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Tronair Quality Manual

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Company Profile

Tronair is a manufacturer of ground support equipment with research, engineering and marketing activities aimed at one goal: The creation of quality ground support equipment at a reasonable cost.

The company was formed in 1972 to supply equipment to the emerging corporate business jet and turbo-prop market. The high growth and demands of the market gave Tronair the opportunity to develop a wide array of ground support equipment products. The experience gained has allowed the company to expand into the regional and commercial airline market as well as several government and military agencies.

Quality Assurance

A complete quality assurance program is in place conforming to the concepts of ISO 9001-2000. Systems and procedures cover all products throughout the plant, including procurement, receiving, material storage, manufacturing, testing, packaging and shipping.

Engineering

Core technologies include Mechanical, Structural, Hydraulic, Pneumatic and Electrical design. Degreed Engineers and Designers use state of the art design software to develop cost effective products that emphasize simplicity and serviceability.

Products

Not limited to one product line, Tronair manufactures many items of ground support equipment. Current products include:

Towbars	Deicing Equipment
Hydraulic Jacks	Lavatory Service Equipment
Work Stands	Ground Power Units
Hydraulic Power Units	Transport Carts
Hydraulic Servicing Units	Tire Bead Breakers
Defueler	Cabin Pressurization Units
Engine Stands	Oxygen Booster
Engine Slings	Nitrogen Booster
Service Cranes	Turbine Engine Compressor Washers
Tail and Wings Stands	Nitrogen/Oxygen Bottle Carts

Quality Mission Statement

We, the employees of Tronair, are committed to being a global, innovative provider of quality aircraft ground support equipment for the aerospace industry.

It is our policy to design and to manufacture products efficiently, perform services as specified and deliver products on time.

We are dedicated to working together, employing our technical knowledge and utilizing the most current technology in our products and business systems.

Quality Policy

Tronair will achieve customer satisfaction by continuously improving our systems of designing, producing and supporting innovative ground support equipment products and services to meet or exceed industry and customer requirements and expectations.

Quality Policy Statement

The objective of the Company is to supply products that are fit for use and have the desired quality in accordance with customer requirements and specifications. Our customers expect safe, reliable and optimum cost products delivered on time.

To achieve the above objective and satisfy the customer's expectations, the Company is totally committed to implementing and maintaining a Quality Management System based on ISO 9001-2000.

Quality problems arising in various areas are to be identified and resolved with speed, technical efficiency and economy. We shall focus our resources, both technical and human, towards the prevention of quality deficiencies.

The successful operation of the system relies upon the co-operation and involvement of personnel at all levels. Our commitment to quality will ensure the continued success of our Company and the satisfaction of customers and staff.

The Quality Assurance Supervisor is authorized to ensure that the requirements of this Quality Management System are implemented. Any problems that cannot be resolved between departments or personnel shall be brought to the attention of the President/CEO for final resolution.

Quality Manual Control

The Quality Assurance Supervisor is responsible for the administration, control, review and distribution of the Quality Manual and Procedures.

Revisions are identified by numbers 00, 01, 02, 03, etc. The Quality Manual shall be controlled per our Document Control Procedure P-4.2.3-QUALITY.001.

Controlled copies are available for company personnel and to customers, as required. The controlled copy number will be stamped in red on the cover page.

The Quality Assurance Supervisor shall maintain a distribution list of controlled copies. Controlled copyholders will receive future revisions, when applicable.

Copies issued to external organizations or personnel are generally uncontrolled. These manuals shall be the current issue and revision. An uncontrolled copyholder will not receive future revisions or issues.

General

Scope:

This Manual describes the Quality Management System used by Tronair, Inc. The aim of the Quality Management System is to ensure that:

- a. The products supplied by Tronair, Inc. have the desired quality.
- b. The customer and statutory authority requirements are recognized and consistently implemented.
- c. The technical, administrative and human factors affecting quality are under control and oriented towards the reduction, elimination and, most importantly, the prevention of quality deficiencies.

The Quality Management System is based on the applicable requirements of ISO 9001-2000.

Application:

The Quality Management System described in this manual is applicable to all work undertaken by Tronair, Inc. If an inconsistency exists between this manual and the contract or order requirements, the latter shall prevail.

Reference Documents:

ISO 9001-2000, Quality Management Systems – Requirements.
Tronair, Inc. Quality Management System Procedures Manual.
Unless otherwise specified all standards referred to are the latest editions.

Definitions:

Company: Tronair, Inc., 1740 Eber Road, Holland, OH 43528-9794, USA.

Product: The result of activities or processes. The term "product" is used throughout the Quality Management System documentation to denote as appropriate, "hardware", software, processed material and service or a combination thereof and shall apply to "intended product" only.

Quality Management System: The organizational structure, responsibilities, procedures, processes and resources for implementing Quality Management.

