 <p><b>Shaw</b>® The Shaw Group Inc. Shaw Nuclear</p>	<p><b>Standard Nuclear Quality Assurance Program</b></p>
<p><b>SECTION 10 - INSPECTION</b></p>	<p><b>Revision: B</b> <b>Dated: 6-1-09</b></p>

## 1.0 REQUIREMENTS

- 1.1 Drawings, specifications, instructions, and procedures shall include the necessary technical requirements, quality characteristics, and acceptance criteria. Inspections are conducted to provide assurance that material, equipment, and work conforms to quality requirements. Acceptance and inspection activities shall be performed by individuals or groups that are independent of those performing the activity and shall not be performed by personnel who have performed the activity being inspected or who report directly to the immediate supervisors who are responsible for performing the work being inspected.
  - 1.1.1 Inspection and test verification shall be performed at Supplier's facilities in accordance with the requirements of the procurement document.
  - 1.1.2 Inspections shall be performed on material, equipment, and work to ensure conformance to applicable specifications, instructions, codes, standards, and procedures.
  - 1.1.3 Inspection planning shall be performed by Quality Assurance (QA) for QA and Procurement Source Inspection and Site Quality Control, as part of their inspection process. Quality planning activities include an ongoing review of supplier fabrication and site construction schedules to assure that inspection procedure and inspection plan needs are identified and the procedures/plans completed in advance of required dates. The work and inspections of the work are performed to specifications/drawings; therefore, a lack of a specification or drawing would preclude either work or inspections being performed.
- 1.2 Technical and quality assurance requirements shall be translated into inspection procedures, plans, and reports to provide documentation of the work. While direct in-process and final inspections are preferred, indirect control by monitoring of the process, equipment, and personnel may be used when direct inspection is impossible or not feasible. Direct and indirect controls shall be used when control is inadequate without both methods.
  - 1.2.1 Assurance that inspection procedures, instructions, and/or checklists contain the following is obtained as indicated next to each item:

- A. Quality Characteristics to be Inspected - These are identified in the appropriate specification or purchase documents which are reviewed and approved by Quality Assurance/Quality Control (QA/QC) personnel.
- B. Individuals or Groups Responsible for Performing the Inspection - Identified in the appropriate Quality Standard.
- C. Acceptance and Rejection Criteria - Same as A.
- D. A Description of Method of Inspections - Identified in the appropriate inspection document; e.g., Quality Assurance Directive, Site Quality Control Inspection Plans and/or Source Inspection Plans, etc.
- E. Evidence of Completions and Certifications of Inspection Operations - An inspection report prepared in accordance with the applicable inspection procedures/plans.
- F. Record of the Results of the Inspection Operation - Same as E.
- G. Verification that all Inspection Operations are complete and acceptable - A comparison of the inspection reports/documentation to the inspection attribute list developed during the inspection planning stage by QA for Source Inspections and Site Quality Control.

Final assurance of the satisfactory implementation of items A. through G. is gained through an independent audit of the above activities performed by the QA Audit Group.

- 1.3 Sampling techniques may be utilized for inspecting a group of homogeneous items. If sampling is used to verify the acceptability of items, the sampling plan shall be based on a recognized standard sampling plan or other accepted technique and be approved by Engineering. The method utilized and conclusions obtained from sampling shall be documented to assure correct interpretation of the plan and the results. Client approval of sampling plans for safety related and important to safety items (i.e., QA Category I or other QA designations as used on the project) is required when the method is outside the scope of approved procedures or accepted techniques.
- 1.4 When notification or hold points have been established, the process control procedure or checklist shall include provisions to ensure that work does not progress beyond these points until released by the designated authority. Construction, Site Quality Control, QA Source Inspection, QA/QC, Procurement Source Inspection, Client, or third party inspection personnel may establish notification or hold points.
- 1.5 Individuals or groups who have been designated to evaluate inspection data by specifications, procedures, or instructions shall indicate the conformance or nonconformance on the data sheet or other appropriate documents. Those evaluating the inspection data shall be qualified to evaluate the technical adequacy of the inspection results.

- 1.6 Inspection records shall clearly identify the item inspected, date of inspection, the inspector's identity, type of observation, results, or acceptability, and reference to information on action taken in connection with nonconformances.
- 1.7 Personnel performing inspection activities shall be qualified and certified to perform the applicable inspection task.
- 1.8 QA/QC, QA Source Inspection, Procurement Source Inspection, and Site Quality Control shall have the authority to stop work in those situations where continued work could cause damage, preclude further inspection, or preclude effective corrective action.
- 1.9 Any modifications, repairs, or replacements of items performed subsequent to final inspection require re-inspection or retest, as appropriate, to verify acceptability.

## 2.0 TASKS

- 2.1 Engineering shall:
  - 2.1.1 Include necessary technical requirements with acceptance criteria in drawings, specifications, instructions, and procedures.
- 2.2 QA Source Inspection or Procurement Source Inspection, as applicable, shall:
  - 2.2.1 Perform inspection and test verification tasks at Supplier's facilities in accordance with the procurement documents and document inspection and test verification results.
- 2.3 Construction shall:
  - 2.3.1 Notify Site Quality Control when work approaches Site Quality Control, owner, and ANI hold/notification inspection points.
- 2.4 QA/QC shall:
  - 2.4.1 Site Quality Assurance shall:

Perform site subcontractor quality verification inspections and provide documentation appropriate to the individual supplier consistent with the work or service provided.
  - 2.4.2 Site Quality Control shall:
    - A. Perform inspection/testing of soils, concrete, reinforcing steel, structural steel, and special coatings in accordance with applicable specifications, instructions, and procedures.

- B. Perform specified inspections and tests of all safety related and important to safety (i.e.: QA Category I or other QA designations as used on the project) equipment. Unless there are specific requirements in applicable specifications, instructions, or procedures, QA Category II and III equipment shall be routinely inspected on a surveillance basis with the level of effort determined by functional importance.
- C. Perform inspection of welding in accordance with applicable specifications, instructions, and procedures. Visual inspection of welding shall, at least, be in accordance with the following:
- All welding of, or to, safety related and important to safety (i.e., QA Category I or other QA designations as used on the project) items shall be 100 percent inspected, except as described in Paragraph 1.3.
  - Welding of QA Category II or III items to the non-pressure boundary portions of non-ASME III safety related and important to safety (i.e., QA Category I or other QA designations as used on the project) items shall be inspected on a surveillance basis.
  - Welding inspection of QA Category II and/or III items to each other will vary based upon the importance to plant operation.
- D. Perform required NDE such as liquid penetrant, magnetic particle, ultrasonic, and radiographic examinations and oversee subcontracted NDE services when applicable.
- E. Make all necessary arrangements with and assist the Authorized Nuclear Inspector so that Shaw Nuclear may obtain Code certification of ASME III work.
- F. Document inspection/testing tasks performed.



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**SECTION 11 - TEST CONTROL**

Revision: B  
Dated: 6-1-09

**1.0 REQUIREMENTS**

- 1.1 A test program shall be established and documented by test program directives and test procedures to demonstrate that structures, systems, and components will perform satisfactorily in service.
- 1.2 Testing shall be accomplished by qualified personnel in accordance with written controlled test procedures. The test control program shall include, as appropriate, proof tests before installation, preoperational tests, post maintenance tests, and operational tests.
- 1.3 Modifications, repairs, and replacement equipment shall be tested in accordance with the original testing requirements and acceptance criteria or approved changes.
- 1.4 Test procedures shall be prepared and controlled in accordance with requirements established in a test program directive, and they shall:
  - 1.4.1 Include or reference the requirements and acceptance criteria for testing established by the design documents applicable to the structure, system, or component.
  - 1.4.2 Specify calibrated equipment and instrumentation required to perform the test.
  - 1.4.3 Identify the prerequisites that must be met. Shaw Nuclear considers Regulatory Guide 1.116, as committed to in Appendix VII, to cover the major prerequisites to be addressed.
  - 1.4.4 Specify required environmental conditions if applicable.
  - 1.4.5 Provide instructions for performance of the test and recording of required test data and results.
  - 1.4.6 Identify, when applicable, mandatory hold points for witnessing of tests by the Client, the Authorized Nuclear Inspector, and Site Quality Control.
  - 1.4.7 When post installation testing is used for acceptance of purchased items, post installation test and acceptance documentation recommended by the seller shall be considered.

- 1.5 Test results, as a minimum, shall identify the item tested, date of the test, identity of the tester or data recorder, type of observation, results and acceptability, and action taken in connection with any deviations noted.
- 1.6 Tests results shall be evaluated by qualified personnel to assure that test requirements have been satisfied.

## 2.0 TASKS

- 2.1 Construction shall review and approve NSTPDs and PTPDs affecting Construction to assure proper interface with Construction activities.
- 2.2 Engineering shall:
  - 2.2.1 Develop and control Nuclear Standard Test Program Directives (NSTPDs) which form the Nuclear Standard Test Program Manual. The NSTPDs establish Shaw's standard administrative systems for implementing the test program. NSTPDs are approved by the VP/Director Nuclear Engineering and the Director Nuclear Quality and the heads of other affected organizations. Project Test Program Directives (PTPDs) are developed from NSTPDs.
  - 2.2.2 Direct performance of tests required by the test program and evaluate the test results.
  - 2.2.3 Develop and implement a program for indoctrination, qualification and certification of test personnel.
- 2.3 Project Engineering shall:
  - 2.3.1 Establish the requirements and acceptance criteria for testing of structures, systems, and components in approved design documents.
  - 2.3.2 Prepare and control PTPDs based upon the NSTPDs. PTPDs form the Project Test Program Manual.
  - 2.3.3 Prepare, review, approve, and control project test procedures for testing structures, systems, and components. At least one approver of test procedures, an individual other than the preparer, shall be a certified Level III test person certified in accordance with the Nuclear Standard Nuclear Test Program Manual.
  - 2.3.4 Identify Hold Points in Test Procedures, as requested by Site Quality Control, the ANI, or the client.

- 2.3.5 Provide assistance for evaluation of test results.
- 2.3.6 Establish provisions to assure that computer software used in applications affecting safety is prepared, documented, verified and tested, and used such that the expected output is obtained and configuration control is maintained. To this end, Shaw Nuclear commits to compliance with the requirements of NQA-1, Supplement 11S-2 and subpart 2.7 to establish appropriate provisions. Refer to Section 3 of this manual.
- 2.4 **Quality Assurance/Quality Control** shall:
  - 2.4.1 Review and approve NSTPDs and PTPDs to assure compliance with quality assurance program requirements.
  - 2.4.2 Review and approve QA Category I system test procedures applied to ASME Section III and those test procedures which involve quality verification responsibilities to ensure that quality verification activities are properly specified.
- 2.5 **Site Quality Control** shall perform hold point activities in accordance with test procedures.



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**SECTION 12 - CONTROL OF MEASURING AND TEST  
EQUIPMENT**

**Revision: B**  
**Dated: 6-1-09**

**1.0 REQUIREMENTS**

- 1.1 When tools, gages, instruments, and other measuring and testing equipment (M&TE) are used for measurements, inspections, and tests performed to document compliance with specified requirements, the calibration, maintenance, and use of such equipment shall be controlled.
- 1.2 The control program shall include the following:
  - 1.2.1 Positive identification of the equipment and its calibration status, including the due date of the next calibration.
  - 1.2.2 A frequency of calibration schedule for types of equipment based on required accuracy, purpose, recognized industry standards, manufacturers' recommendations, usage factors, stability characteristics, and other conditions affecting the measurement.
  - 1.2.3 Written procedures describing the calibration control system. Standards traceable to national standards shall be used; if national standards do not exist, the basis for calibration shall be documented. Calibration of equipment shall be against standards that have an accuracy that assures the equipment being calibrated will be within the required tolerance.
  - 1.2.4 A records system which will indicate the calibration dates, the capability of measuring and test equipment to satisfactorily perform its intended function, and the identification of personnel performing the calibrations.
  - 1.2.5 A recall system to prevent use of equipment beyond the calibration due date.
  - 1.2.6 A system for corrective action when out-of-calibration or damaged measuring and test equipment has been used. "Corrective action" as used herein requires that an investigation be conducted and documented to determine the validity of previous inspections performed when uncalibrated, damaged, or out-of-calibration measuring and test equipment has been used. Inspection records shall identify M&TE used during acceptance inspection, thereby allowing evaluation of results.



1.2.7 M&TE is divided into two groups for effective control.

A. Calibrated M&TE is M&TE which is subject to variation and/or is adjustable, e.g., micrometers, thermometers, electrical meters, temperature recorders, etc. Calibrated M&TE requires periodic calibration at a suitably equipped facility.

B. Verified M&TE is M&TE which is stable and non-adjustable, e.g., slump cones, steel rules, penetrameters, etc., or which must be standardized prior to each use by the user (Ferrite Gauge, Dry Film Thickness Gauge, etc.). Verified M&TE requires receipt acceptance, periodic verification and/or visual inspection prior to each use by the user to assure it has not become worn or damaged.

## 2.0 TASKS

2.1 Engineering shall:

2.1.1 Establish procedures for control and calibration of measuring and test equipment used in engineering activities affecting quality.

2.2 QA Source Inspection and /or Procurement Source Inspection shall:

2.2.1 Monitor tasks at Suppliers' facilities relative to the control of measuring and test equipment in accordance with the requirements of the procurement documents.

2.3 Construction shall:

2.3.1 Control measuring and test equipment used by construction forces at the site and forward equipment due for calibration to Site Quality Control.

2.4 Site Quality Control shall:

2.4.1 Establish and maintain a calibration program for measuring and test equipment.

2.4.2 Calibrate, or have calibrated by approved calibration laboratories, measuring and test equipment.

2.4.3 As an alternative to survey and audit of a calibration facility, Shaw Nuclear may accept accreditation by the National Voluntary Laboratory Accreditation Program (NVLAP), the American Association for Laboratory Accreditation (A2LA), or other accrediting body recognized by NVLAP through the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) provided requirements listed in Section 7 are met. For ASME III Code activities acceptance of these laboratory accreditation programs shall be in accordance with the Shaw ASME III Program.

2.4.4 Verify that properly calibrated equipment is used.

2.4.5 Ensure that measuring and test equipment is identified.

2.4.6 Maintain calibration records.



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**SECTION 13 - HANDLING, STORAGE, AND SHIPPING**

**Revision: B**  
**Dated: 6-1-09**

## **1.0 REQUIREMENTS**

- 1.1 The handling, storage, shipping, cleaning, and preservation of materials and equipment shall be controlled to prevent damage, deterioration or release of radioactive or hazardous material. The specified work shall be accomplished by qualified individuals in accordance with applicable procedures.
- 1.2 **Procurement** documents shall include the following:
  - 1.2.1 Requirements for Suppliers to establish special procedures, when necessary, to prevent damage or deterioration of the supplied items.
  - 1.2.2 Requirements for the preparation of items for shipment, as necessary, to ensure **physical and environmental protection**, cleanliness, identification, and proper handling.
  - 1.2.3 Requirements for **warehousing and storage**, installation, operation, and maintenance instructions, when specified, to be available at the site on a timely basis.
- 1.3 A preventive maintenance program shall be established at the site. This program shall include a schedule of maintenance operations performed. The **preventive** maintenance program shall be based on the manufacturer's recommendation and/or Project Engineering instructions.
- 1.4 The preventive maintenance program shall be applied to materials and equipment in storage and work areas, and after installation up to the time of acceptance by the client.
- 1.5 **Operators of special handling and lifting equipment shall be experienced or trained in the use of the equipment. Shaw complies with applicable hoisting, rigging, and transportation regulations and codes in conjunction with the alternatives identified in Appendix VII.**

## **2.0 TASKS**

- 2.1 Engineering shall:

Include criteria in procurement documents for the handling, storage and shipping of items including storage at the site, and resolve any problems relative to the assignment of storage levels.

