



## **Supplemental Quality Assurance Plan**

**for the**

### **12 GeV CEBAF Upgrade**

**at**

### **Jefferson Lab**

**For the U.S. Department of Energy**

**Office of Science**

**Office of Nuclear Physics (SC-26)**

**June 1, 2007**



## 12 GeV CEBAF Upgrade Project

### Supplemental Quality Assurance Plan

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**Supplemental Quality Assurance Plan  
for the  
12 GeV CEBAF Upgrade**

**CHANGE LOG**

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## Introduction

Thomas Jefferson National Accelerator Facility (Jefferson Lab), located in Newport News, VA, is owned by the U.S. Department of Energy (DOE) and operated by Jefferson Science Associates, LLC, under Department of Energy Contract No. DE-AC05-06OR23177. The DOE Office of Nuclear Physics (NP) operates the Continuous Electron Beam Accelerator Facility (CEBAF) as a National User Facility at Jefferson Lab for studies of sub-atomic quark structure. The full scope of the 12 GeV CEBAF Upgrade project (12 GeV) includes the upgrade of the maximum electron energy of the main accelerator from 6 GeV to 12 GeV, the construction of a new experimental area (Hall D) dedicated to the study of gluonic excitations, and upgraded capabilities in the three existing experimental halls.

The Director of the Office of Science (SC), Raymond L. Orbach, approved Critical Decision Zero (CD-0 – Approval of Mission Need) on March 31, 2004. He subsequently approved Critical Decision One (CD-1 – Approval of Alternative Selection and Cost Range) on February 14, 2006. This approval authorizes start of Project Engineering Design (PED), as part of the process of gaining approval of Critical Decision Two (CD-2 – Approve Performance Baseline).

The project is controlled by management systems described in the Project Execution Plan<sup>1</sup> for the 12 GeV CEBAF Upgrade project. The primary objective of the 12 GeV QA program, as mandated by the PEP, is to implement the quality assurance criteria in O 414.1A<sup>2</sup>, in accordance with the Jefferson Lab QA Plan<sup>3</sup>, by means tailored to the specific requirements and mission of the 12 GeV CEBAF Upgrade Project. Some elements of JLAB-QAP-01 are incorporated in their entirety into this document by reference.

## Conventional Facilities Construction

In the area of quality, Conventional Facilities Construction is distinguished from the other elements of the 12 GeV Upgrade Project by the fact that, except for a very small internal management oversight effort, all of it is purchased. Procurement of Conventional Facilities Construction services is a Jefferson Lab activity and Department of Energy activity of long-standing, with well-established standards and practices, governed by the Federal Acquisition Regulations. These standards include quality standards, as exemplified by:

- FAR Clause 52-236-5 *Material and Workmanship*, which requires the construction contractor to obtain approval on materials prior to incorporating into the work. The contract specifications state the specific submittals required and Jefferson Science Associates uses the Submittal Log for tracking the approval of these submittals. This clearly serves the purposes of elements of the Quality Monitoring and Inspection and Acceptance Testing sections of this document.

This clause also gives Jefferson Science Associates the authority to require removal of any contractor employee deemed incompetent, which serves some of the purposes of the section on Personnel Qualification and Training.

- FAR Clause 52-236-21 *Specifications and Drawings for Construction*, which provides for variations (substitutions) for materials that do not conform to the specifications, and which serves some of the purposes of the sections of this document on Control of Nonconforming Product.
- FAR Clause 52-246-12 *Inspection of Construction*, which requires the construction contractor maintain an adequate inspection system (quality control) and that all work is subject to JSA inspection (quality assurance). This clause also provides the remedy for accepting non-conforming work with appropriate adjustment in contract price.