Sub-contractor: Person or company engaged by Tronair, Inc. to supply or manufacture any of the work included in Tronair, Inc.'s scope of work. Sub-contractors include suppliers and vendors.

1 MANAGEMENT RESPONSIBILITY

1.1 Quality Policy:

The President/CEO with executive responsibility for Quality has formally issued the Quality Policy Statement. Detailed and measurable goals are also set and reviewed as part of Management Reviews. Management ensures that the Quality Policy is understood, implemented and maintained at all levels of the company. This is achieved by:

- a. The proper induction of all personnel to the Quality Management System.
- b. The display of the Quality Policy at prominent locations.
- c. Regular reviews and audits of quality procedures (to verify their implementation).

1.2 Organization:

1.2.1 Responsibility and Authority:

1.2.1.1 The organization chart (Appendix I) shows the interrelationship of positions and functions within the company, the paths of responsibility and authority in relation to Quality.

1.2.1.2 The responsibility, authority and interrelationship of every person who manages, performs and verifies work-affecting quality are defined in "Job Descriptions". Job Descriptions are issued to all personnel and maintained in personnel files. These are available for review at our premises.

1.2.1.3 All personnel may, in their absence, delegate their responsibilities and authority to others as specified in their "Job Descriptions". All personnel have the authority to stop work on nonconforming products or services.

1.2.1.4 Procedures along with Work Instructions and Job Descriptions define the responsibility and authority of personnel for all pertinent quality matters, such as:

- a. Initiating action to prevent the occurrence of any nonconformities relating to product, process and the Quality Management System.
 - b. Identifying and recording any product, process and Quality Management System problems.
 - c. Initiating, recommending or providing solutions through designated channels.
 - d. Verifying the implementation of solutions.
 - e. Controlling further processing and delivery of nonconforming product until the deficiency or unsatisfactory condition has been corrected.
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1.2.2 Resources:

- 1.2.2.1 The company has identified resource requirements for management, performance of work and verification activities. Adequate resources and trained personnel are provided.
- 1.2.2.2 Company's management believes in "self inspection" and all personnel are trained to carry out the required inspections. Approved sub-contractors and their resources may be utilized for specialized verification activities.
- 1.2.2.3 Internal Quality Audits are undertaken by representatives (auditors) assigned by the President/CEO or Quality Assurance Supervisor. These representatives are independent of the department or function being audited.
- 1.2.2.4 Adequacy of resources and personnel are formally reviewed as required as part of management review. Resources and personnel requirements are also reviewed as part of contract or order review.

1.2.3 Management Representative:

- 1.2.3.1 The President/CEO, with executive responsibility for quality, has nominated the Quality Assurance Supervisor as the company's "Management Representative". The Quality Assurance Supervisor is responsible and has the authority to:
 - a. Ensure that the requirements specified in this manual, and ISO 9001-2000, are implemented and maintained.
 - b. Report on the performance of the Quality Management System to management, as required. Formal reports will identify quality improvement opportunities. Reports shall be submitted to management for action during management reviews.
 - c. Coordinate with various internal departments or external bodies on matters relating to the company's Quality Management System.
 - 1.2.3.2 The Quality Assurance Supervisor or the nominated representative during his/her absence reports directly to the Operations Manager.
 - 1.2.3.4 The Quality Assurance Supervisor has full organizational freedom to stop, reject and resolve any work or services not conforming to the requirements of the Quality Management System.
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1.3 Management Review:

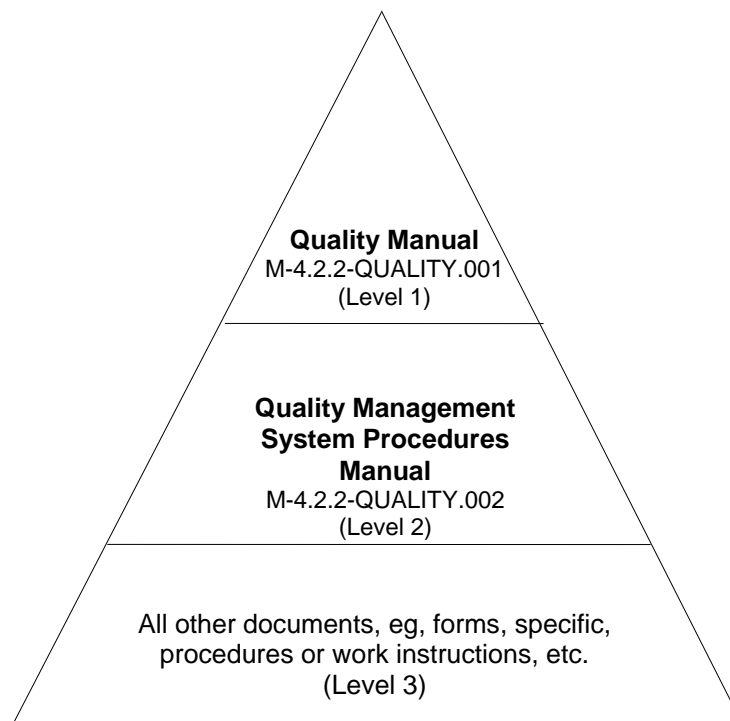
- 1.3.1 The Management reviews the Quality Management System periodically as per documented procedure P-5.6-MANAGEMENT.001 to ensure its continued suitability and effectiveness in satisfying:
- a. Stated company policy and objectives.
 - b. Customer expectations and needs.
 - c. Quality standard, ISO 9001-2000.
 - d. Quality expectations and requirements of Government Contracts.
- 1.3.2 The review is carried out in a meeting chaired by the President/CEO and attended by the Quality Assurance Supervisor, Operations Manager, Engineering Manager, Sales Manager, IS&T Manager and Secretary/Treasurer.
- 1.3.3 During the review, management will utilize all available information, including internal and external quality audit results, customers and third party complaints, quality costs, quality targets, nonconformances, corrective and preventive actions, in order to improve the Quality Management System.
- 1.3.4 Review results are recorded and maintained. The resultant decisions and actions taken will be implemented by the personnel concerned.