2.2 Quality Assurance/Quality Control shall:

2.2.1 Perform specified verification source inspection activities, when assigned, at Supplier's facilities relative to the handling, cleaning, and preparation of items for shipment as required by the procurement documents and shall perform verification activities of the maintenance program for items in long term storage at Supplier's facilities on a case-by-case basis as required by specific requests from the client.

2.2.2 Site Quality Control shall:

- A. Perform surveillance/verification inspection of the maintenance program for items in long term storage at Supplier's facilities on a case-by-case basis as required by specific requests from the client.
- B. Verify storage of items to assure that specified storage requirements are met.
- C. Verify implementation of the maintenance program.
- D. Verify that only acceptable items are released for installation (risk released items are considered acceptable within the conditions of the risk release).
- E. Document Site Quality Control storage inspections/verifications.

2.3 Procurement shall:

2.3.1 Perform specified verification source inspection activities, when assigned, at Supplier's facilities relative to the handling, cleaning, and preparation of items for shipment as required by the procurement documents and shall perform verification activities of the maintenance program for items in long term storage at Supplier's facilities on a case-by-case basis as required by specific requests from the client.

2.4 Site Procurement shall:

- 2.4.1 Establish and implement a storage and preventive maintenance program for items stored at the site and at specified nearby locations and maintain appropriate maintenance records.
- 2.4.2 Assign levels of storage for items based on criteria provided by Engineering.
- 2.4.3 Control the issue of items for field use or installation by authorized storage requisition documentation.

2.4.4 Ensure that the quality of items is maintained throughout storage so that no degradation or deterioration is evident.

2.5 Construction shall:

2.5.1 Implement a preventive maintenance program and maintain storage requirements for items and material under their jurisdiction during the installation and test phase.

2.5.2 Establish and implement a system to address the requirements for hoisting, rigging, and transportation of items for nuclear power plants.



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**SECTION 14 - INSPECTION, TEST, AND OPERATING STATUS**

**Revision: B**  
**Dated: 6-1-09**

## **1.0 REQUIREMENTS**

- 1.1 The status of inspections and test operations shall be identified during manufacturing, fabrication, construction, installation, testing, maintenance, repair, replacement, and decommissioning. The status shall be indicated by tags, markings, shop travelers, stamps, route cards, inspection records, checklists, or other suitable means provided that the method used ensures that only accepted items are used, installed, or operated. The removal of such tags, shop travelers, route cards, checklists, etc., shall only be performed by authorized personnel. Removal by unauthorized personnel shall be prohibited.
- 1.2 The bypassing or waiver of a required inspection, test or critical operation shall be cause for rejection unless Quality Assurance/Quality Control (QA/QC) has reviewed and approved the document that authorized the bypass or waiver, i.e., an addendum to a specification and/or an authorized design change. The bypassing, waiver or altering of the sequence of inspections, tests, or verifications by the inspector which are not specified in engineering documents shall be cause for rejection unless the inspector has provided documented authorization for the bypass or waiver.
- 1.3 Temporary design changes (temporary modifications), such as temporary by-pass lines, electrical jumpers and lifted wires, and temporary trip point settings, shall be controlled by approved procedures that include requirements for appropriate installation and removal, independent / concurrent verifications and status tracking.
- 1.4 Nonconforming items shall be uniquely identified and controlled.

## **2.0 TASKS**

- 2.1 QA Source Inspection and/or Procurement Source Inspection, as applicable, shall:
  - 2.1.1 Perform tasks relative to the assurance of inspection, test, and operational status of items at Supplier's facilities in accordance with procurement documents.
  - 2.1.2 Verify during inspections of Suppliers furnishing safety related and important to Safety items (i.e.; QA Category I or other QA designations as used on the project) that the Supplier is properly using a system for the identification of inspection and test operations, as appropriate, or as required by the procurement documents.

2.1.3 Ensure that only accepted items are incorporated into systems, structures, and components prior to the shipping of these items to the client.

2.1.4 Maintain current documentation regarding the status of inspections and tests witnessed or conducted by Shaw's source inspection.

2.2 Site Quality Control shall:

2.2.1 Perform tasks relative to the assurance of inspection, test, and operational status of items at site Supplier's facilities in accordance with procurement documents.

2.2.2 Verify during inspections of safety related and important to Safety (i.e., QA Category I or other QA designations as used on the project) items furnished by site Suppliers that the Supplier is properly using a system for the identification of inspection and test operations, as appropriate, or as required by the procurement documents.

2.2.3 Identify the status of inspections and tests performed during construction and installation.

2.2.4 Ensure that only accepted items are incorporated into systems, structures, and components prior to the turnover of these items to the client.

2.2.5 Maintain current documentation regarding the status of inspections and tests witnessed or conducted by Site Quality Control.

2.3 Engineering shall:

2.3.1 Identify the status of inspections and tests performed during the test program.

2.3.2 Maintain current documentation regarding the status of inspections and tests during the test program.



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**SECTION 15 - NONCONFORMING MATERIALS, PARTS,  
OR COMPONENTS**

**Revision: B  
Dated: 6-1-09**

## **1.0 REQUIREMENTS**

- 1.1 Nonconforming and unsatisfactory (unsat) items shall be controlled to prevent their inadvertent use or installation until the unsat or nonconforming condition is corrected either by rework to return it to the specified condition or by a change in the specified requirements by Engineering. The controls shall include measures for identification, documentation, segregation (as appropriate), disposition, and notification to affected organizations.
- 1.2 While physical segregation and marking are preferred, other means of identification (e.g., marking, tagging, etc.) are acceptable when physical segregation is impractical.
- 1.3 Dispositions authorizing a change in requirements shall be made by the same (or equally authorized) personnel or group responsible for establishing the original requirements. A rework disposition for an unsatisfactory item is subject to a Quality review and approval by Site Quality Control. Engineering dispositions of nonconforming conditions that result in a change in the specified requirement are subject to a Quality review and approval by Quality Assurance/Quality Control (QA/QC).
- 1.4 Nonconformances to design requirements that are dispositioned as repair or accept-as-is, shall be subject to design control measures commensurate with those applied to the original design. The technical justification for the acceptability of a nonconforming item shall be documented.
- 1.5 Nonconformance and Disposition Reports (N&Ds) may be initiated by Engineering, Construction, Procurement and/or QA Source Inspection, and/or QA/QC personnel.
- 1.6 Nonconforming items existing at the time of system turnover to the client will be identified.
- 1.7 A system shall be established for reporting potential defects and failures to comply in accordance with 10CFR21 and 10CFR820 Appendix A.

## 2.0 TASKS

### 2.1 Nuclear QA Manager shall:

Review and approve engineering dispositions for nonconforming conditions that result in a change in engineering specified requirements.

### 2.2 Site Quality Control and QA Source Inspection shall:

2.2.1 Prepare, issue, distribute, and control N&Ds when unsatisfactory conditions which cannot be corrected within the scope of the applicable drawings and specifications or otherwise require an Engineering disposition are observed.

2.2.2 Review dispositions and close N&Ds when actions have been completed.

2.2.3 Provide copies of N&Ds to the client, if required.

2.2.4 Analyze unsatisfactory and nonconforming conditions. Copies of related status, trend, and analysis reports are issued to Project Engineering, Project Management, and QA/QC to assure timely resolution of identified problems.

2.2.5 Issue quality trend reports for specific activities and forward to management of the following organization: Operations, Federal Business, QA/QC, Engineering, Construction; as well as the Manager of Projects, the Project Manager, the Project Engineer, and the Construction Site Manager as applicable.

2.2.6 Re-inspect nonconforming items, reported on a Nonconformance and Disposition (N&D) Report, in accordance with the accept/reject criteria contained in the engineering disposition/specification/procedure and document the results of the re-inspection on the N&D.

2.2.7 Ensure that each N&D identifies and describes the nonconformance, the disposition of the nonconformance, the appropriate inspection requirements either directly or by reference, and includes signature approval of the disposition.

2.2.8 These actions shall include the preparation of N&Ds for processing by Site Quality Control.

### 2.3 Construction shall:

2.3.1 Request an Engineering disposition for unsatisfactory conditions that cannot be resolved within the scope of the applicable drawings and specifications or otherwise requires an Engineering disposition.



2.3.2 Review project Engineering N&D dispositions which affect construction activities to determine whether the disposition can be implemented.

2.4 Engineering shall:

Develop and approve dispositions for N&Ds including N&Ds that originate from nonconformances noted in Supplier's shops and at the site.

2.5 Procurement Source Inspection and/or Procurement QA Source Inspection shall:

2.5.1 Prepare, issue, distribute, and control N&Ds when unsatisfactory conditions which cannot be corrected within the scope of the applicable drawings and specifications or otherwise require an Engineering disposition are observed.

2.5.2 Re-inspect nonconforming items, reported on a Nonconformance and Disposition (N&D) Report, in accordance with the accept/reject criteria contained in the engineering disposition/specification/procedure and document the results of the re-inspection on the N&D.

2.5.3 Ensure that each N&D identifies and describes the nonconformance, the disposition of the nonconformance, the appropriate inspection requirements either directly or by reference, and includes signature approval of the disposition.

2.5.4 Analyze unsatisfactory and nonconforming conditions. Copies of related status, trend, and analysis reports are issued to Project Engineering, Project Management, and QA/QC to assure timely resolution of identified problems.



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**SECTION 16 - CORRECTIVE ACTION**

**Revision: B**  
**Dated: 6-1-09**

**1.0 REQUIREMENTS**

- 1.1 Major and recurring conditions adverse to quality, such as failures, malfunctions, deficiencies, defective material and equipment, unsats, and nonconformances shall be identified, the cause(s) determined, and corrective and preventive action taken to preclude repetition. These conditions include failures of the Quality Assurance Program.
- 1.2 The corrective action program shall provide for prompt identification, documentation, classification, and correction of the conditions. Provisions shall be included that ensure that corrective actions are not inadvertently nullified by subsequent actions.
- 1.3 The corrective action taken to correct deficient conditions discovered by inspection, test, or audits shall be verified by reinspection, retesting, subsequent audits including corrective action audits, and or the review of corrective action documentation to assure that the agreed upon corrective action has been satisfactorily implemented to close out the deficiency. For conditions adverse to quality and significant conditions adverse to quality, the corrective action process, including the resulting action to resolve the deficiency, shall be documented and reported to responsible management. The area of concern shall be re-audited in a timely manner to assure that the corrective action has been accomplished.
- 1.4 Significant Conditions Adverse to Quality also require processing through the Problem Report System, determining whether the client should be notified of a potentially reportable deficiency under 10CFR50.55(e), determining whether the condition should be processed as a potentially reportable condition under 10CFR21, determining if a Stop Work Action/Order is needed, performing a Root Cause Analysis to determine the cause of the condition, and performing a detailed evaluation to determine the Extent of Condition.
- 1.5 Anyone may initiate a Corrective Action Report (CAR) after it has been established that the condition of concern is not more appropriately processed by another corporate system. If in doubt as to whether a condition warrants a CAR to be written, personnel should write the CAR and allow the CAR system to review and determine the need in accordance with the CAR procedure.
- 1.6 Measures shall be taken to keep appropriate Shaw Nuclear personnel informed of potential problems by a feedback system of reports on significant and recurring problems encountered on other Shaw Nuclear projects and by review of selected government and industry documents.

## 2.0 TASKS

### 2.1 Quality Assurance/Quality Control (QA/QC) shall:

- 2.1.1 Analyze audit and surveillance data and Corrective Action Reports to determine significant conditions and trends. Report results of analysis to management. Maintain a file of completed CARS and trend documentation.
- 2.1.2 Review selected government and industry documents for problems related to engineering, design, construction, operating experience, construction experience, or QA/QC so that applicable potential problems and lessons learned are brought to the attention of appropriate personnel.
- 2.1.3 Implement a feedback system for the reporting of significant and recurring problems for preventive action.
- 2.1.4 Initiate, evaluate and process Corrective Action Reports (CARs) for conditions adverse to quality which are not documented and resolved in accordance with the inspection reporting system, the nonconformance system or the audit system.
- 2.1.5 Procurement QA Source Inspection shall:
  - A. Fulfill the requirements of this section by utilizing inspection data to perform analysis to determine the cause of major and recurring nonconforming conditions.
  - B. Initiate, evaluate and process Corrective Action Reports for conditions adverse to quality which are not documented and resolved in accordance with the inspection reporting system, the nonconformance system, or the audit system.
- 2.1.6 Site Quality Control shall:
  - A. Fulfill the requirements of this section by implementing the tasks of Section 15 and shall utilize inspection data to perform analysis to determine the cause of major and recurring nonconforming conditions.
  - B. Take corrective and preventative action for those conditions which are the responsibility of Site Quality Control.
  - C. Initiate, evaluate and process Corrective Action Reports for conditions adverse to quality which are not documented and resolved in accordance with the inspection reporting system, the nonconformance system, or the audit system.

2.2 Engineering shall:

2.2.1 Fulfill the requirements of this section by implementing the engineering tasks of Section 15 and shall utilize inspection data to perform analysis to determine the cause of major and recurring nonconforming conditions.

2.2.2 Take corrective and preventative action for those conditions which are the responsibility of the Engineering Department.

2.2.3 Initiate, evaluate and process Corrective Action Reports for conditions adverse to quality which are not documented and resolved in accordance with the inspection reporting system, the nonconformance system, or the audit system.

2.2.4 Licensing shall review selected government and industry documents for problems related to engineering design, construction, operating experience, construction experience, or QA/QC so that potential problems and lessons learned are brought to the attention of appropriate personnel.

2.3 Construction shall:

2.3.1 Take corrective and preventative action for those conditions which are the responsibility of the Construction Department.

2.3.2 Initiate, evaluate and process Corrective Action Reports for conditions adverse to quality which are not documented and resolved in accordance with the inspection reporting system, the nonconformance system, or the audit system.

2.4 Procurement shall:

2.4.1 Take corrective and preventative action for those conditions which are the responsibility of Procurement.

2.4.2 Initiate, evaluate and process Corrective Action Reports for conditions adverse to quality which are not documented and resolved in accordance with the inspection reporting system, the nonconformance system, or the audit system.

2.5 Procurement Source Inspection shall:

2.5.1. Take corrective and preventative action for those conditions which are the responsibility of Procurement Source Inspection.

2.5.2 Initiate a Corrective Action Reports for conditions adverse to quality which are not documented and resolved in accordance with the inspection reporting system, the nonconformance system, or the audit system.

2.6 Subcontracts shall:

- 2.6.1 Take corrective and preventative action for those conditions which are the responsibility of Procurement Source Inspection.
- 2.6.2 Initiate, evaluate and process Corrective Action Reports for conditions adverse to quality which are not documented and resolved in accordance with the inspection reporting system, the nonconformance system, or the audit system.