These and other FARs provide a comprehensive QA/QC process for Conventional Facility Construction that is already a Jefferson Lab operating contract requirement. Therefore the 12 GeV Upgrade project will not repeat those requirements in this Supplemental QA Plan. Accordingly, the 12 GeV Upgrade project acknowledges a full equivalence between the existing procurement regulations applied to Conventional Facilities Construction activities and the intent of this plan, and determines that, in any disagreement between the requirements of this plan and those of the existing procurement regulations as applied to Conventional Facilities Construction, the latter shall prevail.

## **Section 1: Program**

### **1.1. Purpose**

The purpose of Section 1 is to describe the 12 GeV organizational structure and responsibilities for disciplines that provide for the achievement and verification of quality in a manner that ensures the successful completion of the 12 GeV CEBAF Upgrade Project.

### **1.2. Requirements**

This Supplemental Quality Assurance Plan (SQAP) is established to document, implement, maintain and integrate 12 GeV project functions into the JLab quality management system as set forth in the JLab Quality Assurance Plan.

#### ***1.2.1. Organizational Structure***

The 12 GeV project organizational and management structures<sup>1</sup> are designed to accomplish the project's mission effectively and safely. The 12 GeV project utilizes a management and organizational system, supplemented by documented requirements<sup>4-11</sup> to establish clear and defined roles, responsibilities and authorities.

#### ***1.2.2. Functional Authority, Lines of Authority and Interfaces***

The 12 GeV CEBAF Upgrade Project Manager has the primary responsibility, authority and accountability for management of the Project. He is accountable to the JLab Director, serves as the primary interface to the DOE for the Project and chairs the Change Control Board, as described in the Project Execution Plan<sup>1</sup>.

#### ***1.2.3. Management Commitment***

The 12 GeV CEBAF Upgrade Project Manager demonstrates commitment to the quality management system by developing and implementing a signed quality policy.

#### ***1.2.4. Quality Policy***

The Jefferson Laboratory Quality Assurance Plan<sup>3</sup> is the policy document from which this project-specific quality plan flows.

#### ***1.2.5. Quality Planning***

The 12 GeV CEBAF Upgrade Project Manager, in partnership with Project management and staff, establishes quality objectives. The objectives emphasize compliance with and performance to specifications, standards, and statutes that apply to the Project. Quality objectives and planning are normally updated throughout the duration of the Project.

The responsibility for achieving quality is delegated to the line organization responsible for the item or activity. Processes used to achieve and verify quality shall be commensurate with the complexity and importance of the activity, the risk and consequences of failure, and other relevant factors – using a graded approach. Specific responsibilities shall be defined and assigned in implementing documents. Quality requirements are further defined and described as necessary by the cognizant Subject Matter Expert.

### **1.2.6. Quality Management System**

Processes used by 12 GeV shall be managed in accordance with this plan and as a minimum:

- Identify the processes needed for the quality management system and their application throughout the Project,
- Determine the sequence and interaction of these processes,
- Determine criteria and methods needed to ensure that both the operation and control of these processes are effective,
- Ensure the availability of resources and information necessary to support the operation and monitoring of these processes,
- Monitor, measure and analyze these processes, and
- Implement actions necessary to achieve planned results and continuous improvement of these processes.

Outsourcing processes affecting product quality shall be controlled in accordance with applicable contract requirements and procedures.

### **1.2.7. Graded Approach**

The 12 GeV Project shall implement a graded approach which gives flexibility in the degree of rigor involved when implementing requirements. This allows the requirements to be applied appropriately to items and activities.

Graded approach is a process for determining that the appropriate level of analysis, control, documentation and necessary actions are commensurate with an item's or activity's potential to:

- Create an environmental, safety, health or radiological hazard,
- Incur significant monetary loss due to damage or repair/rework/scrap costs,
- Impact the life cycle stage and/or reduce the availability of equipment or facilities, and
- Unfavorably impact the programmatic mission of JLab or the public's perception of the JLab/DOE mission.

To ensure efficient use of limited resources while maintaining safety and quality, JLab will use the graded approach in implementing this SQAP.

