ENERGYSOLUTIONS

Manual of Quality Assurance

for

Energy*Solutions* Spent Fuel Division

Approved by Quality Assurance Manager: Digitally signed by Douglas A. Brown
Reason: I am approving this document
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Revision 12

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Record of Revisions

Issue Date	Revision Number	Change(s)		Description
		Page(s)	Paragraph	
5/05	11	---	---	See previous revision for revision history
3/06	12	All	---	Changed “BNG Fuel Solutions Corporation” and “BFS” to “EnergySolutions Spent Fuel Division, Inc.”, “the Company”, or “Company” throughout
		v	1	Deleted “These include Sierra Nuclear Corporation (SNC) and Pacific Sierra Nuclear Associates (PSNA), which is a partnership between BFS and SNC. Both BFS and SNC are wholly owned subsidiaries of BNG America.”
		v	2	Editorially deleted comma
		2	3	Changed “BNG America Corporate Quality Assurance” to “The Quality Assurance Department of Energy*Solutions* LLC”
		2	4	Changed “BNG America” to “Energy*Solutions* LLC”. Changed “BNG America Corporate QA Department” to “Corporate QA Department”
		3	3	Relocated text from Section 3 and clarified requirements for small projects
		4	Figure 1	Deleted “BNG America”
		6	5	Hyphenated “project specific”
		25	1	
		26	1	
		31	5	

Record of Revisions

Issue Date	Revision Number	Change(s)		Description
		Page(s)	Paragraph	
		7-9	table	Updated QA Procedures listed
		12	2	Moved the Project Plan requirements to Section 1
		14	10	Added statement that procurement process allows for the use of a graded quality approach per NRC Regulatory Guide 7.10
		16	1	Hyphenated “quality related”
		23	1	
		29	1, 2	
		18	2	Added language describing differences in qualifying suppliers of Category B and C items per NRC Regulatory Guide 7.10
		20	1	Editorially revised “Quality Assurance Manager” to “the Quality Assurance Manual”
		29	1	Hyphenated “design related”

Preface

This manual has been developed for and applies to Energy*Solutions* Spent Fuel Division, Inc. (the Company) and any wholly or partially owned subsidiary, affiliate or partnership engaged in the supply, design or licensing of spent fuel storage and/or transportation systems.

The Quality Assurance Manual (QAM) sections contained herein describe the Company's basic policy for the control of quality for products and services being provided by the Company and meets the requirements of Title 10 Code of Federal Regulations, Part(s) 71 Subpart H, 72 Subpart G, and 50 Appendix B, and other comparable industry standards such as ANSI/ASME NQA-1.

The QAM is supported by quality procedures, which provide detailed requirements for implementing this corporate quality assurance policy. Procedural coverage is included for design and product quality assurance. Operating and maintenance requirements are included in the licensed product's Safety Analysis Report. The application of this program uses the "graded" approach, as defined in Regulatory Guide 7.10, depending on the complexity, criticality, and safety requirements of each project or component.

The initial release of the QAM and all subsequent revisions will be transmitted with a memo approved by the Quality Assurance Manager or equivalent position. Additional procedures will be prepared under appropriate sections or in subsequently identified sections for special coverage as required for contracts, if not adequately covered in the basic manual.

Statement of Management Policy

The Quality Assurance Program described herein is applicable to all spent fuel storage and/or transportation products and services provided by Energy*Solutions* Spent Fuel Division, Inc. (the Company) and any applicable wholly or partially owned subsidiary, affiliate or partnership to customers requiring a Quality Program meeting the requirements of Title 10 Code of Federal Regulations Part(s) 50 Appendix B, 71 Subpart H, and 72 Subpart G, or other comparable industry standards such as ANSI/ASME NQA-1.

The executive management of the Company is devoted to the support of this program and charges all personnel involved in activities affecting quality with the responsibility of upholding and abiding by the Quality Assurance requirements in this manual. The Quality Assurance organization is authorized sufficient freedom to identify quality problems; initiate, recommend or provide solutions; verify implementation of solutions; and control further processing of service(s) or delivery of a nonconforming item, deficiency or unsatisfactory condition until proper disposition has been completed.

While it is the responsibility of everyone at the Company to assure that quality and reliability objectives are achieved, the overall responsibility for the development, maintenance and assurance of the implementation of the Quality Assurance Program has been assigned to the Quality Assurance Manager, who reports directly to the President of the Company.

The Quality Assurance Manager has the complete support of Corporate Management in the performance of required duties and, by organizational arrangement, has no responsibility for production costs or schedules. The authority, as defined herein, extends to all activities performed by or for the Company that may affect product quality. Decisions made by the Quality Assurance Manager within the scope of duties, responsibilities and authority as defined in this program may be changed or modified only by direction of the President.

All personnel assigned to operations subject to the requirements of this program shall be required to familiarize themselves with the policies and objectives set forth in this program. They shall be responsible for executing those policies, explicitly or implied, pertinent to their assignments.

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President
Energy*Solutions* Spent Fuel Division, Inc.