## 1.0 REQUIREMENTS

- 1.1 Measures shall be established that ensure sufficient records of completed items and activities affecting quality are collected, maintained, and appropriately stored.
- 1.2 A records system(s) shall be established at the earliest practical time consistent with the schedule for accomplishing work activities.
- 1.3 The record system(s) shall be defined, implemented, and enforced in accordance with written procedures, instructions, or other documentation.
- 1.4 For QA records in electronic media, the program shall include provisions for the generation, distribution, use, maintenance, storage, and disposition of electronic records.
- 1.5 The program shall provide for all acceptable media on which electronic records are created and stored and include provisions to verify that the media is appropriate, suitable for the capture or storage of records, and error/defect free.
- 1.6 The program shall be developed to implement Generic Letter 88-18, "Plant Record Storage on Optical Disks".
- 1.7 Applicable specifications, procurement documents, procedures or other documents shall specify the receipt, storage, preservation, safekeeping, retrieval, types of records to be generated, the record media type (hard copy or electronic), retention period, and their disposition.
- 1.8 Training is required for individuals or organizations in charge of electronic records generation, data/media storage, and implementation of security measures, mitigation/regeneration, and recovery.
- 1.9 Inspection and test records shall be reviewed and authenticated to ensure that, as a minimum, they identify the inspector or data recorder, the type of operations, the results, the acceptability, and the action taken if deficiencies were noted. The reviewer shall sign these records.

- 1.10 Authenticating signatures will not be required if the document is clearly identified as a statement by the reporting individual or organization. Procedures shall address the authentication of electronic records by manually affixing a seal, signature, an electronic representation, or other acceptable process control that ensures genuineness, validity, or reliability. The system provides controls for users who enter or alter information in electronic records to ensure data integrity and prevent unauthorized alteration or erasure.
- 1.11 Records shall be legible, identifiable, retrievable and traceable to the item or activity to which it applies.
- 1.12 Records shall be indexed. The indexing system(s) shall include, as a minimum, record retention times and the location of the record within the record system. Indexing for electronic records, in addition to the minimum indexing information requirements, the software name, version, and equipment (hardware) used to produce and maintain the electronic media must be provided.
- 1.13 Records shall be classified as "Lifetime" or "Nonpermanent" by the Owner. Lifetime records are required to be maintained by or for the plant owner for the life of the item while it is installed in the plant or stored for future use. Nonpermanent records are required to show evidence that an activity was performed in accordance with the applicable requirements but need not be retained for the life of the item.
- 1.14 Electronic records classified as lifetime or nonpermanent are subject to the same retention requirements prescribed for paper records/hardcopies. Retention requirements also identify and maintain the information system, the documentation that describes the information system operation and use, and the record standard it produces.
- 1.15 Procedures shall address an electronic record migration/regeneration program for electronic records storage in media with a standard life expectancy that fails to meet the specific retention period.
- 1.16 Procedures shall address storage of electronic media in a dust-free environment, away from electronic devices and demagnetizing equipment. Temperature and humidity requirements shall be addressed as well as periodic testing of optical media.

- 1.17 Procedures shall be developed to address entry and storage of department, division, and project records in Shaw Nuclear's Electronic Document Management System known as ShawDocs (Documentum®). Procedures should address access controls, user privileges, and other appropriate security controls.
- 1.18 Procedures shall be generated to address correction of records and shall provide for appropriate review or approval by the originating organization.
- 1.19 Procedures shall identify the organization or individual responsible for receiving records, organizing and implementing a system of receipt control of records and for providing protection from damage or loss during the time records are in their possession. It will also address organizing and implementing an inventory of system applications, record formats, and programs required to process and retrieve electronic records.
- 1.20 A receipt control system shall be structured to permit a current and accurate assessment of the status of records during the receiving process.

## 2.0 TASKS

- 2.1 Project Management shall:
  - 2.1.1 Implement a records management system for the control of project quality assurance records.
  - 2.1.2 Ensure the inclusion of such records in the permanent file.
  - 2.1.3 Verify the completeness and accuracy of the documents prior to entry into ShawDocs.
- 2.2 Construction shall:
  - 2.2.1 Implement the Construction portion of the records management system established by Project Management to ensure the inclusion of required construction records in the permanent file.
  - 2.2.2 Establish and maintain a record facility, as authorized by the client, for the collection and storage of permanent records.
  - 2.2.3 Verify the completeness and accuracy of the Construction documents prior to entry into ShawDocs.
  - 2.2.4 Transfer permanent records to the Client via transmittal, as required.



2.3 Engineering shall:

2.3.1 Implement the Project Engineering portion of the records management system established for control of design and engineering documents to assure the records for design and engineering are properly collected, stored, and maintained. This documentation includes not only final design documents, such as drawings and specifications, and revisions thereto, but also documentation which identifies the important steps, including sources of design inputs that support the final design.

2.3.2 Verify the completeness and accuracy of the engineering and design documents prior to entry into ShawDocs.

2.4 Procurement / Subcontracts shall:

2.4.1 Ensure Procurement implements the applicable portion of the records management system established for control of documents to assure the inclusion of records for Procurement.

2.4.2 Ensure Subcontracts implements the applicable portion of the records management system established for control of documents to assure the inclusion of records for Subcontracts.

2.4.3 Verify the completeness and accuracy of the Procurement and Subcontract documents prior to entry into ShawDocs.

2.4.4 Procurement Source Inspection shall implement the portion of the project records management system established by Project Management that is applicable to source inspection activities in addition to the following generic tasks.

- A. Ensure that specified quality assurance records are available before items are released for shipment from Supplier facilities, as required by procurement documents.
- B. Verify the completeness and accuracy of specified Supplier quality assurance records for purchased items or services.
- C. Release quality assurance records required by procurement documents. Records are to be complete, accurate, and legible.

- 2.5 The Site Quality Control organization shall:
- 2.5.1 Implement the Site Quality Control portion of the project records management system established by Project Management.
  - 2.5.2 Ensure that specified quality related records are available before items are released from Suppliers, as required by contract documents. Records are to be complete, accurate, and legible.
  - 2.5.3 Verify the completeness of the Site Quality Control documents prior to entry into ShawDocs.
- 2.6 Quality Assurance shall:
- 2.6.1 Implement the Quality Assurance portion of the project records management system established by Project Management.
  - 2.6.2 Verify the completeness and accuracy of the Quality Assurance documents prior to entry into ShawDocs.
- 2.7 Procurement QA Source Inspection shall:
- 2.7.1 Implement the portion of the project records management system established by Project Management that is applicable to source inspection activities in addition to the following generic tasks.
    - A. Ensure that specified quality assurance records are available before items are released for shipment from Supplier facilities, as required by procurement documents.
    - B. Verify the completeness and accuracy of specified Supplier quality assurance records for purchased items or services.
    - C. Release quality assurance records required by procurement documents. Records are to be complete, accurate, and legible.
- 2.8 Nuclear Project Information Services shall:
- Develop, implement and staff the company's document retention and retrieval program in accordance with the requirements of NQA-1.



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**Standard Nuclear Quality Assurance Program**

**SECTION 18 - AUDITS AND SURVEILLANCES**

**Revision: B**  
**Dated: 6-1-09**

## **1.0 REQUIREMENTS**

- 1.1 An audit **program and a surveillance program** shall be established to ensure that quality activities are in compliance with the requirements of this manual and related procedures, to determine the effectiveness of the quality assurance program, and that the program has been **implemented effectively. Audits provide a comprehensive independent evaluation of activities and procedures.**
- 1.2 The audit program shall provide a planned and scheduled system of audits of internal operations, Supplier's operations, and areas of identified concern.
  - 1.2.1 Project audits are scheduled and conducted based on the scope of work being performed by the project. The audit schedule starts at the time **Shaw Nuclear** is awarded the work and runs until the project is completed. Additional audits, relating to specific areas of interest, are conducted as determined by the appropriate management. The audit program includes an evaluation of:
    - A. Work areas
    - B. Activities
    - C. Processes
    - D. Items (hardware)
    - E. Documents and records
    - F. Quality related practices, procedures, and instructions
    - G. Effectiveness of QA Program implementation
    - H. Compliance with policy objectives
  - 1.2.2 **Periodic audits of systems, software applications, and media are performed to ensure electronic records retrievability, integrity, and retention period.**
  - 1.2.3 The program shall include provisions for reporting nonconforming conditions to the responsible level of management for any necessary corrective action.

- 1.2.4 Deficient areas shall be re-audited to assure accomplishment of the corrective action.
- 1.2.5 Audit data shall be analyzed by Quality Assurance/Quality Control (QA/QC) and reported to the Director of Nuclear Quality and other appropriate management.
- 1.3 Internal audits shall be scheduled and performed in such a manner as to assure that all applicable elements of the QA program that are being implemented by a project and by department/discipline organizations, in support of multiple projects, are audited at least once each year or at least once during the life of the project, whichever is shorter.
- 1.4 Audit plans identify the audit scope, requirements, audit personnel, activities to be audited, organizations to be notified, applicable documents, schedule, and written procedures or checklists.
- 1.5 The audit report shall be signed by the Audit Team Leader and contains the following:
  - 1.5.1 description of the scope of the audit
  - 1.5.2 identification of the auditors and any technical representatives
  - 1.5.3 identification of persons contacted during the audit
  - 1.5.4 summary of the audit results, including a statement of the effectiveness of the QA program elements which were audited
  - 1.5.5 description of each reported adverse audit finding in sufficient detail to enable corrective action to be taken by the audited organization
- 1.6 Audits shall be performed in accordance with written procedures, audit plans, or checklists by appropriately trained personnel having no direct responsibility in the activity being audited, and shall be under the direction of a qualified lead auditor and the cognizance of the Director of Nuclear Quality.
- 1.7 Records of audits performed shall be maintained.
- 1.8 The audit schedule is reviewed periodically and revised as necessary to ensure that coverage is maintained current.
- 1.9 Audit schedules shall be made available to the Client, upon request.
- 1.10 Project audit reports shall be made available to the Client upon request.
- 1.11 Upon request, Shaw Nuclear may act as the Client's agent and perform special audits of activities for which Shaw Nuclear has no direct responsibility.

- 1.12 When any work carried out under the requirements of the QA program is delegated to others, the work will be audited by the QA audit program.
- 1.13 As a supplement to audits, surveillance activities may be carried out to provide an evaluation of records, methods, procedures, activities, and products to assure conformance to applicable Quality Assurance program requirements.

## 2.0 TASKS

- 2.1 The Director of Nuclear Quality shall periodically assess the implementation of each project's quality assurance program for compliance with the project's regulatory and quality requirements (e.g., Safety Analysis Report, 10CFR50 Appendix B, 10CFR830 Subpart A, 10CFR71 Subpart H, 10CFR70 Subpart D, 10CFR72 Subpart G, etc.). Copies of the assessment and recommendations shall be submitted to the Project Manager; Project Engineer; Project QA Manager (PQAM); and other affected parties.
- 2.2 QA/QC shall:
- 2.2.1 Establish audit schedules and provide copies to the PQAM to forward to the Client, if requested.
- 2.2.2 Conduct audits of engineering and design activities including those that determine site features that affect safety; procurement activities; subcontract activities; construction activities; source inspection activities; and quality control activities.
- 2.2.3 Conduct audits of site activities and testing activities.
- 2.2.4 Establish schedules for audits of Suppliers, provide copies to the PQAM to forward to the Client, if requested, and conduct audits of Suppliers for safety related and important to safety (i.e.; QA Category I or other QA designations as used on the project) items and services to determine whether the Suppliers are complying with their approved quality assurance programs.
- 2.2.5 Conduct audits to verify that Suppliers employed at the construction site comply with the requirements of their own manuals and procedures approved by Shaw Nuclear.
- 2.2.6 Initially perform a qualification survey/audit prior to award and, when QA Program implementation cannot be verified by the qualification survey/audit, perform an initial Post Award Implementation Audit after the supplier has completed sufficient work to demonstrate that its organization is implementing its Shaw Nuclear approved QA Program. If the supplier is implementing its QA Program for other customers at the time of the qualification survey/audit and QA Program implementation can be verified on other customer's work, the pre-award qualification survey/audit can serve as the first triennial audit provided the same audit elements and criteria as those to be used on other triennial audits are satisfied.

- 2.2.7 Perform audits of suppliers on a triennial basis beginning when the initial implementation audit is performed.
- 2.2.8 Maintain records of audits performed.
- 2.2.9 Report on the results of audits conducted regarding implementation and adequacy of the overall quality program.
- 2.2.10 Schedule and conduct surveillances in accordance with approved procedures.
- 2.3 As an alternative to Shaw Nuclear conducting a supplier audit, Shaw Nuclear may participate in an outside source for audits such as the Nuclear Industry Assessment Committee (NIAC). This alternative is described in Section 7 of this manual.
- 2.4 Independent audits of QA/QC activities, including auditing activities, will be assessed as part of the management assessment described in Section 2 of this manual or may be conducted by the Procurement section of the Commercial Services Department or by a qualified contractor retained by/for Senior Management. This independent audit of Quality Assurance/Quality Control shall be performed annually.



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**SECTION 19 - CONTROL OF SWSQAP 1-74A AND RELATED  
PROJECT QUALITY ASSURANCE MANUALS**

**Revision: B**  
**Dated: 6-1-09**

## **1.0 REQUIREMENTS**

### **1.1 Control of the Shaw Standard Nuclear Quality Assurance Program (SWSQAP 1-74A).**

**1.1.1 The initial issue and any subsequent revisions to this Standard Nuclear Quality Assurance Program shall be approved, prior to issue, by the President of Shaw Nuclear Services, Inc.'s signature on the Policy Letter and the following department/organization head's approval of those sections affecting their department/organization. Approval shall be the department/organization head's signatures on the approval sheet which is part of the Table of Contents. Signatories include the heads of Nuclear Quality, Nuclear Services, Nuclear Operations Management, Nuclear Construction, Nuclear Engineering, Nuclear Power Maintenance, the President of Shaw Environmental & Infrastructure, Inc., and the Director of Quality for Shaw Environmental & Infrastructure, Inc.**

**A. For United States commercial nuclear facilities regulated by the NRC, each revision, along with an analysis with respect to (1) compliance to Appendix B to 10CFR50 and (2) the program's effectiveness shall be provided to the NRC for approval prior to implementation based on the following:**

- Changes to the Quality Assurance Program description that do not reduce the commitments of the NRC approved program may be implemented upon issue and prior to receiving NRC approval of the changes in accordance with the requirements of 10CFR50.54. The analysis of the changes provided to the NRC shall document that the changes do not reduce commitments. While implementation is permissible upon issue, compliance will be required and activities will be auditable in accordance with a promulgated effective date.**

**Examples of acceptable changes to the Quality Assurance Program that may be implemented prior to NRC approval are: administrative improvements and clarifications, spelling corrections, punctuation, or editorial items, use of a QA standard which is more recent than the QA standard in the NRC approved version, the use of a quality assurance**

alternative or exception approved by an NRC safety evaluation, the use of generic organizational positions functions that clearly denote the position function, supplemented as necessary by descriptive text, the use of generic organizational charts, organizational revisions that ensure persons and organizations performing quality assurance functions continue to have the requisite authority and organizational freedom, including sufficient independence from cost and schedule when opposed to safety considerations.

- Changes to the quality assurance program description that do reduce the commitments must be submitted to the NRC and receive NRC approval prior to implementation.