For details refer to Management Review procedure P-5.6-MANAGEMENT.001.

2 QUALITY SYSTEM

2.1 General:

- 2.1.1 The Company has developed and implemented a Quality Management System that is compliant to the ISO 9001-2000 Standard to ensure that products conform to specified or agreed requirements. The Quality Management System documents are organized into three classifications (Level 1, Level 2 and Level 3).



- 2.1.2 Quality Manual M-4.2.2-QUALITY.001 is the first-tier document. It is a "policy manual" that describes and includes general management policy with regard to quality, organizational structure and responsibilities. It summarizes what is being done, or shall be done, in the various departments and functions of the organization, to achieve the quality objectives.
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2.2 Quality Management System Procedures:

- 2.2.1 Quality Management System Procedures Manual M-4.2.2-QUALITY.002 is the second-tier document. Quality Management System Procedures are the tools through which the policies of each activity are implemented. They describe in detail, as applicable, the purpose and scope of the activity; what shall be done and by whom; when, where and how it shall be done; what materials, equipment and documentation shall be used; and how they shall be controlled.
- 2.2.2 Documents such as Work Instructions, Methods Statements, Specific Procedures, Forms, Records, Inspection and test plans (ITPs) and Quality Plans are classified as third tier documents. They may amplify a system procedure, detail the manner in which specific tasks are carried out or equipment operated, used for quality planning, used to record results, etc. All documents that are not included in tier one and two manuals are classified as third tier documents.

2.3 Quality planning:

- 2.3.1 Product quality requirements are defined and documented in second and third tier documents. When required by the customer, major contracts' quality planning is done in the form of a Quality Plan. The Quality Plan documents those activities, practices and resources necessary to ensure that all specified requirements are met. The Work Instruction and Drawing identify the specific inspections and tests that will be carried out on a particular product.
- 2.3.2 Quality planning is achieved through the Quality Plans, ITPs and or documented procedures for products, projects or contracts. Consideration shall be given to the following activities during quality planning:
- a. Preparation of documents such as quality plans, ITPs, drawings and procedures.
 - b. Identification and acquisition of personnel and equipment resources to achieve the required quality.
 - c. Compatibility of design, production processes and documented procedures.
 - c. Updating of quality assurance and inspection techniques and development of new techniques and equipment.
 - e. Identification of and the timely development or acquisition of measuring or testing equipment that is capable of the measuring accuracy that is required.
 - f. Identification of suitable verification stages in the product realization.
 - g. Clarification of standards of acceptability for all features and requirements.
 - h. Identification and preparation of quality records.
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3 CONTRACT REVIEW

3.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-7.2-SALES.001 contains details for review and coordination of the proposals (tenders or quotations) and contracts (orders).

3.2 Review:

3.2.1 All quotations or tenders are reviewed before submission to the customer. All contracts or orders placed on the company by any means (telephone, fax, mail or electronic data transfer) are also reviewed before acceptance. The review is to ensure that:

- a. The customer's requirements are adequately defined and documented. For orders received by verbal means, the company ensures that the order requirements are documented and agreed to with the customer.
- b. To detect and resolve any differences between contract or order requirements to those in the proposal or quotation.
- c. The company has the capability and resources to meet the accepted contract or order requirements.

3.3 Amendment to Contract:

3.3.1 Variations or amendments to contracts or orders shall be reviewed as per the original contract or order per P-7.2-SALES.001. The variations or amendments received from the customer are to be clearly identified.

3.3.2 Information and details about variations or amendments are to be promptly communicated to affected departments, including sub-contractors.

3.4 Records:

Records of contract reviews are maintained per P-4.2.3-QUALITY.001.

