



2331 Topaz Drive, Hatfield, PA 19440

800-219-9095

Fax: 800-219-9096

Website: www.labtesting.com

E-mail: sales@labtesting.com

QUALITY SYSTEM PROGRAM MANUAL

Original Rev. Issued May 13, 1985

Revision 18 Issued July 27, 2007

This manual is the property of Laboratory Testing, Inc. and incorporates procedures developed by the company. Δ

Section i

POLICY AND AUTHORITY STATEMENT

It is the policy of Laboratory Testing, Incorporated (LTI), as a Material Organization, to furnish and perform testing services in nondestructive, mechanical, chemical, metallographic and metrology fields, including the production of test specimens and machining services, in accordance with all applicable requirements and regulations and to serve our customers needs and expectations with professionalism, competence and the highest degree of ethical standards. LTI's Quality Policy is also defined in the latest revision of Laboratory Testing Procedure ***LTI-QPOLICY**.

To accomplish this objective, Laboratory Testing, Incorporated has developed and implemented this Quality System Program Manual that contains the quality **management** system organizational structures and practices required by the documents as indicated in Section 3.

This Quality System Program Manual shall include instructions for preparation and review of written procedures, training, monitoring or all activities concerned with the control of operations and materials, conducting of examinations and tests, calibration services, calibration of measurement and test equipment, periodic audit of the overall Quality System Program, corrective action, retention of essential records, the protection of customer confidential information and proprietary rights (***LTI-C&P RIGHTS**), preparation of test and examination reports and the purchasing of materials and services to be able to perform all of the above activities.

This manual shall apply to all work performed in the laboratory's permanent facilities, at sites away from it's permanent facilities or in associated temporary or mobile facilities.

Laboratory Testing Incorporated is a corporation registered in the State of Georgia and is located at 2331 Topaz Drive – Hatfield, Pennsylvania 19440.

The authority and organizational freedom are hereby granted to the Quality Assurance Manager to implement and maintain the quality **management** systems, including the resources needed to implement and maintain the Quality System Program and the responsibilities described in **Section 4.7** of this manual. **The signatures below acknowledge the granting of this authority and the acceptance of this responsibility.**

*** See Section 20 for Procedure Number and Title.**



Frank Peszka
Quality Assurance Manager
Laboratory Testing, Inc.
July 27, 2007



Michael J. McVaugh
President
Laboratory Testing, Inc.
July 27, 2007

TABLE OF CONTENTS

Δ

SECTION	TITLE
1	Revision Summary Acceptance
2	Organization Chart
3	Quality System Program
4	Personnel: Responsibilities, Qualifications, Certification
5	Internal Audit
6	Order Entry / Quality Review
7	Document Control
8	Identification and Traceability
9	Accommodation and Environment
10	Equipment and Reference Materials / Standards
11	Equipment, Tool and Instrument Control
12	Examination, Test, Calibration Services and Specimen Preparation
13	Nonconforming Material
14	Handling, Storage, Preservation and Shipment
15	Certification
16	Control of Records
17	Supplier Evaluation
18	Procurement Document Control
19	Correction Action, Preventative Action and Continuous Improvement
20	<i>Referenced Procedures and Documents</i>

SECTION 1

DELETED ITEMS FROM PREVIOUS REVISION

(Areas marked with Δ throughout this revision)

ITEM NO.	ITEMS DELETED
Cover	Reproduction of any part thereof or use for purposes other than those expressly permitted by Laboratory Testing, Inc. in writing is strictly prohibited.
Table of Contents	Revision / Date of Each Section of Manual
Paragraph 4.5.8	Review of completed Technique and Inspection Records in the absence of any of the Lab Managers and / or Supervisors. (was 4.3.8 in Rev. 17)
Paragraph 4.6.2	Address customer questions or concerns on order status and order requirements, as needed. (was 4.4.2 in Rev. 17)
Paragraph 4.7.21	Review of completed Technique and Inspection Records in the absence of any of the Lab Managers and their assistants. (was 4.5.21 in Rev. 17)
Paragraph 4.7.22	The review of customer's Contracts/Purchase Orders. (now 4.7.3) (was 4.5.22 in Rev. 17)
Paragraph 6.2.2 (d)	To determine if manufacturing is required.
Paragraph 8.2.3	Equipment provided for calibration, shall have the results processed in accordance with Section 15 of this manual. Technique and Inspection Record shall not be signed until calibration is completed and results recorded.
Paragraph 12.6.2	Observations, data and calculations are recorded at the time they are made and are identifiable to the specific task.
Paragraph 12.6.3	Errors shall be crossed out, not erased or whited out, made illegible or deleted, and the correct value entered alongside. All such alterations to records shall be signed or initialed and dated by the person making the correction. The use of correction fluid on any of the Quality Records is strictly prohibited. In the case of records stored electronically, equivalent measures shall be taken to avoid loss or change of original data. (now 16.2.7)
Paragraph 13.3.6.1	In cases where personnel caused the deficiency, the person shall be suspended from performing the deficient process until retrained or other disciplinary action can be taken.
Paragraph 16.2.7 Last Sentence	(Annotating amended or corrected onto the document after the change).
Section 20	Exhibits

NOTE: *All other changes from the previous revision are notated in bold and italics.*

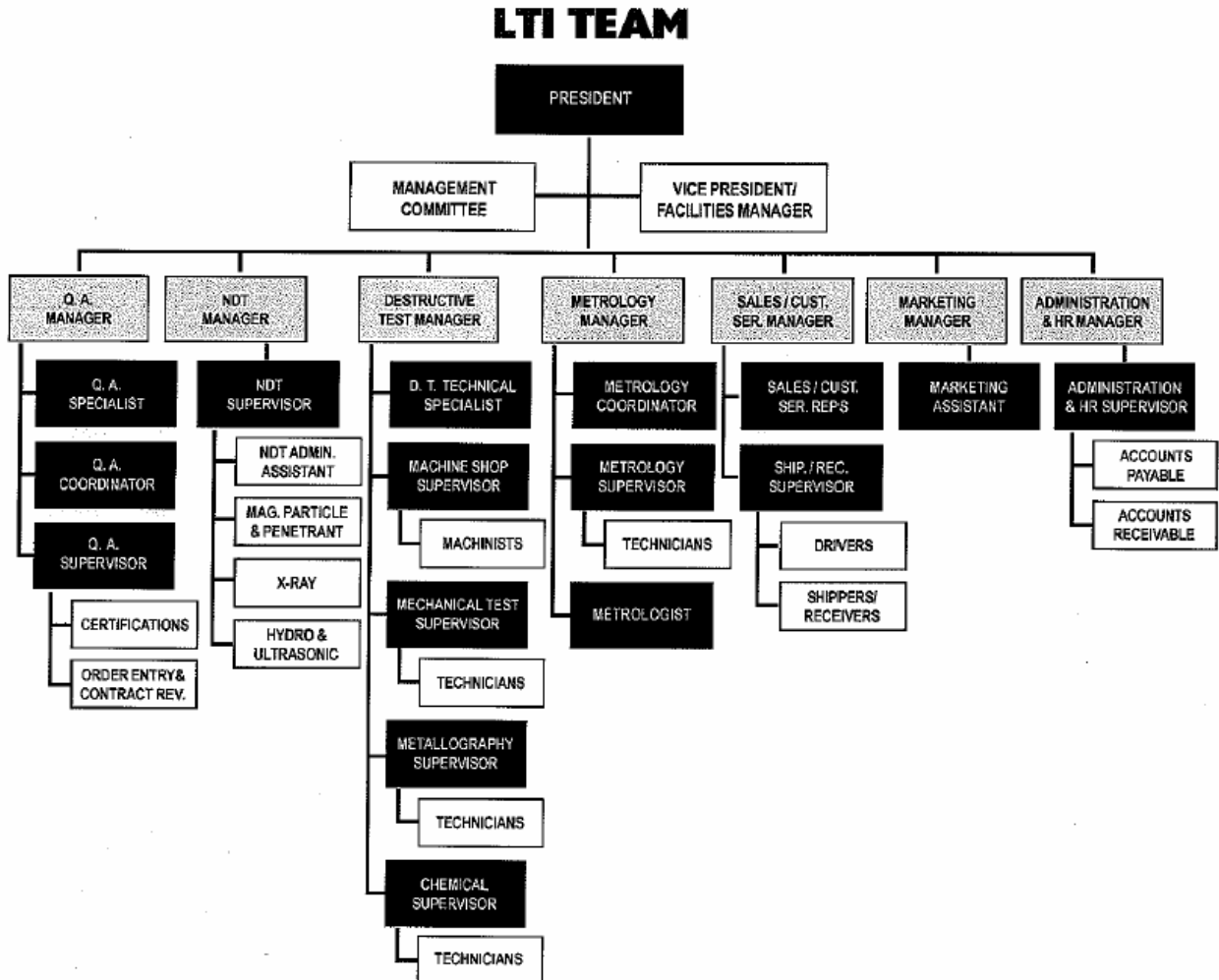
Quality Assurance Approval:


Frank Peszka, Quality Assurance Manager

Corporate Approval:


 Michael J. McVaugh, President

SECTION 2
ORGANIZATION CHART



SECTION 3

QUALITY SYSTEMS PROGRAM

3.1 SCOPE:

- 3.1.1 This section provides for the description of the documentation systems used at Laboratory Testing, Inc. (LTI), including instructions on how this quality manual will be controlled.
- 3.1.2 This Quality Systems Program Manual contains a description of the system and is further supplemented by procedures that detail the operational controls of specific processes and examinations.

3.2 MANUAL CONTROL:

- 3.2.1 This manual and any associated procedures shall apply to all testing, dimensional inspections, examinations, calibration, specimen preparation and machining services performed by LTI and the purchasing of materials and equipment to be able to perform the above to the requirements of the Codes, Standards, Specifications or Regulations referenced in Paragraph 3.2.2. In addition, applicable sections of this manual shall apply to that testing, examinations, calibration, specimen preparation and machining services performed to the requirements of the Codes, Standards, Specifications or Regulations referenced in Paragraph 3.2.2, which are subcontracted by LTI.
- 3.2.2 This manual and associated documents are written so as to meet or exceed the applicable requirements of the ***standards / specifications listed below. The latest applicable edition, addenda or revision shall be maintained.***
- a) ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NCA (NCA-3800)
 - b) 10CFR50, Appendix B
 - c) MIL-I-45208A
 - d) MIL-STD-45662A
 - e) ANSI / NCSL Z540-1
 - f) ISO / IEC 17025
 - g) ISO-9001
 - h) ANSI / ASME NQA-1, Basic Requirements
 - i) ISO-10012-1
 - j) ASTM E-543

- k) ASTM E-1212
 - l) AS7101
 - m) AS7006
 - n) **AS9100**
 - o) **AS7114**
 - p) **10CFR21**
 - q) **ISO / TS 16949**
- 3.2.3 This Quality System Program Manual and revisions will be issued to controlled manual holders, the American Association for Laboratory Accreditation (A2LA) and Performance Revision Institute (PRI).
- 3.2.4 This manual and associated procedures shall be controlled in accordance with LTI Procedure ***LTI-MAN-CTRL.**
- 3.2.5 This manual and associated procedures shall be reviewed and revised by the Quality Assurance Manager for conformance to the latest issues of the Codes, Standards, Specifications and Regulations referenced in paragraph 3.2.2.
- 3.2.6 The Quality Assurance Manager is responsible for obtaining the approval of the President of LTI for this Quality System Program Manual.

3.3 DOCUMENTATION TIERS:

- 3.3.1 Quality System Program Manual
- 3.3.2 Quality Procedures
- 3.3.3 Department Procedures and Technique Sheets

*** See Section 20 for Procedure Number and Title**

SECTION 4

PERSONNEL: RESPONSIBILITIES, QUALIFICATION, CERTIFICATION

- 4.1 It shall be the responsibility of the Quality Assurance Manager to assure that all personnel performing functions within the scope of this manual are qualified and / or certified as required. This shall include nondestructive testing, mechanical testing, chemical analysis, dimensional inspection, calibration and specimen preparation personnel.
- 4.2 **Responsibilities – All Personnel:** All LTI personnel shall be responsible for:
- 4.2.1 Proper handling of materials in-plant to preclude damage or contact with detrimental materials.
 - 4.2.2 Maintenance of material traceability while in-plant.
 - 4.2.3 ***Notifying the Quality Assurance Manager of the following:***
 - a) Suspected loss of traceability
 - b) Equipment Malfunction
 - c) Procedural Discrepancies
 - d) Contaminated Materials
 - e) Suspected Fraud or Malpractice
 - 4.2.4 Maintaining proper qualification for the work assigned.
 - 4.2.5 Having proper procedures on hand for the activity being performed.
 - 4.2.6 Preparation and completion of Technique and Inspection Records for all work performed.
 - 4.2.7 Compliance with applicable requirements of this Quality Systems ***Program*** Manual and related procedures.
 - 4.2.8 All personnel shall be and are free from any commercial, financial ***and*** other pressures which might adversely affect the quality of their work ***or technical judgement.***
 - 4.2.9 All personnel generating data / documents in regard to tests, examinations, calibrations and inspections are required to sign a signature log. Personnel signing the log must print their name, initials and title or position.
 - 4.2.10 All personnel shall comply with the ***LTI Employee Handbook** including avoiding involvement in any activities that would diminish confidence in its competence, impartiality, ***independence in*** judgment or operational integrity.

* See Section 20 for Procedure Number and Title.

4.3 Responsibilities – Management Committee:

- 4.3.1** *The Management Committee shall consist of the President, Vice President and Department Managers. The President may select supervisors and other key personnel to serve on the Management Committee.*
- 4.3.2** *The Management Committee shall be responsible for providing guidance to the President on establishing policy, setting goals and objectives, reviewing performance matrices and taking appropriate action and undertake projects in order to achieve continuing improvement in the management system.*
- 4.3.3** *Meetings shall be scheduled on a regular basis. An agenda and minutes shall be prepared for each meeting.*
- 4.3.4** *The Management Committee shall be responsible for communicating the objectives and effectiveness of the management system by means of department meetings, employee meetings, newsletters and the posting or distribution of key performance indicators.*

4.4 Responsibilities – Outside Board of Advisors:

- 4.4.1** *The Board of Advisors shall consist of business leaders who have been selected by the President and ownership of the corporation. The Board of Advisors shall provide guidance to the President and ownership on the operation of the business. The function of the board is strictly advisory without any responsibility or authority for the operation of Laboratory Testing, Inc.*

4.5 Responsibilities – President:

- 4.5.1** Assuring that the Quality Assurance Manager has the authority and organizational freedom to **meet the responsibilities** listed **in Section i** of this manual.
- 4.5.2** Review the status and adequacy / effectiveness of the Quality Program through the Management Review process included in this manual.
- 4.5.3** Performance of a management audit of the Quality System Program once each year.
- 4.5.4** Ultimately responsible for the storage of **Quality Assurance records**.
- 4.5.5** Assuring that facilities, equipment and personnel are adequate to perform the required work.
- 4.5.6** May perform final review and sign certifications in the absence of the QA Manager **and other authorized signers** in accordance with Section 15 **of this manual**.
- 4.5.7** Reporting of **defects and non-compliances** in accordance with the requirements of 10CFR21.

Δ

4.6 Responsibilities – Vice President / Facilities Manager: Reports to President.

4.6.1 In the absence of the President, perform the responsibilities as stated in **Paragraphs 4.5.3 and 4.5.6.**

Δ

4.6.2 In the absence of any Department Manager and the Supervisor, perform the responsibilities as stated in Paragraphs **4.8 and 4.12.**

4.6.3 Is responsible to acquire and maintain the infrastructure needed, as applicable:

- a) building, workspace and associated utilities
- b) process equipment (both hardware and software), and
- c) supporting services (such as transport or communication).

4.6.4 Maintain the facilities and equipment so they are adequate to perform the required work.

4.6.5 Provide the necessary space for the storage of **Quality Assurance** records.

4.7 Responsibilities – Quality Assurance Manager: Reports to the President.

4.7.1 Is appointed the Management Representative.

4.7.2 Revision and control of this Quality System Program Manual.

4.7.3 Review of customer purchase orders **and contracts** for **defined requirements, capability to meet requirements and the availability of appropriate methods. This responsibility may be performed by Order Entry personnel, Destructive Test Manager, Nondestructive Test Manager, Customer Service Manager, QA Specialist, QA Supervisor, QA Coordinator, Metrology Supervisor, Metrologist, Metrology Coordinator and President.**

4.7.4 **Review / approval and control of all quality, calibration and test procedures.**

4.7.5 Control of non-conforming materials, equipment and services.

4.7.6 Performance of vendor audits and preparation and control of the Approved Vendors List.

4.7.7 Control and documentation of calibration system.

4.7.8 Performance of Internal Audits.

4.7.9 Preparation and control of corrective action requests.

4.7.10 Reporting regularly to management on the status and adequacy of the program.

4.7.11 Assuring that the policies in this manual are strictly followed for all work performed under the scope of this manual.

4.7.12 Identify quality system problems.

4.7.13 Initiate actions which result in solutions.

Responsibilities – Quality Assurance Manager (continued):

- 4.7.14 Verify implementation *and adequacy of corrective actions.*
- 4.7.15 *Control further processing and shipment of non-conforming items, deficiencies or unsatisfactory conditions, until a proper disposition has been obtained.*
- 4.7.16 Monitoring the overall effectiveness of the program by the performance of surveillance / audits, etc.
- 4.7.17 May perform final review and sign certifications in accordance with Section 15 *of this manual.*
- 4.7.18 Control of personnel *indoctrination, training and certification records.*
- 4.7.19 *Review and initial or sign all purchase order that directly effect examination, testing and calibrations.*
- 4.7.20 Oversee preparation of all certifications including review of request for changes to certifications.
- Δ 4.7.21 Delegate others to perform these responsibilities, provided they are independent of the activity or process.
- 4.7.22 Report to the President on all 10CFR21 *defects and non-compliances.*
- 4.7.23 Be sufficiently independent from the pressures of production.
- 4.7.24 Have direct access to responsible management at a level where appropriate action can be initiated.

4.8 Responsibilities – Destructive Test Manager, Metrology Manager and Nondestructive Test Manager: All Managers report to the President.

- 4.8.1 Assuring that all work performed under their supervision is in accordance with the Quality System Program requirements stated in this manual.
- 4.8.2 Assuring that all personnel under their supervisor are trained, qualified and certified, as applicable, for the work performed.
- 4.8.3 *Review test results for accuracy and completeness.*
- 4.8.4 Preparation of Technical operating procedures.
- 4.8.5 Assuring that all equipment under their control is properly maintained and calibrated.
- 4.8.6 Notification of customer “hold points”, when required.
- 4.8.7 *Initiate purchase orders for items and services. Obtain QA review for those purchase orders that directly effect examination, testing or calibration.*

4.9 Responsibilities – QA Specialist: Reports to the QA Manager.

- 4.9.1** Perform final review and sign certifications in accordance with Section 15 *of this manual*, as required.
- 4.9.2** *Verify that purchased items / services that effect examinations, testing or calibration comply with purchase order / specification requirements.*
- 4.9.3** In the absence of the QA Manager, perform the responsibilities as stated in *Paragraph 4.7, except for paragraph 4.7.21.*
- 4.9.4** *Initiate customer complaint records, resolve issues, obtain corrective action and respond to customers.*
- 4.9.5** Perform Internal Audits to meet QA Manual Section 5 requirements.
- 4.9.6** *In the absence of the QA Supervisor, perform or delegate the responsibilities listed in paragraph 4.13.*
- 4.9.7** *In the absence of the QA Coordinator, perform or delegate the responsibilities listed in paragraph 4.10.*

4.10 Responsibilities – QA Coordinator: Reports to the QA Manager.

- 4.10.1** Designated as responsible for performing final review and sign certifications in accordance with Section 15.
- 4.10.2** *Verify that purchased items / services that effect examinations, testing or calibration comply with purchase order / specification requirements.*
- 4.10.3** *As delegated by the QA Manager, perform the responsibilities as stated in Paragraphs 4.7.2 through 4.7.4, 4.7.6, 4.7.8, 4.7.9, 4.7.11 through 4.7.15 and 4.7.17 through 4.7.20.*
- 4.10.4** Maintain customer complaint log and assist in corrective action program.
- 4.10.5** Maintain all internal calibration, which includes the generating of the travelers and revisions to the customer instrument module.

4.11 Responsibilities – All Supervisors: Reports to their Department Managers.

- 4.11.1** Performance of responsibilities of their immediate manager *as delegated by the manager.*
- 4.11.2** *Supervise personnel to ensure that functions are performed in accordance with applicable procedures.*
- 4.11.3** *Assure that trainees work under the direction of persons familiar with the methods and procedures.*

- 4.11 Responsibilities – All Supervisors: Reports to their Department Managers (continued...)**
- 4.11.4 *Provide instructions and training on functions under their responsibility.***
- 4.11.5 *Assess calibration / test results for accuracy and completeness.***
- 4.11.6 *Assign personnel to perform functions for which they are qualified and certified.***
- 4.12 Responsibilities – Customer Service / Sales Manager: Reports to the President.**
- 4.12.1** Primary contact with customers for questions concerning orders and order requirements and notification of “Hold Points”.
- 4.12.2 *Review customer purchase orders, contracts and specifications for defined requirements, capability to meet requirements and the availability of appropriate methods.***
- 4.12.3 *Initial customer contact for complaints. This responsibility includes resolution of the problem and routing of complaints to QA.***
- 4.12.4** Marketing the capabilities of the laboratory to maintain **and** enlarge the LTI customer base.
- 4.13 Responsibilities – QA Supervisor: Report to the QA Manager.**
- 4.13.1 *Review test results for accuracy and completeness*** in accordance with the Quality System Program Manual.
- 4.13.2** Assuring that all personnel under the supervision of the **QA Supervisor** are trained and qualified, as applicable for the work performed.
- 4.13.3** Reports directly to the Quality Assurance Manager and oversees the preparation and proof reading of all certifications.
- 4.13.4 *Signs test reports and calibration certificates in accordance with Section 15 of this manual.***
- 4.13.5 *Supervises order entry function and preparation of technique and inspection reports.***
- 4.14 Responsibilities – Marketing Manager: Reports to the President.**
- 4.14.1 *Responsible for planning and implementing assigned marketing, advertising, corporate planning, research and public relations projects.***
- 4.14.2 *Develop / maintain company web page, literature, newsletters, direct mail, flyers, stationery and other advertising and communication materials.***
- 4.14.3 *Conduct customer and prospect surveys and follow-up calls to collect information on satisfaction with LTI and service needs.***

4.14 Responsibilities – Marketing Manager: Reports to the President (continued...)

4.14.4 *Coordinate arrangements and supplies for tradeshow.*

4.15 Responsibilities – NDT Administrative Assistant: Reports to the NDT Supervisor.

4.15.1 Enter NDT test result data in the computer in preparation for generating a Certified Test Report.

4.15.2 Prepared procedures and forms for review as needed by the NDT department.

4.15.3 Maintain a list of all NDT standards.

4.15.4 *Preparation of Technique and Inspection Reports.*

4.15.5 Address customer questions or concerns for the NDT Department on order status and order requirements, as needed.

4.15.6 Prepare NDT certifications, as needed.

4.16 Responsibilities – DT Administrative Assistant: Reports to the DT Manager.

4.16.1 *Enters test results and prepares Certified Test Reports, as needed.*

4.16.2 *Preparation of Technique and Inspection Reports.*

4.16.3 *Determine testing requirements.*

4.16.4 *Maintain specification files.*

4.17 Responsibilities – Calibration, Testing, Inspection and Specimen Preparation Personnel: Reports to their appropriate Supervisor / Manager.

4.17.1 NDE personnel shall be trained, qualified and certified, when applicable to ***PQ-NDT-1** and the applicable level of SNT-TC-1A. NDE personnel shall be trained, qualified and certified, when applicable to ***PQ-410-1** and the applicable level of the latest revision of **NAS 410**. NDE personnel shall be trained, qualified and certified to ***PQ-2132-1** and the applicable level of the latest revision of MIL-STD-2132.

4.17.2 All other testing and calibration personnel shall be trained and qualified to ***PQ-MAS-1** for the scope of the work to be performed.

4.17.3 Specimen preparation personnel shall be trained and qualified, when applicable, to LTI Procedure ***PQ-MAS-1**.

4.17.4 Dimensional inspection personnel shall be trained and qualified, when applicable, to LTI Procedure ***PQ-MAS-1**.

* See Section 20 for Procedure Number and Title.

- 4.18 Responsibilities – Metrologist: Reports to the Metrology Manager.**
- 4.18.1 Reviews calibration and inspection results for accuracy and completeness.**
 - 4.18.2 Prepares technical operating procedures.**
 - 4.18.3 Ensures that equipment is properly maintained and calibrated.**
 - 4.18.4 Perform the responsibilities of the Metrology Supervisors, as required.**
- 4.19 Responsibilities – DT Technical Specialist: Reports to the Destructive Test Manager.**
- 4.19.1 Oversees distribution of work orders to the appropriate departments.**
 - 4.19.2 Oversees identification of testing requirements.**
 - 4.19.3 Ensures that the Specification and Standards library is maintained.**
 - 4.19.4 Reviews test results for accuracy and completeness.**
 - 4.19.5 Communicates with customers on testing requirements and order status.**
 - 4.19.6 Directs others to perform the functions within this scope of responsibility.**
- 4.20 Responsibilities – Specification / Distribution Coordinator: Reports to the DT Technical Specialist.**
- 4.20.1 Responsible for the distribution of all work orders to the Mechanical, Chemical, Metallographic and Machine Shop.**
 - 4.20.2 Review the purchase order and identify on the Mechanical Test work orders the test requirements.**
 - 4.20.3 Maintain the Specification and Standards Library.**
 - 4.20.4 Addresses customer questions or concerns for the Destructive Test Department on order status and order requirements, as needed.**
- 4.21 Responsibilities – Administration Manager and Director of Human Resources: Reports to the President.**
- 4.21.1 Responsible for all the day to day Human Resource activities.**
 - 4.21.2 Responsible for Accounts Payable and Accounts Receivable.**
 - 4.21.3 Responsible for LTI payroll.**

4.22 Responsibilities – Administration / H.R. Supervisor – Reports to the Administration Manager.

4.22.1 Responsible for the Human Resource activities as directed by the Administration Manager.

4.22.2 Responsible for **accounting functions** as directed by the Administration Manager.

4.23 Responsibilities – Metrology Coordinator – Reports to Metrology Manager.

4.23.1 *Assigns work to technicians.*

4.23.2 *Schedules field work.*

4.23.3 *Notifies customers and subcontracts work when necessary.*

4.23.4 *Reviews subcontractor's documentation for compliance with procurement requirements.*

4.23.5 *Contacts customers when necessary.*

4.24 Personnel Training:

4.24.1 LTI employees shall have the education, experience and training to provide testing and calibration services to meet all customer requirements.

4.24.2 Procedures are established and maintained for identifying training needs and provide for the training of all personnel performing activities affecting quality.

4.24.3 The Quality Assurance Manager shall ensure employees whose function affects quality receive the training / **indoctrination** they need for their position.

4.24.4 Personnel performing specific assigned tasks are qualified on the basis of appropriate education, training and / or experience.

4.24.5 When contracted, and if additional technical and key support personnel are used, LTI shall ensure that such personnel are competent and that they work in accordance with LTI's Quality System.

4.25 CHANGES TO RESPONSIBILITIES AND AUTHORITY:

4.25.1 *The President, upon written notification to the QA Manager, may revise or append responsibilities and authority stated in this manual.*

SECTION 5
INTERNAL AUDIT

5.1 **Scope:**

5.1.1 This section provides instructions for the periodic evaluation and audit of the LTI Quality **Management** system to assure its adequacy and implementation.

5.2 **Procedure:**

5.2.1 Personnel (internal or external) conducting internal audits shall be appointed by the President and have no direct line of responsibility for the area or activity being audited.

5.2.2 Internal auditors shall be qualified in accordance with procedure ***PQ-AUD-1**. Current records of auditor qualifications shall be documented and maintained on file in accordance with the aforementioned procedure. The records shall include education, experience, audit training and examination, and audit participation which shall be used as a basis of qualification and annual evaluation.

5.2.3 Audits of each department, including the quality system, shall be performed at least once each year to a defined documented schedule in accordance with LTI Procedure ***LTI-INT-1**. This shall be accomplished through the performance of audits in the area of responsibility contained within the scope of this manual.

5.3 **Audit Findings and Corrective Action:**

5.3.1 ***Audit deficiencies discovered during the course of an audit will be documented on a Corrective Action Report in accordance with LTI Procedure *LTI-CAR and forwarded to the manager / supervisor who is responsible for the area.***

5.3.2 ***When audit findings cast doubt on the effectiveness of the operation or on the correctness or validity of testing or calibration results, an investigation shall be performed to determine the effect on reported results. The QA Manager or his/her designee is responsible to notify the customers if results have been affected.***

5.3.3 ***Where appropriate, re-audits and follow-up audits of deficient areas shall be conducted to evaluate the effectiveness of the corrective actions taken. Lead time to correct deficient areas is determined by the Quality Assurance Manager based on the seriousness and impact on quality.***

5.4 **Distribution of Results:**

5.4.1 ***The original audit report shall be kept in the Quality Assurance files. Copies shall be distributed to the President and members of the Management Committee.***

* See Section 20 for Procedure Number and Title.

5.5 Management Review:

5.5.1 The President is responsible for performance of an annual review of the Quality **Management** System to determine it's adequacy, effectiveness and implementation. This review shall take into consideration results of the following:

- a. the suitability of policies and procedures;
- b. reports from managerial and supervisory personnel;
- c. the results of recent internal audits;
- d. **corrective and preventative actions;**
- e. assessments by external bodies;
- f. the results of inter-laboratory comparisons or proficiency tests;
- g. changes in the volume and type of work;
- h. customer feedback **and** complaints;
- i. changes that could affect the quality management system and its processes;
- j. other relevant factors, such as quality control activities, resources and staff training;
- k. recommendations for improvement;**
- l. performance as related to objectives.**

5.5.2 Findings or results from the management review and any actions that arise from it shall be recorded. The management shall ensure that those actions are carried out within an appropriate and agreed timetable. The actions shall be related to improvements of the quality management system and its processes, improvement of testing, **machining** and calibrations related to customer requirements, and resources needed.

5.5.3 The Management Review Report shall be distributed to the Management Committee.

SECTION 6

ORDER ENTRY / QUALITY REVIEW

6.1 Scope:

6.1.1 This section shall detail the requirements for order entry and quality review of orders for materials and services within the scope of this manual.

6.2 Procedure:

6.2.1 An order shall be received and processed in accordance with LTI Procedure *RI-1.

6.2.2 ***Order Entry personnel who are part of the Quality Assurance Department review orders to ensure that:***

- a. ***orders*** include appropriate technical requirements and / or methods ***and are documented and understood;***
- b. ***requirements are*** within the scope of LTI's technical capability and resources, and
- c. ***the appropriate test and / or calibration method are selected and documented on the Technique and Inspection Record and are capable of meeting customer's requirements.***

Δ

The review shall also cover any work that is to be subcontracted by LTI.

6.2.2.1 QA personnel and Department Managers may also perform this review.

6.2.3 ***When Order Entry personnel are unable to determine the appropriate test / process or if the customer's test method is inappropriate, the order will be forwarded to the responsible Lab Manager for disposition. The Lab Manager will select the appropriate method, procedure or process. When required, the Customer Service Department or responsible department manager shall notify the customer to obtain a resolution of any questionable items.***

6.2.4 When orders do not meet any of the above items or require additional information, they shall be reviewed by the Quality Assurance Manager and / or the appropriate Laboratory Manager or Supervisor to assure LTI has the capability and resources to comply with the requirements of the order. The Quality Assurance Department shall review any needed changes to purchase orders.

6.2.5 Order entry personnel will enter applicable information into LTI's computerized purchase order tracking system and onto appropriate Technique and Inspection Record.

6.2.6 Once an order has ***been reviewed***, the purchase order shall be ***marked "LTI Contract Review", dated and initialed*** by the Order Entry personnel to document the quality review.

***See Section 20 for Procedure Number and Title.**

6.2.7 The purchase order is part of the records filed by LTI. This includes records of pertinent discussions with a customer relating to their requirements or the results of work during the execution of their contract.

6.3 Changes to Orders:

6.3.1 Changes to orders shall be reviewed by the Quality Assurance Department **or Customer Service Manager**. The Quality Assurance Department **or Customer Service Manager** shall notify the appropriate Lab Manager of any changes to orders affecting processing. The Lab Managers are responsible for changing the Technique and Inspection Record to reflect the change. **The review** shall be documented on change orders as spelled out in **Paragraph 6.2.6**.

6.3.2 **The customer shall be informed of any deviation from the contract.**

SECTION 7

DOCUMENT CONTROL

7.1 Scope:

- 7.1.1 This section provides instructions for the review, issuance and maintenance of customer, commercial, military and internal procedures, specifications, standards and drawings covering systems, traceability, testing, **calibration, machining** and examination.
- 7.1.2 Procedures, standards, specifications and drawings are defined as documents per this manual.
- 7.1.3 LTI Procedure ***LTI-DOC** and LTI Addenda ***DOCSTAR-PROC** describes in more detail document control.

7.2 Distribution:

- 7.2.1 All standard internal procedures **are available online in docSTAR** to personnel using the procedure. **Original hardcopies are maintained in the Quality Assurance Department.**
- 7.2.2 **Effected personnel will be notified of new and revised procedures by the Quality Assurance Department.**
- 7.2.3 It is the responsibility of the Quality Assurance Department to assure that invalid or obsolete procedures are removed from the **docSTAR file. Original hardcopies of superseded procedures are identified and maintained in Quality Assurance.**

7.3 Review, Approval and Revision:

- 7.3.1 All internal procedures and revisions thereto shall be reviewed and approved as described in ***LTI-PROCEDURE** as applicable. Additionally, these procedures are subject to periodic review and / or revision as describe in ***LTI-DOC**.
- 7.3.2 All internal written procedures shall follow the format of ***LTI-PROCEDURE** as close as possible.
- 7.3.3 All internal procedures shall have a review and approval by a technically competent individual and the QA Manager or designee.

7.4 Published Industry and Customer Documents:

- 7.4.1 Published documents such as ASME, ASTM and SAE shall be purchased as required. LTI shall keep up to date with new releases, revisions or addenda of required standards / specifications.

***See Section 20 for Procedure Number and Title.**



- 7.4.2 LTI may maintain relationship(s) with update service(s) to ensure notification and access to the latest documents needed.
- 7.4.3 All published and customer documents shall be maintained in various libraries throughout LTI on an as needed basis.
- 7.4.4 LTI shall also maintain customer specifications where applicable.

SECTION 8

IDENTIFICATION AND TRACEABILITY

8.1 Scope:

8.1.1 This section shall detail the requirements for marking or identification of material and to maintain traceability from the time LTI receives the material, through completion of processes or examinations and ships the material back to the customer or scraps the material at LTI.

8.2 Procedure:

8.2.1 Equipment or material markings or identification are verified against customer purchase orders upon receipt by the receiving department in accordance with LTI Procedure ***RI-1**. Discrepancies or unidentified equipment or material shall be reported to the Quality Assurance Department.

8.2.1.1 Equipment and material shall be tagged or marked with LTI Lab Report Number and put with appropriate Technique and Inspection Record with corresponding Lab Report Number. This identification shall be maintained throughout the process. All calibration equipment in addition shall have a unique number assigned and labeled, tagged or stickered on the material or equipment. When a customer has assigned a number to a piece of equipment this may be used in addition to the unique number.

8.2.1.2 This number will never be issued to another piece of equipment and for LTI equipment will be used to track the calibration history on the equipment.

8.2.1.3 Markings on material shall not be removed unless required by the test or examination procedure. If markings are removed, the material shall be kept with the Technique and Inspection Record at all times, and where possible, be tagged or placed in bags. Marking shall be reapplied when required using either the customer's number or LTI Lab Report Number as appropriate.

8.2.1.4 For Machining Services, all materials will be identified by marking, tagging or through processing document maintained with the material. When machining removes markings, they shall be reapplied upon completion of the operation. When materials are sub-divided, marking will be transferred to each piece of material or the lot identified through tagging or accompanying processing documents. Customer identification or specified marking shall be maintained on materials as required.

***See Section 20 for Procedure Number and Title.**

8.2.2 *Calibration and test results shall be entered into Labman computer program or recorded and accompany the Technique and Inspection Record, submitted to the certification department for formal report preparation. Technique and Inspection Records shall not be signed by the technician until calibration or test is complete.*

Δ

8.2.3 Additional procedures exist for orders referencing ASME Section III.

8.2.4 Equipment provided for calibration as well as materials submitted for examination and test that are suspected of having lost traceability in the LTI plant, ***shall be reported immediately to the Quality Assurance Manager and segregated*** in a holding area designated by the Quality Assurance Manager.

SECTION 9

ACCOMMODATION AND ENVIRONMENT

9.1 Scope:

9.1.1 This section details the general requirements for accommodation and environment for the Laboratory.

9.2 General Requirements:

9.2.1 Each area of test shall have appropriate **energy sources**, lighting, heating, ventilation **and environmental conditions** to facilitate **correct** performance of tests **and calibrations**.

9.2.1.1 Areas that require documentation of specific lighting, heating and ventilation shall have the specific requirements described in working procedures for applicable area.

9.2.2 The environment in which all testing is performed shall be undertaken so as not to **invalidate the results or** adversely affect the required accuracy of measurement or test.

9.2.2.1 Areas that require specific environmental controls shall have those specific controls addressed in working procedures for specific applicable areas.

9.2.3 **Areas that require specific environmental controls shall maintain records for those controls.**

9.2.4 Tests and calibrations shall be stopped when the environmental conditions jeopardize the results of the tests and / or calibrations. (*85-CP-1)

9.2.5 All areas that are incompatible shall have effective separation so as not to adversely affect the required accuracy of measurement or test.

9.2.6 It is the responsibility of all employees to maintain acceptable housekeeping within their respective areas.

9.2.6.1 Acceptable housekeeping shall be defined as floors and equipment clean of litter, trash, grease, oil, dust and anything else that will prohibit personnel from performing their respective jobs.

9.2.7 Access to and use of areas affecting the quality of the tests and / or calibrations is limited to authorized personnel.

9.2.8 **Particular care shall be taken when tests and / or calibrations are undertaken at sites other than the permanent laboratory facility to ensure that environmental conditions do not adversely affect the required accuracy of the measurement and / or test or invalidate the results.**

*See Section 20 for Procedure Number and Title.

SECTION 10

EQUIPMENT AND REFERENCE MATERIALS / STANDARDS

10.1 Scope:

10.1.1 This section describes the control of equipment and reference standards required for the correct performance of tests and calibrations including preparation of test and calibration items.

10.2 Control of Equipment:

10.2.1 Equipment and its software used for testing and calibration will be capable of achieving the accuracy required and shall comply with specifications relevant to the tests. Software shall be controlled in accordance with procedure *LTI-SWQA-1. Measuring and test equipment shall be entered into the Labman instrument module and assigned a unique instrument number. Prior to being placed in service and/or used, equipment shall be calibrated or checked to establish that it meets the laboratory's specification requirements and complies with the relevant standard specifications.

10.2.2 Equipment shall be operated by authorized personnel. Up-to-date instructions or procedures on the use and maintenance of equipment shall be available to appropriate personnel or shall be obtained from the OEM when required. Generally preventative maintenance shall be performed at the time of calibration as indicated in *85-CP-1, ADDENDA A. Maintenance is also performed on an as required basis.

10.2.3 Records are maintained for each item of measuring and test equipment.

10.2.4 The following are entered into the Labman instrument module:

- a. Instrument number**
- b. Description**
- c. Manufacturer, model no. and /or serial no. (where assigned)**
- d. Department where used and work center (if applicable)**
- e. Date in service (indicates initial compliance with specifications)**
- f. Maintenance, modifications & repairs are listed in the "Notes" section of the Labman Instrument module.**
- g. Calibration date and due date**

10.2.5 Calibration Certificates shall include:

- a. Instrument number**
- b. Description**
- c. Calibration date**
- d. Results as-found and as-left**
- e. Acceptance criteria or tolerance**
- f. Calibration frequency or due date for next calibration**

***See Section 20 for Procedure Number and Title.**

- 10.2.6** *All equipment shall be handled, stored and transported in such a manner as to prevent damage and to ensure proper function. Equipment shall be kept clean and free from dirt, oil, rust and other containments that may adversely affect the item or its function. Personnel shall report to their supervisor or manager any damage or malfunction and/or requirements for maintenance of equipment. Equipment that has been subjected to overloading or mishandling, gives suspect results, is defective or outside specified limits shall be removed from service, isolated and labeled or marked to indicate that it should not be used. An evaluation shall be made to determine the affect on previous tests and calibrations and where determined necessary a nonconformance report shall be generated in accordance with LTI Procedure *LTI-NONCONFORMANCE. Where appropriate the customer will be notified.*
- 10.2.7** *Equipment used outside the laboratory's facility shall be controlled in accordance with LTI Procedure *CP-17025-FIELD.*
- 10.2.8** *Whenever equipment is sent outside the laboratory (ex: calibration, repair, etc.) it shall be examined for function and calibration status and determined to be satisfactory prior to being returned to service*
- 10.2.9** *Where practical, measuring and test equipment or its container, shall be labeled with the status of calibration, including the date when last calibrated and the date or expiration criteria when recalibration is due. When not practical to label an item, records are to be readily available to determine its calibration status.*

10.3 **Reference Standards.**

- 10.3.1** LTI has procedures for the calibration of its reference standards. Reference standards are calibrated by an organization that can provide traceability to national or international standards in the International System of Unites (SI). These reference standards are held by LTI and are used for calibration only and for no other purpose, unless it can be shown that their performance as reference standards would not be invalidated. Reference standards shall be calibrated before and after any adjustment.

10.4 **Intermediate Checks.**

- 10.4.1** *Checks needed to maintain confidence in the calibration status of reference, primary, transfer or working standards shall be carried out in accordance with LTI Procedure *LTI-AQMR.*

*See Section 20 for Procedure Number and Title.

SECTION 11

EQUIPMENT, TOOL AND INSTRUMENT CONTROL

11.1 Scope:

11.1.1 This section covers the calibration of all equipment, tools and instruments used for **testing**, inspection, examination and calibration, as well as measurement standards used for calibration.

11.2 Requirements:

11.2.1 A procedure (*85-CP-1) is maintained in accordance with ISO / IEC 17025, MIL-STD-45662, ANSI 45.2, NQA-1, ISO-10012-1 and ANSI / NCSL Z540-1, latest revisions, that include the following requirements:

- a) Unique serialization of all equipment, tools and instruments;
- b) Controls to assure positive identification and disposition of out-of-service equipment, tools and instruments;
- c) Adequacy of instruments and standards for calibration;
- d) Estimates of the uncertainty of measurement where appropriate;
- e) Consideration of environmental controls;
- f) Calibration of environmental controls;
- g) Maintenance of calibration records that are traceable to measuring and test equipment via the serial number or unique identification number and the data included on the calibration record;
- h) Traceability to national or international standards or fundamental physical constants, where such standards exist;
- i) Control of material tested with equipment, tools or instruments discovered to be out of calibration;
- j) The labeling of equipment, tools or instruments to show calibration date, unique number, calibration technician and recalibration date.

11.2.2 LTI will maintain an internal calibration recall system.

11.3 Computerized Equipment:

11.3.1 Where computers or automated equipment are used for the capture, processing, manipulation, recording, reporting, storage or retrieval of test data, LTI shall assure that:

- a) all applicable requirements are complied with;
- b) computer software is documented and adequate for use;
- c) procedures are established and implemented for protecting the integrity of data; such procedures shall include but are not limited to integrity of data entry or capture, data storage, data transmission and data processing;
- d) computer and automated equipment is maintained to ensure proper functioning and provided with the environmental and operating conditions necessary to maintain the integrity of the test data;
- e) it establishes and implements appropriate procedures for the maintenance of security of data including the prevention of unauthorized access to, and the unauthorized amendment of computer records.

*See Section 20 for Procedure Number and Title.

SECTION 12

EXAMINATION, TEST, CALIBRATION SERVICES AND SPECIMEN PREPARATION

12.1 Scope:

12.1.1 This section provides the general requirements on how examinations, testing, specimen preparation and calibration services are carried out at LTI.

12.1.2 LTI shall permit all customers or their representatives' access to LTI to monitor LTI's performance in relation to the work being completed for the customer, provided that LTI ensures confidentiality to other customers.

12.2 Nondestructive Examination:

12.2.1 All nondestructive examinations shall be performed by personnel qualified by the latest revision of *PQ-NDT-1, *PQ-410-1 or *PQ-2132-1, whichever is applicable as specified in Section 4. Current personnel records shall be kept on file in the Quality Assurance Department for each inspector performing nondestructive testing examinations.

12.2.2 All contractually required nondestructive examinations shall be performed in accordance with written, qualified procedures prepared and approved by Level III Examiners and reviewed by the Quality Assurance Manager. This includes instructions on the use and operation of equipment, and on the handling and preparation of samples for testing. The qualified procedures shall be written in accordance with military, customer or national / international voluntary consensus standards and requirements.

12.2.2.1 When necessary to employ methods that have not been established as a standard, the customer shall give written approval to do so, and the method shall be validated.

12.2.2.2 Evaluation of nondestructive examination shall be in accordance with contractually required acceptance criteria.

12.2.3 All nondestructive examination activities are performed in accordance with the procedure or specification referenced on the Technique and Inspection Records, including the customer's acceptance criteria as applicable.

12.2.4 ***When nondestructive examinations are complete, the Technique and Inspection Records shall be completed, dated, signed or initialed by the inspector and level of the inspector performing the test. The results are recorded on work sheets or templates in hard copy or electronic form.***

12.2.4.1 ***When finished, the Technique and Inspection Records shall be submitted to documentation personnel for preparation of formal report.***

12.2.5 NDE processes are monitored on an ongoing basis through daily checks required by specific procedures.

***See Section 20 for Procedure Number and Title.**

12.2.6 When the nondestructive examination is performed by an outside source, the procedure and technique used to perform the examination shall be approved by the Quality Assurance Manager or a Level III, as required. Upon completion of the examination, **Quality Assurance or NDE Level III** shall review results and sign or initial the **subcontractors** report.

12.3 Chemical, Dimensional, Mechanical and Metallurgical:

12.3.1 All chemical, dimensional, mechanical and metallurgical testing shall be performed by personnel qualified to the latest revision of LTI Procedure ***PQ-MAS-1** as specified in Section 4. Current personnel records shall be on file in the Quality Assurance Department for each technician performing testing.

12.3.2 Chemical, dimensional, mechanical and metallurgical testing shall be performed by LTI or an approved outside source in accordance with written procedures, industry specification or equipment manufacturer's instructions. This includes instructions on the use and operation of equipment, and on the handling and preparation of samples for testing. Qualified procedures shall be written in accordance with military, customer or national / international voluntary consensus standards and requirements. All written LTI procedures shall be **reviewed** / approved by the Quality Assurance Manager.

12.3.2.1 When it is necessary to employ methods that have not been established as a standard, the customer shall give written approval to do so, and method shall be validated.

12.3.2.2 All written procedures, industry specifications, or equipment manufacturer's instructions applicable to tests being performed shall be referenced on the Technique and Inspection Records.

12.3.3 **When a chemical, dimensional, mechanical or metallurgical test has been completed, the Technique and Inspection Record shall be dated, signed or initialed by personnel performing the test. The results are recorded on work sheets or templates in hard copy or electronic form.**

12.3.3.1 **When finished, the Technique and Inspection Record shall be submitted to documentation personnel for preparation of formal report.**

12.3.4 **When a chemical, dimensional, mechanical or metallurgical test is performed by an outside source, Quality Assurance, Lab Manager, Supervisor or Metrologist of the respective area involved, shall review the results and sign or initial the subcontractors' report.**

12.4 Calibration Services:

12.4.1 All calibration services shall be performed by personnel qualified to the latest revision of ***PQ-MAS-1** as specified in Section 4. Current personnel records shall be on file in the Quality Assurance Department for each technician performing calibrations.

***See Section 20 for Procedure Number and Title.**

12.4.2 All calibration performed by LTI or an approved outside source, shall be done in accordance with written procedures developed from ANSI, Federal Standards, National / International Standards or equipment manufacturer's instructions. This includes instructions on the use and operation of equipment, and on the handling and preparation of equipment for calibration.

12.4.2.1 When it is necessary to employ methods that have not been established as a standard, the customer shall give written approval to do so, and the method shall be validated.

12.4.2.2 All written procedures, ANSI Specifications, Federal Standards, National Standards or equipment manufacturer's instructions as applicable to the calibration being performed shall be included on the certificate.

12.4.3 Upon completion of calibration, the Technique and Inspection Record shall be signed or initialed and dated by personnel performing the calibration. The results are recorded on work sheets or templates in hard copy or electronic form.

12.4.3.1 ***When items have been calibrated, the Technique and Inspection Record shall be submitted to the documentation personnel for preparation of a formal report.***

12.4.4 ***When calibrations are performed by an outside source, Quality Assurance, Metrology Manager, Metrology Supervisor, Metrologist or Metrology Coordinator shall review the results and sign or initial the subcontractors' calibration certificate.***

12.5 Machining Services.

12.5.1 ***Machining services*** shall be performed by personnel qualified by the latest revision of *PQ-MAS-1. Current personnel records shall be kept on file in the Quality Assurance Department.

12.5.2 When the Machine Shop Supervisor receives a Technique and Inspection Record for ***Machining services***, a Machine Shop Process Control Plan is prepared. The Process Control Plan shall be reviewed and approved by the Machine Shop Manager and Quality Assurance.

12.5.2.1 The Machine Shop Process Control Plan details ***the following:***

- a) Job Number
- b) Customer
- c) Part Name
- d) Material or Part Identification
- e) Drawing and / or Specification
- f) The sequence of operations to be performed.

***See Section 20 for Procedure Number and Title.**

12.5.3 All contractually required machining shall be performed in accordance with the appropriate written procedures.

12.5.4 When required by purchase order, contract or specification, machining jobs shall have a first piece inspection completed and documented on the process control plan.

12.5.5 As each required operation is completed, the operator signs or initials and dates the operation **indicating** completion and forwards the job to the next operation.

12.5.6 Final inspection will be completed by a qualified person other than the machinist that performed the machining and document the results on the Machine Shop Process Control Plan or worksheet.

12.5.7 Upon completion of all machining, the machinist shall give the Machine Shop Process Control Plan and machined specimens or parts to the Supervisor **for shipping**.

12.6 Reports.

12.6.1 **Technique and Inspection reports for all completed examinations, tests and calibration services shall be submitted to the appropriate personnel for preparation of the test reports or calibration certificates.**

Δ

12.7 Procedure Submittal.

12.7.1 Specific examination, testing and calibration procedures are available and shall be submitted for customer review when contractually required.

12.8 Customer “Hold” Points.

12.8.1 **Customer witnessing of tests or calibrations shall be noted on the associated Technique and Inspection Record by the Order Entry personnel.**

12.8.2 When work is ready for testing, the Customer Service / Sales Manager or the appropriate Manager shall be responsible for notifying the customer or their designated representative to coordinate a suitable time for witnessing of the test.

12.8.3 Work shall not proceed until appropriate instructions are received from the appropriate **customer or their designated representative.**

12.8.4 LTI shall ensure the confidentiality of work being performed for other customers during such monitoring.

12.8.5 **Customer representatives shall be provided with the necessary facilities, equipment and the assistance of personnel to perform their functions.**

12.9 Sampling.

12.9.1 Unless otherwise stipulated by contract, all material will undergo testing or examination for 100% of the lot received.

12.10 Assuring the Quality of Test and Calibration Results.

12.10.1 *Monitoring the validity of test, inspection and calibration results shall be performed in accordance with procedures and include, but are not limited to the following:*

- a. *Regular use of certified reference standards and check standards.*
- b. *Participation in proficiency testing and round robin programs.*
- c. *Internal Audits.*
- d. *Recalibration or re-inspection of completed items.*
- e. *Auditing of completed orders.*

12.11 Replacement or Retesting.

12.11.1 Prior to completing Technique and Inspection Record on failed items, replacement or retesting per LTI Procedure ***MAS-RETEST** shall be done wherever possible. If replacement or retesting is done, it shall be so documented on Technique and Inspection Records.

12.12 Returning Tested Material.

12.12.1 All material that is to be returned to customers upon completion of testing, should be tagged or have container tagged with an acceptance or rejection tag, depending on results of testing performed.

12.13 General Requirements for Procedures and Non Standard Methods.

12.13.1 Validation of non-standard methods and methods used outside their intended scope.

12.13.1.1 LTI shall validate non-standard methods and modifications of standard methods to confirm that the methods are fit for the intended use. The validation shall be as extensive as necessary to meet the needs of the given test and / or calibration.

12.13.1.2 LTI shall record the results obtained, the procedure used for the validation and a statement as to whether the method is fit for the intended use.

12.3.2 Deviation from test and calibration methods shall occur only if the deviation has been documented, technically **justified**, authorized and accepted by the customer.

***See Section 20 for Procedure Number and Title.**

SECTION 13

NON-CONFORMING TESTING AND / OR CALIBRATION

13.1 Scope.

13.1.1 *This section describes the process of reporting and controlling any aspect of testing, machining and / or calibration work that does not conform to internal procedures or customer requirements.*

13.1.2 *Items found not conforming to acceptance standards during testing or out of tolerance during calibration are addressed in Paragraph 13.2.*

13.2 Items Not Meeting Acceptance Standards or Tolerance.

13.2.1 *Customer materials and equipment which are rejected as a result of testing shall be identified as such.*

13.2.1.1 Where feasible, parts shall be tagged as to reason **for** rejection.

13.2.1.2 All rejected material shall be separated from acceptable material where applicable.

13.2.1.3 *The Certified Test Report shall identify the noncomplying characteristic(s).*

13.2.2 *Any item that has been submitted for calibration and found out of tolerance shall be identified on the certificate as the "As Found" condition.*

13.2.2.1 *If the item can be adjusted, it shall be calibrated and identified on the Calibration Certificate "As Left".*

13.2.2.2 If the item can be repaired and the customer gives consent, the item shall be repaired and recalibrated. Upon successful repair and acceptable recalibration, certification will be issued.

13.2.2.2 *Items that cannot be calibrated in tolerance or repaired shall be identified as such.*

13.3 Discrepant Materials, Equipment or Processing.

13.3.1 *Any LTI employee can initiate a Nonconformance Report. Any deficiency detected during testing, calibration or machining shall be documented on a Nonconformance Report (NCR) in accordance with LTI Procedure *LTI-NONCONFORMANCE. Work in process shall be stopped, including the withholding of test reports and calibration certificates.*

13.3.2 *The NCR shall be forwarded to Quality Assurance for initial evaluation and determination of significance as well as 10CFR21 reportability.*

*See Section 20 for Procedure Number and Title.

13.3.3 ***Nonconformances may be dispositioned by the department manager, QA Manager and customer as stated below.***

- a. **Scrap** Used when it is considered that the item cannot be restored to a useable condition. ***Determination made by customer for customer items.***
- b. **Rework** This disposition permits restoration of the item to within specified requirements by completion, re-machining, reassembling or reprocessing ***by normal processes.***
- c. **Repair** This disposition permits restoration of the item in accordance with Customer approval.
- d. **Use As Is** Used when analysis of the nonconformance can demonstrate that the utilization of the item in the "as is" condition will not infringe upon the capability of the item to satisfactorily perform its intended functions. ***Determination made by the customer for customer items.***

Once the disposition has been completed, a copy of the Nonconformance Report will be forwarded to the appropriate personnel to implement the disposition. Upon completion of the disposition, the Quality Assurance Manager will be notified. All repaired or reworked items will be re-inspected to assure conformance to LTI and customer requirements.

13.3.4 The Nonconformance Report shall be forwarded to the Quality Assurance Manager for final review and approval of the resolution and determine if any follow-up action is required.

13.3.5 All nonconformance reports will be reviewed on a ***regular*** basis by the Quality Assurance Manager to determine if a Corrective Action Request is necessary.

13.3.6 If a Corrective Action Request is required, it shall be completed in accordance with LTI Procedure ***LTI-CAR** and Section 19 of this Quality System Program Manual.

Δ

13.3.7 LTI shall notify customers promptly, in writing, of any identification of defective measuring and test equipment that cast a doubt on the validity of results given in any Test Report **or** Calibration Certificate.

13.4 10CFR21 Compliance.

13.4.1 For discrepant conditions reportable under the provisions of 10CFR21, the President shall be notified by the Quality Assurance Manager in writing. The President is responsible for all notification outside the company in accordance with established procedures.

13.4.2 The procedure ***10CFR21 Compliance** shall be posted by the time clock in the shop and in the cafeteria.

***See Section 20 for Procedure Number and Title.**

SECTION 14

HANDLING, STORAGE, PRESERVATION AND SHIPMENT

14.1 Scope.

14.1.1 This section describes the way that LTI shall handle, store, preserve and ship material or items that come to LTI for testing, machining and calibration.

14.2 Method of Handling, Storage, Preservation and Shipment.

14.2.1 All materials or items shall be stored and moved in containers which are not detrimental to the product. In general, materials will be stored and moved in the container in which they were received.

14.2.1.1 **When** specified in the contract or purchase order, **material** shall not come in contact with sulfur, mercury, halogens or other detrimental materials while in LTI's possession.

14.2.1.2 Slings and other handling equipment shall not be detrimental to the product.

14.2.1.3 All items received for calibration shall be taken to the Calibration Lab after being logged in per LTI Procedure *RI-1 and Section 6 of this manual.

14.2.1.4 All items shall be **identified with the** Lab Report No. and **shall be accompanied by the** corresponding Technique and Inspection Record.

14.2.2 All items and material to be shipped back to the customer shall be placed in the returned material holding area after processing.

14.2.2.1 **Items for calibration shall remain in the calibration lab or in a specified holding area until calibration certificates have been completed.**

14.2.2.2 Upon receiving the certifications and a packing list, shipping shall pack all materials and items in a manner as to preclude any damage. Shipping shall return the package to **the** customer in accordance with best commercial practice and Interstate Commerce Rules or as required by Purchase Order / Contract.

14.2.2.3 Nuclear orders shall be packed in accordance with LTI Procedure *LTI-2.2, which is in accordance with NQA-1, Subpart 2.2, when referenced.

14.2.3 Specific instructions about handling / storage of certain materials shall be put into working procedures, Technique and Inspection Records and / or the Process Control Plan when specified by contract.

*See Section 20 for Procedure Number and Title.



14.3 **Direct Shipments.**

- 14.3.1 *Shipments to other parties shall be done in accordance with the instructions given by our customer.*

SECTION 15

TEST REPORTS AND CERTIFICATIONS

15.1 Scope.

15.1.1 This section describes the requirements *for* Test Reports and *Calibration Certificates* completed at LTI.

15.2 Certificates and Test Reports.

15.2.1 Test reports and *certificates* shall be prepared by the QA Department upon completion and review of all testing, dimensional inspection and calibration results.

15.2.2 Certifications and Test Reports shall be signed or equivalent identification of the person(s) as designated in Section 4 of LTI's Quality System Program Manual *and as designated by the President.*

15.2.3 Certifications and Test Reports retained by LTI and / or supplied to customers shall comply with the following:

15.2.3.1 Certification and Test Reports shall be legible, reproducible and in good condition.

15.2.3.2 The legibility and contrast of records shall be such that every line, number, letter and character of data shall be clearly legible and readable.

15.2.3.3 The certifications and test reports shall have such clarity as to be capable of providing a second generation copy which shall meet the legibility requirements as stated in 15.2.3.2 above.

15.2.3.4 The certification and test report shall accurately describe the item to which they are certifying.

15.2.4 Each certification or report shall meet the requirements as stated in LTI Procedure ***LTI-CERT/REPORT.**

15.2.5 Where the certificate or report contains results of tests performed by subcontractors, these results shall be clearly identified.

15.2.6 Changes to a Test Report or Calibration Certificate after issue shall be made only in the form of a revised document, or data transfer including an "Amended" or "Corrected" statement.

15.2.6.1 An "Amended" Test Report or Calibration Certificate identifies the change was at the request of the customer.

15.2.6.2 A "Corrected" Test Report or Calibration Certificate identifies the change was due to an error by LTI.

***See Section 20 for Procedure Number and Title.**

- 15.2.7 When opinions and interpretations are included, LTI shall document the basis upon which the opinions and interpretations have been made. Opinions and interpretations shall be clearly marked as such in a test report.
- 15.2.8 In case of transmission of test or calibration results by telephone, **email**, facsimile or other electronic or electromagnetic means, ***the requirements of ISO / IEC 17025 shall be met.***
- 15.2.9 The format shall be designated to accommodate each type of test or calibration carried out to minimize the possibility of misunderstanding or misuse. Each type of test or calibration shall be separated with heading standardized as much as possible.
- 15.2.10 *The use of assessment body logos, such as A2LA and PRI / Nadcap, shall be in accordance with the policies and guidelines for their use.***

SECTION 16

CONTROL OF RECORDS

16.1 Scope.

16.1.1 This section describes the requirements for the control of Quality Records ***which may be in any media, such as hardcopy or electronic media.***

16.2 Quality Records.

16.2.1 **Definition** – Quality Records are those completed records which furnish documentary evidence of the quality of items and of activities affecting quality.

16.2.1.1 Quality Records include, but are not limited to Technique and Inspection Records, Calibration Records, Personnel Qualifications and Certifications, Examination Procedures, Internal Audits, Corrective Action, Nonconformance Reports, Management Reviews and Reports, Vendor Audits, Customer Complaints, completed certifications and any records or original observations derived from data and sufficient information to establish an audit trail.

16.2.2 Quality records shall be controlled in accordance with LTI Procedure ***LTI-QR-1**.

16.2.3 All quality records shall be legible and stored so as to preclude deterioration, to promote retrievability, prevent loss and traceability to the items to which they apply.

16.2.4 All quality records, in the absence of contractual requirements, shall be stored for a ***minimum of ten (10) years.***

16.2.5 Sample materials / remnants, in the absence of contractual requirements, shall be kept for a ***minimum of thirty (30) days.***

16.2.6 The President shall be responsible for adequate storage and retrieval of all records.

16.2.7 ***Errors shall be crossed out with a single line, not erased or whited out, made illegible or deleted, and the correct value entered alongside. All such alterations to records shall be signed or initialed and dated by the person making the correction. The use of correction fluid on any of the Quality Records is strictly prohibited. In the case of records stored electronically, equivalent measures shall be taken to avoid loss or change of original data. Δ***

*See Section 20 for Procedure Number and Title.

SECTION 17

VENDOR EVALUATION

17.1 Scope.

17.1.1 *This section details the requirements for the selection and approval of vendors for supplying materials and services, including calibration and testing.*

17.2 Approved Vendors.

17.2.1 *Vendors supplying material or subcontracted services that effect quality shall be approved prior to procurement.*

17.3 Selection.

17.3.1 *Vendors shall be selected and placed on the Approved Vendors List (AVL), based on at least one of the following criteria:*

- a. *Accredited to ANSI/ISO/IEC 17025 and/or ANSI/NCSL Z540-1 by a recognized accreditation body.*
- b. *On-site audit and approval as being competent and compliance with the quality system standard applicable to the items and services that are being supplied.*
- c. *Vendor is qualified at LTI for services performed at LTI based on acceptance of the following:*
 - *Vendor's Quality Manual or program description.*
 - *Procedure for the specific work being performed.*
 - *Personnel Qualification records.*
 - *Calibration certificates for the equipment or standards used.*
- d. *Vendor is a National Metrology Institute (Ex: NIST).*
- e. *Review and approval of vendors' QA Program and/or satisfactory performance. Such vendors are designated on the AVL as "Commercial Use Only" and shall not be used when compliance to ANSI/ISO/IEC 17025 or nuclear standards such as 10CFR50 Appendix B, 10CFR21, ASME Section III NCA-3800 and/or ASME NQA-1 is required.*

17.3.2 *For nuclear customers requiring compliance to 10CFR50, Appendix B and/or ASME Section III, NCA-3800, LTI shall perform an audit of the vendors' quality program. The audit shall be performed by a qualified representative of LTI, using a checklist for detailing applicable requirements. Objective evidence shall be reviewed during the audit and documented. **Any non-conformances shall be noted on a Corrective Action Request form.***

17.3.2.1 Personnel conducting audits of vendors shall be qualified in accordance with ***PQ-AUD-1**. Current records of auditor qualifications shall be documented and maintained on file in accordance with the aforementioned procedure. The records shall include education, experience, audit training and examination and audit participation which shall be used as a basis of qualification.

17.3.2.2 All audit reports, including any corrective action request responses and follow-ups, shall be reviewed and approved by the Quality Assurance Manager, **Lead Auditor** or the President of LTI.

17.3.3 *As an alternate to the audit of suppliers of subcontracted calibration services, LTI may accept accreditations by NVLAP, A2LA or other accreditation bodies recognized by NVLAP through the ILAC Mutual Recognition Arrangement (MRA), provided the following criteria are met:*

- a. The Laboratory is accredited to ANSI/ISO/IEC 17025.*
- b. The published scope of accreditation for the calibration laboratory covers the needed measurement parameters, ranges and uncertainties.*
- c. The procurement documentations shall specify that the calibration certificate / report shall identify the laboratory equipment / standards used and shall include the as-found and as-left data.*
- d. QA reviews objective evidence for compliance with the procurement documents.*

*This alternative shall be performed in accordance with LTI Procedure ***LTI-SCS-RAL**.*

17.3.4 *Upon approval, the vendor shall be placed on LTI's Approved Vendors List for three years or until the accreditation expiration date. Once a year, Approved Vendors, other than those accredited, are contacted to confirm organizational structure and quality program status as well as to verify address, responsible party, etc. or to note any significant company change.*

17.3.4.1 If the vendors' performance becomes unsatisfactory, or if their services are no longer needed, vendors may be removed from the Approved Vendors List by the Quality Assurance Manager or designated representative.

17.3.4.2 The list shall be updated as required and **be available** to personnel of the respective areas who would be responsible for purchase materials or services for their departments.

SECTION 18

PROCUREMENT DOCUMENT CONTROL

18.1 Scope.

18.1.1 This section details the requirements for the control of procurement documents to assure the inclusion of applicable quality requirements for materials purchased to perform testing, calibration and for subcontracted services.

18.2 Requirements.

18.2.1 All purchase orders for materials and services shall be documented and controlled in accordance with the latest revision of LTI Procedure ***PI-1**.

18.2.1.1 Purchase Orders to vendors for materials or services shall include applicable quality and technical requirements as required for the subject procurement.

18.2.1.2 Prior to release, the above stated purchase orders will be reviewed and approved by the Quality Assurance Manager or his delegated representative. Signing or initialing and dating the purchase order shall indicate approval.

18.2.1.3 Changes to purchase orders will be subject to the same controls and approvals as originals.

18.2.2 Upon receipt of materials and services, the Quality Assurance Manager or his designated representative shall review and approve certifications verifying that what was purchased complies with the requirements of the purchase order.

18.2.2.1 When material is purchased at a customer's request, LTI will verify mechanical and physical properties as appropriate. Materials purchased for a customer will require a Certified Material Test Report or other certification to accompany the material.

18.2.2.2 Verification of compliance to requirements of the purchase order shall be by initialing and dating the certification.

18.2.3 LTI shall be responsible for the subcontractors work, except where the customer specifies which subcontractor is to be used.

18.2.4 *When LTI subcontracts any testing or calibration requiring compliance to ANSI / ISO / IEC 17025, the customer shall be notified in writing and, when appropriate, gain the approval of the customer.*

SECTION 19

CORRECTIVE ACTION PREVENTATIVE ACTION CONTINUOUS IMPROVEMENT

19.1 Scope.

19.1.1 This section describes the requirements for corrective action *for conditions* that have an adverse affect on quality, preventative action and continuous improvement.

19.2 General Requirements.

19.2.1 Corrective action and prevention of recurrence shall be accomplished in accordance with LTI Procedure *LTI-CAR.

19.2.2 *The corrective action and / or prevention of recurrence documentation shall be recorded on the Corrective Action Request form.*

19.2.3 The need for corrective action and prevention of recurrence shall be determined by nonconformances, formal or informal audit results, customer complaints or other condition adverse to quality.

19.2.3.1 Formal audit results could be generated through customer audits of our facility, internal audit of Quality System or Management Review by the President.

19.2.3.2 Informal audit results could be generated through spot checks of any area at any time.

19.2.3.3 Initiation of a corrective action is the responsibility of any LTI employee.

19.2.3.4 Corrective actions shall be to a degree appropriate to the magnitude and the risk of the problem.

19.3 Corrective Action.

19.3.1 The procedure for Corrective Action, *LTI-CAR shall include:

- a) the effective handling of customer complaints and report of product nonconformance;
- b) investigation of the *root* cause of non-conformities relating to product, process and the quality system and recording the results of the investigation;
- c) determination of the corrective action needed to eliminate the cause of nonconformities;
- d) application of controls to ensure that the corrective action is taken and that it is effective.

*See Section 20 for Procedure Number and Title.

19.4 Preventative Action / Continuous Improvement.

- 19.4.1 Preventative Action and Continuous Improvement shall be in accordance with LTI Procedure ***LTI-PACI**. ***Preventative action is a pro-active process to identify opportunities for improvement rather than reactive to problems and complaints.***

19.5 Customer Complaints and Feedback.

- 19.5.1 Customer complaints shall be processed and resolved in accordance with LTI Procedure ***LTI-COMP** and are documented on a Customer Complaint Form. Customer complaints are generated based on the Customer's verbal or written notification.
- 19.5.2 Depending on the nature of the complaint, these may be documented as a Corrective Action Request for further investigation and action to prevent recurrence.
- 19.5.3 *Feedback, both positive and negative is sought from customers in the following manner:***
- a. *Customer Satisfaction Questionnaires***
 - b. *Marketing Department contacting customers and prospective customers.***
 - c. *Customer Service Department daily contact with customers.***
 - d. *Participation in trade shows.***

Such information is analyzed and used to improve our systems, testing and calibration activities and customer service.

19.6 Vendor Corrective Action and Prevention of Recurrence.

- 19.6.1 LTI shall require Corrective Action and / or Prevention of Recurrence from its vendors whenever material or services are received which are non-conforming, or upon deficiencies noted during audit of vendors quality system.
- 19.6.2 The Quality Assurance Manager shall be responsible for notifying Vendors of the need for the corrective action.
- 19.6.3 Vendors are required to investigate the cause, complete the corrective action request forms and return to LTI, at which time the Quality Assurance Manager reviews the actions taken and either approves them or requests additional actions to be taken.
- 19.6.4 As appropriate, the Quality Assurance Manager shall be responsible for any follow-up review of the Vendor corrective action.
- 19.6.5 Failure of the Vendor to take and document positive corrective action may result in removal from LTI's Approved Vendors List.

***See Section 20 for Procedure Number and Title.**

19.7 Records.

19.7.1 All **Corrective** Action Requests shall be kept on file by the Quality Assurance Department.

19.8 Monitoring of Corrective Actions.

19.8.1 LTI will monitor the results of corrective actions and prevention of recurrence actions to ensure that the corrective actions taken have been effective.

19.8.2 When identification of nonconformances or departures cast doubt as to LTI complying with procedures and policies, **ISO / IEC 17025** or this Quality Manual, LTI shall audit the areas of nonconformances within 15 working days.

19.8.3 The results of these processes shall be considered during the annual Management Review.

Δ
SECTION 20
REFERENCED PROCEDURES AND DOCUMENTS

PROCEDURE NUMBER	MANUAL SECTION	PROCEDURE TITLE	WHERE REFERENCED
LTI-QPOLICY	POLICY STATEMENT	Quality Policy	Section i
LTI-C&P RIGHTS	POLICY STATEMENT	Protection of Confidentiality & Proprietary Rights of LTI Customers	Section i
LTI-MAN-CTRL	SECTION 3	Control of Quality System Program Manual	3.2.4
PQ-NDT-1	SECTION 4 & 12	Personnel Qualification and Certifications – NDT	4.17.1 & 12.2.1
PQ-2132-1	SECTION 4 & 12	Personnel Qualification to MIL-STD-2132 and NSTR-99	4.17.1 & 12.2.1
PQ-410-1	SECTION 4 & 12	NDT Personnel Qualification & Certification in accordance with NAS 410	4.17.1 & 12.2.1
PQ-MAS-1	SECTION 4 & 12	Procedure for Personnel Qualification of Material Analysis Services	4.17, 12.3.1, 12.4.1 & 12.5.1
PQ-AUD-1	SECTION 5 & 17	Qualification and Certification of Auditors and Lead Auditors in accordance with ASME / ANSI N45.2.23 and ASME / ANSI NQA-1	5.2.2 & 17.3.2.1
LTI-INT-1	SECTION 5	Procedure for Performance of Internal Audits	5.2.3
RI-1	SECTION 6, 8 & 14	Procedure for Receiving and Order Entry	6.2.1, 8.2.1 & 14.2.1.3
LTI-DOC	SECTION 7	Document Control of Internal Procedures, Customer, Government and International Standards & Specifications	7.1.3 & 7.3.1
ADDENDA DOCSTAR-PROC	SECTION 7	Control of Procedures using the docSTAR System	7.1.3
LTI-PROCEDURE	SECTION 7	Preparation of Documents	7.3.1 & 7.3.2
85-CP-1	SECTION 9 & 11	Calibration Procedure in accordance with MIL-STD-45662A, ANSI/NCSL Z540-1, ISO-10012-1 & ISO-17025	9.2.4 & 11.2.1
85-CP-1, Addenda A	SECTION 10	Calibration Frequency List	10.2.2
85-CP-1, Addenda B	- - -	Scope of Calibrations for A2LA Accreditation	- - -
LTI-NONCONFORMANCE	SECTION 10 & 13	Reporting and Control of Nonconforming Testing and/or Calibration Items	10.2.6 & 13.3.1
10CFR21 COMPLIANCE	SECTION 13	Reporting of Defects and Nonconformances in accordance with 10CFR21	13.4.2
LTI-2.2	SECTION 14	Packing, Shipping and Marking in accordance with ASME NQA-1	14.2.2.3
LTI-CERT / REPORT	SECTION 15	Procedure for Compiling Certificate or Test Report	15.2.4
LTI-QR-1	SECTION 16	Procedure for the Control of Quality Records	16.2.2
PI-1	SECTION 18	Purchasing Instructions for Materials and Services	18.2.1
LTI-CAR	SECTION 5, 13 & 19	Procedure for Corrective Action	5.3.1, 13.3.6, 19.2.1 & 19.3.1
LTI-COMP	SECTION 19	Resolution of Customer Complaints	19.5.1
EMPLOYEE HANDBOOK	SECTION 4	LTI Employee Handbook	4.2.10

REFERENCED PROCEDURES AND DOCUMENTS
(continued...)

PROCEDURE NUMBER	MANUAL SECTION	PROCEDURE TITLE	WHERE REFERENCED
LTI-SWQA-1	SECTION 10	Validation of Computer Software	10.2.1
CP-17025-FIELD	SECTION 10	Calibration Procedure of ISO / IEC 17025 Field Calibrations	10.2.7
LTI-AQMR	SECTION 10	Assuring Quality of Metrology Results	10.4.1
LTI-SCS-RAL	SECTION 17	Subcontracted Calibration Services from Recognized Accredited Laboratories	17.3.3
MAS-RETEST	SECTION 12	Material Analysis Services Procedure for Retests and Replacement Tests	12.11.1
LTI-PACI	SECTION 19	Preventative Action and Continuous Improvement Plan	19.4.1