- B. For United States DOE nuclear facilities, DOE approval of the projectized version of this Program shall be obtained via the Project QA Manager. Revisions made over the previous year to a DOE approved program shall be submitted as a revision to the program annually to DOE for review, along with an analysis with respect to (1) compliance to 10CFR830 Subpart A, and (2) the reason for the revisions.
- C. For nuclear facilities located in other countries where that country's government or an associated agency of that country's government requires review and approval of the program, the program and subsequent revisions shall be provided for approval as required by the governing regulations of that country.

1.1.2 This program document is controlled by Quality Assurance / Quality Control (QA/QC) and will be issued in a controlled manner.

1.1.3 Program document holders are responsible for maintaining their assigned documents.

1.1.4 The Director of Nuclear Quality shall be responsible for an annual (12-month) review of this program and direct updating, as applicable. The frequency of updating shall be based on the significance of applicable changes and the affect these changes would have on Shaw Nuclear's current nuclear project activities.

## 1.2 Development of the Project Quality Assurance Manual

1.2.1 Projects which choose to adopt this Standard Nuclear Quality Assurance Program (i.e., by direct reference in their SAR for NRC licensed facilities, or direct reference in the project QA plan for other nuclear facilities) without a Project Quality Assurance Program Manual shall be subject to all applicable provisions of this program and subsequent approved changes to the program.

1.2.2 Projects which adopt this Standard Nuclear QA Program but choose to develop a Project QA Manual may do so providing the Project QA Manual is consistent with this Standard Nuclear QA Program revision in force on the date of acceptance for



use by the Client. The Project QA Manual shall be the governing QA Document for the Project and shall be a verbatim copy of the Shaw Standard Nuclear QA Program with the exception of project, Client, and NSSS names; titles; policy letter; introduction; and Section 19 text. Client additions to the Project QA Program Manual shall be entered under, "Client Considerations", within each section and appendix, and shall not be considered as a program revision. The Project QA Manual's Policy Letter shall denote the accepted revision of SWSQAP 1-74A, address the Project QA Manual, and be signed by the Director of Nuclear Quality. The Introduction shall substitute "Project Quality Assurance Program" for the "Shaw Standard Nuclear QA Program."

- 1.2.3 If the Client requirements are applicable in general to the entire Project QA Program Manual, they may be delineated in the Introduction section. Section 19 shall be altered to address the control of the Project QA Manual only. Any degradation of the Shaw Standard Nuclear QA Program in the conversion to the Project QA Program Manual or by subsequent revision of the Project QA Program Manual shall be detailed in writing by the Director of Nuclear Quality and brought to the attention of the Client (i.e., for SAR change and/or approval by the NRC, DOE, or others having jurisdiction at the facility) prior to adoption.
- 1.2.4 The Project Quality Assurance Program Manual shall be prepared by Quality Assurance and shall be approved in accordance with Appendix VI.
- 1.3 Revisions to the Shaw Standard Nuclear QA Program subsequent to initial issue of an approved Project Quality Assurance Manual shall be evaluated by the Project QA Manager to determine if revisions to the Project Quality Assurance Manual are warranted. If revisions are warranted, they shall be brought to the Client's attention for consideration in adopting similar changes in the Project Quality Assurance Program Manual. Such changes may be made on a section by section basis. Adoption of sections previously approved by the NRC, DOE, or others having jurisdiction at the facility as part of the process described in Paragraph 1.1.1 shall not constitute Project Quality Assurance Program Manual degradation.
- 1.4 Projects with a limited scope of work may choose to adopt appropriate portions of SWSQAP 1-74A. In such cases, a Project Quality Plan (PQP) shall be developed referencing SWSQAP 1-74A and shall be approved in accordance with Appendix VI.

## 2.0 **TASKS**

- 2.1 For Controlled Copy Distribution, QA/QC shall:
  - 2.1.1 Assign a number to each hard copy Manual or Manual on electronic media format such as CD ROM or DVD that are issued to manual holders.
  - 2.1.2 Maintain a controlled copy distribution list of recipients of hard copy and electronic media format of SWSQAP 1-74A and Project Quality Assurance Program manual holders and their locations.

2.1.3 Maintain history files for the originals, revisions, and cancellations issued against each section of SWSQAP 1-74A and the Project Quality Assurance Program manuals.

2.1.4 Maintain history files of any approved alternative (i.e., NRC/DOE/others having jurisdiction at the facility) in the conversion from the Standard Program to the Project QA Program Manual or Project Quality Plan.

2.1.5 Distribute documents as either a hard copy manual, manual on electronic media format or by electronic posting on the Company's intranet site, ShawNet.

A. If hard copy or electronic media format, record or file receipt acknowledgments until the next revision distribution.

B. If electronic posting is utilized :

- The website will only contain the latest effective revision.
- The latest version will be a read-only file.
- Receipt acknowledgement is not required.

2.1.6 Issue an updated Table of Contents with each change, revision, or addition.

2.2 Manual holders shall:

2.2.1 Upon receipt of their assigned program document (Hard Copy or electronic CD ROM/DVD media) acknowledge receipt and completeness by signing, dating, and returning the letter of transmittal.

2.2.2 Notify QA/QC of any discrepancies, change of manual holders, and changes of address.

2.2.3 Maintain the hard copy manual by replacing superseded material with the revised material received.

2.2.4 Destroy superseded material immediately.

2.2.5 Return the Manual to QA/QC when it is no longer needed or when return is requested.

**APPENDIX CROSS REFERENCE MATRICES  
REGULATIONS TO SHAW IMPLEMENTING PROGRAMS & PROCEDURES**

<b>SHAW PROCEDURES &amp; MANUALS</b>	<b>10CFR 50 APP. B/NQA-1 SECTIONS (N/A = NOT APPLICABLE)</b>																	
	<b>SECTION I ORGANIZATION</b>	<b>SECTION II - QUALITY ASSURANCE PROGRAM</b>	<b>SECTION III DESIGN CONTROL</b>	<b>SECTION IV - PROCUREMENT DOCUMENT CONTROL</b>	<b>SECTION V - INSTRUCTIONS PROCEDURES &amp; DRAWINGS</b>	<b>SECTION VI DOCUMENT CONTROL</b>	<b>SECTION VII - CONTROL OF PURCHASED MATERIAL, PARTS &amp; COMPONENTS</b>	<b>SECTION VIII - IDENTIFICATION &amp; CONTROL OF MATERIALS, PARTS &amp; COMPONENTS</b>	<b>SECTION IX - CONTROL OF SPECIAL PROCESSES</b>	<b>SECTION X INSPECTION</b>	<b>SECTION XI TEST CONTROL</b>	<b>SECTION XII - CONTROL OF MEASURING &amp; TEST EQUIPMENT</b>	<b>SECTION XIII - HANDLING, STORAGE AND SHIPPING</b>	<b>SECTION XIV- INSPECTION, TEST &amp; OPERATING STATUS</b>	<b>SECTION XV - NONCONFORMING MATERIALS, PARTS OR COMPONENTS</b>	<b>SECTION XVI CORRECTIVE ACTION</b>	<b>SECTION XVII - QUALITY ASSURANCE RECORDS</b>	<b>SECTION XVIII AUDITS AND SURVEILLANCES</b>
<b>SHAW STANDARD NUCLEAR QUALITY ASSURANCE PROGRAM (OR PROJECT QAPM)</b>	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII
<b>QUALITY STANDARDS MANUAL (PROJECT MODEL OR GENERIC)</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>QUALITY ASSURANCE DIRECTIVES MANUAL (PROJECT MODEL OR GENERIC)</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>ENGINEERING ASSURANCE PROCEDURES MANUAL</b>	N/A	2-5	3 & 4	3-5 & 9	3-5 & 9	3-5	3-5	N/A	3, 6, 9	4	4	4	4	N/A	3	N/A	17	N/A
<b>NUCLEAR ENGINEERING PROCEDURES (NEP)</b>	<b>Entire NEPG &amp; NEPP Procedure Set</b>																	
<b>SHAW E&amp;I PROCUREMENT STANDARD OPERATING PROCEDURES</b>	N/A	N/A	N/A	Entire Manual	N/A	N/A	Entire Manual	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>WORLDWIDE PROCUREMENT PROCEDURES (WPPs) (Being rewritten as Nuclear Procurement Procedures -NPPs)</b>	1 & 9	1 & 9	N/A	Entire Manual	1 & 9	Entire Manual	N/A	N/A	N/A	4 & 9	N/A	N/A	N/A	N/A	2 & 9	2 & 9	1 & 9	N/A
<b>NUCLEAR CONSTRUCTION PROCEDURES</b>	<b>Entire Procedure Set</b>																	
<b>CONSTRUCTION WELDING PROGRAM MANUAL</b>	N/A	N/A	N/A	N/A	General Instruct	N/A	N/A	N/A	Entire Manual	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>CALIBRATION MANUAL</b>	N/A	N/A	N/A	1	1	1	1	N/A	N/A	N/A	N/A	Entire Manual	N/A	N/A	N/A	N/A	1	N/A
<b>NUCLEAR STD TEST PROGRAM DIRECTIVES (OR PROJECT TPDs)(NSTPDs)</b>	2	2,3, & 6	N/A	N/A	1	1,3,5	N/A	5	N/A	5	Entire Manual	8	7	5	5	5	3	N/A
<b>ASME (SECTION III, XI and NB-NR activities)</b>	1 & 3	1-4, 19, 21, & 23	5 & 6	7	5 & 6	Entire Manual	7, 8 & 27	8, 9 & 11	10, 12 & 14	13	22	16	8	8, 13, 15, 17 & 22	13 & 15	15	20 & 24	18
<b>NUCLEAR DIVISION / NUCLEAR PROJECT MANUAL (NDG/NPM)</b>	<b>See Note for NDG/NPM on Page 2</b>																	
<b>NUCLEAR PROJECT INFORMATION SERVICES PROCEDURES (NPISP)</b>	N/A	N/A	N/A	N/A	N/A	Proc's affect. Doc Cntrl.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Proc's affect QA Rec.	N/A
<b>Note: If a new procedure set is established for implementation of this program due to organizational or other changes, those new procedures can be used once QA has reviewed them to verify there is no program reduction of commitment.</b>																		

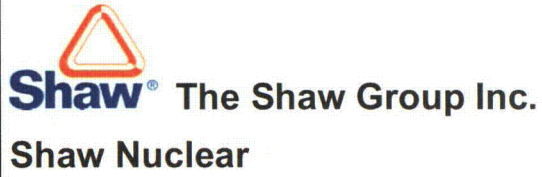
APPENDIX I - CROSS REFERENCE MATRICES  
REGULATIONS TO SHAW IMPLEMENTING PROGRAMS & PROCEDURES

Note for NDG/NPM from Page 1

NDG & NPM's are procedures for the overall conduct of Project Management activities including planning, organizing, staffing, directing, and controlling those activities required to achieve project objectives within approved schedules, budgets, and contract requirements. As such, they do not address quality affecting activities addressed by SWSQAP 1-74A and do not necessarily respond to the 18 criteria of 10CFR50 appendix B.

**APPENDIX I - CROSS REFERENCE MATRICES  
REGULATIONS TO SHAW IMPLEMENTING PROGRAMS & PROCEDURES**

SHAW PROCEDURES & MANUALS	10 CFR 830.120 Sections									
	MANAGEMENT				PERFORMANCE				ASSESSMENT	
	SECTION 1, PROGRAM	SECTION 2, PERSONNEL TRAINING AND QUALIFICATION	SECTION 3, QUALITY IMPROVEMENT	SECTION 4, DOCUMENTS AND RECORDS	SECTION 5, WORK PROCESS	SECTION 6, DESIGN	SECTION 7, PROCUREMENT	SECTION 8, INSPECTION AND ACCEPTANCE TESTING	SECTION 9, MANAGEMENT ASSESSMENT	SECTION 10, INDEPENDENT ASSESSMENT
SHAW STANDARD NUCLEAR QUALITY ASSURANCE PROGRAM (OR PROJECT QAPM) (ALSO CORRESPONDING 10CFR50 APPENDIX B/NQA-1 CRITERIA)	I, II	II	XV, XVI, XVIII	IV, VI, VII, XVII	V, VIII, IX, XII, XIII	III	IV, VII, VIII	X, XI, XII, XIV, XV	XVI, XVIII	II, XVIII
QUALITY STANDARDS MANUAL (PROJECT MODEL OR GENERIC)	1, 2	2	15, 16, 17	4, 5, 7, 17	5, 8, 9, 12, 13	3	4, 7, 8	10, 11, 12, 14, 15	16, 17	2, 18
QUALITY ASSURANCE DIRECTIVES MANUAL (PROJECT MODEL OR GENERIC)	1, 2	2	15, 16, 17	4, 5, 7, 17	5, 8, 9, 12, 13	3	4, 7, 8	10, 11, 12, 14, 15	16, 17	2, 18
ENGINEERING ASSURANCE PROCEDURES MANUAL	2, 3, 4 & 5	2, 3, 4 & 5	3	3, 4, 5, 9 & 17	3-6 & 9	3 & 4	3-5	3 & 4	N/A	2-5
NUCLEAR ENGINEERING PROCEDURES (NEPs)	Entire NEPG & NEPP Procedure Set									
SHAW E&I PROCUREMENT STANDARD OPERATING PROCEDURES	N/A	N/A	N/A	N/A	N/A	N/A	Entire Manual	N/A	N/A	N/A
WORLDWIDE PROCUREMENT PROCEDURES (WPPs) (Being rewritten as Nuclear Procurement Procedures - NPPs)	1 & 9	1 & 9	N/A	1 & 9	1 & 9	N/A	1, 7 & 9	4 & 9	N/A	1 & 9
NUCLEAR CONSTRUCTION PROCEDURES	Entire Procedure Set									
CONSTRUCTION WELDING PROGRAM MANUAL	N/A	WQT Section	N/A	N/A	Entire Manual	N/A	N/A	N/A	N/A	N/A
CALIBRATION MANUAL	N/A	N/A	N/A	1	Entire Manual	N/A	1	Entire Manual	N/A	N/A
NUCLEAR STD TEST PROGRAM DIRECTIVES (OR PROJECT TPDs)(NSTPDs)	2, 3 & 6	2, 3 & 6	5	1, 3 & 5	1	N/A	7	Entire Manual	5	2, 3 & 6
ASME (SECTION III, XI and NB-NR activities)	1-4, 19, 21, & 23	1-4, 19, 21, & 23	13 & 15	Entire Manual	5 & 6	5 & 6	7, 8 & 27	8, 13, 15, 17, 18 & 22	15 & 18	1-4, 18, 19, 21 & 23
NUCLEAR DIVISION / NUCLEAR PROJECT MANUAL / NUCLEAR PROJECT INFORMATION SERVICES PROCEDURES (NDG - NPM - NPISP)	Entire NDG & NPM & NPISP Procedure Sets that Address Quality Functions in accordance with the Shaw Nuclear Quality Program									
Note: If a new procedure is established for implementation of this program due to organizational or other changes, those new procedures can be used once QA has reviewed them to verify there is no program reduction of commitment.										



**Standard Nuclear Quality Assurance Program**

APPENDIX II -

**Revision:** B  
**Dated:** 6/1/09

THIS APPENDIX HAS INTENTIONALLY BEEN LEFT EMPTY.

