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Subject: Louisiana Energy Services Gas Centrifuge Enrichment Facility
NRC Docket No. 70-3103

On September 5, 2002, representatives of Louisiana Energy Services (LES) and the NRC held a meeting during which LES presented its approach to the development of a Quality Assurance Program for the design, construction, operation, and decommissioning of a gas centrifuge uranium enrichment facility. At that time, we stated our intention to submit a Quality Assurance Program Description (QAPD) document in advance of the facility license application. The NRC has indicated that it would conduct an early review of the QAPD if it was submitted ahead of the license application.

Accordingly, this letter submits the attached LES QAPD for NRC review. This QAPD for the design, construction, operation, and decommissioning of a gas centrifuge uranium enrichment facility will also be included in the facility license application that we are planning to submit to the NRC by January 30, 2003.

If you have any questions or need additional information, please contact me at 630-657-2813.

Respectfully,

R. M. Krich
Director, Licensing

Attachment:
Louisiana Energy Services Quality Assurance Program Description

cc:
T. C. Johnson, NRC Project Manager

NMSS01

Louisiana Energy Services

Quality Assurance Program Description

Design, Construction, Operations and Decommissioning Phases

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INTRODUCTION

Louisiana Energy Services (LES) maintains full responsibility for ensuring that the Hartsville Enrichment Plant is designed, constructed, tested, operated, maintained, modified, and decommissioned in conformance with applicable regulatory requirements, specified design requirements, applicable industry standards and good engineering practices in a manner to protect the health and safety of the public. To this end, the LES Quality Assurance Program conforms to the criteria established in Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, "Quality Assurance Criteria For Nuclear Power Plants and Fuel Reprocessing Plants." The criteria in 10 CFR Part 50, Appendix B, are implemented following the guidelines of the American Society of Mechanical Engineers (ASME) Quality Assurance (QA) standard NQA-1-1994, "Quality Assurance Program Requirements for Nuclear Facilities," as revised by the ASME NQA-1a-1995 Addenda.

The LES QA Program described herein includes design, construction, pre-operational testing, operation, maintenance, modification, and decommissioning of the facility. This Quality Assurance Program Description (QAPD) describes the requirements to be applied to those structures, systems and components, and activities that have been determined to be designated QA Level 1. The QA Level 2 description is provided in Section 20 of this QAPD. These requirements are implemented by LES and their contractors through the use of approved QA programs and procedures.

Three QA Levels have been established and apply throughout the life of the facility from licensing and siting through design, construction, testing, startup, operation, maintenance, modification, and decommissioning. The three levels are defined as follows.

QA Level 1 Requirements

The QA Level 1 Program shall conform to the criteria established in 10 CFR Part 50, Appendix B. These criteria shall be met by following the guidelines of ASME NQA-1-1994, as revised by the ASME NQA-1a-1995 Addenda. The QA Level 1 QA program shall be applied to those structures, systems, components, and activities that have been determined to be items relied on for safety (IROFS).

QA Level 2 Requirements

The QA Level 2 program is a graded owner-defined QA program that uses the NQA-1 standard as guidance. General QA Level 2 requirements are described in Section 20. For contractors, the QA Level 2 program shall be described in documents that must be approved by LES. The QA Level 2 program shall be applied to Owner designated structures, systems, components, and activities. A QA program that meets the requirements of the International Organization for Standardization ISO 9000 is acceptable for QA Level 2 applications.

An approved QA Level 1 program is acceptable for QA Level 2 applications.

QA Level 3 Requirements and Applicability

The QA Level 3 program is defined as standard commercial practice. A documented QA Level 3 program is not required. QA Level 3 governs all activities not designated as QA Level 1 or QA Level 2.

Subsequent changes to the LES QA Program shall be incorporated in this Appendix of the Safety Analysis Report (SAR). Any changes that reduce the approved QAPD commitments will be submitted to the NRC for review and approval prior to implementation.

SECTION 1 ORGANIZATION

LES employees and contractor employees representing LES have full responsibility to ensure that the facility is designed, constructed, tested, operated, maintained, modified, and decommissioned in a manner to protect the health and safety of the public. This responsibility begins with initial design and continues throughout the life of the facility. The LES QA Program is designed to ensure that the necessary quality requirements for structures, systems, components and activities identified as Quality Levels 1 and 2 are achieved.

The LES President establishes the basic policies of the LES QA Program. The policies described in this QAPD are transmitted to all levels of management and are implemented through approved procedures. The QA Director ensures that contractor QA programs meet all applicable requirements of the LES QAPD. LES management is continually involved in activities affecting quality.

The LES President is the executive responsible for quality assurance and is the highest level of management responsible for LES' QA policies, goals, and objectives. The President receives policy direction from the LES Management Committee. Reporting to the President are the Quality Assurance Director, Engineering and Contracts Manager, Chief Operating Officer, Chief Financial Officer, Corporate Communications Manager, and Health, Safety & Environment Manager. The LES corporate organization is presented in Figure A1. During the Operations Phase the QA Manager reports to the Plant Manager. However, the QA Manager has the authority and responsibility to contact directly the LES QA Director and/or LES President with any Quality Assurance concerns. The LES organization during the operational phase is presented in Figure A2.

The Engineering and Contracts Manager is responsible for all aspects of the facility design, preparation for construction, construction, and preparation for turnover to operations. These responsibilities are carried out through the Project Managers reporting to the Engineering and Contracts Manager.

The Plant Manager is responsible for the overall operation and administration of the facility. The Chief Operating Officer is responsible for ensuring the facility complies with all applicable regulatory and QA requirements. In the discharge of these responsibilities, the Plant Manager takes direction from the Chief Operating Officer and directs the activities of the following groups as presented below and in Figure A2.

- Quality Assurance
- Health, Safety and Environment
- Operations
- Uranium Management
- Technical Services
- Human Resources

The QA organization is responsible for establishing a documented Quality Assurance Program and verifying its effective implementation. The QA Director is responsible for assuring the

development, management and implementation of the LES QA Program. QA personnel are organizationally separate and independent from engineering, construction, operational, and decommissioning activities. QA personnel have the freedom and responsibility to identify quality problems; initiate, recommend or provide solutions, and to verify and report such solutions directly to management. QA personnel have the authority and responsibility to stop work in accordance with procedures when the continuance of the work could produce results adverse to quality.