Any interpretation needed for QA requirements or graded approach application of quality program requirements implementation shall be provided by the Project Manager.

## **Section 2: Personnel Qualification and Training**

### **2.1. Purpose**

The purpose of Section 2 is to describe the personnel training and qualification process to be established and implemented by the 12 GeV CEBAF Upgrade Project. It is anticipated that the scope, nature and hazards of the work undertaken by JLab staff in the course of the 12 GeV CEBAF Upgrade Project will be very similar to the scope, nature and hazard of the work presently undertaken by those same staff in support of present programs. Thus, existing programs for personnel qualification and training as described in the Jefferson Laboratory Quality Assurance Plan<sup>3</sup> are directly relevant and applicable.

In addition, if it should prove necessary to undertake work of substantially new scope, nature or hazard, the provisions of that plan<sup>3</sup> will be sufficient for the development and implementation of appropriate personnel qualification and training programs. **Therefore, the purposes of this Section are met by the incorporation by reference of the entire contents of Section 2 of the Jefferson Laboratory Quality Assurance Plan<sup>3</sup>.**

## **Section 3: Quality Improvement**

### **3.1. Purpose**

The purpose of Section 3 is to describe the quality improvement process to be established and implemented by the 12 GeV CEBAF Upgrade Project to ensure requirements are met. The quality improvement process includes measurement, analysis and improvement; nonconformity controls; and data analysis. Also, continuous improvement and corrective and preventative actions will be documented in procedures (to be developed). The quality improvement process ensures the Project requirements are met or exceeded by providing a higher confidence in Project services. It identifies the causes of problems and eliminates recurrence.

### **3.2. Requirement**

The 12 GeV CEBAF Upgrade Project is committed to continuous improvement in cost, schedule and technical performance, EH&S and best business practices.

### **3.3. Quality Monitoring: Travelers**

The 12 GeV CEBAF Upgrade Project shall implement a system of travelers, which will be the primary tool used to monitor process fidelity and product quality.

Travelers shall record successful completion of key process steps and all appropriate quantitative and qualitative measures of process performance and product quality. Data shall be entered into the traveler as the work is being done, and not held for later batch mode data entry. The identity of the person entering the data shall be part of the data. To the extent possible, data entry shall be electronic, computer-based and automated. The database into which the data is collected shall be available for on-line, real-time analysis.

Travelers shall be implemented on a graded basis for all activities during the construction, integration and pre-operational phases of the project. The basis for determination of which activities use travelers and the degree of rigor with which they are implemented shall be the risk to the project associated with a failure of quality in that activity. It is expected that the norm will be for there to be a traveler.

The responsibility for developing, implementing and using a traveler shall fall to the Work Breakdown Structure (WBS) manager for that activity. The responsibility for determining the need for, reviewing and approving a traveler shall fall to the next-higher WBS manager. (This statement is repeated in the section on Responsibilities.)

The requirements of this section shall be imposed on vendors of commercially-produced components, sub-systems and systems through the terms of the procurement contract. Where exemptions to these requirements are cost-effective by reason of limitations of vendor capability, they may be granted, but responsibility for granting the exemption falls to the WBS manager one level above the manager who determined the need for, and approved, the traveler.

### **3.4. Quality Monitoring: Customer Satisfaction**

The ultimate customers for the 12 GeV CEBAF Upgrade Project are Jefferson Laboratory, the experimental physics user community and the Department of Energy. Quality monitoring at this level is clearly important, but it must be supported by monitoring throughout the project. In this context, the “customer” for a component, sub-system, system or process is the WBS manager who integrates the item into his/her sub-system, system or process.

Each WBS manager receiving for assembly or integration, components, systems or sub-systems from another WBS manager shall conduct an incoming inspection of these components, systems or sub-systems, and shall record receipt with satisfactory quality on both the traveler for the item or items being received (if one exists) and on the traveler for the system into which the item or items are assembled or integrated (if that exists).