NOTE:

Refer to Quality Standard No. QS-1.1 for Qualification and  
Experience Requirements for Shaw Quality Assurance and  
Quality Control Personnel



**Shaw® The Shaw Group Inc.**  
**Shaw Nuclear**

**Standard Nuclear Quality Assurance Program**

**APPENDIX III - GLOSSARY**

**Revision:** B  
**Dated:** 6-1-09

## INTRODUCTION

The primary reference or source of each definition included in this glossary is identified next to the term using the following "Base Source Acronym Key Code":

- ANSI - American National Standard Institute N45.2.10; Quality Assurance Terms & Definitions.
- ASME - The American Society of Mechanical Engineers
- ASQ - American Society for Quality
- DOE - United States Department of Energy
- EOQC - European Organization for Quality Control
- EPRI - Electric Power Research Institute
- NRC - United States Nuclear Regulatory Commission.
- ASME NQA-1 - ASME NQA-1, Quality Assurance Requirements for Nuclear Facility Applications
- SHAW - Shaw Nuclear Services, Inc.
- 10CFR50, Appendix B- Appendix B to Part 50, Title 10, Code of Federal Regulations, "Quality Assurance Requirements for Nuclear Power Plants"
- 10CFR830.120- Section 830.120 "Quality Assurance Requirements" to Part 830, Title 10, Code of Federal Regulations, - Department of Energy Nuclear Safety Management.
- 10CFR70.22 Subpart D- "Contents of applications" to Part 70, Title 10, Code of Federal Regulations, "Domestic Licensing of Special Nuclear Material".
- 10CFR71 Subpart H- Subpart H "Quality Assurance" to Part 71, Title 10, Code of Federal Regulations, "Packaging and Transportation of Radioactive Material".
- 10CFR72 Subpart G- Subpart G "Quality Assurance" to Part 72, Title 10, Code of Federal Regulations, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High Level Radioactive Waste".

## GLOSSARY

### Acceptance Criteria (ASME NQA-1)

Specified limits placed on characteristics of an item, process, or service defined in codes, standards, or other requirement documents.

### Accept-as-is (Shaw)

See Use-as-is.

### Accuracy (EOQC)

The degree of conformity of a measurement with a standard or true value.

### Approval (Shaw)

The act of endorsing or adding positive authorization or both to an action or document. Unless otherwise stated, approval requires signature or initials or unique stamp and date. In electronic media, may involve a coded identification number.

### Approved Procedure (Shaw)

A written document signed by authorized personnel, which prescribes actions required to implement a program, specification, method, or technique.

### ASME Section III (Shaw)

American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components, Division 1, Metal Components; Division 2, Concrete Containments; or Division 3, Containments for Transport and Storage of Spent Nuclear Fuel and High Level Radioactive Material and Waste, as applicable.

### Assessment (ASQ)

The evaluation process used to measure the performance or effectiveness of a system and its elements. In this Glossary, assessment is an all-inclusive term used to denote any of the following: audit, performance evaluation, management systems review, peer review, inspection or surveillance.

### Audit (ASME NQA-1)

A planned and documented activity performed to determine by investigation, examination, or evaluation of objective evidence the adequacy of and compliance with established procedures, instructions, drawings, and other applicable documents, and the effectiveness of implementation. An audit should not be confused with surveillance or inspection activities performed for the sole purpose of process control or product acceptance.



Audit Report (Shaw)

A written report which states a purpose or scope; identifies the auditors and personnel contacted; identifies the observations listing details of deficiencies in systems or procedures requiring corrective action; identifies action parties responsible for corrective action; establishes date by which action replies are expected; and may contain recommendations for corrective action or action for improvement.

Authorized Nuclear Inspector (ASME)

An employee of an accredited Authorized Inspection Agency who has qualifications for and has been properly qualified to perform inspections under the ASME Section III Code.

Calibration (Shaw)

Comparison of a measuring or test device with a standard of sufficient accuracy to determine whether the device is within specified limits of accuracy over a required range of values and, if not, repairing and/or adjusting the device to conform to requirements.

Certificate of Compliance (ANSI)

A written statement, signed by a qualified party, attesting that the items or services are in accordance with specified requirements and accompanied by additional information to substantiate the statement. A Shaw Certificate of Product Quality is a Certificate of Compliance.

Certificate of Conformance (ASME NQA-1)

A written document signed or otherwise authenticated by an authorized individual certifying the degree to which items or services comply with specified requirements.

Certification (ASME NQA-1)

The act of determining, verifying, and attesting in writing to the qualifications of personnel, processes, procedures, or items in accordance with specified requirements.

Chain of Custody (ASQ/E4)

An unbroken trail of accountability that ensures the physical security of samples, data, and records.

Characteristic (ASME NQA-1)

Any property or attribute of an item, process, or service that is distinct, describable, and measurable.

Characteristic (ANSI)

Any property or attribute of an item, process, or service that is distinct, describable, and measurable, as conforming or nonconforming to specified requirements. Quality characteristics are generally identified in specifications and drawings that describe the item, process, or service.

Client (Shaw)

The owner, person, group, or corporation for which Shaw is providing professional services under contract as Architect/Engineer, Constructor, Maintenance organization, Repair/Replacement organization, Decommissioning organization, and/or Consultant. For nuclear power plants, the client may be the Licensee and/or the owner, person, group, or corporation who has or will have title to the Nuclear Power Plant Facility.

Code (Shaw)

A set of specific requirements, published under the cognizance of a recognized Technical Society or Trade Association, invoked to the degree stated in applicable Engineering documents. The word is capitalized when describing ASME Section III.

Commercial Grade Item (ASME NQA-1)

An item satisfying (a), (b), and (c):

(a) not subject to design or specification requirements that are unique to nuclear facilities;

(b) used in applications other than nuclear facilities;

(c) is to be ordered from the manufacturer/supplier on the basis of specifications set forth in the manufacturer's published product description (for example, catalog).

Commercial Grade Service (Shaw)

A service that was not provided in accordance with the requirements of NQA-1.

Company (Shaw)

Refers to The Shaw Group Inc., Shaw Nuclear Services, Inc., Stone & Webster Construction, Inc., Shaw Environmental & Infrastructure, Inc., and/or Shaw Constructors, Inc.

Component (ASME)

A vessel, concrete containment, pump, pressure relief valve, line valve, storage tank, piping system, or core support structure that is designed, constructed, and stamped in accordance with the rules of ASME Section III.

Condition Adverse to Quality (ASME NQA-1)

All-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, and nonconformances. A significant condition adverse to quality is one which, if uncorrected, could have a serious effect on safety or operability.

Contract (Shaw)

A form of agreement used to procure site services or labor and may include the procurement of material and/or equipment.

Contractor (Shaw)

The business entity that enters into a Contract and becomes the primary obligor for the supply of labor and materials (or equipment) associated therewith and is deemed to be a principal Contractor.

Controlled Document (Shaw)

A document whose distribution, updating, and use is regulated.

Corrective Action (ASME NQA-1)

Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

Counterfeit or Fraudulent Material, Items or Components (Shaw)

A counterfeit or fraudulent material, item, or component is something that has been copied or substituted without legal right or authority to do so or one whose material, performance, or characteristics are misrepresented by the supplier or manufacturer.

Product that does not conform to established requirements is normally considered counterfeit or fraudulent if the nonconformance results from one or more of the following conditions: defects resulting from inadequate design or production quality control, damage during shipping, handling, storage, improper installation, deterioration during service, degradation during removal, failure resulting from aging for misapplication or other controllable causes.

Data Quality Objective Process (ASQ/E4)

A systematic strategic planning tool based on the scientific method that identifies and defines the type, quality and quantity of data needed to satisfy a specified use. The key elements of the process include:

- Concisely defining the problem
- Identifying the decision to be made
- Identifying key inputs to the decision
- Defining the boundaries of the study
- Developing the decision rule
- Specifying tolerable limits on potential decision errors
- Selecting the most resource efficient data collection design

Data quality objectives are the qualitative and quantitative outputs from the DQO process. The DQO process was developed originally by the U.S. Environmental Protection Agency, but has been adapted for use by other organizations to meet their specific planning requirements.

Defective Item (Shaw)

An item which has one or more characteristics that does not comply with specified requirements; also, termed to be unsatisfactory or nonconforming.

Design (used as a verb) (Shaw)

Technical and management processes, which lead to and include the issuance of documents such as drawings, specifications, and other documents specifying technical requirements of structures, systems, and components.

Design Change (ASME NQA-1)

Any revision or alteration of the technical requirements defined by approved and issued design output documents and approved and issued changes thereto.

Design Input (ASME NQA-1)

Those criteria, parameters, bases, or other design requirements upon which detailed final design is based.

Design Output (ASME NQA-1)

Drawings, specifications, and other documents used to define technical requirements of structures, systems, components, and computer programs.

Design Process (ASME NQA-1)

Technical and management processes that commence with identification of design input and that lead to and include the issuance of design output documents.

Design Final (ASME NQA-1)

Approved design output documents and approved changes thereto.

Design Reliability Assurance Program (D-RAP) (Shaw)

The program implemented as an integral part of the design process on passive plants to provide confidence that reliability is designed into the plant and that the important reliability assumptions made as part of the Probabilistic Risk Assessment (PRA) will remain valid throughout the plant life.

Deviation (ASME NQA-1)

A departure from specified requirements.

Disposition (Shaw)

The decision determining how to resolve a nonconformance.

Document (ASME NQA-1)

Any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results. A document is not considered a Quality Assurance Record until it satisfies the definition of a Quality Assurance Record.

Engineering Service Scope of Work (ESSOW) (Shaw)

An Engineering document used to describe, in detail, an engineering service to be performed by an engineering service supplier.

Engineering Service Supplier (Shaw)

The engineering consultant, contractor, scientist, mathematician, or other individual, group, or company that performs the engineering service under an Engineering Service Scope of Work (ESSOW) or Engineering Service Specification.

Erection (Shaw)

The process of constructing systems and structures in the field using manufactured or fabricated materials, components, assemblies, and subsystems. Synonymous with "Installation" as used by ASME Code.

Environmental Programs (ASQ/E4)

A term pertaining to any work or activities involving the environment, including characterization of environmental processes and conditions; environmental monitoring; environmental research and development; the design, construction, and operation of environmental technologies; and laboratory operations on environmental samples.

Examination (ANSI)

An element of inspection consisting of investigation of materials, components, suppliers, or services to determine conformance to those specified requirements which can be determined by such investigation. Examination is usually nondestructive and includes simple physical manipulation, gauging, and measurements.

Fabrication (Shaw)

The process of utilizing facilities, material elements, and labor to produce items such as components, assemblies, subassemblies, and materials for further fabrication or erection in the field.

Failure (Shaw)

The inability of an item to perform within specified limits.

Graded Approach (ASQ/E4)

The process of basing the level of managerial controls applied to an item or work according to the intended use of the results and the degree of confidence needed in the quality of the results.

High-level Radioactive Waste or HLW (10CFR72)

Refers to (1) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (2) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation.

Hold Point (ASQ)

A point in a function or process at which inspection shall be performed, and beyond which work may not proceed without inspection action.

Important to Safety (Shaw)

Refer to definition for "Safety Related and Important to Safety"

Independent Spent Fuel Storage Installation or ISFSI (10CFR72)

A complex designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage. An ISFSI which is located on the site of another facility may share common utilities and services with such a facility and be physically connected with such other facility and still be considered independent: Provided, that such sharing of utilities and services or physical connections does not: (1) increase the probability or consequences of an accident or malfunction of components, structures, or systems that are important to safety; or (2) reduce the margin of safety as defined in the basis for any technical specification of either facility.

Inspection (ASME NQA-1)

Examination or measurement to verify whether an item or activity conforms to specified requirements.

Inspector (ASME NQA-1)

A person who performs inspection activities to verify conformance to specific requirements.

Item (ASME NQA-1)

An all-inclusive term used in place of any of the following: appurtenance, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, or unit.

Management Plans for Project Quality (Shaw)

A document prepared for a specific project, normally of limited scope, which describes the scope of work, organizational assignments, and applicable procedures. These plans are also described as Quality Plans and, when used on a commercial nuclear facility subject to NRC regulation, will be based upon and reference an NRC approved quality program document such as Shaw's Standard Nuclear QA Program (Topical Report), SWSQAP 1-74A, a Licensee's quality program or a specially prepared quality program document.

Manufacturer (Shaw)

One who constructs a component, part or appurtenance to meet prescribed design requirements.

Material (ASME)

Material that is manufactured and certified to a Code specification or any other material specification permitted by ASME Section III.

Measuring and Test Equipment (M&TE) (ASME NQA-1)

Devices or systems used to calibrate, measure, gage, test, or inspect in order to control or acquire data to verify conformance to specified requirements.

Modification (Shaw)

A planned and documented change in plant design or operation.

Monitor (Shaw)

To watch, keep track of, observe, regulate, or control any activity.

Monitored Retrievable Storage Installation or MRS (10CFR72)

A complex designed, constructed, and operated by DOE for the receipt, transfer, handling, packaging, possession, safeguarding, and storage of spent nuclear fuel aged for at least one year and solidified high-level radioactive waste resulting from civilian nuclear activities, pending shipment to a HLW repository or other disposal.

Nonconformance (ASME NQA-1)

A deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate.

Nonconformance and Disposition Report (N&D) (Shaw)

A report requesting an Engineering disposition of a nonconforming condition.

NSSS (Shaw)

Nuclear Steam Supply System

Objective Evidence (ASME NQA-1)

Any documented statement of fact, other information, or record, either quantitative or qualitative, pertaining to the quality of an item or activity, based on observations, measurements, or tests, which can be verified.

One Hundred Percent (100%) Inspection (Shaw)

In 100 percent inspection, all applicable attributes are applied to the entire lot, batch, or available portion/segment of product or service. It is synonymous with screening or sorting inspection.

Owner (ASME NQA-1)

The person, group, company, agency, or corporation who has or will have the title to the nuclear power plant.

Permanent File (Shaw)

A file established for or by the licensee/owner/client for the receipt and storage of QA records received from Shaw Nuclear offices that are required to be retained for the Client or which the Client wishes to retain.

Plant (ANSI)

The equipment, piping, structures, buildings, and property that comprise an installation or facility.

Preventive Action (Shaw)

Action taken and documented to preclude recurrence of deficiencies or nonconformances.

Procedure (ASME NQA-1)

A document that specifies or describes how an activity is to be performed. (ANSI) It may include methods to be employed, equipment or materials to be used, and sequence of operations.

Procurement Documents (Shaw)

Contractual documents that identify and define the requirements, which items or services must meet in order to be considered acceptable by the Purchaser. Procurement documents include contracts, letters of award, engineering documents such as specifications and ESSOW's, and purchase orders that define and authorize the Supplier to perform services or supply equipment, material, or facilities on behalf of the Purchaser.

Product Quality Certification (Shaw)

A document which certifies that a product(s) has been inspected in accordance with Shaw Nuclear requirements and that supporting documentation has been reviewed and conforms to applicable procurement requirements. This completed document will serve as evidence for acceptance of the product(s) for shipment.

Program (Shaw)

A plan or procedure instituted to provide materials or services in accordance with specified procurement, design, and regulatory requirements.



Project (Shaw)

A planned series of design, engineering, construction, maintenance, repair, replacement or decommissioning activities necessary to provide, utilize, maintain, repair, replace or decommission a facility or portion thereof.

Project Engineering (Shaw)

The engineering group consisting of the Project Engineer, Assistant Project Engineer(s), Lead Engineers, and support engineers responsible for engineering and design activities on the Project. Technical guidance is drawn from the various Engineering discipline organizations represented on the Project.

Project Procedures (Shaw)

Administrative and technical instructions for personnel assigned to a specific project.