4.0 DESIGN CONTROL

4.1 Design and Development Planning:

Design Engineering and Project Management together plan and document each design project and clearly define design activity. As the design evolves, design and implementation plans are reviewed and updated as required. Control of over all design activities will be maintained throughout the design review process.

4.2 Development of Product Requirements:

Design requirements are identified, specified, communicated and reviewed according to the Design Review Procedure P-7.3.1-ENGINEERING.001. The design is developed after the contract review is complete. During this phase functional and performance requirements are defined. Applicable statutory and regulatory requirements, essential for design, development and safety are reviewed.

4.3 Design and Development Contribution:

Design reviews are planned, conducted, and documented during concept, design, manufacturing and assembly stages according to the project plan. Design reviews are coordinated by the Project Engineer and include representatives of each department concerned with the design stage being reviewed including Manufacturing and Sales. Records of reviews are kept in the Engineering department per P-4.2.3-QUALITY.001

4.4 Design and Development Review:

Design review will contain or reference product acceptance criteria in the Instruction (INS) and specify the requirements of the product that are essential for its safe and proper operation as found in the Customer Parts List (CPL).

4.5 Design and Development Approval:

Design approvals are conducted and documented by the Engineering Change (EC) sign-off procedure P-7.3.7-ENGINEERING.002 for the product after completion of successful design review by all departments.

4.5.1 Design and Prototype Build and Approval will review the build of prototypes with all of the departments that are concerned.

4.6 Design and Development Confirmation:

All final products are inspected to ensure compliance to the defined specifications and requirements prior to release for stock or shipment to the customer.

4.7 Control of Design and Development Changes:

Responsible design engineers review all requests for design changes or modifications that are identified through the Engineering Change Request system. All design changes are reviewed and approved by the relevant Tronair personnel and the customer (when required) prior to implementation per P-7.3.7-ENGINEERING.002.

5 DOCUMENT AND DATA CONTROL

5.1 General:

5.1.1 Manual M-4.2.2-QUALITY.002, Procedure P-4.2.3-QUALITY.001 contains details for control of all essential documents and data affecting either product quality or the Quality Management System. Documents and data can be generated by the company or issued by the external organizations. Documents and data can be in the form of hard copy media, electronic media or other media.

5.1.2 Documents that are controlled include: Quality Manual, Procedures Manuals, ITPs, Quality Plans, Price Books, Standards, Drawings, Forms, Work Instructions and Specifications.

5.2 Document and data approval and issue:

5.2.1 All documents and data are reviewed and approved for adequacy by the Quality Assurance Supervisor prior to issue. Master lists of controlled documents identifying the current revision status are maintained and are readily accessible in order to preclude the use of invalid and or obsolete documents. Master copies of documents are stamped "Master Copy"

5.2.2 The required issues of applicable documents are made available at work locations where operations essential to the effective functioning of the Quality Management System are performed. Workstation documents are stamped "Reference Only".

5.2.3 Invalid and or obsolete documents are promptly removed from all points of issue or use, or otherwise assured against unintended use.

5.2.4 Obsolete documents retained for legal, reference or knowledge preservation purposes are suitably identified. Obsolete documents that are being preserved are stamped or labeled "Superceded".

5.3 Document and data changes:

5.3.1 All changes to the documents and data are reviewed and approved by the Quality Assurance Supervisor, unless specifically designated otherwise. The designated functions or organizations (including Customers and Inspecting Authorities) are given access to pertinent background information upon which to base their review and approval.

5.3.2 The natures of the changes are to be identified in the document or on the Document Initiation/Change Request Form.

6 PURCHASING

6.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-7.4-PURCHASING.001 contains details for controlling purchasing activities to ensure that the purchased product conforms to the specified requirements.

6.2 Evaluation of sub-contractors (including suppliers and vendors):

6.2.1 The evaluation and selection of sub-contractors is based on their ability to meet sub-contract requirements, including quality requirements (Quality Management System and Assurance).

6.2.2 The type and extent of control exercised by the company over sub-contractors is defined and documented in procedure P-7.4-PURCHASING.001 and or purchase orders or sub-contracts. The type and extent of control depend upon the type of product, the impact of sub-contracted product on the quality of final product and sub-contractors' previously demonstrated capability and performance.

6.2.3 A list of acceptable sub-contractors and or records of acceptable sub-contractors are maintained.

6.3 Purchasing Data:

6.3.1 Purchasing documents shall contain data clearly describing the product ordered, including, where applicable:

- a. The type, class, grade or other precise identification.
- b. The title or other positive identification and applicable issue of specifications, drawings, process requirements, inspection instructions and other relevant technical data, including requirements for approval or qualification of product, procedures, process equipment and personnel.
- c. The title, number and issue of the Quality Management System standard to be applied to the product.