The QA organization is responsible for the following activities.

- Oversight of the quality of design, construction, preoperational testing and operations.
- Oversight of supplier QA programs, including development and approval of approved suppliers lists, conducting audits and surveillances of supplier QA programs, and the review, approval and control of supplier and procurement QA records.
- Development, maintenance, approval, and issuance of QA departmental procedures.
- Review and approve QA procedures that affect activities relied on for safety, including establishment of inspection hold points.
- Management of the QA Audit and Surveillance Program.
- Specifying QA requirements for QA Levels 1 and 2 materials, equipment and or spare parts.
- Administering the non-conformance process.
- Administering the corrective action process, including tracking and trending.
- Inspections as specified in facility modification packages.
- Inspection of incoming materials.
- Inspection of product (UF6) during enrichment process and prior to shipment.
- Oversight of procedures to ensure they are effective and include appropriate regulatory requirements.

Figure A2 documents that QA inspectors, auditors and technical support personnel are in the QA organization and are located at the Hartsville Enrichment Plant.

During design, construction and operation, QA is considered part of the team and as such is included in day-to-day operations (e.g., scheduling of inspections and status meetings). During design and construction of the facility, the contracted Engineering and Construction QA Managers are in charge of their respective LES approved QA programs. The LES QA Director is responsible for LES corporate QA activities and acts in an oversight role of the contracted engineering and construction work activities. The LES QA Director serves in a capacity to ensure that activities during design and construction are performed under an approved QA

program. The QA Managers for contracted design and construction of the facility are able to make quality assurance decisions and have sufficient authority, access to work areas, and organizational freedom to:

- Identify quality problems
- Initiate and recommend solutions to quality problems through designated channels
- Verify implementation of solutions and ensure that further processing, delivery, installation, or use is controlled until proper disposition of nonconformances, deficiencies or unsatisfactory conditions has occurred
- Have direct access to highest levels of management
- Be sufficiently independent from cost and schedule considerations and have stop-work authority.

Organizational Interfaces

The various LES departments and contractors of LES perform Quality Levels 1 and 2 activities. LES contractors are responsible for development and implementation of their respective QA programs that shall be consistent with the requirements of this QAPD for those activities determined to be within the scope of Quality Levels 1 and 2 activities. The interfaces between contractors and LES or among contractors shall be clearly identified and documented. LES and LES contractors have the authority and obligation to stop work pending resolution of any quality problems. If a member of another area disagrees, that individual has the responsibility to take the matter to management. The disagreement may either be resolved at that level or at any level up to and including the LES President.

SECTION 2 QA PROGRAM

The LES QA Program and its supporting procedures are applicable to items and activities designated as QA Levels 1 and 2.

The QA Director is responsible for developing and revising the LES QAPD and ensuring it is in compliance with applicable regulations, codes and standards. The QA Director and/or the QA Manager approve the QA program procedures and revisions thereto for their respective scope of responsibility.

The LES QA Program specifies mandatory requirements for performing activities affecting quality and is set forth in QA procedures which are distributed on a controlled basis to organizations and individuals responsible for performing quality level work activities. Revisions to these procedures are also distributed on a controlled basis. Applicable portions of the LES QA Program are documented, approved and implemented via the appropriate procedures prior to performing the work activity.

An LES management assessment of the facility QA Program is performed at least six months prior to scheduled receipt of licensed material on the site. Items identified as needing completion or modification are tracked and corrective actions must be completed 90 days before scheduled receipt of licensed material. The LES President monitors the facility QA Program prior to the period of initial facility operation through project review meetings and annual assessments. This follow up process, along with integrated schedules and program review meetings, ensure that an effective facility QA Program is in place prior to receiving licensed material.

The LES QA Program for design, construction, and preoperational testing continues simultaneously with the QA program for the operational phase while construction activities are in progress.

LES employees may propose changes to the LES QA Program procedures. When reviewed by the QA Manager or QA Director and found acceptable and compatible with applicable requirements, guidelines and LES policy, the changes may be implemented after being processed through the procedure change process. The LES QA Program and procedures are reviewed periodically to ensure they are in compliance with applicable regulations, codes, and standards. New or revised regulations, codes, and standards are reviewed for incorporation into the LES QA Program and procedures as necessary.

Personnel performing activities covered by the LES QA Program shall perform work in accordance with approved procedures, and must demonstrate suitable proficiency in their assigned tasks. Formal training programs are established for quality assurance policies, requirements, procedures, and methods. Training is provided to ensure continuing proficiency as procedural requirements change. Employees are required to attend a QA indoctrination class on authority, organization, policies, and procedures.

Personnel performing non-destructive testing are certified in accordance with American Society for Nondestructive Testing (ASNT), Recommended Practice SNT-TC-1A, December 1988 Edition, "Guidelines for Qualification and Certification of Nondestructive Testing Personnel," and

its applicable supplements.

Line managers are responsible for the content and effective conduct of training for their personnel. Training responsibilities for line managers are included in position descriptions, and line managers are given the authority to implement training for their personnel. The training organization provides support to line managers by facilitating the planning, directing, analyzing, developing, conducting, evaluating, and controlling of a systematic approach to training. Additional formal training is conducted in specific topics such as QA procedures, auditing and assessments, and applicable codes and standards. Training records are maintained for each person performing quality-related job functions.

Periodic audits and/or assessments are conducted in accordance with QA procedures to measure the effectiveness of implementation of the QA program. The system of audits and assessments is described in Section 18.

The LES President assesses the scope, status, adequacy and regulatory compliance of the LES QA Program through regular meetings and correspondence with the Chief Operating Officer and the LES QA Director. The LES QA Director provides QA program status to the LES President on a periodic and as needed basis.

The LES QA organization participates in the planning and scheduling for system turnover as construction is completed. Prior to system turnover, procedures are developed for control of the transfer of systems, structures, components and associated documentation. The procedures include, but are not limited to; checklists, marked drawings, documentation lists, system status, and receipt control.

Major work activities contracted by LES shall be identified and controlled. Principal contractors shall be required to comply with the applicable portions of 10 CFR Part 50, Appendix B and this QAPD, as determined by LES. The Engineering and Contracts Manager during construction, or the Plant Manager during operation, shall be responsible for establishing and documenting management controls (including interfaces) and lines of communication with contractors. The performance of contracted activities shall be audited by LES commensurate with the importance of the activities to safety.