Organizational Structure

Energy*Solutions* Spent Fuel Division, Inc. (the Company) is organized as shown in Figure 1.

The President is responsible for management of the Company, setting overall company policy and identification of long-term company goals and resources. The President retains ultimate authority and responsibility for the Quality Assurance Program and its compliance with the applicable requirements.

The assurance of quality at the Company is an interdisciplinary function that involves, as applicable, all organizations. Furthermore, quality assurance encompasses many diversified functions and activities and extends to various job levels within these organizations, including all executives and all employees whose activities affect quality. The implementation of quality assurance throughout the various functions of design, procurement, construction, operation and services at the Company must, therefore, be considered the direct responsibility of the organization performing the work and cannot be considered the sole domain of any single quality assurance group.

Persons or organizations charged with the development, enforcement or measurement and the adequacy and effectiveness of the quality assurance program shall have the authority and organizational freedom necessary to effectively discharge those responsibilities. Such persons or organizations shall be independent of direct pressures of cost, schedule or production, and their authority and organizational freedom shall be sufficient to: (1) identify quality problems; (2) initiate, recommend or provide solutions; (3) verify implementation of solutions; and (4) withhold and segregate nonconforming material or other action, including stopping work, to maintain program integrity. Furthermore, they shall have direct access to responsible management at a level where appropriate action can be mandated.

Persons performing quality assurance functions such as checking, verifying or reviewing the work of others (functions that do not encompass the development, enforcement or measurement of the adequacy or effectiveness of the Company's Quality Assurance Program) shall have authority and organizational freedom to a degree sufficient to properly discharge their assigned quality assurance responsibilities. However, when authority and organizational freedom are restricted for any person performing quality assurance functions, an established line of communication to responsible management must exist sufficient to prevent suppression of those quality assurance functions and/or to resolve any disputes.

Managers have the organizational freedom to identify issues related to their organization directly to the President.

Final responsibility for the effectiveness and adequacy of the Company's Quality Assurance Program resides with the Company. However, the Company may delegate the establishment and execution of the program, or any part thereof, to other organizations. Those organizations may, in turn, delegate responsibility for applicable portions of the Program to other organizations.

The President of the Company has overall responsibility for assuring the development and maintenance of an effective quality assurance program for the Company. Responsibility for the establishment, training, administration, and enforcement of the Company's Quality Assurance Program has been delegated by the President to the Quality Assurance Manager. The Quality Assurance Department functions as a staff position reporting to the President of the Company and is independent of all other organizations within the Company. The Quality Assurance Department assumes line responsibility for assuring compliance with the Company's Quality Assurance Policy. The Quality Assurance Manager will review the status, adequacy and implementation of the QA program at least annually and report this status to the President. The Quality Assurance Department of Energy*Solutions* LLC provides general guidelines and oversight and corporate support to the Company Quality Assurance Manager.

The Quality Assurance Manager may delegate any of the functions assigned to him by this Manual to another individual, but he shall retain the responsibility for accomplishment of the function in accordance with the provisions of this Manual. The Quality Assurance Manager may obtain support/resources from Energy*Solutions* LLC and receives QA functional input from the Corporate QA Department.

Any dispute over Quality Assurance with the management of other functions that cannot be resolved with the respective manager shall be referred to the President for resolution.

The Company shall verify the accomplishment of Quality through scheduled and/or unscheduled audits of in-house functions and, as applicable, at sub-vendors and/or at suppliers.

The Manager of Operations is responsible for the design, engineering, product development, corrective action, licensing, and regulatory management of Company activities and systems important to safety. The specific functions, authorities, and duties of persons and organizations performing activities affecting the functions of structures, systems, and components that are important to safety are delineated in the implementing procedures.

Project Organization

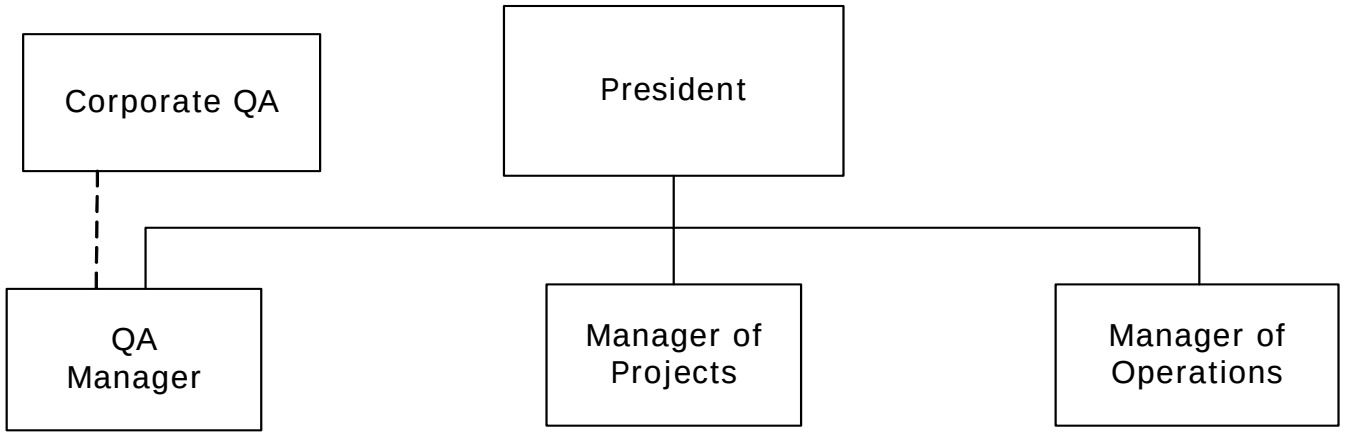
The Manager of Projects has the overall programmatic responsibility for the strategic planning, direction, compliance with technical requirements, procurement,

fabrication and construction activities for all projects, and may serve as the Project Manager for one or more projects.

The Manager of Projects is responsible for the quality and commercial aspects of projects. This includes review of purchase orders received by the Company to supply items or services to assure that quality and technical requirements are included in new projects. The Manager of Projects may assign a project staff, supported by a Project Engineer and by managers that are matrixed from their respective organizations. The Manager of Projects is responsible for interface control. In a small, single discipline project, the Project Manager and the Project Engineer may be the same person reporting to the Manager of Projects.

Before any quality-affecting work, including design input, conclusion, or review remarks, can be performed on a project, the Manager of Projects shall prepare an appropriate project planning document. For large or complex projects, this planning shall be documented in a Project Plan that lists all of the intended activities required to accomplish/support specific project needs, including all design bases and/or regulatory requirement documents applicable to the project, design interfaces, and quality requirements. For smaller or less complex projects, the planning may be provided in a project initiation form that lists the appropriate quality and technical requirements.

Figure 1
Company Organization Chart



Section 2 - Quality Assurance Program

This Quality Assurance Program shall apply to all activities that are important-to-safety (or nuclear safety-related) and require compliance with any or all of the documents listed below.

- 10 CFR 71, Subpart H
- 10 CFR 50, Appendix B
- 10 CFR 72, Subpart G
- ANSI N45.2
- ANSI/ASME NQA-1

Conditions that may be reportable either as deficiencies affecting the ability of important-to-safety structures, systems and components to perform their intended safety function per 10CFR72.242 or as "substantial safety hazards" under 10CFR21, shall be reported in accordance with applicable Quality Assurance Procedures.

Manual Review and Approval

The Company Quality Assurance Program is fully described in and implemented in accordance with this document, the Energy*Solutions* Spent Fuel Division Quality Assurance Manual. The Manual is reviewed annually or more frequently as directed by the President. The intent of this review is to keep the Manual current with the documents specified above. Revisions to the Manual required for compliance to the referenced documents are authorized by the President.

Approval of this Manual, and revisions thereto, is documented by the signature of the President on the title page with the respective date of approval. All revisions to the Manual are issued for implementation by the President within thirty (30) days of approval of the revision by the NRC.

Revision Control

The QA Manual shall be revised and issued in its entirety, with changes highlighted in the text. Changes in the footer of each page or on the title page and relocated text resulting from page reformatting are not considered revisions and are not highlighted as such.

A history of revisions is maintained for the QA Manual as indicated on the Record of Revisions. The current revision of the Manual is indicated on each page.

Distribution Control

The Manual may be distributed electronically or in hard-copy form. Electronic distribution channels shall limit access to only the current version of the Manual; hence, there is no requirement for transmittal control and receipt acknowledgement. Hard-copy distribution of Controlled Manuals shall be performed using transmittal forms with required receipt acknowledgement and follow-up on

delinquent acknowledgements. Both electronic and hard-copy distribution shall be performed in accordance with the Company Quality Assurance procedures for document control.

Indoctrination and Training

Each manager will assure that all personnel performing activities affecting quality are indoctrinated, trained and qualified according to their level of responsibility and assigned functions. Indoctrination and training shall consist of informal, on-the-job activities under the guidance of trained personnel, self study and/or formal meetings, classes, lectures, and seminars. The Quality Assurance Manager shall assist the managers in implementing this responsibility including providing training courses, materials and standards. Formal training shall be documented and the associated record maintained as a Quality Assurance Record in accordance with Section 17.

Qualification and Certification of Personnel

The Company performs inspections, examinations or tests for which a formal Company program of training, qualification and certification is required per QAM Section 10 and Section 11. When these inspections, examinations or test activities are performed, they shall be performed by appropriately certified personnel.

Surveys and audits for which the Company is responsible are conducted by Lead Auditors who are qualified as specified in ANSI/ASME N45.2.23; 10 CFR 50, Appendix B; and ANSI/ASME NQA-1. Records of Lead Auditor qualification are maintained in the Company files (refer to Section 18).

Quality Assurance Program Implementation

Quality Assurance Procedures (QAP) are developed to implement the requirements defined by this Quality Assurance Manual. Additional QAPs, or project-specific procedures, may be developed for each project because of different interface requirements between customers and suppliers. These project-specific procedures shall be part of the project plan. In all cases, the QAPs shall conform to the requirements specified in this Quality Assurance Manual.

The following table identifies the relationships among the 18 criteria and the Company Quality Assurance Manual and implementing Quality Assurance Procedures.

Relationship of 18 Criteria to Company QA Program

Criteria of: 10 CFR 50 Appendix B 10 CFR 71 Subpart H 10 CFR 72 Subpart G		Corresponding QA Manual Section QA Procedures[1]	
I.	Organization	QAM Section 1 and Organization Charts	
		QAP 1.0:	Order Entry and Project Planning
		QAP 1.1:	Project QA Plans and Project-Specific QA Procedures
		QAP 1.2:	Readiness Reviews
		QAP 1.3:	Organization
II.	Quality Assurance Program	QAM Section 2	
		QAP 2.1:	Control of Quality Assurance Manual, Procedures, and Forms
		QAP 2.2:	Certification of Inspection Personnel
		QAP 2.4:	Quality Assurance Program Assessment and Reporting
		QAP 2.5:	Indoctrination and Training
		QAP 2.6:	Personnel Qualifications

[1] This listing and the content of these Quality Assurance Procedures may change as needed to provide procedural direction applicable to BFS' commercial activities, or as necessary to reflect changes in governing standards/regulations. These changes may be made without revision of the Quality Assurance Manual (QAM) providing the QAM requirements are maintained.

Criteria of: 10 CFR 50 Appendix B 10 CFR 71 Subpart H 10 CFR 72 Subpart G	Corresponding QA Manual Section QA Procedures[1]
III. Design Control	QAM Section 3
	QAP 3.0: Design Control
	QAP 3.1: Design Input
	QAP 3.2: Calculations
	QAP 3.3: Drawings
	QAP 3.4: Specifications
	QAP 3.5: Technical Reports
	QAP 3.6: Safety Analysis Reports
	QAP 3.7: Quality Level Assessment
	QAP 3.8: Engineering Change Notice
	QAP 3.9: 10CFR72.48 Screening Review
	QAP 3.10: System Design Verification
	QAP 3.11: Receipt of Engineering and Fabrication Deliverables
	QAP 3.12: Computer Software Development, Installation and Revisions
	QAP 3.13: Computer Software Control and Usage Tracking
	QAP 3.14: Identification and Control of Computer Errors
	QAP 3.15: 10CFR72.48 Evaluation
	QAP 3.16: 10CFR71 Change Evaluation
	QAP 3.17: Processing of 10CFR72.48 Records

Criteria of: 10 CFR 50 Appendix B 10 CFR 71 Subpart H 10 CFR 72 Subpart G		Corresponding QA Manual Section QA Procedures[1]	
IV.	Procurement Document Control	QAM Section 4	
		QAP 4.0:	Procurement Control
		QAP 4.1:	Procurement of Graded Quality Items
V.	Instructions, Procedures and Drawings	QAM Section 5	
		QAP 5.2:	Process Control
VI.	Document Control	QAM Section 6	
		QAP 6.0:	Document Control
VII.	Control of Purchased Materials, Equipment and Services	QAM Section 7	
		QAP 7.1:	Supplier Evaluation
		QAP 7.2:	Source Inspection
		QAP 7.3:	Receipt Inspection
		QAP 7.5:	Commercial Grade Dedication
VIII.	Identification and Control of Materials, Parts and Components	QAM Section 8	
		QAP 8.0:	Identification and Control of Materials, Parts and Components
		QAP 8.1:	Certificate of Conformance

Criteria of: 10 CFR 50 Appendix B 10 CFR 71 Subpart H 10 CFR 72 Subpart G		Corresponding QA Manual Section QA Procedures[1]
IX.	Control of Special Processes	QAM Section 9 QAP 9.0: Control of Special Processes
X.	Inspection	QAM Section 10 QAP 10.0: Inspection
XI.	Test Control	QAM Section 11 QAP 11.0: Test Control
XII.	Control of Measuring and Testing Equipment	QAM Section 12 QAP 12.0: Control of Measuring and Test Equipment
XIII.	Handling, Storage and Shipping	QAM Section 13 QAP 13.0: Handling, Storage and Shipping
XIV.	Inspection, Test and Operating Status	QAM Section 14 QAP 14.0: Inspection and Test Status

Criteria of: 10 CFR 50 Appendix B 10 CFR 71 Subpart H 10 CFR 72 Subpart G	Corresponding QA Manual Section QA Procedures[1]
XV. Nonconforming Material, Parts or Components	QAM Section 15 QAP 15.0: Nonconforming Material, Parts, Components or Services QAP 15.2: Reporting of Defects and Noncompliances
XVI. Corrective Action	QAM Section 16 QAP 16.0: Corrective Action Process QAP 16.1: Cause Analysis QAP 16.3: Effectiveness Reviews
XVII. Quality Assurance Records	QAM Section 17 QAP 17.0: Quality Records
XVIII. Audits	QAM Section 18 QAP 18.0: Audits and Surveys QAP 18.1: Qualification and Certification of QA Audit Personnel QAP 18.2: Quality Assurance Surveillance of Suppliers QAP 18.3: Internal Surveillance

Section 3 - Design Control

The purpose of this section is to establish the basic minimum requirements to provide control of design activities including program planning, design and design verification from initial concepts through completion of design, manufacturing, inspection and planning for Company and customer-based projects. The Company provides designs, investigations, analyses and reports based on specific project requirements.

The Manager of Operations is responsible for assuring the technical adequacy and correctness of the design and that the final design meets the Company, customer and regulatory requirements. Procedures have been developed to assist in assuring and documenting the quality of the design output. These procedures cover the following:

- Preparation of calculations
- Review and checking of calculations and reports
- Computer program control and usage
- Drawing and specification preparation
- Design verification
- Change control
- Procured design services
- Preparation of licensing documents

The Company Quality Assurance Procedures (QAPs) have been developed, approved and implemented to control the design process in such a manner to assure that:

- The design activity is planned, controlled and documented.
- The design documents contain Quality Assurance requirements for inspections and tests that will assure control, inspection and testing of design characteristics.
- Deviations from quality requirements are controlled.
- Design verification is performed by qualified personnel independent of the design activity, but with a skill level at least equal to that of the original design personnel. These verifications may include tolerance studies, alternate calculations or tests. Qualification tests are conducted in accordance with approved test programs and procedure.
- The design verification method selection is based on regulatory and contractual requirements, level of complexity of the design and "state-of-the-art" considerations, i.e., materials, fabrication processes, etc., and operating conditions.
- Interface control is established and adequate to assure that the review, approval, release, distribution and revision of design documents

involving interfaces are performed with all cognizant design personnel.

- Design and specification changes are reviewed and approved by the same organization(s) as the original issue.
- Design errors and deficiencies are documented and appropriate corrective action is taken.

Section 4 - Procurement Document Control

The QA Program provides controls to assure that all purchased material, components, equipment, and services adhere to design specifications, regulatory and contractual requirements.

Evaluation and selection of suppliers, objective evidence of supplier quality assurance programs, assignment of quality requirements to procurement documents, and related design documents, and source, in-process and receiving inspections are administered and controlled in accordance with this section of the Quality Assurance Manual and approved procedures.

Procurement is performed under the supervision of the Manager of Projects. Changes to procurement documents shall be prepared, reviewed, approved and authorized for use in the same manner as established for the original issue of the document.

Quality Assurance requirements, including the applicability of Part 21 when required, are provided with purchase orders and/or applicable specifications.

The Company may procure any design, manufacturing, inspection, testing, auditing or construction activity described in this Manual. Procurement documents for these services shall include requirements that assure that the requirements of this Manual will be met by the subcontractor. The Company retains final responsibility to assure the service is acceptable for the Company project.

Contract documents such as Purchase Orders, drawings and specifications are reviewed to assure the inclusion of all requirements. Personnel qualification requirements are either defined or verified by reference on a procurement document. Review also includes verification of the suitability of standard items for the use required by the applicable drawings and design specifications with the inclusion of valid industry standards, references, and related data, when applicable.

The Manager of Projects assures that requirements for acceptance of hardware and documentation, such as the supplier's submittal and retention of instructions appropriate to the contract, are included in procurement documentation.

The Company maintains the right of access to all supplier facilities and documentation for source inspection and/or audit activities. A statement to this effect is included on procurement documentation when it is appropriate to the contract.

Company QA personnel check procurement documents for completeness and the inclusion of quality requirements in accordance with written procedures. Procurement documents require the approval of the Company Quality Assurance Manager.

The procurement process allows for the use of a graded quality approach per NRC Regulatory Guide 7.10.

Section 5 - Instructions, Procedures and Drawings

Procedures and instructions are developed by qualified personnel assigned by the responsible manager. Procedures are developed for activities requiring design and/or fabrication, performance verification, witnessing, measurements, testing or other Quality Assurance related activities. These procedures are approved by the responsible manager, the Quality Assurance Manager and the President.

All fabrication documents (i.e., drawings, specifications, special processes, test and calibration procedures, etc.) are reviewed by a qualified engineer as assigned by the Manager of Operations. The fabrication documents are also referenced in inspection procedures as necessary to assure adherence to package, system or other design approvals and the applicable regulatory and contractual requirements.

The inspection procedures also include appropriate acceptance criteria such as dimensions, tolerances, operating limits, workmanship standards, and other qualitative and quantitative measures.

All instructions, procedures, and drawings are developed, reviewed, approved, utilized and controlled in accordance with approved procedures.

Changes to instructions, procedures and drawings shall be prepared, reviewed, approved and authorized for use in the same manner as established for the original issue of the document.

Section 6 - Document Control

The review, approval, release and revision of quality-related documents, as well as revisions/changes to all such approved documents, are controlled by quality procedures. Revisions are subjected to the same approval cycle and sequence as initial issuances. Provisions are made for identifying individuals/organizations responsible for review and approval of controlled documents in the Quality Assurance Procedure applicable to the controlled document. Documents may be authenticated electronically (e.g., digital signatures), manually (e.g., signature and date), or by a combination thereof. Document control responsibilities and distribution requirements are also addressed in procedures.

Controlled documents may be distributed either electronically or in hard-copy format. Electronic distribution shall make available only the current versions of documents (unless the user takes specific actions to obtain historical versions); hence, there is no requirement for transmittal control and receipt acknowledgement. For hard-copy controlled distribution, transmittal sheets with provisions for acknowledging receipt are utilized to provide proper records of the transmittal and receipt of controlled documents and subsequent revisions.

Controlled documents include but are not limited to:

- Design Specifications
- Calculations
- Analyses
- Safety Analysis Report(s)
- Drawings
- Specifications (Procurement, Equipment, etc.)
- Special Process Procedures (Welding, Forming, Heat Treating, NDE, Etc.)
- Inspection Procedures
- QA Manuals and Procedures
- Source Surveillance and Inspection Reports
- Test Procedures and Reports
- Operational Test and Inspection Reports
- Subvendor Procedures, Specifications and Drawings
- Customer Specifications, Procedures and Drawings

When documents being revised appear in other documents as references, supplements or include the attribute being changed, an impact assessment will be conducted and depending upon the results, either:

- A process to control the revision of that document will be provided, or

- That document will be revised prior to release of the approved change.

Document lists are maintained listing the title, identification number and current revision for all controlled documents.

Section 7 - Control of Purchased Materials, Equipment and Services

It is the policy of the Company that all suppliers of materials, components, systems or services, receive controlled and approved procurement documents that contain or reference all applicable regulatory requirements, appropriate design/engineering drawings and specifications, and other requirements necessary to produce a product or service that meets the quality requirements of the Company and its customers. In addition, procurement documents shall contain provisions that require suppliers and their subtier suppliers to execute quality assurance programs in a manner and to the extent specified by the Company. Furthermore, procurement documents shall provide for the right of the Company to audit its contractors as well as their subtier suppliers, on their implementation of these controls.

The following requirements apply to all Quality Category A (as defined in NRC Regulatory Guide 7.10) items. For Quality Category B and C items, appropriate supplier controls shall be in place consistent with Regulatory Guide 7.10.

Procurements will be made only from Company-approved suppliers based on their past history, pre-award and/or post-award audits and surveys. Suppliers may be utilized for a customer's work based on a letter from the customer authorizing such use. This is limited only to work for the customer providing such approvals. The Company shall maintain an Approved Suppliers List (ASL).

As directed by the Quality Assurance Manager, evaluations are conducted by Company QA qualified personnel to further assure supplier acceptability and performance. These evaluations are based on the following criteria:

- The capability of the supplier to comply with the requirements of 10CFR72 Subpart G, 10CFR71 Subpart H, 10CFR50 Appendix B, ANSI N45.2, ANSI/ASME NQA-1, or other requirements appropriate to the contract as determined by the Company.

- A review of previous records and performance of the supplier by Company Quality Assurance.

- A survey/audit by QA, assisted by Operations and Projects as appropriate, of the supplier's facilities and Quality Program to determine their capability to supply a product that meets design, manufacturing, and quality requirements.

Suppliers shall be evaluated by audit except for Regulatory Agencies/Nationally Recognized Standards Laboratories.

Results of the supplier evaluations and audits are appropriately recorded and included as part of the vendor's history file retained by Quality Assurance.

Audits are conducted at active supplier's facilities during the performance of activities, to assure continued adherence to the imposed Quality Assurance, design and contract performance criteria. These audits are conducted at least once every three years (during active periods) or more often as directed by the Quality Assurance Manager.

As an alternative to the aforementioned requirements, dedication of commercial grade items and services may be performed in accordance with approved procedures.

As directed by the Quality Assurance Manager, source and/or receiving inspections are performed by qualified personnel to assure the following:

- The material, component, or equipment is properly identified, refers to applicable codes, standards and specifications, and corresponds with the identification on receiving documentation.
- Prior to their use or installation, materials, components, equipment and acceptance records are inspected and are accepted in accordance with appropriate contractual requirements.
- Inspection records and/or certificates of conformance are available that attest to the acceptance of materials and components prior to their installation or use.
- Items accepted and released are identified as to their inspection status prior to forwarding to a controlled storage area or release for further work.

All described activities are delineated in approved Company Quality Assurance Procedures.

Section 8 - Identification and Control of Materials, Parts and Components

A process for identifying and controlling materials, parts, components and completed and in-process assemblies is administered by the Quality Assurance Manager in accordance with approved Quality Assurance Procedures. These procedures address quality status tags, marking, and/or stamping to assure maintenance of material identification, traceability, and part identification, to related documentation. Some of the details of these procedures are as follows:

- Material identification procedures included in Quality Assurance inspection instructions and fabrication drawings require that identification of material, components, and/or hardware be maintained on the item or in traceable records to prevent use of incorrect or defective material.

- Specifications, procurement documentation, fabrication and inspection records, discrepancy reports and material test data are also periodically audited to assure continued adherence to design, regulatory and contractual requirements.

- Identification requirements, such as method and size, may be specified on applicable drawings or in applicable procurement/equipment specifications. Such identification shall not interfere with fit, interface or performance.

The Quality Assurance Manager shall assure that materials and equipment are controlled, protected, stored, handled, operated and packaged so that identification, traceability and condition are maintained. Some or all of the material control functions described herein may be delegated to approved suppliers.

Section 9 - Control of Special Processes

This section delineates the policies and practices established for special processes that control or verify quality, such as those used in welding, heat treating, and non-destructive examination. Examples of other processes that may be considered a special process, include coating, painting, and lead pouring. Special processes developed by suppliers and/or the Company are documented, reviewed and approved by the responsible technical personnel within the Company, and/or customer organizations. In addition, special process equipment is identified, inspected and performance tested prior to use.

All procedures for special processes are performed in accordance with applicable codes, standards, specifications and contract requirements. The personnel performing such processes are trained and qualified in accordance with approved procedures. Both the procedures and personnel are subjected to full review and approval cycles as defined herein, by personnel qualified and approved by the Quality Assurance Manager for the subject matter relating to the special process.

Qualification records and support data are retained in the Quality Assurance files.

All documentation shall be administered and controlled in accordance with the requirements of the Company Quality Assurance Program.

Section 10 – Inspection

Receiving, source, test, in-process, shipping and in-service inspection activities are performed in accordance with the requirements of this manual and approved procedures. Inspection personnel and/or organization qualifications are reviewed and accepted by the Quality Assurance Manager prior to inspection activity. The inspection activity is performed to verify conformance to drawings, procedures and/or specifications.

Inspection personnel report to the Quality Assurance Manager.

The qualifications of inspection personnel are based on their capability to perform the required inspection functions in accordance with applicable codes and standards. Qualification reviews are performed periodically to maintain personnel proficiency and assure current qualification.

Inspection procedures and instructions include hold points, inspection equipment requirements, accept-reject criteria, personnel requirements, characteristics to inspect, variable attributes, recording instructions, reference documentation and other requirements, as appropriate.

Inspection results shall include supporting information such as variables, attributes, data, test results, NDE records, welding information, certified materials test report (and/or certification), special process data, discrepancy reports, related dispositions and resultant reinspection data as necessary.

Section 11 - Test Control

A quality-related test control program is defined by approved test procedures. Prerequisites, accept/reject criteria, data recording criteria, instrumentation calibration, environmental conditions, documentation and evaluation requirements, etc., are defined in test procedures.

The Manager of Operations assures that the service conditions described in applicable design, regulatory and contractual documents are verified by testing activities. Changes to test procedures are required to be reviewed/approved by the same organization(s) as the original issue.

Whenever equipment, components, and/or assemblies require modification, repairs, or replacement that could result in requirements for re-test or additional testing, the Manager of Projects shall assure that original or new test inspection instructions are prepared and adhered to as appropriate.

Test results are documented, evaluated and accepted by the Manager of Operations as required by the test procedure prepared for the test under the cognizance of the Manager of Projects.

Section 12 - Control of Measuring and Testing Equipment

Calibration of measuring equipment and instrumentation is established by the Quality Assurance Manager. The calibration process assures that all standard measuring instruments used in the acceptance of material, equipment, and assemblies are calibrated and properly adjusted at specified intervals to maintain accuracy within pre-determined limits.

Calibrated equipment is identified and is traceable to the calibration test data. Identification includes the equipment property number, next calibration due date and inspector's or calibrator's signature or initials attesting to the accuracy and validity of the calibration.

Calibration accuracy is maintained by utilizing standards traceable to the National Institute of Standards Technology (NIST), derived from accepted values for natural physical constants, or by the ratio type of self-calibration.

Section 13 - Handling, Storage and Shipping

Requirements for handling, storage and shipping shall be documented in project-specific procedures or specifications. These requirements are designed to prevent damage or deterioration of material and equipment. Information pertaining to shelf life, environment, packaging, temperature, cleaning, handling, preservation, etc., is included as required to meet design, regulatory and/or customer requirements.

Inspection procedures and instructions contain assessment of criteria for handling, storage, preservation and shipping requirements.

Shipping documentation preparation is also addressed, when applicable. The requirements pertaining to shipping must be met prior to release for shipment.

Section 14 - Inspection, Test and Operating Status

Inspection status tags, quality inspection stamps, and other means are used to indicate inspection and test status and are described in project-specific procedures or fabrication travelers.

These documents provide that indications of status are clear, inspection and/or test steps are not bypassed, and removal or modification of status indicators are prohibited, except with Manager of Projects and/or Quality Assurance Manager approval. The Quality Assurance Manager assures via procedure and training sessions that personnel are aware of and understand the meaning and uses of status indicators on hardware, material, and test setups. The satisfactory use of status indicators is verified by audit or surveillance.

Section 15 - Nonconforming Material, Parts or Components

Material, components, and equipment that do not conform to requirements are controlled to prevent their inadvertent use. This control is through identification, marking and/or segregation. Discrepancy reporting, disposition of nonconformances by authorized individuals and reinspection activities are performed and controlled in accordance with written procedures.

Nonconformance Reports (NCRs) are utilized and logged to identify discrepant items, describe the discrepancy and provide disposition and reinspection requirements. Authorized, cognizant personnel review and approve NCRs to signify acceptance of the disposition.

NCRs are reviewed by the Manager of Projects, Manager of Operations and Quality Assurance Manager to assure that "use-as-is" or "repair" dispositions include sufficient technical justification to assure continued compliance with design, regulatory and contractual requirements. When appropriate, copies of dispositions are forwarded to the owners and users of the affected equipment.

In conjunction with "repair" or "rework" dispositions, Quality Assurance personnel assure that supplemental inspections are performed to verify compliance with the NCR disposition when required. This assures that the item is re-tested and/or reinspected to a degree equivalent to the original acceptance level.

Section 16 - Corrective Action

Conditions adverse to quality, such as failures, malfunctions, deficiencies and deviations in material, components, equipment and services, are identified, documented, and reported to Company Management. Significant conditions adverse to quality will be reported to the President. Each condition adverse to quality is documented in a Condition Report and is forwarded to the Quality Assurance Manager for review and analysis. A log of Condition Reports is maintained. For significant conditions adverse to quality the cause of the condition and the corrective action necessary to prevent recurrence is identified, implemented and when required, followed up to verify continued corrective action effectiveness.

Analyses of identified conditions are conducted within thirty days of their submittal or as otherwise approved by the Quality Assurance Manager and/or the President. These analyses identify causal factors and help to pin-point areas in need of corrective action. Quality trends and related reports are prepared and presented to the President for review and action.

Section 17 - Quality Assurance Records

The Company's QA records system is established and administered in accordance with approved Company QA Procedures. The purpose of the QA records system is to assure that documented evidence pertaining to quality-related activities is maintained and available for use by company, customer, and/or regulatory personnel, as appropriate. QA records include, but are not limited to, design-related records (calculations, drawings, research, development test reports, and design reviews), inspection and test records (including identification of inspectors and data recorders), audit reports, condition reports, quality personnel qualification(s), quality-related procurement data, supplier evaluation reports, materials analyses (certified material test reports or certificates of compliance as applicable), fabrication/manufacturing records, modification records, repair records, and maintenance records.

The retention period for the above identified records is as follows: 1) Transportation Packaging – Life of the packaging plus three years; 2) Spent Fuel Storage Packaging – Maintained by or under the control of the licensee until the NRC terminates the license. For all other equipment, quality-related records are retained for a minimum of three years unless otherwise specified by applicable regulatory, code, standard or contractual requirements.

Additionally, records of use, for all transport packages, shall be maintained for a period of three years after the shipment.

Records are identified by project number, part number, contract number, or drawing number as appropriate to the record type. The Company maintains a complete list of QA records to provide identification and location information.

Inspection records retained in the QA records system provide the following data when applicable:

- Inspection type, i.e., in-process, in-service, testing, receiving and shipping.
- Evidence of completion and verification of manufacturing, inspection or test operation.
- The date and results of the inspection or test.
- Information related to noted discrepancies.
- Inspector or data recorder identification.
- Evidence of acceptance.

Protection for QA records is provided by using either one of the following storage methods:

- Single Storage in a facility or container that minimizes the risk of damage or destruction from natural disasters, environmental conditions, and biological infestation, or

- Dual Storage in locations sufficiently remote from each other as to eliminate or minimize the chance of exposure to a simultaneous hazard.

Section 18 – Audits

The Company carries out a comprehensive system of planned and periodic audits by personnel qualified in accordance with this QA Program to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program.

Audit Logs, Audit Plans and Audit Checklists are prepared and utilized by the audit team. All audits are performed under the direction of a qualified Audit Team Leader. At the completion of each audit, the Quality Assurance Manager evaluates the planning sheets and checklists to confirm that the audit effectively addressed all the appropriate Program elements.

Audit results and corrective action activities are documented in an Audit Report by the Quality Assurance Manager and transmitted to the responsible management personnel of the audited organization, the President and the Manager of Operations. Responsible management personnel are required to respond to audit findings with the necessary action to correct the noted deficiencies.

Records of audits and the qualifications of Auditors and Audit Team Leaders are maintained by the Quality Assurance Manager.

Internal Audits

Internal Program audits are performed annually (or more often, if deemed necessary by the Quality Assurance Manager). These audits may be project-specific or cover multiple projects. These audits provide comprehensive, independent verification and evaluation of the implementation of the entire Quality Assurance system established in response to the appropriate requirements of 10CFR72 Subpart G, 10CFR71 Subpart H, 10CFR50 Appendix B, ANSI N45.2, ANSI/ASME NQA-1, and other applicable codes, standards, specifications and requirements.

Areas found deficient during these audits are re-audited on a priority basis to verify corrective action implementation and effectiveness.

External Audits

The Company performs audits of active suppliers once every three years to assure continued adherence to imposed design, procurement and quality requirements.

Written audit results are reviewed with the affected supplier, and appropriate and mutually accepted corrective actions are determined. Corrective action implementation and effectiveness is evaluated by designated personnel as part of subsequent audits to review the supplier for continued approval.