6.3.2 Purchase Orders are reviewed and approved by nominated personnel for adequacy of specified requirements prior to release.

6.4 Verification of Purchased Product:

6.4.1 Company verification of sub-contracted product:

Verification arrangements and method of product release shall be specified in the purchase order when the company elects to verify the purchased product at the sub-contractor's premises.

6.4.2 Customer verification of sub-contracted product:

- 6.4.2.1 Where specified in the contract, the customer or their representative is afforded the right to verify at source or upon receipt that a purchased product conforms to specified requirements.
 - 6.4.2.2 The company shall not use the customer verification of the sub-contracted product, either at sub-contractor premises or the company premises, as evidence of effective control of quality by the sub-contractor.
 - 6.4.2.3 Verification by the customer shall not absolve the company's responsibility to provide an acceptable product, nor shall it preclude subsequent rejection by the customer.
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7 CONTROL OF CUSTOMER SUPPLIED PRODUCT

7.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-7.5.4-SALES.002 contains details for verification, storage and maintenance of customer-supplied product (i.e., free-issue material) provided for incorporation into the final product or for related activities.

7.2 Inspection:

Customer supplied products are inspected upon receipt for identification, certification, quantity, type and to detect transit damage. No further inspection or tests are performed unless otherwise specified in the contract specifications.

7.3 Control:

Customer supplied products from receipt onwards are treated as any other procured products and are controlled according to the requirements of this manual.

7.4 Nonconformance:

Any product that is damaged, lost, nonconforming or otherwise unsuitable for use, is recorded and reported to the customer.

7.5 Verification:

Verification by the company does not absolve the customer of the responsibility to provide an acceptable product.

8 PRODUCT IDENTIFICATION AND TRACEABILITY

8.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-7.5.3-QUALITY.009 contains details for identification and traceability of the product. Identification and traceability records are maintained.

8.2 Identification:

8.2.1 The Company's Product Identification System enables positive identification of each product and its components from applicable drawings or specifications from receipt of material through all stages of production for which the company is responsible.

8.2.2 All products are identified by part number, part name, part description or other information such as customer order number, purchase order number and manufacturing order number.

8.3 Traceability:

8.3.1 Traceability methods are used only if required by a Standard, Inspecting Authority or contract conditions.

8.3.2 The extent of traceability, if already not defined by codes or contract, is to be agreed between the company and the customer concerned and documented before the start of work.

8.3.3 Each job or production run carries a unique Manufacturing Order Number (MO) associated to the Customer Order Number (CO), which is associated to the Customer's Purchase Order (PO) and / or Lot Identification. If required, each individual item has a unique part number or serial number to distinguish apparently identical items.

8.3.4 The MO Number associated with the CO Number and the associated Customer's PO number and / or lot identification are recorded, ensuring that any item or lot is traceable to the specific point of origin.

8.3.5 Traceability numbers are referenced on all inspection and quality records, if required.

9 PROCESS CONTROL

9.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-8.2.3-QUALITY.010 contains details and methods for process control to ensure that all work is performed under controlled conditions.

9.2 Identification and Planning:

Production processes, which directly affect quality, are identified and planned to ensure that the processes are carried out under controlled conditions. Controlled conditions include the following:

- a. Documented procedures or work instructions defining the manner of production, where the absence of such instructions would adversely affect quality.
- b. Use of suitable production equipment and suitable working environment.
- c. Compliance with work instructions and/or documented procedures.
- d. The monitoring and control of suitable processes parameters and product characteristics during production.
- e. The approval of processes, personnel and equipment, as required.
- f. The criteria for workmanship which shall be stipulated, in the clearest practical manner, e.g., work instructions, representative samples or illustrations.
- g. Suitable maintenance of equipment to ensure continuing process capability.

9.3 Qualification:

The requirements for any qualification of process operations including associated equipment and personnel are specified.

9.4 Records:

Records are maintained for qualified processes, equipment and personnel.

9.5 Inspection and Testing:

Special consideration is given to the manufacture, inspection and testing processes where the results of which cannot be fully verified by subsequent inspection and testing of the product. Such processes require pre-qualification of their process capability and are classified as "Special Processes". Qualified personnel using qualified process procedures, documentation and equipment carry out all special processes. Special processes are regularly or continuously monitored, per written procedure, to ensure that the specified requirements are met.

10 INSPECTION AND TESTING

10.1 General:

- 10.1.1 Manual M-4.2.2-QUALITY.002, Procedure P-8.2.4-QUALITY.011 contain details for inspection and testing activities. Inspection and testing is carried out to verify that the product meets the specified requirements.
- 10.1.2 The nature and extent of inspection and testing activities and the records to be established shall be specified in documents such as customer purchase orders, manufacturing orders, procedures, work instructions, drawings and specific information listed in Government Contracts.
- 10.1.3 Nonconforming products are segregated where practicable and identified by HOLD tags per P-8.3-QUALITY.007. The cause of nonconformance is investigated and product disposal and corrective actions are taken as per P-8.5.2-QUALITY.008.