SECTION 3 DESIGN CONTROL

The LES QA Program requires procedures and instructions for implementation and assurance of design control during the various phases of design activities. These procedures and instructions ensure the design is performed in accordance with approved criteria, and that deviations and nonconformances are controlled.

Each design document (calculations, specifications, procedures, or drawings) is prepared by a qualified individual who specifies and includes the appropriate codes, standards, and regulatory commitments within the design documents. A qualified individual notes any deviations or changes from such standards within the design documentation package. Each design document is then checked by another qualified individual and is reviewed for concept and conformity with the design inputs. These design inputs are in sufficient detail to permit verification of the document. After checking is complete, the document is approved by a qualified individual or a designee having overall responsibility for the design function. A review of each specification is made by the QA organization to ensure incorporation of necessary QA information. The Engineering organization and QA organization document the entire review process in accordance with approved procedures. These procedures include provisions to assure that appropriate quality standards are specified in design documents, including quantitative or qualitative acceptance criteria. The QA organization conducts audits and assessments on the design control process using independent technically qualified individuals to augment the QA audit and assessment teams.

During the check and review, emphasis is placed on ensuring conformance with applicable codes, standards and regulatory commitments. The individuals in Engineering and QA assigned to perform the check and review of a document have full and independent authority to withhold signature until questions concerning the work have been resolved. Design reviews, alternative calculations, or qualification testing accomplishes checking of design. The bases for a design, such as analytical models, theories, examples, tables, codes and computer programs must be referenced in the design document and their application verified during check and review. Model tests, when required to prove the adequacy of a concept or a design are reviewed and approved by the responsible qualified individual. Testing used for design verification shall demonstrate adequacy of performance under conditions that simulate the most adverse design conditions. The tests used for design verification must meet all the requirements of the designing activity.

Documented measures must be established to control software quality. These measures must include provisions for acquisition, development, operation, maintenance, and retirement of software as applicable.

Design verification is performed by qualified individuals other than those who performed the design, but may be from the same design organization. Verification may be performed by the supervisor of the individual performing the design, provided: 1) this need is documented and approved in advance by the supervisor's management, 2) the supervisor did not specify a singular design approach or rule out certain design considerations and did not establish the design inputs used in the design or, 3) the supervisor is the only individual in the organization competent to perform the verification. The verification by a supervisor of their own design constraints, design input, or design work would only occur in rare instances. This would occur

only when the supervisor is the only individual in the organization competent to perform the verification. These instances are authorized and documented in writing on a case-by-case basis.

Independent design verification shall be accomplished before the design document (or information contained therein) is used by other organizations for design work or to support other activities such as procurement, construction, or installation. When this is not practical due to time constraints, the unverified portion of the document is identified and controlled. In all cases, the design verification shall be completed before relying on the item to perform its function. Any changes to the design and procurement documents, including field changes, must be reviewed, checked and approved commensurate with the original approval requirements.

After design documents have been properly prepared, checked, reviewed, verified and approved by the appropriate parties, the responsible engineer sends the document to distribution in accordance with Section 6 of this QAPD.

When deficiencies are discovered which affect the design of structures, systems, and components, such deficiencies are documented in a report and resolved in accordance with approved procedures. The report is forwarded for appropriate review to the responsible engineer, who coordinates further review of the problem and revises all design documents affected by the deficiency as necessary. Where required, the responsible engineer also forwards copies of the report to the engineers in other areas, who coordinate necessary revisions to their affected documents.

Design interfaces are maintained by communication among the participating organizations. Methods by which this is accomplished shall be proceduralized and include the following.

- Design documents are reviewed by the responsible engineer or authorized representative. As appropriate, subsequent multi-disciplinary review or waiver of review by the other area engineers is documented.

- Project review meetings are scheduled and held to coordinate design, procurement, construction and pre-operational testing of the facility. These meetings provide a primary working interface among the principal organizations.

- Reports of variations and nonconformances are transmitted and controlled by procedures and as outlined in this section. The QA Director or QA Manager approves resolution of all nonconformances. All variations from design documents must be approved. The individual performing the design is required to evaluate the cause of the variation to determine if a nonconformance exists. When a nonconformance results, it must be submitted to the QA organization for review. Resolution of the nonconformance must be reviewed and approved by the QA Director or QA Manager.

During the operational phase, measures are provided to ensure responsible facility personnel are made aware of design changes and modifications that may affect the performance of their duties.

SECTION 4 PROCUREMENT DOCUMENT CONTROL

The LES QA Program requires that applicable regulatory requirements, guidelines, design bases and other requirements which are necessary to ensure adequate quality, be included or referenced in procurement documents for material, equipment, and services and related spare and replacement parts. Control of procurement documents is described below.

LES and its contractors procure material and services in accordance with the LES QAPD. The QA organization reviews procurement documents in accordance with implementing procedures. The QA organization is involved in the procurement process from the evaluation of the supplier (i.e., audits and surveillances), review of specifications, review of purchase orders and requisitions, receipt inspection of materials and installation and testing. Also, these processes are audited and assessed internally on a periodic basis. Implementing procedures are generated to control these activities. Contractors specify requirements for materials and services needed. The QA organization independently reviews requisitions in accordance with the LES QA Program and assesses whether the procurement documents are effective and specify all necessary QA requirements.

All QA Level 1 services and materials are procured in accordance with the QA procedures with 10 CFR Part 21, "Reporting of Defects and Noncompliance," applicability. Those services or materials which cannot meet the 10 CFR 21 reporting requirements can be commercially dedicated, when necessary, in accordance with the Electric Power Research Institute (EPRI), Nuclear Construction Issues Group (NCIG), "Guidelines for Utilization of Commercial Grade Items in Nuclear Safety Related Application," as modified by Nuclear Regulatory Commission (NRC) Generic Letter 89-02, "Actions to Improve the Detection of Counterfeit and Fraudulent Market Products," dated March 21, 1989. This guidance as well as other industry guidance for procuring commercial-grade materials is reviewed and applied as appropriate to materials procured for the Hartsville Enrichment Plant. This includes the following characteristics of an effective procurement and dedication program:

- Involvement of the engineering staff in the procurement and product acceptance process, including testing, and identification of critical characteristics needed to adequately dedicate commercial grade items,
- Effective source inspection, receipt inspection, and testing programs, and
- Engineering based programs for product use in safety-related applications.