Project Quality Assurance Manager (PQAM) (Shaw)

The QA individual assigned to the project, who has the responsibility for coordinating all quality assurance matters with the Client. A PQAM may carry alternate titles such as Quality Assurance Project Representative or Quality Assurance Coordinator.

Purchase Order (Shaw)

A formal, legally binding document that defines the duties, rights, and remedies of a specific purchaser and supplier in the supply of goods and services.

Purchaser (ASME NQA-1)

Responsible for issuance or administration, or both, of procurement documents.

QA Category I (All Facilities) (Shaw) (See also "Safety Related and Important to Safety")

Plant systems or portions of systems, structures and equipment whose failure or malfunction could cause a release of radioactivity that would endanger public safety. This category also includes equipment, which is vital to a safe shutdown of the plant and the removal of decay and sensible heat, or equipment, which is necessary to mitigate consequences to the public of a postulated accident. All NRC governed regulatory activities under 10CFR50, 10CFR71, or 10CFR72 requiring the application of a quality assurance program in compliance with 10CFR50, Appendix B; 10CFR71, Subpart H, or 10CFR72, Subpart G; and all DOE Nuclear Facility activities requiring the application of a quality assurance program in compliance with 10CFR830.120 are included in this Category. This category includes all ASME Section III Code items, regardless of ASME III Code Class, that are required by the system's safety criteria to be fabricated or installed under Section III of the ASME Code.

QA Category II (Power Plants) (Shaw)

Plant systems, portions of systems, structures and equipment essential for the reliable generation of electric power, but which are not essential for a safe shutdown. Failure of this equipment could result in loss of power generation but would not endanger public safety. Equipment and systems which contain radioactive materials but whose failure could not release quantities sufficient to prejudice public safety are included in this category.

NOTE: The term "essential for the reliable generation of electric power" should be interpreted to mean structures, systems and components whose failure would result in the halt of electric power generation in approximately eight hours or less.

NOTE: Category II also includes non-safety related Structures, Systems and Components (SSC's) that are significant contributors to plant safety which are subject to augmented quality controls and quality assurance requirements. These non-safety related SSC's fall into the group known as Regulatory Treatment of Non-Safety Related Systems (RTNSS) and their augmented quality controls and quality assurance requirements must be consistent with Section 17.5.II.V of NUREG-0800.

QA Category II (Facilities other than Power Plants) (Shaw)

- Systems, structures and equipment, the failure of which has significant potential for preventing the attainment of facility mission objectives. It also includes complex systems that must operate reliably in a harsh or hazardous environment, thus warranting an additional level of confidence in their quality. Equipment and systems which contain radioactive materials but whose failure could not release quantities sufficient to prejudice public safety are included in this category. NRC governed regulatory activities (other than those requiring the application of a quality assurance program in compliance with 10CFR50, Appendix B; 10CFR71, Subpart H; or 10CFR72, Subpart G under 10CFR50, 10CFR71, 10CFR72, or 10CFR830.120) that require an augmented commercial quality assurance program (QA Category IIA or RadWaste QA) are included in this category. These activities include but are not limited to Radiation Protection, Final Status Survey and Waste Management Programs.
- Regulatory governed activities associated with the transportation and disposal of radioactive materials (i.e., 49CFR173, 10CFR61) are included in this category. These activities require an augmented commercial quality assurance program (QA Category IIA or RadWaste QA). Decommissioned systems that were previously classified as "Important to Defueled Condition" and have been re-energized to perform design functions similar to those prior to the system being abandoned are included in this category.

QA Category III (Power Plants) (Shaw)

Plant systems, portions of systems, structures and equipment which are not essential for the reliable generation of electric power and which do not contain radioactive material, or whose failure could not result in release of radioactive material.

NOTE: The term “not essential for the reliable generation of electric power” should be interpreted to mean structures, systems and components whose failure would not result in the halt of electric power generation in approximately 8 hours or less.

QA Category III (Facilities other than Power Plants) (Shaw)

General facility support systems, structures and equipment that are not critical to facility mission objectives and that are not covered by QA Categories I or II.

Qualification Audit (Survey) (Shaw)

A review of the capability of a bidder or potential bidder, contractor, or subcontractor which is conducted at their facility to establish the organization's qualifications and evaluate their Quality Program.

Qualification (Personnel) (ASME NQA-1)

The characteristic or abilities gained through education, training, or experience as measured against established requirements, such as standards or tests, which qualify an individual to perform a required function.

Quality (ASQ)

The totality of features and characteristics of a product or service that bear on its ability to satisfy a given need.

Quality Assurance (ASME NQA-1)

All those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service. (Shaw-Quality Assurance includes Quality Control.)

Quality Assurance Directive (QAD) (Shaw)

A procedure applicable only to Quality Assurance personnel that describes actions necessary to implement quality related activities.

Quality Assurance Records (ASME NQA-1)

Those completed documents that furnish evidence of the quality of items and/or activities affecting quality.

Quality Control (10CFR50)

Those quality assurance actions related to the physical characteristics of a material, structure, component or a system which provide a means to control the quality of the material, structure, component, or system to predetermined requirements.

Quality Standard (QS) (Shaw)

A corporate standard procedure that defines the responsibilities and interfacing activities of the various Shaw Nuclear organizations involved in a specific quality related activity.

Quality Verification Inspection (Shaw)

Quality verification inspection is a Quality Control measure by which the work performed, inspected, and accepted by others, such as contractors, is subject to a confirmation inspection. Verification inspections are generally performed on a sampling, surveillance, or hold point basis, as appropriate.

Receiving (ASME NQA-1)

Taking delivery of an item at a designated location.

Regulatory Guide (NRC)

Regulatory Guides are issued to describe and make available to the public, methods acceptable to the NRC Staff of implementing specific parts of the Nuclear Regulatory Commission's Regulations, to delineate techniques used by Staff in evaluating specific problems or postulated accidents, or to provide guidance to Licensees. Regulatory Guides are not substitutes for regulations and compliance with them is not required. Methods and solutions different from those set out in the Guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission. Compliance to Regulatory Guides is mandatory when a commitment to comply is made by Shaw Nuclear in this program or other authoritative document.

Regulatory Treatment of Non-Safety Related Systems (RTNSS) (NRC)

See QA Category II (Power Plants)

Reject (Shaw)

An item, system, structure, material, or service found to be unsatisfactory or nonconforming.

Repair (ASME NQA-1)

The process of restoring a nonconforming characteristic to a condition such that the capability of an item to function reliably and safely is unimpaired, even though that item still does not conform to the original requirement. (A class of nonconformance disposition.)

Rework (ASME NQA-1)

The process by which an item is made to conform to original requirements by completion or correction.

Safety Related and Important to Safety (Shaw)

All QA Category I and those specific QA Category II items that are identified as significant contributors to safety or other equivalent QA designations as used on the project. Also referred to as Nuclear Safety Related.

NOTE: Under 10CFR72, "*Structures, systems, and components important to safety*" means those features of the ISFSI or MRS whose function is: (1) To maintain the conditions required to store spent fuel or high-level radioactive waste safely, (2) To prevent damage to the spent fuel or the high-level radioactive waste container during handling and storage, or (3) To provide reasonable assurance that spent fuel or high-level radioactive waste can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public.

Sampling Inspection (Shaw)

Sampling inspection involves the complete evaluation of all applicable attributes for a randomly selected sample, which is less than 100 percent of the items. The sample size is determined by using an accepted sampling plan or other approved plan based on valid statistical techniques. The term "random" is not synonymous with "sampling," but only relates to the method of choosing the items for the samples.

SHAWDOCS (Shaw)

The Company's electronic filing and retention system, such as Documentum<sup>®</sup>, that is used for the filing, retention, and retrieval of electronic documents and records prior to conversion to physical electronic media such as CDROM or DVDROM for turnover to the client.

Software Tool (ASME NQA-1-2008)

A computer program used in the development, testing, analysis, or maintenance of a program or its documentation. Examples include comparators, cross-reference generators, compilers, CASE (computer Aided Software Engineering) tools, configuration and code management software, decompilers, disassemblers, editors, flowcharters, monitor test case generators, and timing analyzers.

Source Inspection (Shaw)

An inspection activity performed at the manufacturing location on material or components.

Special Process (ASME NQA-1)

A process, the results of which are highly dependent on the control of the process or the skill of the operator, or both, and in which the specified quality cannot be readily determined by inspection or test of the product.

Special Process (Shaw)

Unique manufacturing, construction, inspection, or test processes performed under controlled conditions in accordance with specified requirements utilizing qualified procedures, equipment, and personnel. Special processes may include, but are not limited to, welding, welding repair, exothermic rebar splicing, stud welding, brazing, soldering, coating, nuclear system cleaning, heat treating, leak testing, and NDE.

Specification (Shaw)

An Engineering document specifying technical and quality assurance requirements for materials, items, or services.

Standard (Calibration) (Shaw)

Calibrated measuring or test equipment whose calibration is traceable to the National Bureau of Standards, where such standards exist, physical constants, or recognized industrial standards and used for the calibration of Measuring and Test Equipment.

Standard (Reference Document) (Shaw)

A recognized reference document that establishes a set of rules, goals, or objectives published by a recognized Technical Society or Trade Association such as ANSI, ASTM, ASME, ASQC, and IEEE.

Storage (Shaw)

The act of placing or leaving items in a suitable location for preservation or later use or disposal.

Subcontractor (Shaw)

The sub-tier business entity deriving its authority to perform work under the Contract from the Contractor after approval by the Purchaser. It includes contractors who furnish materials worked to a special design according to the plans and specifications, but does not include Contractors who merely furnish materials not so worked.

Supplier (ASME NQA-1)

Any individual or organization who furnishes items or services in accordance with a procurement document. An all-inclusive term used in place of any of the following: vendor, seller, contractor, subcontractor, fabricator, consultant, and their subtier levels.

Surveillance (ASME NQA-1)

Monitoring or observing processes, activities, or items to assess adequacy and effectiveness and to verify conformance to specified requirements.

Suspect Item (Shaw)

An item in which visual inspection, testing, or other means indicate that it may not conform to established industry accepted specifications or national consensus standards; or one whose documentation, appearance, performance, material, or other characteristics may have been misrepresented by the supplier or manufacturer.

Suspect items must be further investigated to determine whether they are counterfeit or fraudulent. When an item contains sufficient evidence or irregularities such as noncompliance with agreed upon specifications in the manufacturing process, it may be declared suspect.

System (ANSI)

A group of subsystems, united by some interaction or interdependence, performing many duties but functioning as a single unit.

Testing (ASME NQA-1)

An element of verification for the determination of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating conditions.

Traceability (ASME NQA-1)

The ability to trace the history, application, or location of an item and like items or activities by means of recorded identification.

Unsatisfactory Condition or UNSAT (Shaw)

A deficiency in characteristic, documentation, or procedure that renders the quality of an item unacceptable or indeterminate. Examples of UNSATs include physical defects, test failures, incorrect or inadequate documentation, or deviation from prescribed processing, inspection, or test procedures.

Use-as-is (ASME NQA-1)

A disposition permitted for a nonconforming item when it can be established that the item is satisfactory for its intended use.

Validation (ASQ/E4)

Confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use have been fulfilled. In design and development, validation concerns the process of examining a result of a given activity to determine conformance to the stated requirements for that activity.

Verification (ASME NQA-1)

The act of reviewing, inspecting, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, or documents conform to specified requirements.

Verify (Shaw)

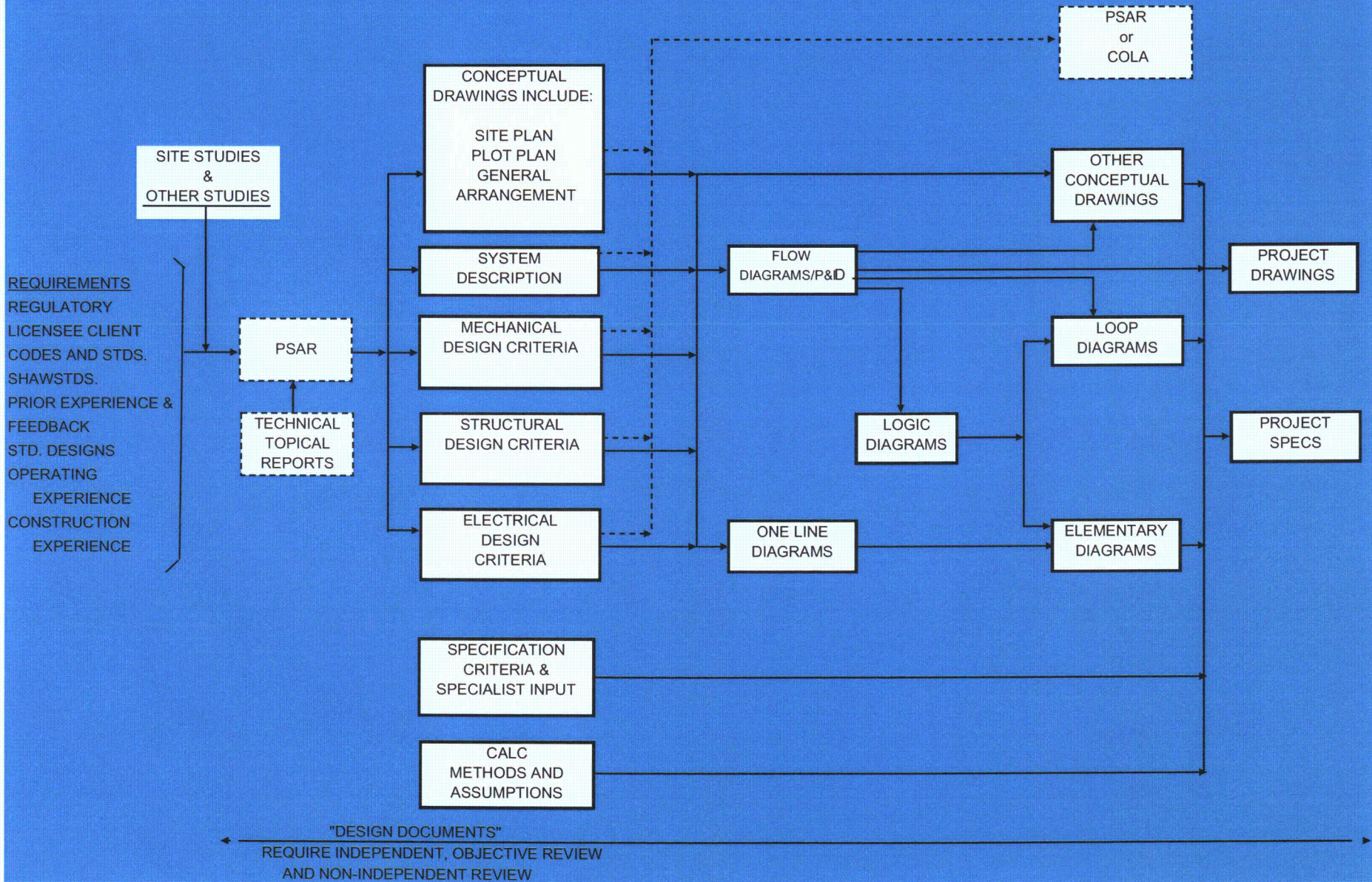
The act of proving that a function or requirement has been met by examining objective evidence. This evidence can be in the form of documentation or confirmed by witnessing or performing a function.

Witness (Shaw)

The act of observing and giving an account of inspections and/or tests performed by others.



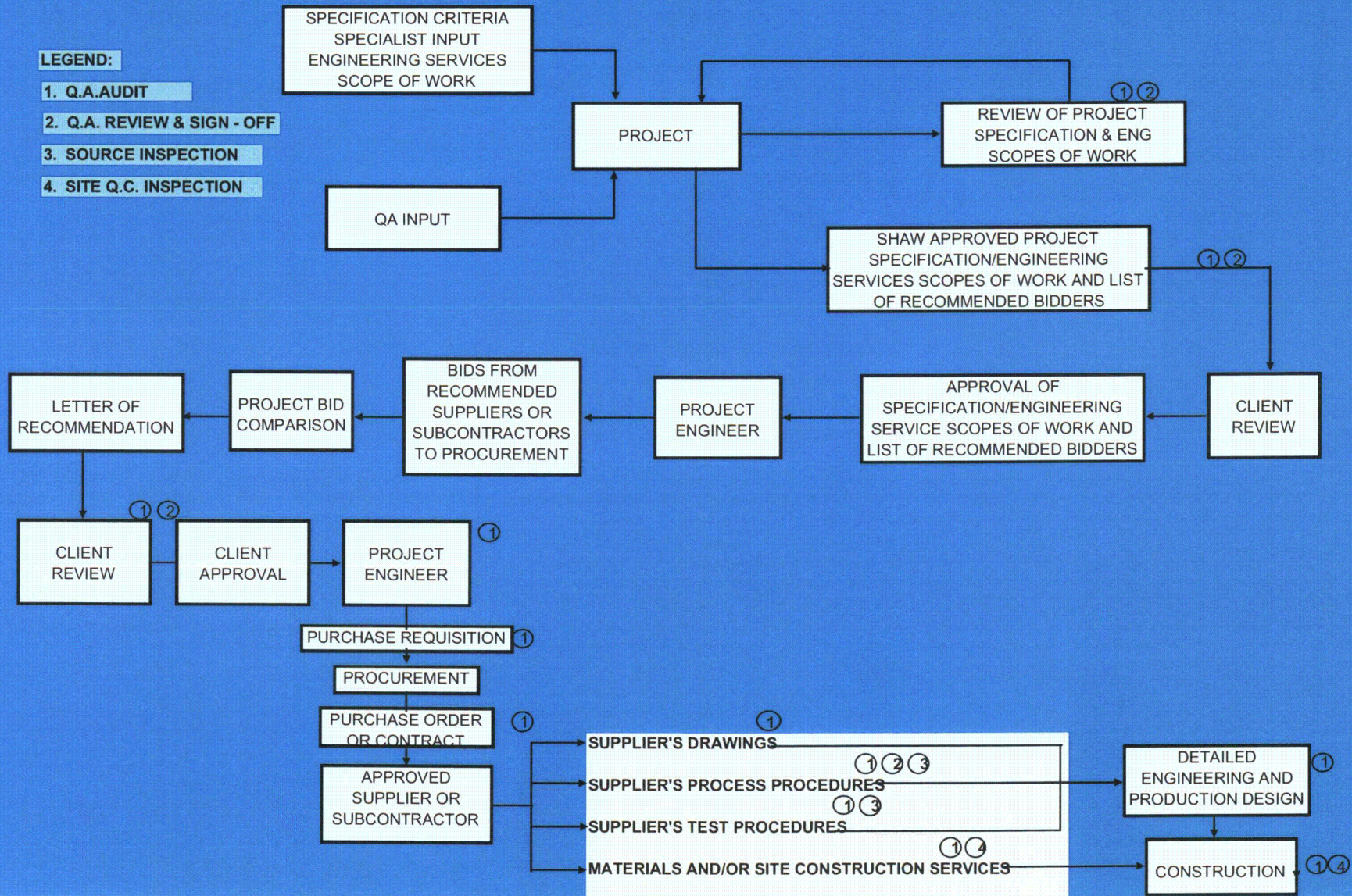
# APPENDIX IV - TYPICAL NUCLEAR ENGINEERING AND DESIGN CONTROL



# APPENDIX V - TYPICAL SPECIFICATION, ESSOW, AND BIDDERS

**LEGEND:**

- 1. Q.A.AUDIT
- 2. Q.A. REVIEW & SIGN - OFF
- 3. SOURCE INSPECTION
- 4. SITE Q.C. INSPECTION





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**APPENDIX VI – APPROVALS AND CONCURRENCES FOR QUALITY ASSURANCE SYSTEM DOCUMENTATION**

**Revision: B**  
**Dated: 6-1-09**

**Program Documents**

<b><u>Program Documents</u></b>	<b><u>Approval</u></b>	<b><u>Concurrence</u></b>
1. <u>Shaw Nuclear's Standard Nuclear Quality Assurance Program (SWSQAP 1-74A)</u>	President, Shaw Nuclear Services, Inc. (Policy Letter)  Directors/Managers of Affected Organizations (Table of Contents)	-----
2. <u>Project QA Program</u>	Directors/Managers of Affected Organizations; Project Manager; Nuclear QA Manager; and Project QA Manager (Table of Contents)	Client QA Representative (if required)
3. <u>Management Plans for Project Quality</u>	Director Nuclear Quality and/or Project QA Manager as appropriate; Project Manager or equivalent; Project Engineer (if assigned); VP/Directors, Nuclear Engineering; Nuclear Construction; and Nuclear Procurement (if their activities are included)	Client QA Representative (if required)
4. <u>Nuclear Standard Test Program Directives</u>	VP/Director Nuclear Engineering; Director Nuclear Quality; and Heads of other affected organizations	
5. <u>Project Test Program Directives</u>	Project Engineer or Senior Engineering Test Representative, as applicable; Project QA Manager; Construction Site Manager, if affected; and Heads of other affected organizations. The above personnel shall be specifically identified in the appropriate Project Test Program Directive	
6. <u>Company Quality Assurance and Control Manual - ASME Section III Policy</u>	President, Shaw Nuclear Services, Inc.	-----

<u>Program Documents</u>	<u>Approval</u>	<u>Concurrence</u>
Table of Contents (Entire Manual)	Director Nuclear Quality; Authorized Inspection Agency (Acceptance)	
Manual Sections, Appendices, and revisions	Director Nuclear Quality; Directors / Heads of affected organizations	
Changes	Director Nuclear Quality	-----

**Procedural Documents**

<u>Procedural Documents</u>	<u>Approval</u>	<u>Concurrence</u>
<b>1. <u>Quality Standards</u></b>		
Generic and Project Model:		
Originals, revisions	Director Nuclear Quality and the Heads of affected organizations	-----
Changes	Director Nuclear Quality	-----
Cancellations	Director Nuclear Quality	-----
Projectized original, revisions, and changes	Director Nuclear Quality and the Heads of other affected organizations; and as appropriate by the Project QA Manager, the Senior Site QC Manager, Construction Site Manager, Project Manager/Engineer, and others as designated in Project procedures.	-----
<b>2. <u>Quality Assurance Directives</u></b>		
Generic and Project Model Original, revisions, and changes	Director Nuclear Quality	
All NDE QADs	Director Nuclear Quality	Level III NDE Engineer
Cancellations	Director Nuclear Quality	
Projectized original, revisions, and changes	Director Nuclear Quality, Project QA Manager.	Level III, NDE Engineer for NDE related QADS

<u>Procedural Documents</u>	<u>Approval</u>	<u>Concurrence</u>
3. <u>Calibration</u>		
Metrology Standards	Director Nuclear Quality	
Calibration Procedures	Level III NDE Engineer	
4. <u>Nuclear Engineering Procedures</u> <u>See (1)</u>		
Originals, revisions, changes, and cancellations	VP/Director Nuclear Engineering	Director Nuclear Quality
5. <u>Project Manual</u> <u>See (2)</u>	Project Manager	Project Quality Assurance Manager
6. <u>Nuclear Project Management Procedures</u> <u>See (3)</u> Nuclear Division Procedures (NDG), Nuclear Project Manual Procedures (NPM) Original and revisions	VP/Director Nuclear Services	Director Nuclear Quality and other Department Heads that are Affected
7. <u>Nuclear Project Information Services Procedure (NPISP)</u> <u>See(1)</u> Original and revisions	Director Nuclear Operations Management	Director Nuclear Quality and other Department Heads that are Affected
8. <u>Nuclear Construction and Start-up Procedures Manual (NCSP)</u> <u>See (4)</u> Original and revisions	VP Nuclear Construction	Director Nuclear Quality and other Department Heads that are Affected
9. <u>Construction Welding Program Manual</u> Original & Revisions	VP Nuclear Construction	-----
10. <u>Worldwide Procurement Procedures Manual (WPP)</u> <u>Note: WPP procedures are being converted to Nuclear Procurement Procedures (NPP)</u> <u>See (1)</u> Original and Revisions (Any WPP's that govern Subcontracting to be approved as specified in item #11 below)	Manager, Commercial Services	Director Nuclear Quality and other Department Heads that are Affected

11. **Subcontracting Procedures (SP) in support of Nuclear** **See (1)** **Original & Revisions** **Manager, Commercial Services** **Director Nuclear Quality and other Department Heads that are Affected**

**Footnotes:**

- (1) Reviewed by the Director Nuclear Quality, and as mutually agreed to by the affected commenting organization as being applicable; by Nuclear Construction, Nuclear Engineering, Nuclear Operations, Nuclear Procurement, and Nuclear Subcontracting with comments resolved prior to issue. Signed by Nuclear Quality signifying QA concurrence/acceptance.
- (2) Reviewed by the Project Quality Assurance Manager (PQAM) with comments resolved prior to issue. Signed by the PQAM signifying QA concurrence/acceptance.
- (3) NPM procedures are reviewed/concurred by the Director Nuclear Quality when mutually agreed that they affect QA related activities under this program. Signed by Nuclear Quality signifying QA concurrence/acceptance.
- (4) Reviewed by the Director Nuclear Quality and as mutually agreed to by the VP/Director Nuclear Engineering with comments resolved prior to issue by Nuclear Construction. Signed by Nuclear Quality and Nuclear Engineering, as applicable, signifying concurrence/acceptance.



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**Standard Nuclear Quality Assurance Program**

**APPENDIX VII- RESPONSE TO REGULATORY GUIDANCE**

**Revision: B**  
**Dated: 6-1-09**

Details of Shaw Nuclear's responses to NRC Regulatory Guides and quality assurance provisions of Regulatory Guide 1.70 are as listed below. These responses are commitments to maintain compliance with listed guides except as noted in positions stated in this Appendix.

Shaw Nuclear's systems and procedures that support the commitments stated in this Appendix fully support compliance with the requirements contained in either ANSI/ASME N45.2 and the listed daughter standards or in the later endorsed ASME NQA-1. Shaw Nuclear commits to the most restrictive requirements of the NQA-1 editions identified below. Specific applicability will depend on a Licensee/Client's commitments.

#### I. Regulatory Guides

- A. Regulatory Guide 1.26, Rev 4, dated March 2007, Rev 3 dated February 1976, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing- Components of Nuclear Power Plants". Commit to comply with the guide.

**NOTE: (Rev 3 & 4)**

For Westinghouse AP1000 plant design, Westinghouse has taken exception to Criteria C.1.d, C.1.q, and C.1.n of the Reg. Guide. Refer to the Westinghouse AP1000 Design Control Document, Appendix 1A, for a detailed discussion of these exceptions.

- B. Regulatory Guide 1.28, Rev. 2, dated February 1979 (ANSI N45.2 - 1977) -"Quality Assurance Program Requirements" - commit to comply with Guide.

Regulatory Guide 1.28, Rev. 3, dated August 1985 (ANSI/ASME NQA-1-1983 and ASME NQA-1a -1983) - commit to comply with Guide.

**NOTE:**

This program is also responsive to the quality assurance criteria of:

- ASME NQA-1-1994 and NQA-1-2008, "Quality Assurance Requirements for Nuclear Facilities Applications." For new NRC Licensed Facilities that are in the design and/or construction phase, Shaw Nuclear commits to the most restrictive requirements of NQA-1, 1994 Edition and the 2008 Edition. NQA-1 Editions in between the 1994 and the 2008 Editions are not acceptable for use on these new NRC Licensed Facilities.

- 10CFR830 Subpart A for DOE Nuclear Facilities. For DOE Nuclear Facilities, Shaw Nuclear commits to NQA-1, 2000 Edition.

NOTE:

Since DOE accepts a version of NQA-1 that is not acceptable to the NRC and since this QA Program is intended to apply to work for both types of facilities, this QA Program is responsive to the more restrictive requirements of the accepted versions of NQA-1 unless separate requirements are identified for each application.

- C. Regulatory Guide 1.29, Rev 4, dated March 2007 – “Seismic Design Classification” – Commit to comply with the guide.

NOTE:

For Westinghouse AP1000 plant design, Westinghouse has taken exception to Criteria C.1.d, C.1.q, and C.1.n of the Reg Guide. Refer to the Westinghouse AP1000 Design Control Document, Appendix 1A, for a detailed discussion of these exceptions.

- D. Regulatory Guide 1.30, dated August 11, 1972 (ANSI N45.2.4 - 1972) - "Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment" - commit to comply with Guide.
- E. Regulatory Guide 1.33, Rev.2, dated February 1978 (ANSI N18.7 - 1976/ANS - 3.2) “Quality Assurance Program Requirements (Operation)” - The requirements of Regulatory Guide 1.33 apply to the Licensee/Client and their onsite operating organization and would apply to Shaw Nuclear activities to the extent that they are passed on for Shaw Nuclear’s scope of services. Shaw Nuclear’s participation is normally limited to maintenance and modification activities including repair and replacement. Commit to comply with Guide to the extent that the requirements are passed on to Shaw Nuclear for their scope of services and with the additional alternatives and positions provided in this Appendix for the ANSI standards referenced in the Guide.
- F. Shaw Nuclear’s QA program requirements commit to comply with the quality assurance provisions of the following guides (RG 1.37, 1.38, and 1.39). Shaw Nuclear’s response to the technical (engineering, design, and construction) provisions to the following guides (RG 1.37, 1.38, and 1.39) is given in this Appendix and / or the Licensee's SAR.

- Regulatory Guide 1.37, Rev 1, dated March 2007 (ANSI N45.2.1 -1973) - "Quality Assurance requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants."
- Regulatory Guide 1.38, Rev. 2, dated May 1977 (ANSI N45.2.2 - 1972) - "Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants."

Shaw Nuclear’s QA Program requirements commit to comply with this Regulatory Guide subject to the following alternatives:

ANSI N45.2.2, paragraph 7.3 and, specifically, subparagraph 7.3.3, shall be



interpreted to apply to and shall be complied with for only the use and maintenance of hoisting equipment and not the qualification of personnel engaged in operating material handling equipment as implied by reference to ANSI B30.2, B30.5, and B30.6.

Qualification of personnel engaged in operating material handling equipment shall be by successfully passing a practical operating examination demonstrating satisfactory ability in operating equipment similar to the type to be operated during production activities, as specified in ANSI N45.2.2, Paragraph 7.5.

Shaw Nuclear commits to NQA-1-1994, Subpart 2.15 for Hoisting, Rigging, and Transporting of Items for Nuclear Power Plants.

- Regulatory Guide 1.39, Rev. 2, dated September 1977 (ANSI N45.2.3 - 1973) - "Housekeeping Requirements for Water-Cooled Nuclear Power Plants."

- G. Regulatory Guide 1.58, Rev. 1, dated September 1980 (ANSI N45.2.6 - 1978) - "Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel." (Note: withdrawn – see 56 FR 36175, July 31, 1991) (See Regulatory Guide 1.28 Rev 3 and NQA-1 for current requirements relative to the Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel)

Shaw Nuclear's QA program requirements commit to comply with this Regulatory Guide subject to the following alternatives:

1. ANSI N45.2.6 - 1978, Paragraph 2.2, "Determination of Initial Capability"

Shaw Nuclear's Position: Initial capability will be determined by an evaluation of the candidate's education and experience or by testing. If the candidate fails to meet the criteria established in Paragraph 3.5, subject to our alternatives stated below in Item 3, Shaw Nuclear will evaluate the candidate by testing. Testing to demonstrate proficiency will be accomplished by a practical demonstration, oral or written examination, or by any suitable combination of the three. In all cases, the results will be documented and retained in the candidate's qualification file. Evaluation by testing may be optionally exercised at anytime in lieu of verified education and experience.

2. ANSI N45.2.6 - 1978, Paragraph 2.4, "Written Certificate of Qualification"

Shaw Nuclear's Position: For purposes of certification, Shaw Nuclear will use the following disciplines on certificates of qualification to identify activities certified to perform:

- Mechanical (includes equipment, piping, and mechanical instrumentation, and controls)

- Electrical (includes equipment, wiring, and electrical instrumentation, and controls)
- Civil (includes concrete, structural, and soils)
- Special Processes (except NDE - see below) - (includes welding, painting, and chemical, and thermite welding)
- Quality (includes first line supervisory personnel who review or administer inspections, examinations, or tests over one or several disciplines, as well as multi-disciplines such as receiving inspection, shop inspection, documentation, calibration, and contract monitoring.)
- NDE Disciplines (as delineated in SNT-TC-1A-1992)

Certification will be accomplished either by (1) education, experience and training, or (2) testing. The method used will be shown on the certificates. Results of testing and records of education, experience, and training will be maintained in the candidate's qualification file.

3. ANSI N45.2.6 - 1978, Paragraph 3.5, "Education and Experience - Recommendation"

NOTE: Alternatives to ANSI N45.2.6 - 1978, are identified in "***Bold Italics***".

3.1 - Level 1

- (1) Two years of related experience in equivalent inspection, examination, or testing activities or, ***within a discipline, specific task certification is allowed after six (6) months experience and successful completion of proficiency test for the task*** or
- (2) High School Graduation/***General Education Development equivalent*** plus six (6) months of related experience in equivalent inspection, examination, or testing activities or, ***within a discipline, specific task certification is allowed after 1 months experience and successful completion of proficiency test for the task*** or
- (3) Completion of college level work leading to an Associate Degree in a related discipline plus three months of related experience in equivalent inspection, examination, or testing activities, ***or, within a discipline, specific task certification is allowed after (1) month experience and successful completion of proficiency test for the task*** or
- (4) ***Four year college graduation plus one (1) month of related experience in the corresponding inspection, examination, or testing activities or***

- (5) ***Graduate degree plus one (1) month of related experience in equivalent inspection, examination, or testing activities.***

3.2- Level II

- (1) One year of satisfactory performance as level I ***or 5 years related experience*** in the corresponding inspection, examination or test category or class, or, ***within a discipline, specific task certification is allowed after three (3) years experience and successful completion of proficiency test for the task*** or
- (2) High School Graduation/***General Education Development equivalent*** plus three (3) years of related experience in equivalent inspection, examination, or testing activities or, ***within a discipline, specific task certification is allowed after 2 years experience and successful completion of proficiency test for the task*** or
- (3) Completion of college level work leading to an Associate Degree in a related discipline plus one (1) year of related experience in equivalent inspection, examination, or testing activities, ***or, within a discipline, specific task certification is allowed after (1) month experience and successful completion of proficiency test for the task,*** or
- (4) Four year college graduation plus six (6) months of related experience in equivalent inspection, examination, or testing activities, ***or, within a discipline, specific task certification is allowed after (1) month experience and successful completion of proficiency test for the task,*** or
- (5) ***Graduate degree plus six (6) months of related experience in equivalent inspection, examination, or testing activities, or, within a discipline, specific task certification is allowed after (1) month experience and successful completion of proficiency test for the task.***

3.3 - Level III

- (1) Six years of satisfactory performance as a Level II ***or 15 years of related experience.*** Both must have related experience in corresponding inspection, examination, or test category or class, or
- (2) High School Graduation/***General Education Development equivalent*** plus ten years of related experience in equivalent inspection, examination, or testing activities; or High School Graduation/***General Education Development equivalent*** plus eight years experience in equivalent inspection, examination, or testing activities, with at least two years as Level II, and with at least two years associated with nuclear facilities - or - if not, at least sufficient training to be acquainted with the relevant quality

assurance aspects of a nuclear facility, or

- (3) Completion of college level work leading to an Associate Degree and seven (7) years of related experience in equivalent inspection, examination, or testing activities, with at least two (2) years of this experience associated with nuclear facilities, - or - if not, at least sufficient training to be acquainted with the relevant quality assurance aspects of a nuclear facility, or
- (4) Four year college graduation plus five (5) years of related experience in equivalent inspection, examination, or testing activities, with at least two (2) years of this experience associated with nuclear facilities, - or - if not, at least sufficient training to be acquainted with the relevant quality assurance aspects of a nuclear facility, *or*
- (5) *Graduate degree plus 3 years of related experience in equivalent inspection, examination, or testing activities with at least two (2) years of this experience associated with nuclear facilities, - or - if not, at least sufficient training to be acquainted with the relevant quality assurance aspects of a nuclear facility.*

- H. Regulatory Guide 1.64, Revision 2, dated June 1976 (ANSI N45.2.11 - 1974) - "Quality Assurance Requirements for the Design of Nuclear Power Plants." (Note: withdrawn – see 56 FR 36175, July 31, 1991) (See Regulatory Guide 1.28 Rev 3 and NQA-1 for current requirements relative to the Quality Assurance Requirements for the Design of Nuclear Power Plants)

Shaw Nuclear's QA program requirements commits to this Regulatory Guide subject to the following alternative:

"If in an exceptional circumstance the engineer's immediate supervisor is the only technically qualified individual available, this review will be conducted by the supervisor, provided that:

1. The other provisions of the Regulatory Guide are satisfied and,
2. The justification is individually documented and approved in advance by the supervisor's management and,
3. Quality assurance audits cover frequency and effectiveness of use of supervisors as designed verifiers to guard against abuse."

- I. Regulatory Guide 1.70, Rev. 3, dated November 1978 "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" - commit to comply with Section 17 of Guide.

- J. Regulatory Guide 1.71, Rev. 1, dated March 2007 "Welder Qualification for Areas of

Limited Accessibility” - Commit to comply with this Guide.

- K. Regulatory Guide 1.74, dated February 1974 (ANSI N45.2.10 - 1973) - "Quality Assurance Terms and definitions." (Note: withdrawn – see 54 FR 38919, September 21, 1989) (See Regulatory Guide 1.28 Rev 3 and NQA-1 for current requirements relative to Quality Assurance Terms and definitions)

Appendix III "Glossary" has been submitted as an acceptable alternative.

- L. Regulatory Guide 1.88, Rev. 2, dated October 1976 (ANSI N45.2.9 - 1974) - "Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records" - commit to comply with Guide. (Note: withdrawn – see 56 FR 36175, July 31, 1991) (See Regulatory Guide 1.28 Rev 3 and NQA-1 for current requirements relative to Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records)
- M. Regulatory Guide 1.94, Rev. 1, dated April 1976 (ANSI N45.2.5 - 1974) -"Quality Assurance Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants."

Shaw Nuclear's QA program requirements commits to this Regulatory Guide subject to the following alternatives which address:

1. High strength bolting of structural steel.
2. Evaluation of Mechanical (Cadmeld) Splice Test Results.

Section 5.4 High Strength Bolting

No mention is made of direct tension indicators for controlling bolt tightening and inspection for adequate tension. However, the referenced document "Specification for Structural Joints Using ASTM A325 or A490 Bolts" of the AISC as approved by the Research Council on Riveted and Bolted Structural Joints, (RCRBSJ) dated May 8, 1974, includes these devices as a control measure for indicating bolt tension. Shaw Nuclear is presently using these devices and plans to continue their use.

Shaw Nuclear will provide quality control measures on direct tension indicators, in accordance with applicable AISC documents, as follows:

- Use only Shaw Nuclear qualified manufacturers.
- Evaluate and concur with the manufacturer's test procedure to assure the procedure provides an adequate measure of direct tension indicator performance.
- Require the manufacturer to test at least three direct tension indicators from each keg, prior to shipment, to verify the load indicating qualities of the devices. Each verification test shall show not less than the specified tension when the average gap on the indicator is equal to that specified by the manufacturer.

- Require test reports, documenting test results and material traceability, to accompany each shipment of indicators and conduct periodic confirmatory inspections and tests to ensure continuous manufacturer's compliance.
- Install direct tension indicators in accordance with the manufacturer's instructions.
- Visually inspect bolted joints made with direct tension indicators to ensure that all bolts have the devices properly installed and to the proper average gap. At least 20 percent of the bolts in each connection, but not less than two bolts, shall be checked with a feeler gauge to verify the bolts are properly tightened.
- Direct tension indicators used with bolts that have been tightened to the full extent specified in Table 3 of AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts," shall not be reused.

Section 5.4, second paragraph, Item 1 of the standard requires that "Bolts are the correct length as indicated by at least two threads extending beyond the nut." This provision exceeds the requirements contained in present and past issues of the RCRBSJ Specification, which requires "full thread engagement." This term is then defined: "Full thread engagement is deemed to have been met when the end of the bolt is flush with the face of the nut." Shaw Nuclear proposes the alternative to the requirement for "at least two threads extending beyond the nut" by use of the industry practice of bolts flush with the face of the nut.

#### Section 6.2.2 Evaluation of Mechanical (Cadweld) Splice Test Results

Cadweld splices are conducted over long periods of time by single crews when considered on the basis of bar size, position, and crew make up. Since problems discovered are potentially generic, we will examine output on the following basis.

For tests failing the second criteria of 2 in 6, Shaw Nuclear will consider that the failure rate pertains to the total output of all splicers and evaluate the previous 100 splices accordingly. Our specifications will be reworded to reflect this clarification.

- N. Regulatory Guide 1.116, Rev. O-R, dated May 1977 (ANSI N45.2.8 - 1975) -"Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems" - commit to comply with Guide.
- O. Regulatory Guide 1.123, Rev. 1, dated July 1977 (ANSI N45.2.13 - 1976) -"Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants" - commit to comply with Guide, subject to the following alternative:

Certain standard catalog and commercial items may be procured without Seller prequalification as described in Section 7, Paragraphs 1.4.1, 1.4.2, and 3.1.2 of this program.

(Note: withdrawn – see 56 FR 36175, July 31, 1991) (See Regulatory Guide 1.28 Rev 3 and NQA-1 for current requirements relative to Quality Assurance Requirements for

P. Control of Procurement of Items and Services for Nuclear Power Plants)  
Regulatory Guide 1.136, Rev 3, dated March 2007 – “Design Limits, Loading Combinations, Materials, Construction, and Testing of Concrete Containments” - commit to comply with this Guide and section 3.8.1 of NUREG 0800 “Concrete Containment” ASME III Division 2.

Q. Regulatory Guide 1.142, Rev 2, dated November 2001 (ACI 349 dated November 7, 2006) – “Safety-Related Concrete Structures for Nuclear Power Plants (Other than Reactor Vessels and Containments)” - commit to comply with this Guide.

R. Regulatory Guide 1.144, Rev. 1, dated September 1980 (ANSI N45.2.12 - 1977) - "Auditing of Quality Assurance Programs for Nuclear Power Plants" - commit to comply with Guide, subject to the following alternative:

The pre-audit and post-audit conferences required by Sections 4.3.1 and 4.3.3 of ANSI N45.2.12 - 1977 may be fulfilled by a variety of documented communications such as telephone conversations.

(Note: withdrawn – see 56 FR 36175, July 31, 1991) (See Regulatory Guide 1.28 Rev 3 and NQA-1 for current requirements relative to Auditing of Quality Assurance Programs for Nuclear Power Plants)

S. Regulatory Guide 1.146, dated August 1980 (ANSI/ASME N45.2.23 - 1978) - "Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants" - commit to comply with Guide, subject to the following alternative:

As an alternative to the provisions of section 2.3.4, which requires prospective lead auditors to participate in a minimum of five (5) quality assurance audits within a period of time not to exceed three (3) years prior to the date of qualification, one of which shall be a nuclear quality assurance audit within the last year prior to qualification, the following may be performed:

“Prospective lead auditors shall demonstrate their ability to effectively implement the audit process and effectively lead an audit team. Upon successful demonstration of the ability to effectively lead audits, Shaw Nuclear Quality Management may certify the individual as a lead auditor.”

(Note: withdrawn – see 56 FR 36175, July 31, 1991) (See Regulatory Guide 1.28 Rev 3 and NQA-1 for current requirements relative to Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants)

## II. Additional Guidance

Shaw Nuclear commits to comply with the quality assurance provisions of Branch Technical Position ASB 9.5-1, "Fire Protection Guidelines for Nuclear Power Plants". Appropriate quality measures contained in this program document shall be applied. Shaw Nuclear's response to the technical (engineering, design, and construction) provisions is provided in this Appendix or the comparable section of a Licensee/Client's SAR.

The following table establishes the Shaw Nuclear QA Category References:

Shaw Nuclear QA Category References							
Classification References	Quality Program Requirements			Additional Industry References *			
	NRC QA Program Basis	Part 21	50.55(e) New Const only	Equivalent ANS Equipment Safety Class	RG 1.26 Quality Group	RG 1.29 Seismic Class	ASME Sect. III Class ****
Category I	App. B/NQA-1	Yes	Yes	SC-1	Group A	I	1 & CS
Category I	App. B/NQA-1	Yes	Yes	SC-2	Group B	I	2 & MC & CC
Category I	App. B/NQA-1	Yes	Yes	SC-3	Group C	I	3 & TC & SC
Category II ***	Industry Standard ***	No	No	NNS	Group D	Some could be I or II **	NA
Category III *****	Industry Standard	No	No	NNS	NA	Some could be II**	NA





- Notes:**
- \* These columns are included for basic understanding and reference only.
  - \*\* Non-seismic items located in the proximity of safety-related items, the failure of which during a safe shutdown earthquake could result in loss of function of safety-related items are designated as seismic Category II.
  - \*\*\* This category could be either of the following:
    - a) Subject to the controls associated with RTNSS (Regulatory Treatment of Non-Safety Related Systems) that mandate a Quality Program as described in the Design Control Document, Tier 2, Chapter 17 and Section 17.5.II.V of NUREG-0800, however not required to meet 10CFR50 Appendix B. On some projects this Category is sometimes referred to as Category II-SS (Safety Significant) or Category II Augmented Quality.
    - b) Subject to quality controls of an industrial standard QA program.
  - \*\*\*\* For ASME III items a QA Program in compliance with Section III, Sub-section NCA 3800/4000 and N type-stamping, as applicable, is required.
  - \*\*\*\*\* QA Category III would be applicable if the SSCs failure would not result in the halt of electric generation in approximately 8 hours or less.