10.2 Receiving Inspection and Testing:

- 10.2.1 Designated incoming products are inspected or otherwise verified as conforming to the specified requirements before acceptance and release to use or further work. Verification shall be in accordance with customer requirements specified on the customer purchase order or manufacturing order and with work instructions.

10.3 In-process inspection and testing:

- 10.3.1 In-process inspections and tests as specified on the Customer Purchase Order (PO), Manufacturing Order (MO) and work instructions are carried out at appropriate points during production to verify conformity of the product.
 - 10.3.2 Product conformance to specified requirements is established by the use of process monitoring and control methods. These activities are listed on work instructions.
 - 10.3.3 No product is released for further processing until the required paperwork is completed, ensuring that the parts are traceable to the customer purchase order.
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10.4 Final Inspection and Testing:

- 10.4.1 Final inspections and tests as specified on the PO, MO or work instructions are carried out to ensure the product meets the specified requirements.
- 10.4.2 No product is released for shipment to the Customer until all the activities specified in the PO, MO and work instructions have been satisfactorily completed and the associated data and documentation is available and authorized.

10.5 Inspection and Test Records:

- 10.5.1 All inspection and test records, which give evidence that the product has been inspected and tested, are established and maintained. These records shall show clearly whether the product has passed or failed the inspections and or tests according to defined acceptance criteria.
 - 10.5.2 Records shall identify the inspection authority responsible for the release of the product.
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11 CONTROL OF INSPECTION, MEASURING AND TEST EQUIPMENT

11.1 General:

- 11.1.1 Manual M-4.2.2-QUALITY.002, Procedure P-7.6-QUALITY.013 contain details and instructions for control, calibration and maintenance of inspection, measuring and test equipment used to demonstrate the conformance of product to the specified requirements. All inspection, measuring and test equipment used to demonstrate the conformance of product to the specified requirements including test software whether owned by the company, employees or on loan shall be calibrated or verified.
- 11.1.2 Inspection, measuring and test equipment shall be used in a manner, which ensures that measurement uncertainty is known, and is consistent with the required measurement capability.
- 11.1.3 Test hardware, e.g., Jigs, fixtures, templates, or test software, e.g., computer programs, used for inspection are checked to prove that they are capable of verifying the acceptability of the product prior to initial release and at nominated frequency during use. Records of the checks are maintained as evidence of control.
- 11.1.4 Where specified in the contract, technical data pertaining to the inspection, measuring and testing equipment is made available if required to customer or customer's representative for verification that the devices are functionally adequate.

11.2 Control procedure:

Procedures and instructions shall ensure the following:

- 11.2.1 Suitable measuring and test equipment capable of accuracy and precision necessary are selected after identifying the measurements to be made and corresponding accuracy requirements.
 - 11.2.2 All inspection, measuring and testing equipment that can affect product quality are identified and calibrated at the prescribed intervals identified on the Calibration Schedule against certified equipment having a known valid relationship to nationally recognized standards. Where no such standards exist, the basis used for calibration shall be documented.
 - 11.2.3 Methods and processes employed for calibration of inspection, measuring and test equipment are defined, documented and implemented. These shall include details of equipment type, identification number, location, frequency of checks, check method, acceptance criteria and the action to be taken when results are unsatisfactory.
 - 11.2.4 Calibrated equipment is identified with stickers to show the calibration status, per the documented procedure.
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- 11.2.5 Calibration records for inspection, measuring and test equipment are maintained by the Quality Assurance Supervisor and stored in the Quality Lab.
 - 11.2.6 When measuring and testing equipment is found to be out of calibration, the equipment is removed from service and the validity of previous measurement and test results are assessed where feasible and documented.
 - 11.2.7 All inspection, measuring and testing equipment is calibrated and used in an environment where temperature, lighting, vibration, humidity and cleanliness is controlled to the extent necessary to ensure valid measurement.
 - 11.2.8 All inspection, measuring and testing equipment is properly handled, preserved and stored so that the accuracy and fitness for use is maintained.
 - 11.2.9 Inspection, measuring and test equipment shall be handled and stored in a manner which prevents abuse, misuse, damage or change in functional characteristics.
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12 INSPECTION AND TEST STATUS

12.1 General:

12.1.1 Manual M-4.2.2-QUALITY.002, Procedure P-7.5.3-QUALITY.014 contains details for indicating positively the conformance or nonconformance of a product with regard to inspection and tests performed.

12.2 Identification:

12.2.1 Inspection and test status of the products are identified by using authorized stamps, tags, physical location, records or other suitable means. P-7.5.3-QUALITY.014 shall define the requirements for identification of inspection and test status.