The linkage thus created should be interpreted as: the existence of a traveler for an item creates a requirement for travelers in all systems including the item.

Each WBS manager receiving for assembly or integration, components, systems or sub-systems that fail to pass incoming inspection shall record that fact on the traveler for the incoming item, and shall file a Nonconforming Product Report with the WBS manager delivering the defective item, with his/her next-higher level WBS manager, and with the Integration Engineer, who will enter an action item in the Jefferson Lab Corrective Action Tracking System<sup>12</sup>.

### **3.5. Quality Monitoring: Data Analysis and Corrective Action**

The Integration Engineer shall analyze all process and product quality data to demonstrate the suitability and effectiveness of the quality management system, to evaluate the continuous improvement of the effectiveness of the quality management system, and to propose process and product improvements. Specific analysis techniques and methods shall be determined by the Integration Engineer.

Problems, nonconformities, analyses and opportunities for improvement shall be documented, since these are likely sources of Project Lessons Learned.

When specific corrective actions are determined, these shall be entered into the Jefferson Lab Corrective Action Tracking System<sup>12</sup> and followed to closure.

### **3.6. Preventive Action**

Preventive actions differ from corrective actions only in the timing of solutions to problems identified. The processes for determining actions are otherwise the same – to identify the root cause of a problem and correct the problem.

### **3.7. Control of Nonconforming Product**

The 12 GeV CEBAF Upgrade Project will ensure that products and processes which do not conform to product and process requirements are identified and controlled to prevent their unintended use or delivery. Nonconforming product or services will be dealt with by one or more of the following:

- Taking action to eliminate the detected nonconformity;
- Authorizing and documenting their use under a concession; or
- Taking action to preclude the intended use or application.

A waiver for the use of non-conforming products or services can be granted by the customer's WBS manager, with the assistance of subject matter experts, as required.

The Project will emphasize process control, continuous improvement and quality production to prevent the occurrence of nonconforming products or services, including Suspect/Counterfeit Items (S/CI). However, when a product/process is discovered that does not conform to 12 GeV expectations or customer requirements, regardless of the source, the overriding priority is to identify, document and segregate the nonconforming/suspect product or stop the process. This will prevent inadvertent delivery of a product or service that does not satisfy the product requirements or process controls expected by the 12 GeV recipient. A graded approach will be applied. Items relied on for safety will have more rigor applied than other items/processes.

### **3.8. Responsibilities**

The WBS manager responsible for an activity, process or product is responsible for developing, implementing and using a traveler to record performance on that activity, process or product.

The next-higher WBS manager is responsible for determining the need for, reviewing and approving the traveler. He/she is typically also the customer for the activity, process or product, and is responsible for incoming inspection, and recording and reporting both acceptable and nonconforming products or services.

The next-to-next-higher WBS manager is responsible for granting authorizations with respect to the disposition of nonconforming product.

## **Section 4: Documents and Records**

### **4.1. Purpose**

The purpose of Section 4 is to describe the documentation and recording process to be established and implemented by the 12 GeV CEBAF Upgrade Project to ensure requirements are met. The 12 GeV CEBAF Upgrade Project documentation and recording process is itself documented in procedures (document control procedures are to be developed, and the records procedures are to be reviewed and revised as necessary). The document control process assures the availability of the current document to the user. Records provide objective evidence to meet regulator expectations and ensure the retrieval of records when needed.

To a considerable degree, documents and records created for the 12 GeV CEBAF Upgrade Project will be created using pre-existing policies and procedures, as described in the Jefferson Laboratory Quality Assurance Plan<sup>3</sup>. Furthermore, at the conclusion of the Project, most of the documents and records will revert to the ownership of the group owning the system to which they apply, for the purposes of operation and maintenance. For these reasons, existing Jefferson Laboratory-wide policies should apply.

During the period of performance of the Project, however, effective and efficient management of the Project requires that Project Management, and in particular, the Associate and Assistant Project Managers, have explicit control of, and authority over, Project documents and records for components, sub-systems and systems in their areas of responsibility. This section therefore closely follows the corresponding section in reference 3, but with appropriate changes to achieve this additional control, and an explicit mechanism for transfer of control to the operational groups at the end of the project.

### **4.2. Requirements**

The 12 GeV CEBAF Upgrade Project documents and records that are produced during the execution of the quality management system, and which provide evidence of conformity to requirements, are controlled, maintained and stored in accordance with their applicable procedures. The Project maintains these documents and records for future activities at the laboratory or whose maintenance is required by law, regulation or the DOE contract, until the end of the Project, at which time responsibility for maintenance is assumed by Jefferson Lab.

#### **4.2.1. Control of Documents**

Documents required by the quality management system shall be prepared, reviewed, approved, issued, controlled and revised, as necessary, to prescribe processes, specify requirements, or establish design.

A 12 GeV CEBAF Upgrade Project procedure shall be established to define the control of documents, and include:

- Review and approval of documents for adequacy prior to issuance,
- Review, revision and approval of each revised document,

- Ensure the relevant version of the applicable documents are available for use at the work location,
- Ensure changes and current revision status of the document are identified,
- Ensure the document remains legible and readily identifiable; ensure the external documents are identified and distribution controlled,
- Prevent the unintended use of obsolete documents, and to apply suitable identification to those documents if they are to be retained, and
- Establish the process by which documents no longer needed for the purposes of the Project may be turned over to the appropriate Jefferson Laboratory group for long-term use in operation and maintenance of the system to which the documents apply.

Obsolete documents will be controlled when they are required to be retained and will be uniquely identified so as to prevent inadvertent use.

#### **4.2.2. Control of Records**

Records shall be established and maintained to provide evidence of compliance with requirements and the effectiveness of the quality management system.

Quality records are established and maintained to:

- Provide evidence of compliance with 12 GeV CEBAF Upgrade Project requirements and of the effectiveness of the quality management system described in this SQAP,
- Measure progress toward achievement of quality goals and 12 GeV CEBAF Upgrade Project requirements,
- Document resolution of customer concerns, and
- Determine customer satisfaction.

12 GeV CEBAF Upgrade Project records shall be maintained. The following requirements for records shall be consistent with the Jefferson Laboratory Records Management Handbook:

- Identification,
- Storage,
- Retrieval,
- Protection,
- Retention, and
- Disposition.

Long-term storage for records so identified by cognizant management shall be the responsibility of Jefferson Laboratory, and conform to the requirements of the Jefferson Laboratory QAP<sup>3</sup>.

Records supporting this SQAP shall be specified, prepared and reviewed to ensure the records are complete, accurate, approved, remain legible, and are readily identifiable, maintained and retrievable.

Records of assessments of 12 GeV CEBAF Upgrade Project operations and activities shall be retained on file and readily available.

Authorized representatives shall have access to records, data and facilities, with the exceptions of data limited by the Privacy Act.

The data not immediately accessible on-line shall be furnished without undue delay.

Quality records shall be retained for the period specified.

### **4.2.3. Responsibilities**

The 12 GeV CEBAF Upgrade Project WBS manager generating records has the responsibility for maintaining the records during the period of performance of the Project, and when so directed by the Project Manager, for handling the records, and responsibility for their further maintenance to the group responsible for the system to which they apply.

The responsibility and authority for development of the procedures that implement the 12 GeV CEBAF Upgrade Project SQAP are assigned to the Project Manager, who may delegate them, as appropriate, to an Associate or Assistant Project Manager. These responsibilities include maintenance of procedure development, including revisions, and the records generated by the procedures. The Project Manager will determine when documents and records are no longer needed by the project and may be turned over to the appropriate Jefferson Laboratory group for long-term use for system operation and maintenance.

12 GeV CEBAF Upgrade project managers, supervisors and team leaders are responsible for ensuring employees have access to the current document for use.

12 GeV CEBAF Upgrade project managers and supervisors are to ensure the data not immediately accessible on-line will be furnished without undue delay.

## **Section 5: Work Processes**

### **5.1. Purpose**

The purpose of Section 5 is to describe 12 GeV CEBAF Upgrade Project work processes to be established to ensure that the requirements of the Jefferson Laboratory Quality Assurance Plan<sup>3</sup> are met.

12 GeV work processes are documented in procedures (to be developed). Work processes establish technical standards and administrative controls using approved documents. They ensure items are identified, controlled and properly used; that items are maintained to prevent damage, loss or deterioration, and that equipment used for data processing are calibrated and maintained.

## 5.2. Procedures

The function of a procedure is twofold: by specifying precisely the steps in a process and their order, use of the procedure helps to ensure reproducibility of product or service, and the same documented information provides a precise and complete training and qualification syllabus for workers.

The functionality of a procedure determines its nature: a list of initial conditions and required materials and a set of clearly described steps which lead the worker to take the provided materials and safely transform them to the desired product.

12 GeV activities will be carried out as directed in approved procedures. A graded approach shall be used in identifying those activities where procedures are required. The basis for the determination of need for a procedure will be the risk to the project entailed in a failure to perform work reproducibly. Given the complexity of most of the equipment being constructed for the Project, it is expected that procedures will be put in place for most activities.

Procedures shall be developed, implemented and used by the WBS manager responsible for the activity, product or service.

The need for a procedure will be determined by the next-higher WBS manager, who will also review and approve draft procedures.

Copies of procedures shall be prominently posted in the areas in which they are used.

All workers shall be trained on and qualified in the procedures necessary to safely and effectively carry out their assigned tasks. Qualification shall be indicated by signature of the worker and his/her supervisor on the posted procedure.

Procedure and process improvement is an integral part of the organizational response to production difficulties and product nonconformance.

## 5.3. Work Environment

12 GeV shall control and monitor work processes to the extent applicable to meet requirements, to ensure that work is performed consistent with technical standards, administrative controls and hazard controls adopted to meet regulatory or other requirements using approved processes and procedures.

Measuring and testing equipment used for process monitoring or data collection shall be calibrated and maintained.

# Section 6: Design

## 6.1. Purpose

The purpose of Section 6 is to describe 12 GeV CEBAF Upgrade Project design processes to be established and implemented to ensure that requirements are met. **The purposes of this Section**

are met by the incorporation by reference of the entire contents of Section 6 of the Jefferson Laboratory Quality Assurance Plan<sup>3</sup>.

## **Section 7: Control of Purchased Items and Services**

### **7.1. Purpose**

The purpose of Section 7 is to describe the procurement process to be established and implemented by the 12 GeV CEBAF Upgrade Project to ensure requirements are met. **The purposes of this Section are met by the incorporation by reference of the entire contents of Section 7 of the Jefferson Laboratory Quality Assurance Plan<sup>3</sup>.**

## **Section 8: Inspection and Acceptance Testing**

### **8.1. Purpose**

The purpose of Section 8 is to describe the inspection and testing process, including training, to be established and implemented by the 12 GeV CEBAF Upgrade Project to ensure requirements are met. Inspection and testing activities ensure that the proper product is produced, inspected, tested and installed, reducing or eliminating re-work, and providing a safe and cost effective product.

The 12 GeV inspection and acceptance testing process will be documented in procedures.

### **8.2. Requirements**

12 GeV Project management determines when inspections and tests are necessary to determine the quality of a process or product. Such inspections and tests shall be conducted in a manner that assures conformance to the established criteria. The results of inspections and tests are used as a basis for acceptance by a comparison with approved acceptance criteria provided or referenced by the purchase order or other documentation. The signature of the responsible individual indicates acceptance of inspection and test results. Individuals performing the activities shall be trained and qualified/certified prior to performing the inspection and testing activities.

### **8.3. Graded Approach**

A graded approach will be applied to the determination of the level of inspection and acceptance testing to be applied to each incoming component, sub-system and system. The basis for the determination shall be the risk to the project arising from failure of the incoming item to meet its specifications. It is anticipated that the majority of items will have some level of inspection and acceptance testing.

## **8.4. Acceptance Criteria Lists**

The WBS manager responsible for acquisition of an item, with the assistance of subject matter experts as appropriate, will generate, implement and use an Acceptance Criteria List for the item, which details the specifications the item must meet, and the inspection and test results needed to verify that the item is acceptable.

The next-higher level WBS manager will determine if inspection/acceptance testing is necessary, and will review and approve the Acceptance Criteria List.

## **8.5. Documentation**

The results of the inspection and testing process shall be documented and maintained as records providing evidence of conformity. In the event that the product does not meet its requirements, a Nonconforming Product Report shall be generated and processed as in Section 3.

## **8.6. Measuring and Test Equipment**

Control of Measuring and Test Equipment used for verifying conformance to requirements, monitoring processes or collecting data, including the portable and bench test equipment used for critical acceptance testing shall be in accordance with established procedures that specify the methods and frequency of calibration and identification and control of Measuring and Test Equipment found to be out-of-calibration or out-of-tolerance.

Gauges and meters that are permanently installed and are integral to a system shall be calibrated on initial installation and at specified intervals to assure the gauges and meters are within the acceptable ranges.

Measurement and Test Equipment calibration records are to be maintained.

## **8.7. Responsibilities**

Responsibility for maintenance, security, calibration and usage of each item of measuring and test equipment is the responsibility of the supervisor to whom the item is assigned.

# **Section 9: Management Assessment**

## **9.1. Purpose**

The purpose of Section 9 is to describe the management assessment process to be established and implemented by the 12 GeV CEBAF Upgrade Project to ensure requirements are met. **The purposes of this Section are met by the incorporation by reference of the entire contents of Section 9 of the Jefferson Laboratory Quality Assurance Plan<sup>3</sup>.**

## **Section 10: Independent Assessment**

### **10.1. Purpose**

The purpose of Section 10 is to describe the independent assessment process to be established and implemented by the 12 GeV CEBAF Upgrade Project to ensure requirements are met. **The purposes of this Section are met by the incorporation by reference of the entire contents of Section 10 of the Jefferson Laboratory Quality Assurance Plan<sup>3</sup>.**

## References

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- 1) Project Execution Plan for the 12 GeV CEBAF Upgrade Project, June 2007.
- 2) O 414.1A, "Quality Assurance".
- 3) Jefferson Laboratory Quality Assurance Plan, JLAB-QAP-01, January 11, 2007.
- 4) 12 GeV CEBAF Upgrade, System Requirements Document for Accelerator, April 2007.
- 5) 12 GeV CEBAF Upgrade, System Requirements Documents for Hall A, April 2007.
- 6) 12 GeV CEBAF Upgrade, System Requirements Documents for Hall B, April 2007.
- 7) 12 GeV CEBAF Upgrade, System Requirements Documents for Hall C, February 2007.
- 8) 12 GeV CEBAF Upgrade, System Requirements Documents for Hall D, February 2007.
- 9) 12 GeV CEBAF Upgrade, Space Program and Design Criteria Document for Hall D Conventional Facilities, April 2007.
- 10) 12 GeV CEBAF Upgrade, Space Program and Design Criteria Document for Conventional Facilities Accelerator Projects, March 2007.
- 11) 12 GeV CEBAF Upgrade, Space Program and Design Criteria Document for CHL Addition, March 2007.
- 12) Jefferson Lab Corrective Action Tracking System.