are met.

3.0

ADMINISTRATIVE REQUIREMENTS

3.1

Organization

The Contractor's organization shall be established in such a manner that persons involved in the Quality Assurance Program have sufficient authority and organizational freedom to identify quality problems; to initiate, recommend or provide solutions; and to verify implementation of solutions.

The organization shall be established in such a manner that the individual or group assigned the responsibility for checking, auditing, inspecting or otherwise verifying that an activity has been correctly performed is independent of the individual or group directly responsible for performing the specific activity.

The authority and responsibility of persons performing activities affecting quality shall be clearly established and documented in the Contractor's Quality Assurance Manual.

3.2

Quality Assurance Program

The Contractor shall establish and maintain a Quality Assurance Program consistent with the pertinent provisions of 10CFR50 Appendix B and ANSI N45.2-1977 for the control of the quality of the specific items being supplied or the work to be performed.

The quality of all products including materials under contract, whether manufactured within the manufacturer's plant or obtained by an outside supplier shall be controlled at all points necessary to assure conformance with the requirements of this document and associated Codes and Standards.

The Quality Assurance Program shall be documented in detail in a Quality Assurance Manual, which shall be a major basis for determining the Contractor's ability to meet the quality requirements of this specification. A current copy shall be made available to the Engineer for evaluation with all bids.

Within 30 days after award of contract, the Contractor shall officially submit the Quality Assurance Manual, and all requested quality control and process procedures, to the Engineer for approval. Changes requested by the Engineer may be accomplished in the form of supplements or addenda identified to the project. Changes made by the Contractor shall be submitted to the Engineer for approval.

With the Quality Assurance Manual, the Contractor shall submit a matrix (Attachment A) indicating his compliance with each of the subparagraphs in Section 4.0. For each of the items, the Contractor shall list procedures or specific sections of procedures or of the Quality Assurance Manual, which satisfy the requirements of that item.

3.3

Qualification of Personnel

Personnel implementing portions of the Quality Assurance Program shall be qualified under provisions of ANSI N45.2.6 - 1978 except as follows:

- a) The physical requirements of ANSI N45.2.6-1978 concerning visual acuity and color vision shall be complied with.

3.4

Detailed Document List

At the time of drawing submittal the Contractor shall also submit to the Engineer for his review and approval a list of documents including all QA/QC records applicable to the order and to its component parts. Separately identified lists shall include:

- a. Procedures, analyses and reports to be submitted prior to fabrication or shipment.
- b. Documents and records to be included in the document package which accompanies the shipment.

3.5

Detailed Inspection Point Program

Prior to the start of manufacture, the Seller shall submit to UE&C a detailed inspection program depicting the sequential steps to be followed in manufacturing, fabrication and assembly. This program shall indicate all operations, including work performed by suppliers, from raw material (or from the point when electrical equipment becomes an identifiable device - e.g. complete circuit breaker, unmounted relay, etc.) through preparations for shipment. It shall identify the points in the process where inspections and tests are performed. For each inspection/test point, reference should be provided to indicate:

1. Type of inspection or test (e.g. visual, x-ray dielectric megger).
2. Applicable Codes, Standards, Specifications and Procedures.
3. Permanent documentation records to be provided.

After reviewing and approving the Seller's Detailed Inspection Point Program, UE&C will advise Seller of mandatory hold points at which UE&C, the Owner or their Representative will conduct inspections, witness inspection/test performance or require submission of documentation. Seller shall not bypass a mandatory hold point unless written authorization has been granted by UE&C. Inspections and witnessing activities of UE&C Representatives shall not be limited to those designated as mandatory hold points.

3.6

Seller's Responsibilities for Suppliers

The Seller is responsible for the performance of his suppliers and shall establish and maintain a Quality Control Plan to provide surveillance, product and/or process verification at supplier's plants which ensures that applicable requirements are met.

The Seller shall perform an evaluation of the Quality Control or inspection system at supplier's plants at a frequency dependent upon their quality performance. Arrangements shall be made for the Quality Assurance Representative of the Engineer, the Engineering Supervisor or the Owner to participate in these evaluations at their option.

Records of these evaluations of supplier's quality performance shall be maintained by the Seller and are subject to review by UE&C and/or Owner's Quality Control Representatives as applicable to the material or equipment on this purchase order (or contract).

4.0

SYSTEM REQUIREMENTS

4.1

Design Control

The Contractor shall establish and implement written procedures to assure that the applicable specified design requirements, including Codes, Standards and Engineer's performance and fabrication criteria are correctly translated into specifications, drawings, procedures or instructions. These procedures shall include provisions to assure that appropriate quality standards are specified and included in the design documents. Changes or deviations from specified design requirements or quality standards shall be identified, documented, and controlled. The Contractor's procedures shall include, but not necessarily be limited to the following:

4.1.1

Design Process

Design-associated activities shall be prescribed in job specifications, work instructions, planning sheets, operating or procedure manuals, test procedures, or any other type of written form, provided that the activity is adequately described. Quantitative criteria, such as dimensions, tolerances, and operating limits, and qualitative criteria such as check lists, shall be specified, as appropriate, for determining satisfactory work performance and compliance with the Engineer's design requirements. Design activities that shall be documented in written instructions, procedures or drawings include design analysis, drawing preparation, specification preparation, and preparation of instructions developed as a result of design analysis. Records of the important steps including design inputs which support the final design shall be maintained.

4.1.2

Design Verification

The Contractor will verify his design of the equipment by checks, confirmations or substantiations as a means of assuring that the Engineer's design requirements have been achieved. Design verification, as used here, is the next step beyond the normal checking performed by the individual who executed the design aspect and may involve spot checking of calculations, informal or formal design reviews or a suitable testing program. Verifications shall be performed by individuals or groups other than those who performed the original design but who may be from the same organization.

In those cases where the adequacy of a design is to be verified by a qualification test, the testing shall be identified, documented and shall demonstrate adequacy of performance under the most adverse design conditions. All pertinent operating modes shall be considered in determining these design conditions where it is intended that the test program confirm the adequacy of the overall design. Where the test is only intended to verify a specific design feature, the other features of the design shall be verified by other means.

When tests are being performed on models or mock-ups, scaling laws shall be established and verified prior to the tests. The test configuration shall be clearly defined and documented. The results of model test work shall be subjected to error analysis, where applicable, prior to use in final design work.

4.1.3

Design Change Control

The Contractor shall develop systematic procedures to assure that changes including field changes to design parameters are subject to the same controls as the original design provisions. The procedures shall stipulate, to the greatest degree possible, that design changes be reviewed by the organization performing the original design, review and approval. If an alternate organization is to be used, they must have access to the background information, proven capability in the design area and adequate understanding of the requirements and intent of the original design. Changes or deviations from specified design requirements or quality standards shall be identified, documented and controlled.

4.1.4

Interface Control

Written procedures shall be provided, and measures established as necessary to identify and control design interfaces and for coordination among participating design organizations both within and external to the Contractor's organization. These measures shall include the review, approval, release, distribution and revision of documents involving design interfaces.

4.2

Procurement Document Control

The Contractor shall establish and document in writing the procedures to be employed to ensure that the requirements necessary to assure quality are included in procurement documents. The procedures shall be developed in accordance with the requirements of N45.2 for a given procurement. Changes in these procurement documents shall receive the same degree of

contractor control as was employed in the development of the original document. The Contractor's procurement documents shall require suppliers to provide a quality assurance program consistent with the pertinent requirements of this document. The Contractor's procedures shall include, but not necessarily be limited to the following:

4.2.1 Contractor Quality Assurance Program

The Contractor shall identify the quality assurance requirements and the elements of the program applicable to the items or services procured.

4.2.2 Basic Technical Requirements

The Contractor shall identify with drawings and specifications, codes and industrial standards with applicable revision date, test, and inspection requirements and special instructions and requirements covering design, fabrication, cleaning, erecting, packaging, handling, shipping and extended field storage (if applicable); and for test equipment.

4.2.3 Source Surveillance and Audit

The Contractor shall make provision for the Engineer, the Engineering Supervisor and/or the Owner to have unrestricted access to his plant facilities and records for source surveillance, system audits and facility surveys.

4.2.4 Lower Tier Procurement

The Contractor shall make provisions for extending the applicable QA/QC requirements of the engineering procurement documents to lower-tier contractors and suppliers engaged to work on this contract. Access to subcontractor and supplier facilities and records by the Engineer, the Engineering Supervisor and/or Owner shall be provided.

4.3 Instructions, Procedures and Drawings

The Contractor shall have written instructions, procedures, or drawings to direct and control activities affecting quality. These documents may be in the form of job specifications, work instructions, shop drawings, job tickets, planning sheets, operating or procedure manuals, test procedures, or any other type of written format. These documents shall contain appropriate quantitative or qualitative criteria for determining compliance.

Document Control

The Contractor shall have written procedures covering the control of all documents, including the Quality Assurance Manual, affecting quality, including changes thereto. The procedures shall provide for the review of documents, including changes for adequacy and approval by authorized personnel. Procedures will assure that documents are distributed to and used at the location at which the prescribed activity is performed. The Contractor's reviewing organization shall have access to pertinent background information and adequate understanding of the requirements and intent of the original document. In addition, the Contractor's participating organizations shall have procedures for control of the documents and ensuing changes to preclude the possibility of use of outdated or inappropriate documents.

The document control system shall:

- (1) Identify responsibilities for preparation, review, approval, issuance and retrieval of documents and ensuing revisions.
- (2) Identify the proper documents to be used in performing Contractor activities.
- (3) Coordinate and control interface documents.
- (4) Ascertain through surveillance, audit or other methods of review that proper documents are being used.
- (5) Establish current and updated distribution lists.

Control of Purchased Material, Equipment and Services

The Contractor shall have written procedures describing his measures to assure that purchased items and services, whether purchased directly by the Contractor or through his subcontractors conform to the requirements of the procurement documents. The Contractor's procedures shall include, as appropriate, provisions for source evaluation and selection; objective evidence of quality furnished by the subcontractor; source inspection and audit; and examination of items upon delivery.

Measures for evaluation and selection of procurement sources include the use of historical quality performance data, source surveys or audits or source qualification programs.

Source inspection or audit shall be performed as necessary, and documented, to assure the required quality of an item.

Documentary evidence that items conform to the Purchase Order requirements shall be available at the Contractor's facility prior to his acceptance.

The Contractor shall assess the effectiveness of his procurement controls at intervals consistent with the importance, complexity, and quality of the item or service provided.

4.6

Identification and Control of Materials, Parts and Components

The Contractor shall have written procedures for the identification and control of materials, parts, and components including partially fabricated subassemblies. These procedures shall provide for assuring that only correct and acceptable items are used and installed and for relating an item of production (batch, lot, component, part) at any stage, from initial receipt through fabrication, installation, repair or modification, to an applicable drawing, specification, or other pertinent technical document.

Physical identification shall be used to the maximum extent possible. Where physical identification is either impractical or insufficient, physical separation, procedural control, or other appropriate means shall be employed.

Where identification marking is employed, the marking shall be clear, unambiguous and indelible. Marking shall be applied in such a manner as not to affect the function of the item. Markings shall be transferred to each part of an item when subdivided. Markings shall not be obliterated or hidden by surface treatment or coatings unless other means of identification are substituted.

When Codes, Standards or Specifications require traceability of materials, parts or components to specific inspection or test records, the program shall be designed to provide such traceability.

4.7

Control of Special Processes

The Contractor shall establish and document in writing the procedures he will employ to assure that special processes employed such as welding, heat treatment, cleaning and nondestructive examination are accomplished under controlled conditions and in accordance with applicable Codes, Standards,

Specifications, criteria, and other special requirements, using qualified personnel, procedures, and equipment. These special process procedures shall be submitted to the Engineer for review and approval. Qualification of personnel, procedures, and equipment shall be in compliance with the requirements of applicable Codes and Standards.

Personnel performing nondestructive examination shall be qualified in accordance with the requirements of SNT-TC-1A and its supplements. The Contractor shall maintain records for currently qualified personnel (operators and inspectors), processes or equipment in accordance with pertinent Codes, Standards, and Specifications.

Should the Contractor employ special processes not covered by existing codes or standards, or where quality requirements exceed those covered by existing codes, or standards, the Contractor shall submit his qualification procedures to the Engineer for review and approval.

When the Contractor utilizes sub-contractors or suppliers to perform these special processes, he shall impose the same qualification and records requirements upon them that he would have to meet himself were he to perform the work.

4.8

Inspection

The Contractor shall establish a program for in-process and final inspection of activities affecting quality to assure conformance with documented instructions, procedures and drawings. Examinations, measurements or tests of material or product processes shall be performed for each work operation where necessary to assure quality. Results of these inspections shall be incorporated into the quality records. Inspection activities to verify the quality of work shall be performed by persons other than those who performed the activities being inspected. These inspectors shall not report directly to the immediate supervisors who are responsible for the work being performed.

When inspection of processed material or products is impossible or detrimental, indirect control of monitoring processing methods, equipment, and personnel shall be provided. Both inspection and process monitoring shall be provided when control is inadequate without both.

The Contractor shall provide the Engineer with a Detailed Inspection Point Program, identifying the sequence of inspections and tests to be performed to assure quality of equipment supplied. Mandatory inspection hold points, which require witnessing by the Engineer, Engineering Supervisor or Owner and beyond which work shall not proceed without the Engineer's consent, shall be indicated by the Engineer. Following the identification of mandatory inspection hold points by the Engineer, the Contractor shall provide one week's advanced notification as each designated event approaches. Seventy-two (72) hours advanced telephone notification is required for confirmation of a visit. Cancellation of a scheduled visit requires at least 72 hours notice in advance of scheduled inspection.

4.9

Test Control

The Contractor shall establish a written test program to assure that all required testing, including proof testing, acceptance testing, and operational testing, is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in the Engineer's specification. The test procedures shall include provisions for assuring that all prerequisites for the given test have been met, that adequate test instrumentation is available and is used and that the test is performed under suitable environmental conditions as specified in the applicable design documents. In addition, equipment and components shall be tested in the fully assembled condition and not just part-tested, unless specifically permitted by the Engineer's component specification. Where the Contractor subcontracts work to another organization which requires the performance of tests as previously described, the Contractor shall assure that equivalent test controls shall be imposed. Test results shall be documented and evaluated by the responsible authority to assure that test requirements have been satisfied.

Modifications, repairs or replacements made after completion of inspection and tests shall require reinspection and retest to the extent necessary to verify compliance with the Engineer's specification.

The same requirements for mandatory hold points described in section 4.8 are applicable to Test Control.

Control of Measuring and Test Equipment

The Contractor shall establish written procedures to assure that all tools, gages, instruments and other measuring and testing devices employed in activities affecting quality are calibrated and properly adjusted at specified periods to maintain accuracy within necessary limits. He shall further assure that these instruments are of the proper range, type and sensitivity to reliably measure the parameters being evaluated. Calibration shall be against certified measurement standards which have known valid relationships to National Standards. Should no National Standard exist, the Contractor shall document the basis for his calibration.

Standards used to calibrate gages, tools and other measuring devices shall have an uncertainty (error) requirement of no more than one-fourth of the tolerance of electrical equipment being calibrated and one-tenth of the tolerance of the other equipment being calibrated. Greater calibrating standards uncertainty will be acceptable when limited by the "state-of-the-art".

The method and interval of calibration for each item shall be defined and shall be based on the type of equipment stability characteristics, required accuracy, and other characteristics affecting measurement control. The procedures shall provide for special calibrations whenever accuracy of the equipment is suspect. When inspection measuring and test equipment are found to be out of calibration, damaged or missing, procedures shall provide for determining the validity of previous inspection or test results.

Records shall be maintained and equipment suitably marked to indicate calibration status.

Inspection, Test and Operating Status

The Contractor shall establish and document in written procedures his measures for indicating, by use of markings such as stamps, tag, labels, routing cards, or other suitable means, the status of inspections and tests performed upon individual items. These procedures shall provide for the identification of those items which conform to inspection and test requirements; nonconforming items shall be clearly marked for subsequent disposition. Procedures shall be provided for tagging equipment when necessary to prevent inadvertent operation. These procedures shall also provide for the control of status indicators, including the authority for application and removal of tags, markings, labels and stamps. The procedure shall also provide measures to control documentation of any bypassed inspection, test or other critical operation.

4.12

Handling, Storage and Shipping

The Contractor shall establish and document in written procedures his measures to control handling, storage and shipping, including cleaning, packaging and preservation of material and equipment in accordance with purchase order requirements to prevent damage, deterioration and loss. When particular items require special coverings, special equipment and special protective environments, such as inert gas atmosphere, special moisture content levels, and temperature levels, procedures specifying the requirements, including provision for verification shall be provided.

Special handling tools and equipment shall be provided and controlled as necessary to ensure safe and adequate handling. The special tools and equipment shall be inspected and tested to verify that the tools and equipment are adequately maintained.

4.13

Nonconforming Items

The Contractor shall establish and document in written procedures his measures for controlling items, services or activities which do not conform to requirements. These procedures shall include provisions for identification, documentation, segregation, disposition, and notification to affected organizations. The Contractor's procedures shall document his methods to promptly identify and notify UE&C of significant deficiencies found in construction as defined in 10CFR50, paragraph 50.55 (e) and listed below:

1. A significant breakdown in any portion of his Q.A. Program.
2. A significant deficiency in construction of or significant damage to a structure, system or component which will require extensive evaluation, extensive redesign or extensive repair to establish the adequacy of the structure, system or component to perform its intended safety function.
3. A significant deviation from performance specifications which will require extensive evaluation, extensive redesign or extensive repair to establish the adequacy of the structure, system or component to perform its intended safety function.

Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented and approved procedures. The responsibility and authority for the dispositioning of nonconforming items shall be defined. Repaired and reworked items shall be re-inspected in accordance with Engineer approved Contractor procedures.

The procedures shall provide control over further processing, delivery or installation of a nonconforming item pending a decision on its disposition. Documentation shall be provided to verify the acceptability of nonconforming items which have been dispositioned "accept as is" or "repair". A description of the change, waiver, or deviation as approved by the Engineer shall be incorporated into the records and the as-built condition indicated.

Control of nonconforming items by tagging, marking or other means of identification is acceptable where physical separation is not practical, although physical segregation and marking are preferred.

4.14

Corrective Action

The Contractor shall document in written procedures his measures for assuring that conditions adverse to quality, such as failures, malfunction, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected as soon as practicable. In the case of significant conditions adverse to quality, the Contractor shall assure that the cause of the condition is determined and corrective action measures shall extend to the performance of all subcontractors and suppliers as necessary. Nonconformances shall be reviewed periodically to identify trending conditions. The identification of significant conditions adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to the Engineer, Engineering Supervisor and Owner.

4.15

Quality Assurance Records

The Contractor shall have written procedures defining requirements and responsibilities for record preparation, retention, maintenance and transmittal. Sufficient records shall be prepared as work is performed to furnish documentary evidence of the quality of items and of activities affecting quality. These records shall be consistent with applicable codes, standards, specifications, and contracts and shall be listed and submitted for review prior to fabrication as required by

paragraph 3.4 of this specification. Separate lists shall be supplied for general documents that apply to the entire order (such as QA Manual, QC Procedures, special process procedures, personnel qualifications, etc.) and for each individual item or order. The list generated for each item must be specific and complete. For instance, an entry calling for Mill Test Reports of Chemicals and Physicals is not sufficient detail. An acceptable entry might read: Mill Test Reports of Physicals and Chemicals for:

a. Base Materials

1. Body
2. Bonnet
3. Disc

b. Welding Materials

1. Weld joints
2. Repair welds to base metal

The records shall include, but not be limited to materials analyses, inspections, tests, operation logs, monitoring of work performance, the results of reviews, audits, construction and installation records. Where required, a Certificate of Conformance will be provided with an item according to the provisions of ANSI N45.2.13. The records shall also include closely-related data such as qualifications of personnel, procedures, and equipment. Inspection and test records, shall as a minimum, identify the inspector or data recorder, the type of observation, the results, the acceptability, the governing standard, and the action taken in connection with any deficiencies noted. The records shall be identifiable, retrievable, and traceable to the individual components, items and lots and shall be legible.

Records shall be indexed, filed and maintained in facilities that provide suitable environment to minimize deterioration or damage and to prevent loss. Items of documentation which must be submitted to the Owner are listed in section 5.5.

The Seller shall retain the permanent quality records for the design life of the equipment unless written concurrence for their disposal is obtained from the Owner, or records are provided to the Owner for retention.

Audits

An audit program shall be established in accordance with Reg. Guide 1.144 and ANSI N45.2.12 by the Contractor to provide planned and periodic audits of his quality system, including activities of his subcontractors. This program shall be documented in written procedures which include specified frequencies. Results of audits shall be documented and reviewed by appropriate management personnel to assure the implementation of any corrective action.

Audits shall include an evaluation of quality assurance practices, procedures and instructions; the effectiveness of implementation; and conformance with policy directives. In performing these evaluations, audits shall include evaluation of work areas, activities, process, and items, and review of documents and records. Audits shall be performed by personnel qualified in accordance with Reg Guide 1.146 and ANSI N 45.2.23.

5.0 INFORMATION TO BE SUBMITTED

5.1 Quality Assurance Manual

The Contractor shall include with his bid, an uncontrolled copy of the corporate Quality Assurance Manual, which shall be a major basis for demonstrating ability to comply with this specification. A second copy shall be forwarded to the Engineering Supervisor.

5.2 Quality Assurance Program

Within 30 days after award of contract, the Contractor shall submit the following information for approval.

- a. A controlled copy of the Quality Assurance/Control Program that will be applicable to the contract, in conformance with section 3.2 of this specification.
- b. Quality Assurance procedures referenced in the Program
- c. A letter certifying that the Manual is applicable to the contract, and listing any exception, and additional procedures.
- d. Matrix of quality assurance criteria as specified in section 3.2.

All changes to the above documents shall be submitted for approval before the change may be implemented.

5.3 Quality Control and Process Procedures

The following are typical documents which must be submitted for approval for before any work that requires their use can be performed:

- a. Detailed Inspection Point Program as specified in section 3.5
- b. Detailed document list as specified in section 3.4
- c. Inspection procedures
- d. Welding procedures
- e. Welding procedure qualifications

- f. Nondestructive examination procedures
- g. Cleaning procedures
- h. Heat treatment procedures
- i. Packaging and storage procedures
- j. Test procedures and acceptance criteria
- k. Calibration system procedures
- l. Other QC procedures referenced in the QA Program

5.4 Qualification and Certifications

Seismic reports, fire criteria test reports and other certifications and qualifications must be submitted and dispositioned prior to shipment of the order as required by the equipment specification.

5.5 Records and Documentation

The specific requirements of section 4.15 must be met. The following documentation shall, as applicable, be submitted with each shipment and shall be available to the Engineer's Vendor Surveillance Representative at the time of final inspection prior to shipment:

- a. An index of items in the document package including quantities or page locations of each type of document in the package. All document package pages shall be numbered sequentially, beginning with an index. If there is information on both sides of a sheet, each side shall be numbered.
- b. Material certifications
- c. Code data forms
- d. QA check lists, when applicable
- e. Heat treatment records
- f. Weld history records
- g. Nondestructive test records

- h. Radiographs, interpretation sheets, and standard shooting sketches
- i. Electrical test reports
- j. Performance test reports
- k. Special type or qualification test reports

SHIPPING RELEASE

The Contractor shall notify the Engineer at least 72 working hours in advance of any mandatory inspection hold-point identified by the Engineer. Unless otherwise specified or waived, final inspection prior to shipment is a mandatory hold point. At this time, all required documentation shall be available to the Engineer's Vendor Surveillance Representative for review.

Unless otherwise waived, a Quality Shipment Release will be completed by the Engineer's Vendor Surveillance Representative when equipment is ready for shipment following inspection at the Seller's plant. The inspection release for shipment at Seller's plant does not constitute final acceptance or relieve Seller of the responsibility for complying completely with the requirements of all applicable specifications, procedures and drawing requirements of the order, except for deviations specifically brought to the Engineer's attention and specifically waived in writing.

ATTACHMENT A
SHEET 1 of 2

QUALITY ASSURANCE PROGRAM MATRIX

<u>UE&C</u>		<u>CONTRACTOR QA MANUAL</u>		
<u>9763-QAS-1</u> <u>Section</u>	<u>QA Program Requirement</u>	<u>QA Procedure</u> <u>which applies</u>	<u>Section</u> <u>or</u> <u>Paragraph</u>	<u>Comment</u>
4.1	Design Control			
4.1.1	Design Process			
4.1.2	Design Verification			
4.1.3	Design Change Control			
4.2	Procurement Document Control			
4.2.1	Contractor QA Program			
4.2.2	Basic Technical Requirements			
4.2.3	Source Surveillance & Audit			
4.2.4	Lower Tier Procurement			
4.3	Instructions, Procedures and Drawings			
4.4	Document Control			
4.5	Control of Purchased Material, Equipment & Services			
4.6	Identification & Control of Material, Parts, and Components			

ATTACHMENT A
SHEET 2 of 2

QUALITY ASSURANCE PROGRAM MATRIX

<u>UE&C</u>		<u>CONTRACTOR QA MANUAL</u>		
<u>9763-QAS-1</u> <u>Section</u>	<u>QA Program Requirement</u>	<u>QA Procedure</u> <u>which applies</u>	<u>Section</u> <u>or</u> <u>Paragraph</u>	<u>Comment</u>
4.7	Control of Special Processes			
4.8	Inspection			
4.9	Test Control			
4.10	Control of Measuring and Test Equipment			
4.11	Inspection, Test & Operating Status			
4.12	Handling, Storage & Shipping			
4.13	Nonconforming Items			
4.14	Corrective Action			
4.15	QA Records			
4.16	Audits			

QUALITY ASSURANCE
ADMINISTRATIVE AND SYSTEM REQUIREMENTS
FOR NUCLEAR SAFETY CLASS ITEMS

NO. 9763-QAS-1

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

SEABROOK STATION

UNITED ENGINEERS & CONSTRUCTORS INC.

PHILADELPHIA, PENNSYLVANIA

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ATTACHMENT 1

QUALITY ASSURANCE PROJECT STANDARD 9763-QAS-1

IDENTIFICATION OF CHANGES

This Standard has been revised as listed below for the reasons given:

<u>Section</u>	<u>Page</u>	<u>Reason</u>
para. 4.10	15	Added paragraph to specify tolerance allowed in calibration standards.

1.0

SCOPE

This section provides requirements for the Quality Assurance/Control programs to be maintained by Contractors supplying Seismic Category I and Safety Class 1, 2 & 3 items and services.

2.0 GENERAL

2.1 Definitions

2.1.1 Quality Assurance

All those planned and systematic actions necessary to provide adequate confidence that an item or a facility will perform satisfactorily in service.

2.1.2 Quality Control

Those quality assurance actions which provide a means to control and measure the characteristics of an item, or process or facility to established requirements.

2.1.3 Quality Assurance Program

The Contractor's written program describing the actions implemented for the control of the quality of the specific items which he proposes to manufacture or for any other work or services that he proposes to perform.

2.1.4 Contractor

Whenever the term Contractor, Vendor or Manufacturer is used in this document, it is understood to refer to the "Seller".

2.1.5 Subcontractor

Any Supplier who is under contract to the "Seller" to furnish items or services; a lower tier contractor who is not directly under contract with the Owner or Engineer.

2.1.6 Owner

The organization responsible for the operation, maintenance, safety, and power generation of Seabrook Station - Public Service of New Hampshire.

2.1.7

Engineer

The organization responsible for the design, engineering and procurement of equipment for the Balance of Plant of the Seabrook Power Station and for the coordination of all contractor design interfaces - United Engineers & Constructors, Inc.

2.1.8

Engineering Supervisor

The organization responsible for administering and directing the engineering and construction of the project - The Nuclear Services Division of Yankee Atomic Electric Company.

2.2

Quality Assurance Surveillance

All fabrication, inspection, and test operations performed by Contractors and their subcontractors or suppliers are subject to quality assurance surveillance by UE&C and/or the Owner. Surveillance by UE&C or the Owner shall not relieve the Contractor of any responsibility for the requirements of his contract and shall not be considered as waiver of warranty or other rights. Compliance to the requirements of this document does not relieve the Contractor of his responsibility to assure that the requirements of other ordering data (codes, specifications, drawings, etc.) are met.

3.0

ADMINISTRATIVE REQUIREMENTS

3.1

Organization

The Contractor's organization shall be established in such a manner that persons involved in the Quality Assurance Program have sufficient authority and organizational freedom to identify quality problems; to initiate, recommend, or provide solutions; and to verify implementation of solutions.

The organization shall be established in such a manner that the individual or group assigned the responsibility for checking, auditing, inspecting or otherwise verifying that an activity has been correctly performed is independent of the individual or group directly responsible for performing the specific activity.

The authority and responsibility of persons performing activities affecting quality shall be clearly established and documented in the Contractor's Quality Assurance Manual.

3.2

Quality Assurance Program

The Contractor shall establish and maintain a Quality Assurance Program consistent with the pertinent provisions of 10CFR50 Appendix B and ANSI N45.2-1971 for the control of the quality of the specific items being supplied or the work to be performed.

The quality of all products including materials under contract, whether manufactured within the manufacturer's plant or obtained by an outside supplier, shall be controlled at all points necessary to assure conformance with the requirements of this document and associated Codes and Standards.

The Quality Assurance Program shall be documented in detail in a Quality Assurance Manual, which shall be a major basis for determining the Contractor's ability to meet the quality requirements of this specification. A current copy shall be made available to the Engineer for evaluation with all bids.

Within 30 days after award of contract, the Contractor shall officially submit the Quality Assurance Manual, and all requested quality control and process procedures, to the Engineer for approval. Changes requested by the Engineer may be accomplished in the form of supplements or addenda identified to the project. Changes made by the Contractor shall be submitted to the Engineer for approval.

With the Quality Assurance Manual, the Contractor shall submit a matrix (Attachment A) indicating his compliance with each of the subparagraphs in Section 4.0. For each of the items, the Contractor shall list procedures or specific sections of procedures or of the Quality Assurance Manual, which satisfy the requirements of that item.

3.3 Qualification of Personnel

Personnel implementing portions of the Quality Assurance Program shall be qualified under provisions of ANSI N45.2.6.

3.4 Detailed Document List

At the time of drawing submittal the Contractor shall also submit to the Engineer for his review and approval a list of documents including all QA/QC records applicable to the order and to its component parts. Separately identified lists shall include:

- a. Procedures, analyses and reports to be submitted prior to fabrication or shipment.
- b. Documents and records to be included in the document package which accompanies the shipment.

3.5 Detailed Inspection Point Program

Prior to the start of manufacture, the Seller shall submit to UE&C a detailed inspection program depicting the sequential steps to be followed in manufacturing, fabrication and assembly. This program shall indicate all operations, including work performed by suppliers, from raw material (or from the point when electrical equipment becomes an identifiable device - e.g. complete circuit breaker, unmounted relay, etc.) through preparations for shipment. It shall identify the points in the process where inspections and tests are performed. For each inspection/test point, reference should be provided to indicate:

1. Type of inspection or test (e.g. visual, x-ray, dielectric meggar).
2. Applicable Codes, Standards, Specifications and Procedures.
3. Permanent documentation records to be provided.

After reviewing and approving the Seller's Detailed Inspection Point Program, UE&C will advise Seller of mandatory hold points at which UE&C, the Owner or their Representative will

conduct inspections, witness inspection/test performance or require submission of documentation. Seller shall not bypass a mandatory hold point unless written authorization has been granted by UE&C. Inspections and witnessing activities of UE&C Representatives shall not be limited to those designated as mandatory hold points.

3.6

Seller's Responsibilities for Suppliers

The Seller is responsible for the performance of his suppliers and shall establish and maintain a Quality Control Plan to provide surveillance, product and/or process verification at supplier's plants which ensures that applicable requirements are met.

The Seller shall perform an evaluation of the Quality Control or inspection system at supplier's plants at a frequency dependent upon their quality performance. Arrangements shall be made for the Quality Assurance representative of the Engineer, the Engineering Supervisor or the Owner to participate in these evaluations at their option.

Records of these evaluations of supplier's quality performance shall be maintained by the Seller and are subject to review by UE&C and/or Owner's Quality Control Representatives as applicable to the material or equipment on this purchase order (or contract).

4.0

SYSTEM REQUIREMENTS

4.1

Design Control

The Contractor shall establish and implement written procedures to assure that the applicable specified design requirements, including codes, standards and Engineer's performance and fabrication criteria are correctly translated into specifications, drawings, procedures or instructions. These procedures shall include provisions to assure that appropriate quality standards are specified and included in the design documents. Changes or deviations from specified design requirements or quality standards shall be identified, documented, and controlled. The Contractor's procedures shall include, but not necessarily be limited to the following:

4.1.1

Design Process

Design-associated activities shall be prescribed in job specifications, work instructions, planning sheets, operating or procedure manuals, test procedures, or any other type of written form, provided that the activity is adequately described. Quantitative criteria, such as dimensions, tolerances, and operating limits, and qualitative criteria such as check lists, shall be specified, as appropriate, for determining satisfactory work performance and compliance with the Engineer's design requirements. Design activities that shall be documented in written instructions, procedures or drawings include design analysis, drawing preparation, specification preparation, and preparation of instructions developed as a result of design analysis. Records of the important steps including design inputs which support the final design shall be maintained.

4.1.2

Design Verification

The Contractor will verify his design of the equipment by checks, confirmations or substantiations as a means of assuring that the Engineers' design requirements have been achieved. Design verification, as used here, is the next step beyond the normal checking performed by the individual who executed the design aspect and may involve spot checking of calculations, informal or formal design reviews or a suitable testing program. Verifications shall be performed by individuals or groups other than those who performed the original design but who may be from the same organization.

In those cases where the adequacy of a design is to be verified by a qualification test, the testing shall be identified, documented and shall demonstrate adequacy of performance under the most adverse design conditions. All pertinent operating modes shall be considered in determining these design conditions where it is intended that the test program confirm the adequacy of the overall design. Where the test is only intended to verify a specific design feature, the other features of the design shall be verified by other means.

When tests are being performed on models or mock-ups, scaling laws shall be established and verified prior to the tests. The test configuration shall be clearly defined and documented. The results of model test work shall be subject to error analysis, where applicable, prior to use in final design work.

4.1.3

Design Change Control

The Contractor shall develop systematic procedures to assure that changes including field changes to design parameters are subject to the same controls as the original design provisions. The procedures shall stipulate, to the greatest degree possible, that design changes be reviewed by the organization performing the original design, review and approval. If an alternate organization is to be used, they must have access to the background information, proven capability in the design area and adequate understanding of the requirements and intent of the original design. Changes or deviations from specified design requirements or quality standards shall be identified, documented and controlled.

4.1.4

Interface Control

Written procedures shall be provided, and measures established as necessary to identify and control design interfaces and for coordination among participating design organizations both within and external to the Contractor's organization. These measures shall include the review, approval, release, distribution and revision of documents involving design interfaces.

4.2

Procurement Document Control

The Contractor shall establish and document in writing the procedures to be employed to ensure that the requirements necessary to assure quality are included in procurement documents. The procedures shall be developed in accordance with the requirements of N45.2 for a given procurement. Changes in these procurement documents shall receive the same degree of contractor control as was employed in the development of the original document. The Contractor's procurement documents shall require suppliers to provide a quality assurance program consistent with the pertinent requirements of this document. The Contractor's procedures shall include, but not necessarily be limited to the following:

4.2.1

Contractor Quality Assurance Program

The Contractor shall identify the quality assurance requirements and the elements of the program applicable to the items or services procured.

4.2.2

Basic Technical Requirements

The Contractor shall identify with drawings and specifications, codes and industrial standards with applicable revision data, test, and inspection requirements and special instructions and requirements covering design, fabrication, cleaning, erecting, packaging, handling, shipping and extended field storage (if applicable); and for test equipment.

4.2.3

Source Surveillance and Audit

The Contractor shall make provision for the Engineer, the Engineering Supervisor and/or the Owner to have unrestricted access to his plant facilities and records for sources surveillance, systems audits and facility surveys.

4.2.4

Lower Tier Procurement

The Contractor shall make provisions for extending the applicable QA/QC requirements of the Engineering procurement documents to lower-tier contractors and suppliers engaged to work on this contract. Access to subcontractor and supplier facilities and records by the Engineer, the Engineering Supervisor and/or Owner shall be provided.

4.3

Instructions, Procedures and Drawings

The Contractor shall have written instructions, procedures, or drawings to direct and control activities affecting quality. These documents may be in the form of job specifications, work instructions, shop drawings, job tickets, planning sheets, operating or procedure manuals, test procedures, or any other type of written format. These documents shall contain appropriate quantitative or qualitative criteria for determining compliance.

4.4

Document Control

The Contractor shall have written procedures covering the control of all documents, including the Quality Assurance Manual, affecting quality, including changes thereto. The procedures shall provide for the review of documents, including changes for adequacy and approval by authorized personnel. Procedures will assure that documents are distributed to and used at the location at which the prescribed activity is performed. The Contractors reviewing organization shall have access to pertinent background information and adequate understanding of the requirements and intent of the original document. In addition, the Contractors participating organizations shall have procedures for control of the documents and ensuing changes to preclude the possibility of use of outdated or inappropriate documents.

The document control system shall:

- (1) Identify responsibilities for preparation, review, approval, issuance and retrieval of documents and ensuring revisions.
- (2) Identify the proper documents to be used in performing Contractor activities.
- (3) Coordinate and control interface documents.
- (4) Ascertain through surveillance, audit or other methods of review that proper documents are being used.
- (5) Establish current and updated distribution lists.

4.5

Control of Purchased Material, Equipment and Services

The Contractor shall have written procedures describing his measures to assure that purchased items and services, whether purchased directly by the Contractor or through his subcontractors conform to the requirements of the procurement documents. The Contractor's procedures shall include, as appropriate, provisions for source evaluation and selection; objective evidence of quality furnished by the subcontractor; source inspection and audit; and examination of items upon delivery.

Measures for evaluation and selection of procurement sources include the use of historical quality performance data, source surveys or audits, or source qualification programs.

Source inspection or audit shall be performed as necessary, and documented, to assure the required quality of an item.

Documentary evidence that items conform to the Purchase Order requirements shall be available at the Contractor's facility prior to his acceptance.

The Contractor shall assess the effectiveness of his procurement controls at intervals consistent with the importance, complexity, and quality of the item or service provided.

4.6

Identification and Control of Materials, Parts and Components

The Contractor shall have written procedures for the identification and control of materials, parts, and components including partially fabricated subassemblies. These procedures shall provide for assuring that only correct and acceptable items are used and installed and for relating an item of production (batch, lot, component, part) at any stage, from initial receipt through fabrication, installation, repair or modification, to an applicable drawing, specification, or other pertinent technical document.

Physical identification shall be used to the maximum extent possible. Where physical identification is either impractical or insufficient, physical separation, procedural control, or other appropriate means shall be employed.

Where identification marking is employed, the marking shall be clear, unambiguous and indelible. Marking shall be applied in such a manner as not to affect the function of the item. Markings shall be transferred to each part of an item when subdivided. Markings shall not be obliterated or hidden by surface treatment or coatings unless other means of identification are substituted.

When codes, standards or specifications require traceability of materials, parts or components to specific inspection or test records, the program shall be designed to provide such traceability.

4.7

Control of Special Processes

The Contractor shall establish and document in writing the procedures he will employ to assure that special processes employed such as welding, heat treatment, cleaning and nondestructive examination are accomplished under controlled conditions and in accordance with applicable codes, standards, specifications, criteria, and other special requirements, using qualified personnel, procedures and equipment. These special process procedures shall be submitted to the Engineer for review and approval. Qualification of personnel, procedures, and equipment shall be in compliance with the requirements of applicable codes and standards.

Personnel performing nondestructive examination shall be qualified in accordance with the requirements of SNT-TC-1A and its supplements. The Contractor shall maintain records for currently qualified personnel (operators and inspectors), processes or equipment in accordance with pertinent codes, standards, and specifications.

Should the Contractor employ special processes not covered by existing codes or standards, or where quality requirements exceed those covered by existing codes, or standards, the Contractor shall submit his qualification procedures to the Engineer for review and approval.

When the Contractor utilizes sub-contractors or suppliers to perform these special processes, he shall impose the same qualification and records requirements upon them that he would have to meet himself were he to perform the work.

4.8

Inspection

The Contractor shall establish a program for in-process and final inspection of activities affecting quality to assure conformance with documented instructions, procedures and drawings. Examinations, measurements or tests of material or product processed shall be performed for each work operation where necessary to assure quality. Results of these inspections shall be incorporated into the quality records. Inspection activities to verify the quality of work shall be performed by persons other than those who performed the activities being inspected. These inspectors shall not report directly to the immediate supervisors who are responsible for the work being performed.

If inspection of processed material or products is impossible or detrimental, indirect control of monitoring processing methods, equipment, and personnel shall be provided. Both inspection and process monitoring shall be provided when control is inadequate without both.

The Contractor shall provide the Engineer with a Detailed Inspection Point Program, identifying the sequence of inspections and tests to be performed to assure quality of equipment supplied. Mandatory inspection hold points, which require witnessing by the Engineer, Engineering Supervisor or Owner and beyond which work shall not proceed without the Engineer's consent, shall be indicated by the Engineer. Following the identification of Mandatory inspection hold points by the Engineer, the Contractor shall provide one week's advanced notification as each designated event approaches. Seventy two (72) hours advanced telephone notification is required for confirmation of a visit. Cancellation of a scheduled visit requires at least 72 hours notice in advance of scheduled inspection.

4.9

Test Control

The Contractor shall establish a written test program to assure that all required testing, including proof testing, acceptance testing, and operational testing, is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in the Engineer's specification. The test procedures shall include provisions for assuring that all prerequisites for the given test have been met, that adequate test instrumentation is available and is used, and that the test is performed under suitable environmental conditions as specified in the applicable design documents. In addition, equipment and components shall be tested in the fully assembled condition and not just part-tested, unless specifically permitted by the Engineer's component specification. Where the Contractor subcontracts work to another organization which requires the performance of tests as previously described, the Contractor shall assure that equivalent test controls shall be imposed. Test results shall be documented and evaluated by the responsible authority to assure that test requirements have been satisfied.

Modifications, repairs or replacements made after completion of inspection and tests shall require reinspection and retest to the extent necessary to verify compliance with the Engineer's specification.

The same requirements for Mandatory hold points described in section 4.8 are applicable to Test Control.

4.10

Control of Measuring and Test Equipment

The Contractor shall establish written procedures to assure that all tools, gages, instruments and other measuring and testing devices employed in activities affecting quality are calibrated and properly adjusted at specified periods to maintain accuracy within necessary limits. He shall further assure that these instruments are of the proper range, type and sensitivity to reliably measure the parameters being evaluated. Calibration shall be against certified measurement standards which have known valid relationships to National Standards. Should no National Standard exist, the Contractor shall document the basis for his calibration.

Standards used to calibrate gages, tools and other measuring devices shall have an uncertainty (error) requirement of no more than one-fourth of the tolerance of electrical equipment being calibrated and one-tenth of the tolerance of the other equipment being calibrated. Greater calibrating standards uncertainty will be acceptable when limited by the "state-of-the-art".

The method and interval of calibration for each item shall be defined and shall be based on the type of equipment stability characteristics, required accuracy, and other characteristics affecting measurement control. The procedures shall provide for special calibrations whenever accuracy of the equipment is suspect. When inspection, measuring and test equipment are found to be out of calibration, procedures shall provide for determining the validity of previous inspection or test results.

Records shall be maintained and equipment suitably marked to indicate calibration status.

4.11

Inspection, Test and Operating Status

The Contractor shall establish and document in written procedures his measures for indicating, by use of markings such as stamps, tags, labels, routing cards, or other suitable means, the status of inspections and tests performed upon individual items. These procedures shall provide for the identification of those items which conform to inspection and test requirements; nonconforming items shall be clearly marked for subsequent disposition. Procedures shall be provided for tagging equipment when necessary to prevent inadvertent operation. These procedures shall also provide for the control of status indicators, including the authority

for application and removal of tags, markings, labels and stamps. The procedures shall also provide measures to control documentation of any bypassed inspection, test or other critical operation.

4.12

Handling, Storage and Shipping

The Contractor shall establish and document in written procedures his measures to control handling, storage and shipping, including cleaning, packaging and preservation of material and equipment in accordance with purchase order requirements to prevent damage, deterioration and loss. When particular items require special coverings, special equipment and special protective environments, such as inert gas atmosphere, special moisture content levels, and temperature levels, procedures specifying the requirements, including provision for verification shall be provided.

Special handling tools and equipment shall be provided and controlled as necessary to ensure safe and adequate handling. The special tools and equipment shall be inspected and tested in accordance with written procedures and at specified times, to verify that the tools and equipment are adequately maintained.

4.13

Nonconforming Items

The Contractor shall establish and document in written procedures his measures for controlling items, services, or activities which do not conform to requirements. These procedures shall include provisions for identification, documentation, segregation, disposition, and notification to affected organizations. The Contractor's procedures shall document his methods to promptly identify and notify UE&C of Significant Deficiencies found in construction as defined in 10CFR50, paragraph 50.55 (e) and listed below:

1. A significant breakdown in any portion of his Q.A. Program.
2. A significant deficiency in construction of or significant damage to a structure, system or component which will require extensive evaluation, extensive

redesign or extensive repair to establish the adequacy of the structure, system or component to perform its intended safety function.

3. A significant deviation from performance specifications which will require extensive evaluation, extensive redesign or extensive repair to establish the adequacy of the structure, system or component to perform its intended safety function.

Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented and approved procedures. The responsibility and authority for the dispositioning of non-conforming items shall be defined. Repaired and reworked items shall be re-inspected in accordance with Engineer approved Contractor procedures.

The procedures shall provide control over further processing, delivery or installation of a nonconforming item pending a decision on its disposition. Documentation shall be provided to verify the acceptability of nonconforming items which have been dispositioned "accept as is" or "repair". A description of the change, waiver, or deviation as approved by the Engineer shall be incorporated into the records and the as-built condition indicated.

Control of nonconforming items by tagging, marking or other means of identification is acceptable where physical separation is not practical, although physical segregation and marking are preferred.

4.14

Corrective Action

The Contractor shall document in written procedures his measures for assuring that conditions adverse to quality, such as failures, malfunction, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected as soon as practicable. In the case of significant conditions adverse to quality, the Contractor shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The corrective action measures shall extend to the performance of all subcontractors and suppliers as

necessary. Nonconformances shall be reviewed periodically to identify trending conditions. The identification of significant conditions adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to the Engineer, Engineering Supervisor and Owner.

4.15

Quality Assurance Records

The Contractor shall have written procedures defining requirements and responsibilities for record preparation, retention, maintenance and transmittal. Sufficient records shall be prepared as work is performed to furnish documentary evidence of the quality of items and of activities affecting quality. These records shall be consistent with applicable codes, standards, specifications, and contracts and shall be listed and submitted for review prior to fabrication as required by paragraph 3.4 of this procedure. Separate lists shall be supplied for general documents that apply to the entire order (such as QA Manual, QC Procedures, special process procedures, personnel qualifications, etc.) and for each individual item or order. The list generated for each item must be specific and complete. For instance, an entry calling for Mill Test Reports of Chemicals and Physicals is not sufficient detail. An acceptable entry might read: Mill Test Reports of Physicals and Chemicals for:

- a. Base Materials
 - 1. Body
 - 2. Bonnet
 - 3. Disc
- b. Welding Materials
 - 1. Weld Joints
 - 2. Repair Welds to base metal.

The records shall include, but not be limited to, materials analyses, inspections, tests, operation logs, monitoring of work performance, the results of reviews, audits, construction and installation records. Where required, a Certificate of Conformance will be provided with an item according to the provisions of ANSI N45.2.13. The records shall also include

closely-related data such as qualifications of personnel, procedures, and equipment. Inspection and test records, shall, as a minimum, identify the inspector or data recorder, the type of observation, the results, the acceptability, the governing standard, and the action taken in connection with any deficiencies noted. The records shall be identifiable, retrievable, and traceable to the individual components, items and lots and shall be legible.

Records shall be indexed, filed and maintained in facilities that provide suitable environment to minimize deterioration or damage and to prevent loss. Items of documentation which must be submitted to the Owner are listed in section 5.5.

The Seller shall retain the permanent quality records for the design life of the equipment unless written concurrence for their disposal is obtained from the Owner, or records are provided to the Owner for retention.

4.16

Audits

An audit program shall be established by the Contractor to provide planned and periodic audits of his quality system, including activities of his subcontractors. This program shall be documented in written procedures which include specified frequencies. Results of audits shall be documented and reviewed by appropriate management personnel to assure the implementation of any corrective action.

Audits shall include an evaluation of quality assurance practices, procedures and instructions; the effectiveness of implementation; and conformance with policy directives. In performing these evaluations, audits shall include evaluation of work areas, activities, process, and items; and review of documents and records.

5.0 INFORMATION TO BE SUBMITTED

5.1 Quality Assurance Manual

The Contractor shall include with his bid, an uncontrolled copy of the Corporate Quality Assurance Manual, which shall be a major basis for demonstrating ability to comply with this specification. A second copy shall be forwarded to the Engineering Supervisor.

5.2 Quality Assurance Program

Within 30 days after award of contract, the Contractor shall submit the following information for approval.

- a. A controlled copy of the Quality Assurance/Control Program that will be applicable to the contract, in conformance with section 3.2 of this specification.
- b. Quality Assurance procedures referenced in the Program.
- c. A letter certifying that the Manual is applicable to the contract, and listing any exceptions, and additional procedures.
- d. Matrix of quality assurance criteria as specified in section 3.2.

All changes to any of the above documents shall be submitted for approval before the changes may be implemented.

5.3 Quality Control and Process Procedures

The following are typical documents which must be submitted for approval before any work that requires their use can be performed.

- a. Detailed Inspection Point Program as specified in section 3.5
- b. Detailed document list as specified in section 3.4
- c. Inspection procedures
- d. Welding procedures
- e. Welding procedure qualifications

- f. Nondestructive examination procedures
- g. Cleaning procedures
- h. Heat treatment procedures
- i. Packaging and storage procedures
- j. Test procedures and acceptance criteria
- k. Calibration system procedures
- l. Other QC procedures referenced in the QC Program

5.4

Qualifications and Certifications

Seismic reports, fire criteria test reports and other certifications and qualifications must be submitted and dispositioned prior to shipment of the order as required by the equipment specification.

5.5

Records and Documentation

The specific requirements of section 4.15 must be met. The following documentation shall, as applicable, be submitted with each shipment and shall be available to the Engineer's Vendor Surveillance Representative at the time of final inspection prior to shipment.

- a. An index of items in the document package including quantities or page locations of each type of document in the package. All document package pages shall be numbered sequentially, beginning with an index. If there is information on both sides of a sheet, each side shall be numbered.
- b. Material certifications
- c. Code data forms
- d. QA check lists, when applicable
- e. Heat treatment records

- f. Weld history records
- g. Nondestructive test records
- h. Radiographs, interpretation sheets, and standard shooting sketches
- i. Electrical test reports
- j. Performance test reports
- k. Special Type or qualification test reports

SHIPPING RELEASE

The Contractor shall notify the Engineer at least 72 working hours in advance of any mandatory inspection hold-point identified by the Engineer. Unless otherwise specified or waived, final inspection prior to shipment is a mandatory hold point. At this time, all required documentation shall be available to the Engineer's Surveillance Representative for review.

Unless otherwise waived, a Quality Shipment Release will be completed by the Engineer's Vendor Surveillance Representative when equipment is ready for shipment following inspection at the Seller's plant. The inspection release for shipment at Seller's plant does not constitute final acceptance or relieve Seller of the responsibility for complying completely with the requirements of all applicable specifications, procedures and drawing requirements of this order, except for deviations specifically brought to the Purchaser's attention and specifically waived in writing.

ATTACHMENT A
Sheet 1 of 2

QUALITY ASSURANCE PROGRAM MATRIX

UE&C		CONTRACTOR Q.A. MANUAL		
QAS-1 Sub Paragraph	QA Program Req't.	QA Procedure which applies	Section or Paragraph	Comment
4.1	Design Control			
4.1.1	Design Process			
4.1.2	Design Verification			
4.1.3	Design Change Control			
4.2	Procurement Control			
4.2.1	Contr. Q.A. Program			
4.2.2	Basic Tech. Req't.'s			
4.2.3	Source Surv. & Audit			
4.2.4	Lower Tier Procurement			
4.3	Instruction Procedure and Drawings			
4.4	Document Control			
4.5	Control of Purch. Mat'l. Equipment & Services			
4.6	Identification & Control of Material, Parts, Components			

ATTACHMENT A
Sheet 2 of 2

QUALITY ASSURANCE PROGRAM MATRIX

UE&C		CONTRACTOR Q.A. MANUAL		
QAS-1 Sub Paragraph	QA Program Req't.	QA Procedure which applies	Section or Paragraph	Comment
4.7	Control Special Processes			
4.8	Inspection			
4.9	Test Control			
4.10	Control of Measuring and Test Equipment			
4.11	Inspection, Test & Operating Status			
4.12	Handling, Storage & Shipping			
4.13	Nonconforming Items			
4.14	Corrective Action			
4.15	Q.A. Records			
4.16	Audits			