12.2.2 The identification of inspection and test status shall be maintained throughout production of the product to ensure that only product that has passed the required inspection and tests or released under authorized concession is shipped.

12.2.3 REJECTED MATERIAL and HOLD tags are used to identify and segregate the nonconforming product from inadvertent use or delivery. REJECTED MATERIAL and HOLD tags are used during all production stages including incoming, in-process and final inspections.

12.2.4 OK FINAL INSPECTION tags and are used to indicate satisfactory completion of final inspection. Acceptability of the in-process inspections is indicated on the OK FINAL INSPECTION tags and Instructions (INS), where applicable.

12.3 Product Release:

12.3.1 The person or authority responsible for inspection, testing and release of conforming products is identifiable from the records generated or from the signature or Inspector's stamp on the tags. The authority for application and removal of status indicators is documented in the procedure.

13 CONTROL OF NONCONFORMING PRODUCT

13.1 General:

13.1.1 Manual M-4.2.2-QUALITY.002, Procedure P-8.3-QUALITY.007 contains details for ensuring that product that does not conform to specified requirements is prevented from inadvertent use, installation or delivery to customers. Controls for identifying, documenting, segregating, reviewing, notification of and disposing of nonconforming product are established, documented and maintained.

13.1.2 Nonconformances observed in sub-contractor product shall be notified to the sub-contractor and the disposition and corrective action shall be mutually agreed.

13.2 Nonconforming product review and disposition:

13.2.1 The responsibility and authority for the review and disposition of nonconformance is defined and documented in the procedure.

13.2.2 Nonconforming product observed at all stages, e.g., receiving inspection, in-process inspection, final inspection and reviews, is identified, held, recorded, reviewed and disposed of as per documented procedure.

13.2.3 Disposition may be one of the following, as approved by customer:

- a. Rework to meet the specified requirements.
- b. Repair or "use as is" by concession.
- c. Re-grade for alternative application.
- d. Reject or scrap.
- e. Return to customer.

13.2.4 When required by the contract, the proposed use or repair of a product that does not conform to specified requirements shall be reported for concession to the customer or his representative.

13.2.5 All reworked or repaired items are re-inspected per documented procedures or to the requirements developed as part of the nonconforming product disposition. The description of nonconformity that has been accepted, and of repairs, shall be recorded to denote the actual condition.

13.2.6 Records of occurrence of nonconformance, the nature and extent, the disposition, subsequent re-inspection or test results are maintained.

14 CORRECTIVE AND PREVENTIVE ACTION

14.1 General:

14.1.1 Manual M-4.2.2-QUALITY.002, Procedures P-8.5.2-QUALITY.008 and P-8.5.2-QUALITY.015 contain details for investigating conditions adverse to quality and the implementation of corrective and preventive action.

14.1.2 Corrective and preventive actions are taken to eliminate the causes of actual or potential nonconformities. The level or degree of corrective and preventive action taken depends on the magnitude of the problem and is commensurate with the risks encountered.

14.1.3 Changes in procedures resulting from corrective and preventive action are implemented and recorded.

14.2 Corrective Action:

The procedures for corrective action shall ensure:

- a. Customer complaints and reports of product nonconformities are handled promptly and effectively.
- b. Nonconformities relating to product, process and the Quality Management System are investigated to determine the cause. Results of the investigation are recorded.
- c. Corrective action is determined to eliminate the cause of nonconformities.
- d. Corrective action is taken and its effectiveness is verified.

14.3 Preventive Action:

The procedure for preventive action shall ensure:

- a. All processes and work operations, which affect quality, quality records, discrepancy reports, audit reports and customer complaints are analyzed to detect and eliminate potential causes of nonconformities.
 - b. Steps needed to deal with any problems requiring preventive action are determined.
 - c. Preventive action is initiated and that its effectiveness is verified.
 - d. The relevant information on preventive actions taken including changes to company procedures are submitted for management review.
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15 HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY

15.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-7.5.5-QUALITY.016 contains details for ensuring that all products from time of receipt to delivery are properly handled, stored, packed, preserved and delivered.

15.2 Handling:

All products are handled properly to prevent damage or deterioration from receipt to delivery. Special handling tools and equipment are inspected regularly to ensure that tools and equipment is adequately maintained and will not damage products.

15.3 Storage:

Secure storage areas are provided to prevent misuse, damage or deterioration of product pending use or delivery. Receipt and the dispatch to and from such secure areas is controlled. Products in storage are assessed at nominated intervals to detect possible deterioration.

15.4 Packaging:

Packing, packaging and marking processes including materials used are controlled to ensure conformance to the specified requirements.

15.5 Preservation:

Products under the company's control are preserved and segregated. Preservation and segregation methods and criteria shall be specified per P-7.5.5-QUALITY.016.

15.6 Delivery:

Controls are established for the protection of the quality of product after final inspection and test. Where contractually agreed, this protection is extended to include delivery to destination.