The technical aspects of procurement documents for original installations are prepared by the designer and form the bases for purchase order preparation. The QA organization approves QA requirements (e.g., documentation, non-destructive examination, (NDE), tests, and inspections) on these documents. These requirements include or reference applicable design bases, technical requirements (including regulatory requirements and guidelines such as 10 CFR Part 50, Appendix B, and ASME NQA-1 or applicable portions thereof), component and material identification, drawings, specifications, codes, and standards (including their revision status) tests and inspection requirements and special process instructions. Procurement documents also identify the documentation to be prepared, maintained, and submitted by the

supplier for review and approval of such drawings, procedures, inspection and test records and personnel qualification records. Procurement documents contain instructions for record retention and disposition if such records are to be maintained by the supplier. Procurement documents also require the right of access to supplier facilities and records for inspection and audit. Deviations from procurement documents are approved by the organization responsible for procurement of the item or service.

Procurement requisitions are reviewed for inclusion of necessary requirements, proper referencing of procurement specifications, drawings, etc. A qualified checker performs the review and verifies its adequacy. An engineer of the originating work group or designee then approves the document.

QA Level 1 procurements are so identified and verified to contain the applicable QA requirements. The reviews and approvals described above are documented and retained as records. Revisions to procurement documents are reviewed and approved in the same manner as the originals.

Suppliers are evaluated to assure that they have adequate QA controls consistent with the quality level of the item or service being procured, including sub-suppliers. The QA organization monitors conformance with the supplier's QA program. The requirements for procurement document control by suppliers shall be verified to be included in their QA programs.

A current list of approved suppliers providing services to procuring organizations is maintained by the LES QA organization and is a controlled document, to be issued as required.

LES or its designated representative originates purchase orders in strict accordance with the approved procurement document and revisions thereto. An independent check for the correct transfer of data from the procurement document (i.e., the purchase requisition) to the purchase order is performed. This includes confirmation that the supplier is approved.

SECTION 5 INSTRUCTIONS, PROCEDURES, AND DRAWINGS

Written instructions and procedures, approved by authorized individuals shall address:

- Actions to be accomplished
- Associated responsibilities
- Methods or systems used
- Appropriate quantitative (e.g., dimensions, tolerances, operating characteristics) and qualitative acceptance criteria
- Identification of interfacing procedures
- Sequence of activities or operations.

To ensure that design requirements imposed by codes, standards, regulations, and site considerations have been considered, procedures provide for review, approval and documentation of activities that affect the quality of structures, systems, and components.

The LES QA Program requires procedures which specify that work performed shall be accomplished in accordance with the requirements and guidelines imposed by applicable specifications, drawings, codes, standards, regulations, quality assurance criteria and site characteristics.

Acceptance criteria established by the engineering organization are incorporated in the instructions, procedures and drawings used to perform the work. Documentation, including test results, and inspection records, demonstrating that the work has been properly performed is maintained. Procedures also provide for review, audit, approval and documentation of activities affecting the quality of items to ensure that applicable criteria have been met.

Maintenance, modification, and inspection procedures are reviewed by qualified personnel knowledgeable in the quality assurance disciplines to determine:

- The need for inspection, identification of inspection personnel, and documentation of inspection results, and
- The necessary inspection requirements, methods, and acceptance criteria have been identified.

Generally, four types of facility procedures are used to control activities: operating procedures, administrative procedures, maintenance procedures, and emergency procedures. Facility procedures shall be reviewed by an individual knowledgeable in the area affected by the procedure on a frequency determined by the age and use of the procedure to determine if

changes are necessary or desirable. Procedures are also reviewed to ensure all procedures are maintained up-to-date with facility configuration. These reviews are intended to ensure that any modifications to facility structures, systems or components are reflected in current maintenance, operating and other facility procedures.

SECTION 6 DOCUMENT CONTROL

Procedures are established which control the preparation and issuance of documents such as manuals, instructions, drawings, procedures, specifications, and supplier-supplied documents, including any changes thereto. Measures are established to ensure documents, including revisions, are adequately reviewed, approved, and released for use by authorized personnel.

Document control procedures require documents to be transmitted and received in a timely manner at appropriate locations including the location where the prescribed activity is to be performed. Controlled copies of these documents and their revisions are distributed to and used by the persons performing the activity.

Superseded documents are destroyed or are retained only when they have been properly labeled. Indexes of current documents are maintained and controlled.

An electronic document management system may be utilized to identify and track the status of each document that is required to be controlled. Hard copy distribution of controlled documents is provided when needed in accordance with applicable procedures (e.g., when electronic document management system is not available).

SECTION 7 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES

The procurement of material, equipment and services shall be controlled to ensure conformance with specified technical and quality requirements. These controls shall provide for the following as appropriate: source evaluation and selection, objective evidence of quality furnished by the supplier, source inspection, audit, and examination of material, equipment and services upon delivery or completion.

An audit or pre-award survey is conducted by an audit team utilizing a comprehensive checklist. The purpose of the audit is to assess the supplier's documented QA program and its compliance with the applicable criteria of 10 CFR Part 50, Appendix B and this QAPD. The audit team prepares a formal audit report that states whether or not the supplier is approved to supply the specific items or services. The audit report is reviewed and approved or disapproved by the QA Director or QA Manager. An approved supplier may then be included on the QA Approved Supplier's List. This approval is a prerequisite for supplier acceptance.

The LES QA organization shall complete a satisfactory reevaluation of each supplier annually in the anniversary month of the most recent evaluation in order to keep the supplier on the Approved Suppliers List. During the annual evaluation of suppliers, the LES QA organization reviews the audit files, including surveillance of suppliers and nonconformances, to determine if their program is still acceptable. If no activity is indicated in the file, the QA organization may perform an audit or may ascertain whether a supplier's QA program is still in place. Suppliers send copies of their QA Program Description to LES, along with subsequent changes to their program description. These program descriptions and changes may be reviewed to determine if the program remains acceptable.

The QA Supplier Audit Program reviews all phases of procurement and control of certificates of conformance. Audits verify that a process is in place assuring that certificates of conformance are properly based on a system of checks and balances. Surveillance in supplier plants verify this process, and procurement documents require the supplier to certify materials as required by applicable standards. Certificates of conformance and QA records are reviewed by QA personnel to ensure that documents are acceptable. This review is detailed in implementing procedures for this process.

After supplier selection is made, a purchase requisition is prepared which includes applicable QA requirements.

The LES QA Program requires procurement procedures that implement the surveillance program for suppliers and sub-suppliers, as necessary. This ensures that items and services procured are in compliance with applicable procurement documents. These procedures provide for surveillance of those characteristics or processes to be witnessed, inspected or verified. Surveillance activities ensure that the supplier complies with all quality requirements outlined in the procurement documents. The surveillance report becomes a part of the QA file for the item or service. The surveillance representative has the authority and responsibility to stop work when the required quality standards are not met.

Each shipment of items procured from a supplier must be accompanied by a certificate of conformance (or equivalent) that identifies the applicable procurement documents and items. The certificate specifies that the item meets the procurement requirements and lists the documentation transmitted, if any, including repair records and descriptions of any deviations.

The LES QA organization reviews and approves this documentary evidence of item conformance with procurement requirements.

Receipt inspections are performed by the QA organization and in accordance with written procedures to verify item conformance to procurement documents prior to being placed in service or used. During the receipt process, items are reviewed for proper identification and required documentation including test results have been received and are acceptable. Upon completion of receipt inspection, items shall be readily identified so as to easily ascertain the acceptance status of the item (i.e. "accept," "reject," or "hold").

Materials that do not meet specified requirements during the receiving process are identified as nonconforming per Section 15 of this QAPD. QA is actively involved in the disposition and corrective action taken as a result of the non-conformance.

Warehouse personnel issue QA released materials, including spare or replacement parts, to facility workers. Maintenance orders, job orders and modification reports must indicate which items (materials) are used during plant maintenance or modification process. Detailed implementing procedures are used to control these processes.

LES or its representative ensures that supplier QA programs provide for audit, evaluation and approval of sub-suppliers supplying items and services. This assurance is accomplished by reviewing supplier audits of sub-suppliers as part of the pre-bid or pre-award audit, by making supplier control of sub-supplier work a criterion for supplier approval or disapproval, and by making supplier audit of sub-suppliers a requirement of the purchase requisition.

Consultant services that provide technical assistance are controlled by procedures and documents, as are suppliers of QA Level 1 materials and equipment. The LES QA Program controls documentation of such services. Results of consultant services are reviewed and accepted by the responsible engineer and incorporated into the facility design and documented as required.

SECTION 8 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS

Identification requirements for QA Level 1 materials, parts and components are stated in design specifications, drawings, and procurement documents. Specific identification requirements are as follows.

- Materials, parts, components, assemblies, and subassemblies shall be identified either on the item or records traceable to the item to show that only correct and accepted items are used and installed.

- When required by specifications or codes and standards, identification of material or equipment with traceability to the corresponding mill test reports, certifications and other required documentation is maintained throughout fabrication, erection, installation, or use. Traceability is maintained to an extent consistent with the item's importance to safety.

- Sufficient precautions shall be taken to preclude identifying materials in a manner that degrades the function or quality of the item being identified.

Control of material, parts and components is governed by approved procedures. Specific control requirements include the following.

- Identification of nonconforming or rejected materials, parts or components to ensure that they are not inadvertently used.

- Verification of correct identification of materials (including consumable materials or items with a limited shelf life), parts, and components shall be required to prevent the use of incorrect or defective items.

- Receipt inspection to ensure that materials, parts or components are properly identified and that supporting documentation is available as required by procurement specifications.

SECTION 9 CONTROL OF SPECIAL PROCESSES

The LES QA Program requires that special processes such as cleaning, welding, pipe bending, heat-treating and nondestructive examination are controlled and accomplished by qualified personnel using qualified procedures. Special processes must conform to applicable codes, standards, specifications, criteria and other identified special requirements.

Engineering, construction, technical support, operations, QA and maintenance groups determine what is a special process. These groups are best suited for such determination. Special processes are those tasks or activities that require special skills. The governing criteria are industry standards to which LES has committed. These processes are performed to qualified procedures, in accordance with specified requirements, and personnel performing these processes have special training, qualifications, and certifications and have demonstrated proficiency in the task.

Results of special processes are documented to provide evidence of verification. Procedures contain or reference documented procedures, process control sheets, checklists, or similar documents, for the control of special processes. These procedures include appropriate quantitative or qualitative acceptance criteria.

Process procedures and personnel are qualified in accordance with procedures. Personnel performing non-destructive testing are certified in accordance with American Society for Non-destructive Testing, Recommended Practice SNT-TC-1A, "Guidelines for Qualification and Certification of Nondestructive Testing Personnel," 1988 Edition, and its applicable supplements. Welding personnel and welding procedures are certified in accordance with ASME Code, Section IX, "Welding and Brazing Qualifications," when applicable. Qualification records are identifiable and retrievable for both personnel and procedures. Completed checklists and documentation are maintained.

The LES QA Program requires that suppliers are evaluated and approved for adequate control of special processes prior to award of a purchase order.

SECTION 10 INSPECTION

The LES QA Program requires that inspections (source, in-process, final, receipt, maintenance, modification, in-service, operations and decommissioning) be performed for each work operation where necessary to ensure quality. Written procedures describe inspections, measurements, and examinations and list or reference acceptance criteria, both qualitative and quantitative.

Inspections are performed by inspectors who are independent of the personnel who perform the activity. All inspectors are examined and certified in their particular category. Current qualification and certification files are maintained for each inspector. Written procedures require the testing and certification of inspectors.

Inspection procedures, instructions, and checklists contain the following information or require this information on inspection reports.

- Characteristics to be inspected
- Responsibility for the inspection
- Acceptance and rejection criteria
- Method of inspection
- Signature or initials of inspector
- Record of results of the inspection
- Date of inspection
- Information related to applicable nonconformances and corrective action taken
- Filing of records of inspection
- Instrumentation calibration information.

The QA organization specifies inspection hold points, beyond which work is not to proceed without consent of the inspection organization, and witness points in applicable procedures. Inspection procedures or instructions are available with necessary drawings and specifications for use prior to performing inspection operations. The acceptance of the item shall be documented.

Inspections of items are performed for each work operation where necessary to ensure quality. Inspections are conducted during receipt, installation and at completion of installation or repair of items in accordance with written procedures and checklists. Inspection of modifications, repairs or replacements is performed to criteria and procedures commensurate with the original requirements. Results of inspections are documented and, as a minimum, identify the inspector, the type of observation, the acceptability of the result and the action taken in

connection with any deficiencies noted. Inspectors have full authority and responsibility to stop work when conditions adverse to quality are detected. If resumption of work would make later correction impossible, the work cannot proceed until the deficient condition is corrected. Areas requiring corrective measures are re-inspected for compliance prior to acceptance.

SECTION 11 TEST CONTROL

The LES QA Program provides for the control of tests. These tests may be specified by codes, standards, suppliers, and the Owner.

Performance or qualification test requirements are included in purchase specifications that are approved in accordance with approved procedures. Tests may also be specified by referenced codes or standards. It is the responsibility of the supplier to perform tests as required by the specifications. The supplier may not vary from the required tests unless the variation is approved and the test results must be submitted to, and approved by, the responsible engineer and the QA Manager. The engineering organization or QA representatives as appropriate perform monitoring of supplier tests.

Tests, including preoperational tests and post-maintenance/modification tests (which demonstrate plant operability and identify conditions adverse to quality) and operational tests (which verify safe operation of the facility) are performed in accordance with approved procedures. Detailed procedures are developed for each type of test. The procedures shall include provisions for assuring that all prerequisites have been met, adequate test instrumentation is available and used, and that the test is performed under suitable environmental conditions. All tests are performed such that test results demonstrate the item performs as designed. Test records include the following information.

- The item being tested
- A description of the type of test
- Test acceptance criteria
- Evidence of completing and verifying the test
- The date and results of the test
- Information related to applicable nonconformances
- Tester or data recorder identification
- A statement as to the acceptability of the results
- Identification of the person evaluating the test results.

The tests are performed and documented by persons qualified to perform tests. Only equipment calibrated as described in Section 12 may be used. The test results are evaluated and approved by a responsible authority to ensure that test requirements have been satisfied.

SECTION 12 CONTROL OF MEASURING AND TEST EQUIPMENT

To maintain accuracy within specified limits, the LES QA Program requires that tools, gauges, instruments and other measuring and test equipment (M&TE) including process-related instrumentation and controls that have safety significance used in activities affecting the quality of QA Level 1 items, are properly controlled, calibrated, and adjusted at specified periods in accordance with written procedures.

The Technical Services organization is responsible for ensuring effectiveness of the program for calibration of measuring and test equipment during the pre-operation and operations phase. QA verifies the adequacy and implementation of the program, whether it is a supplier service, is performed internally, or both. These activities are audited periodically.

Measuring and test equipment discovered to be out of calibration shall be tagged or segregated and not used until it is recalibrated. Measures are established and implemented to evaluate prior use and control of M&TE found to be "out of tolerance," or "out of calibration." Affected users are notified, when appropriate. The following requirements are included in these written procedures.

- Device identification by the use of a permanently etched or attached serial number.
- Calibration interval by device or generic grouping of devices.
- A label to indicate calibration status.
- An inventory of devices controlled by procedures.
- Reevaluation of devices that have been accepted based on measurements made with other devices that are subsequently found to be out of calibration.
- Techniques and methods, which include the appropriate tolerance requirements, for calibration and adjustment of devices.
- A recall system to ensure return of devices for calibration.
- Preparation and maintenance of calibration records to indicate the identity of the device, date of calibration, identity of the calibration technician, type of observation, results, acceptability, and actions to make the necessary corrections with any deficiencies noted.
- Environmental limitations.
- Standards used to calibrate devices have the capability for the accuracy, stability and range required for the intended use and are certified and traceable to the National Institute of Standards and Technology (NIST). If no national standards exist, the basis for calibration is documented.

- Control measures for the storage, issuance, and shipment of devices.

The reference (primary) and working (secondary) standards used for calibration shall be traceable to the NIST, other recognized standards, or natural law.

SECTION 13 HANDLING, STORAGE, AND SHIPPING

A program is established and implemented to control the handling, storage, and shipping of items. Specifications for handling, storage, shipping, cleaning, and preservation are prepared by the appropriate organization and include special protective requirements to maintain acceptable quality such as: environmental control (e.g., temperature, humidity, pressure, space, loading), containers, shock absorbers, accelerometers, inert gas atmospheres, and identification and documentation (i.e., records of identification, quality control, shipping, receipt, and storage). Controls are provided for the proper storage (including control of shelf life) of chemicals, reagents, lubricants, non-metallic gaskets, and other consumable materials.

Written procedures are developed and used for cleaning, handling, storage, packaging, shipping, and preservation of items. Items are marked and labeled to identify, maintain, and preserve the items' integrity and indicate the need for special controls. As appropriate, these requirements are specified in the procurement documents. Items are received and stored at the facility as set forth in the procurement documents. These procedures are developed to ensure the processes of special handling, preservation, storage, cleaning, packaging, and shipping of items during construction and operation are described. Personnel are trained and demonstrate proficiency in the methods used. Inspections and/or audits are performed periodically to verify these activities.

SECTION 14 INSPECTION, TEST, AND OPERATING STATUS

Process control procedures, test and inspection procedures, installation records, and checklists are used as applicable to control the installation of structures, system and components. These documents contain hold points, activity checklists, and in many cases, step-by-step signoffs which indicate the status of fabrication, installation, inspections, and test. This system is used to prevent inadvertent use of nonconforming items or bypassing of inspections and tests and prevent inadvertent operation.

During operation, in order to ensure that equipment status is clearly evident, and to prevent inadvertent operation, the LES QA Program requires structures, systems and components that are inoperable to be identified as such. This identification may be by means of tags, labels, stamps or other suitable methods. When tags, labels, or stamps are utilized for the identification of equipment status, the issuance and removal thereof is documented to ensure proper control of such identification measures. Also, procedures require that the operability of an item removed from operation for maintenance or testing be verified prior to returning the item to normal service.

Measures taken by QA personnel, during the performance of required inspection and quality control activities, to identify equipment status are controlled by the QA organization independent of measures taken to identify and control equipment status by LES.

Changing the sequence of inspections, tests, and other activities involving safety requires the same controls as the original review and approval.

SECTION 15 NONCONFORMING MATERIALS, PARTS, OR COMPONENTS

The LES QA Program requires that any nonconforming items such as materials, parts, or components be identified and controlled in such a manner that the items are not used, and that the nonconformance be reported to the appropriate department for disposition in accordance with established procedures.

LES or its representative has the responsibility for resolution and approval of the ultimate disposition of nonconforming item reports concerning the design and physical condition of an item. LES or its representative has the responsibility for resolution of nonconforming item reports concerning deficiencies in receipt, fabrication, erection, or construction.

The QA Program requires procedures for the control of nonconforming items. These procedures include the following.

- Notifying the responsible manager of the nonconforming items.
- Tagging or marking (and isolating where possible) items to establish their status as nonconforming.
- Controlling items as necessary to preclude their use until appropriate action has been taken to clear the nonconformances.
- Initiating nonconforming item reports to identify the nonconforming item, describe the nonconformance, disposition of the nonconformance, list the inspection requirements, and include signature approval of the disposition. The QA Director or QA Manager is responsible for assuring that the proper organizations are assigned responsibility for resolution.
- Monitoring the processing of each nonconforming item report.
- Verifying by inspection the acceptability of rework or repair of items originally inspected or by an approved method. Inspection rework and repair procedures are documented.
- Reviewing and approving all resolved nonconforming item reports by the QA organization.

All organizational groups within their areas of responsibility have authority to disposition nonconforming items. Specific responsibilities are detailed in the procedures for identifying and correcting nonconforming items.

SECTION 16 CORRECTIVE ACTION

The LES QA Program identifies the responsibilities and provides authority for those individuals involved in quality activities to identify any condition adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective materials and equipment, and nonconformances. These individuals identify and document conditions adverse to quality, analyze and determine how the conditions can be corrected or resolved and take such steps as necessary to implement corrective actions in accordance with documented procedures.

The LES QA Program requires regularly scheduled inspections, audits and assessments to ensure that needed corrective actions are programmatically identified. LES personnel have the authority and responsibility to stop work if they discover deficiencies in quality. The LES QA Program requires procedures for identifying, reporting, resolving, documenting, and analyzing conditions adverse to quality. Reports of conditions adverse to quality are analyzed to identify trends in quality performance. Significant conditions adverse to quality and significant trends are promptly reported to LES management.

Follow-up action is taken by the QA organization to verify proper implementation of corrective action.

Significant conditions adverse to quality, the cause of the conditions and the corrective action taken to preclude repetition are documented and reported to management for review and assessment.

SECTION 17 QA RECORDS

The LES QA Program assigns responsibility for verifying QA record retention to the QA Director. Applicable design specifications, procurement documents, or other documents specify the QA records to be generated by, supplied to, or held, in accordance with approved procedures. QA records are not considered valid until they are authenticated and dated by authorized personnel.

The LES QA Program requires procedures for reviewing, approving, handling, identifying, retention, retrieval and maintenance of quality assurance records. These records include the results of tests and inspections required by applicable codes and standards, erection and installation records, procurement and receiving records, personnel certification records, design calculations, purchase orders, specifications and amendments, procedures, deviations during manufacture and approvals or corrective action taken, various certification forms, source surveillance and audit reports, component data packages, and any other QA documentation required by specifications or procedures. These records are maintained at locations where they can be reviewed and audited to establish that the required quality has been ensured.

Record storage facilities are constructed, located, and secured in accordance with ASME NQA-1-1994.

SECTION 18 AUDITS

The LES QA Program requires a comprehensive system of periodic and planned internal and external audits and assessments for all phases of design, procurement, construction, operation, maintenance, modification, and decommissioning. Audits are performed to determine effective implementation of applicable criteria in ASME NQA-1-1994 as specified in the QAPD. The LES QA Program establishes periodic review by management to verify that the design, material procurement, construction, and operation are consistent with LES policies, approved procedures and regulatory requirements, and also to assess the scope, implementation and effectiveness of the LES QA Program.

The LES QA Program requires procedures for assessing, auditing, documenting and reviewing audit and assessment results. All organizational components performing quality related activities are audited. Periodic audits are performed of records of processes or activities (e.g., welding, supplier qualification, development of design, record maintenance, or quality control inspections) to determine that procedures are properly and effectively implemented. Audits shall include the objective evaluation of work areas, activities, processes, and items; review of documents and records; and quality related practices, procedures, and instructions, to determine the effectiveness of the LES QA Program. Audit team members selected for technical support purposes to participate in audits shall have technical expertise or experience in the area being audited but not from the area being audited and shall be indoctrinated in audit techniques. Management at all levels of the LES organization shall be actively involved with the audit process.

The frequency of audits is based upon the status and safety importance of the activities being performed and upon work history. The audit system is reviewed periodically and revised as necessary to ensure coverage commensurate with current and planned work activities and to reflect previous LES QA Program compliance performance.

The QA Director or QA Manager initiates all audits. The responsible Lead Auditor and QA Director or QA Manager determine the scope of each audit. The QA Director or QA Manager may initiate special audits or expand the scope of audits in process. The Lead Auditor directs the audit team in developing checklists, instructions, or plans and performing the audit. The audit shall be conducted in accordance with the checklists. The audit team can expand the scope during the audit. The audit team may consists of one or more auditors.

The audit concludes with a post-audit conference between the audit team and responsible management. The conference includes a brief discussion of audit results, including any deficiencies and recommendations. The audit results obtain final review by QA management and are documented in a report. The audit report will be promptly provided to the audited organization.

After receipt of the audit report, responsible management promptly replies in writing to the QA Director or QA Manager describing corrective action and an implementation schedule. When necessary, after receipt of the management reply, an evaluation is performed to verify implementation of corrective action. The re-audit is documented. The QA Director or QA Manager documents the close of the audit with a letter to the responsible management.. All correspondence, checklists, and reports related to the audit are placed in the QA file.

Supplier QA programs require a system of periodic and planned internal and sub-supplier audits conducted by individuals not directly involved in the activity being audited. Supplier QA programs are evaluated and monitored by the QA organization to ensure that applicable LES QA Program requirements are met.

Annual assessments of the overall LES QA Program are initiated and directed by the President of LES. The President selects the assessment team that shall consist of at least two members, none of which is from the area being assessed.

The assessment team conducts a post-assessment conference with responsible management to discuss the results, including deficiencies. A report is generated by the assessment team and is sent to the LES President, QA Director and the QA Manager. The President determines the need for corrective action and re-evaluation.

All pertinent correspondence, checklists and reports related to the assessment are placed in the QA files.

SECTION 19 PROVISIONS FOR CHANGE

This QAPD and applicable implementing procedures are reviewed and revised as necessary to reflect any changes that occur during the design, construction, operation, maintenance, modification, and decommissioning phases. In addition, this QAPD and implementing procedures are revised when corrective actions, regulatory, organizational, or work scope changes warrant changes to the LES QA Program. The LES QAPD is maintained current through design, construction, operation and decommissioning of the facility.

The LES QAPD and implementing procedures are kept current as the design, construction, operation, and decommissioning activities progress, and appropriate changes are made based on any of the following:

- Lessons learned from audit and assessment findings,
- Program improvements identified from analysis of trends, and
- Changes due to regulations, commitments, reorganizations, revised project schedule, or program improvements from continuous review of assessment results and process improvement initiatives.

SECTION 20 QUALITY ASSURANCE PROGRAM FOR QUALITY LEVEL 2 ACTIVITIES

This section outlines the owner defined Quality Assurance Program for Quality Assurance Level 2 activities. For contractors, the QA Level 2 program shall be described in documents that must be approved by LES. The QA Level 2 program shall be applied to owner designated structures, systems, components, and activities. A QA program that meets the requirements of the International Organization for Standardization document ISO 9000 is acceptable for QA Level 2 applications. An approved QA Level 1 program is acceptable for QA Level 2 applications.

Requirements for QA Level 2 are defined below.

Organization

The organization, lines of responsibility and authority are clearly established and documented.

Personnel Qualifications

Measures are established to provide for indoctrination and training of personnel to ensure suitable proficiency is achieved and maintained. Where specific qualifications are required by codes and standards, measures shall be taken to document the qualifications.

Procedures

Work activities are performed in accordance with written procedures. Procedures shall contain the appropriate criteria for determining that prescribed activities have been satisfactorily accomplished.

Document Control

Procedures are established to ensure that appropriate documents are properly initiated, changed, and controlled to prevent use of incorrect or superseded documents.

Design Control

The design shall be defined, controlled, and verified. Applicable design inputs shall be appropriately specified on a timely basis and correctly translated into design documents. Design interfaces are identified and controlled. Design adequacy is verified by persons independent of those who performed the design. Design changes are governed by control measures commensurate with those applied to the original design. Design of systems, structures or components may be verified by the development and service testing of hardware similar to the equipment to be used in the facility. Installation and use of this type of equipment requires approval of LES management.

Control of Purchased Items and Services

Measures are established to ensure conformance with the specified requirements. Measures are established to ensure suppliers of materials, equipment, or services are capable of supplying these items to the quality specified in the procurement documents. This may be done by evaluation and approval of the supplier's products and facilities or audits of the supplier's quality program.

Control of Processes, Measuring and Test Equipment

Processes affecting quality of items or services are controlled. Special processes such as welding, heat treating, and nondestructive examination shall be performed by certified personnel using certified procedures in accordance with specified requirements. To maintain accuracy within specified limits, the LES QA Program requires that devices (e.g., tools, gauges, instruments), and measuring and test equipment including process-related instrumentation and controls that are used in activities affecting the quality of items, are properly controlled, calibrated, and adjusted at specified periods in accordance with written procedures.

Inspections

Inspections required to verify conformance of an item or activity to specified requirements are planned and executed. Characteristics to be inspected and inspection methods to be employed are specified. Inspection results are documented. Inspections for acceptance are performed by persons other than those who performed the work being inspected.

Nonconformances and Corrective Action

Measures are established so conditions adverse to required quality are promptly identified and corrected. Controls are established to prevent inadvertent installation or use of items that do not conform to specified requirements.

Records

Records that furnish documentary evidence of quality are specified, prepared, and maintained. Records shall be legible, identifiable, and retrievable. Records are protected against damage, deterioration, and loss. Requirements and responsibilities for record transmittal, distribution, retention, maintenance, and disposition are established and documented.

Audits and Assessments

Measures are established to verify compliance with the LES QA Program and to determine its effectiveness. The results are documented and reported to and reviewed by responsible management. Follow-up action shall be taken where indicated.

Figure A1. LES Corporate Organization

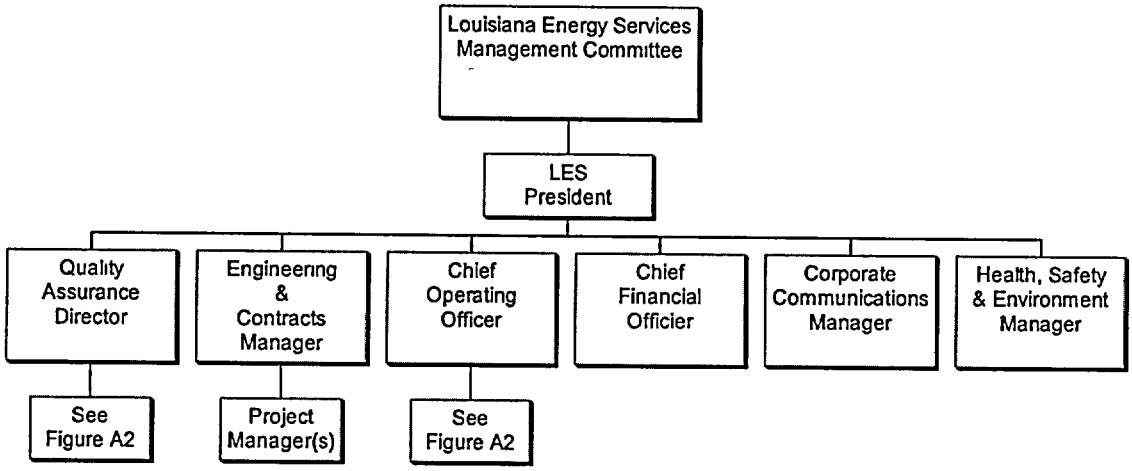

Figure A2. LES Hartsville Enrichment Plant Operating Organization