16 CONTROL OF QUALITY RECORDS

16.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-4.2.4-QUALITY.017 contain details on how all Quality Records are properly collected, identified, filed, accessed, stored, maintained and destroyed. Records can be in the form of hard copy media, electronic media or other media. These records include all pertinent subcontractor records.

16.2 Purpose:

Quality records are maintained to demonstrate:

- a. The effective operation of the Quality Management System. Such records include: Inspection records, Internal Audit records, Training records, Calibration records, Sub Contractor Approval and Surveillance Audit records, Management Review records and Corrective and Preventive Action records.
- b. The achievement of the required product quality or conformance to specified requirements. Such records include inspection records, design records, material certificates, product discrepancy and disposition records.

16.3 Identification:

All quality records are legible and identifiable to the product involved.

16.4 Maintenance:

All records are stored and maintained in such a way that they are readily retrievable in facilities that provide a suitable environment to minimize deterioration or damage and to prevent loss.

16.5 Retention:

The Quality Assurance Supervisor maintains a list of records showing the responsibility, location and retention times. The retention times of quality records are established and recorded after consideration to product liability, legal and statutory legislation or Customer Requirements. Records of product or Quality Management System conformance can be used to defend the company in the event of product litigation.

16.6 Availability:

Where agreed contractually, quality records are made available for evaluation by the customer or customer's representative for an agreed period of time.

17 INTERNAL QUALITY AUDITS

17.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-8.2.2-QUALITY.018 contains details for planning and implementing internal quality audits. Internal Quality Audits are carried out to verify whether quality activities comply with documented procedures, work instructions or other related documents and to determine the suitability and effectiveness of the Quality Management System.

17.2 Scope:

All elements and aspects pertaining to the Quality Management System are audited on a regular basis (at least once a year) as per P-8.2.2-QUALITY.018. Audits are scheduled on the basis of the status and importance of the activity.

17.3 Qualification:

Audits are performed by competent personnel who are independent of those having direct responsibility for the activity being audited.

17.4 Results:

The results of the audits are recorded and brought to the attention of the personnel having responsibility for the area concerned, the President/CEO and Quality Assurance Supervisor. The management personnel responsible for the area shall take timely corrective action on the deficiencies found by the audit per documented procedure.

17.5 Corrective Action:

Timely Corrective actions are implemented. Follow-up audits and actions are carried out as per P-8.2.2-QUALITY.018. Implementation and effectiveness of the corrective actions are verified and recorded.

17.6 Review:

Internal audit findings are reviewed by Management and where necessary additional steps are taken to improve the performance of the Quality Management System.

18. TRAINING

18.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-6.2.2-QUALITY.019 contains details for induction and personnel training. Training needs of all personnel performing activities affecting quality shall be identified and suitable training provided. The personnel authorized and responsible for identifying the training needs, providing training and maintaining training records is defined in P-6.2.2-QUALITY.019.

18.2 Assessment:

Annual assessments are carried out to identify the training needs based on the responsibility and authorities allocated for that position.

18.3 Induction:

18.3.1 All levels of personnel in the company are properly inducted and trained in the tasks they are expected to perform.

18.3.2 Quality Induction Sessions are conducted for all new employees. Every employee is made aware of the company Quality Policy, Quality Management System, Job responsibilities and authorities, advantages of proper job performance and effects of poor performance on quality of services, on other employees, customer satisfaction and the economic well being of the company.

18.4 Qualification:

Personnel performing specifically assigned tasks are qualified on the basis of education, training and or experience.

18.6 Records:

Records of training are maintained per P-4.2.4-QUALITY.012.

19 SERVICING

19.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-7.5.1-QUALITY.020 contain details that provide guidance for Management to develop servicing plans and methods. When specified in the contract, the company shall establish and maintain procedures for performing, reporting and verifying that servicing meets the specified requirements. Procedures shall include personnel training requirements, equipment requirements, systematic break down of what part to be serviced and how, frequency of service, reporting methods and service status stickers.

20 STATISTICAL TECHNIQUES

20.1 General:

Manual M-4.2.2-QUALITY.002, Procedure P-8.2.3-QUALITY.021 contain details that provide guidance for management in assessing the need for statistical techniques and identifying and documenting suitable techniques. Statistical Techniques are used for establishing, controlling and verifying process capability and product characteristics.

20.2 Procedures:

20.2.1 Processes and products requiring statistical techniques shall be identified and detailed third tier documents shall be developed and implemented. Such procedures or instructions shall include:

- a. Attribute or variable to be measured
- b. Control limits.
- c. Sampling requirements.
- d. Method of analysis (Pareto Diagram, Histogram, Scatter Diagram).

20.2.2 Where possible, sampling plans satisfying the requirements of national or international standards shall be used and referenced in the instructions.

Appendix I

Organizational Chart:

