



Approved for Distribution
3/19/09
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QUALITY SYSTEM MANUAL

QSM – 1 Revision 5

Revised March 3, 2009

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* Denotes change from previous version, **changes are in bold type.**

SECTION 1.2 - SCOPE

*Wah Chang has developed and implemented a Quality Management System to demonstrate its ability to consistently provide product that meets customer, **statutory, and** regulatory requirements, and to address customer satisfaction through the effective application of the Quality System, including continual improvement and the prevention of nonconformity. The Quality System is designed to be in compliance with national and international standards, such as ISO 9001:2008, AS9100 Rev. C, ISO 17025, MIL-I-45208, MIL-Q-9858, 10 CFR 50 Appendix B, ASME NCA 3800, ASME NQA-1, and PED 97/23/EC. The Quality department is independent of production and is authorized to halt production or shipment for any reason relating to deficiencies in quality. The Quality System is intended for application to all functional departments involved with providing quality products and services to our customers.

*The Manual is divided into six sections modeled on the sectional organization of the ISO 9001 and AS9100 standards. Sections are further subdivided into several subsections representing main Quality System elements or activities. Each subsection has a general policy statement expressing the commitment to implement the basic principles of the pertinent Quality System element or activity and a reference to the controlling Quality System document for that element.

This Manual is to present the Quality System to our customers and other external interested parties, and to inform them what specific controls are implemented at Wah Chang to assure quality at a reasonable cost. This Manual and current quality certificates can be found at the following website:

* <http://www.wahchang.com/pages/overview/qa.htm>

*SECTION 1.3 – FACILITY LOCATIONS

1600 Old Salem Road N.E.
Albany, Oregon

530 34th Avenue SE
Albany, Oregon

7400 Highway 20 West
Huntsville, Alabama

**12633 N Rowley Road
North Skull Valley, Utah**

**235 Industrial Park Road
Frackville, Pennsylvania**

SECTION 1.4 - EXCLUSIONS

*The Quality Management System has been drafted to be relevant to the nature of our organization and products, and to customer, **statutory**, and regulatory requirements. For this reason, those requirements of ISO 9001 and AS9100 that do not apply are excluded from the scope of our Quality System, as identified below:

1. **ISO 9001 and AS9100** Section 7.3, Design and Development, including all subsections. Wah Chang does not design or develop products. The customer specifies the principal product characteristics. Our engineering activities are limited to developing methods and means of production and fabrication.
2. **AS9100 Section 7.5.1.4**, Control of Service Operations. Servicing is not specified as a requirement for any of Wah Chang's contracts.

SECTION 4 - QUALITY MANAGEMENT SYSTEM

SECTION 4.1 - GENERAL REQUIREMENTS

*Wah Chang is committed to establish, document, implement, and maintain a Quality Management System, and continually improve its effectiveness, in conformance with requirements of ISO 9001 and AS9100, and associated standards identified in Section 1.2 of this Manual. Processes that affect product conformity, including outsourced processes are managed in accordance with the Quality Management System, to ensure that the sequence and interaction of these processes meet specified requirements as identified in Section 4.4 of this Manual.

*Reference Documents: QCI-01-01(Management Review), **QCI-06-02 (Service Subcontractor Evaluation)**, QCI-14-03 (Continual Improvement).

SECTION 4.2 - DOCUMENTATION REQUIREMENTS

*Scope of the Quality System documentation is defined. Establishment and revision of documents and their distribution are controlled. New documents and revisions are reviewed and approved prior to issue, and are identified with respect to their revision level. Appropriate documents are available at locations where they are used for our employees, customers, **statutory**, and regulatory authorities. Obsolete documents are removed from points of use.

*Wah Chang utilizes a three-tier documentation structure as follows:
Level 1 – Quality System Manual; Level 2 – Quality Control Instructions; and Level 3 – Work Instructions, **Manufacturing Instructions**, Test Procedures, and Process Specifications, **etc.**

*Quality records are identified and indexed to facilitate their retrieval, and are stored in a suitable environment to minimize deterioration. Quality records are retained for a minimum of three years or equivalent to customer, **statutory**, and regulatory requirements.

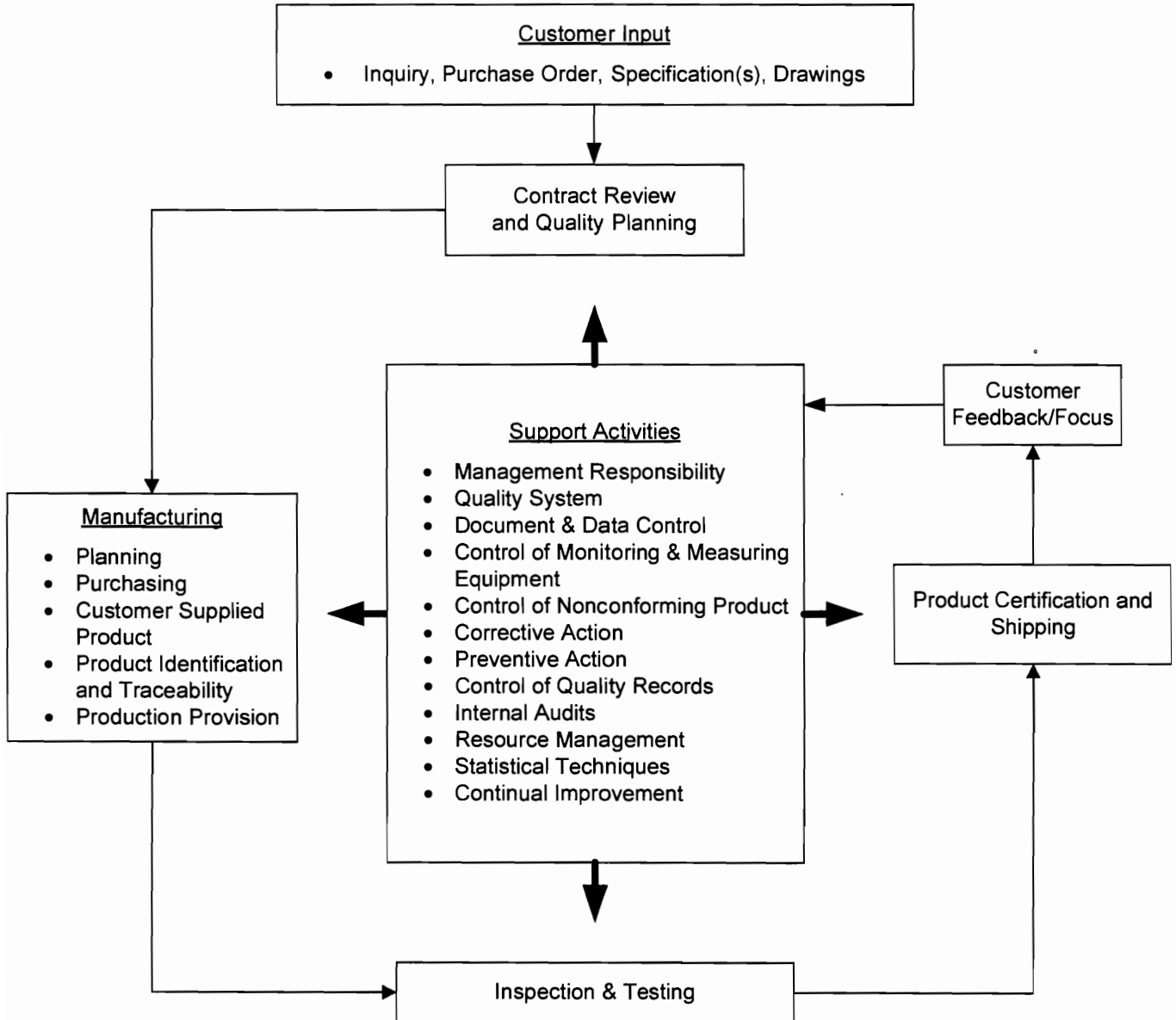
Reference Documents: QCI-05-01 (Quality System Documents), QCI-05-05 (Document Control System), QCI-05-07 (Industry Standards), QCI-16-01 (Quality Records and Samples).

SECTION 4.3 – CONFIGURATION MANAGEMENT

Wah Chang develops and establishes processes and institutes controls that will produce a product consistent with Wah Chang/customer agreed upon requirements.

*Reference Documents: QCI-03-01 (Contract Review), QCI-08-01 (Product Identification and Traceability), QCI-09-05 (Process Change Request System), QCI-09-08 (Production Traveler), QCI-09-09 (Work Instructions), QCI-12-03 (Release of Material for Shipment).

SECTION 4.4 – QUALITY MANAGEMENT SYSTEM PROCESS INTERACTION



SECTION 5 - MANAGEMENT RESPONSIBILITY

SECTION 5.1 - MANAGEMENT COMMITMENT

*Wah Chang top management is ultimately responsible for establishing, implementing, maintaining, and improving the Quality System. Management commitment is demonstrated by communicating to the organization the importance of meeting customer, **statutory**, and regulatory requirements, establishing the Quality Policy and Quality Objectives, conducting management reviews of the Quality System, and ensuring the availability of necessary resources.

*Reference Documents: QCI-01-01 (Management Review).

SECTION 5.2 - CUSTOMER FOCUS

The objective of the Wah Chang Quality Management System is to focus our organization on the customer; and in particular, on customer satisfaction. The key to achieving high customer satisfaction is a good understanding of customer requirements, and a capability to consistently fulfill these requirements.

Reference Documents: QCI-01-01 (Management Review), QCI-02-01 (Quality Planning), QCI-03-01 (Contract Review), QCI-13-03 (Customer Feedback/Returned Material).

SECTION 5.3 - QUALITY POLICY

“Continually improve our Processes and Quality Management System to provide Products and Services of the highest quality consistent with customer requirements”

The Quality Policy is established and communicated by Management to provide the framework for establishing quality objectives and direction for continual improvement.

*Reference Documents: QCI-01-01 (Management Review), QCI-14-03 (Continual Improvement).

SECTION 5.4 - PLANNING

*Quality Objectives are established by Management to support and implement the Quality Policy and continual improvement. Quality planning includes identification and determination of Quality System processes (including any exclusions of ISO 9001 and AS9100 requirements), priorities for continual improvement, and resources needed to achieve Quality Objectives and to maintain and improve the Quality System. Quality processes are periodically reviewed and updated to maintain the integrity of the Quality System during organizational and other changes.

Reference Documents: QCI-01-01 (Management Review), QCI-01-07 (Quality Objectives), QCI-02-01 (Quality Planning), QCI-14-03 (Continual Improvement).

SECTION 5.5 - RESPONSIBILITY, AUTHORITY, AND COMMUNICATION

Wah Chang departmental functions and their interrelation within the organization are defined and communicated in documented procedures.

*The Company President has appointed the Manager of Quality Assurance as the management representative responsible for establishment and maintenance of the Quality System, for reporting to top management on the performance of the Quality System, **and to resolve issues**.

Issues regarding the Quality System are communicated internally through distribution of pertinent documents, meetings, training and awareness programs, and management reviews.

Reference Documents: QCI-01-01 (Management Review), QCI-01-02 (Wah Chang Organization), QCI-05-01 (Quality System Documents), QCI-18-01 (Training).

SECTION 5.6 - MANAGEMENT REVIEW

Wah Chang top management conducts reviews of the Quality System quarterly. The review evaluates the suitability and effectiveness of the Quality System, identifies opportunities for improvement, and considers the need for changes to the Quality Policy and Quality Objectives. Results of the review are documented.

*Reference Documents: QCI-01-01 (Management Review).

SECTION 6 - RESOURCE MANAGEMENT

SECTION 6.1 - PROVISION OF RESOURCES

Wah Chang management is committed to provide adequate resources for the implementation and improvement of the Quality System, and for addressing customer satisfaction.

Reference Documents: QCI-01-01 (Management Review), QCI-13-03 (Customer Feedback/Returned Material).

SECTION 6.2 - HUMAN RESOURCES

*Wah Chang identifies personnel training needs, provides required training, and evaluates the effectiveness of the training provided for personnel performing work affecting **conformity to product requirements**. Personnel assigned to perform specific tasks, operations, and processes are qualified on the basis of appropriate education, experience, or training. Employees are made aware of the relevance and importance of their activities and how they contribute to the achievement of quality objectives. Records of personnel qualifications and training are maintained.

Reference Documents: QCI-18-01 (Training), QCI-18-04 (Work Instruction Training).

SECTION 6.3/6.4 - INFRASTRUCTURE AND WORK ENVIRONMENT

*Suitable infrastructure, facilities and work environment are provided as required to achieve product conformity. This includes planning, provision, and maintenance of employee facilities, workspaces, equipment, and **supporting** services.

Reference Documents: QCI-09-04 (Maintenance of Process Equipment), QCI-09-08 (Production Traveler), QCI-09-09 (Work Instructions).

SECTION 7 - PRODUCT REALIZATION

SECTION 7.1 - PLANNING OF PRODUCT REALIZATION

*Planning of product realization processes includes determination of quality **requirements** for products, development of required processes and process documentation, and establishment of product verification, validation programs, **and establishment of resources**. The processes also define requirements for records necessary to demonstrate process and product conformity.

Reference Documents: QCI-02-01 (Quality Planning), QCI-03-01 (Contract Review), QCI-10-10 (Final Inspections), QCI-16-01 (Quality Records and Samples).

SECTION 7.2 - CUSTOMER-RELATED PROCESSES

*Product requirements include customer, **statutory, and regulatory requirements**, and other **applicable** requirements that may not be specified by customers. Orders are reviewed to ensure that product and order requirements are defined and can be met, and to resolve any incomplete or conflicting requirements. Verbal orders are confirmed **in writing** before acceptance. Order amendments and changes are likewise reviewed and are communicated to all relevant functions. Order reviews are recorded and are retained.

Arrangements for communication with customers relating to product information order handling, and customer feedback and complaints are defined and implemented. Where applicable, operational procedures and instructions for these activities are established and implemented.

Reference Documents: QCI-02-01 (Quality Planning), QCI-03-01 (Contract Review).

SECTION 7.3 - DESIGN AND DEVELOPMENT

Exclusion - See Section 1.4.

SECTION 7.4 - PURCHASING

*Wah Chang evaluates its suppliers and purchases only from those that can satisfy appropriate quality, customer, **statutory**, and regulatory requirements. Quality performance of suppliers is monitored and evaluated. Purchasing documents clearly and completely describe ordered products, including quality requirements. Purchasing documents are reviewed and approved as appropriate prior to release. Purchased products are verified before they are used or shipped.

Reference Documents: QCI-06-01 (Auditing of Subcontractors), QCI-06-02 (Service Subcontractor Evaluation), QCI-06-03 (Calibration Subcontractor Evaluation), QCI-06-04 (Material Supplier Evaluation).

SECTION 7.5 - PRODUCTION AND SERVICE PROVISION

Product and process information, and appropriate Work Instructions are established, and are communicated to relevant personnel. Operations and production processes are monitored and controlled, and are validated where appropriate. Machines and equipment used in production and for monitoring and measurement activities are maintained. Methods for product release and delivery are defined.

Materials, components, parts, subassemblies, and finished products are identified. When required, traceability of materials and processes is recorded and maintained. Inspection and test status of product is identified to ensure that only product that has passed the required inspections is used, installed, or dispatched.

Customer-supplied products are controlled in the same manner as are purchased products. Customer-owned tools, equipment, software, or other property are marked to indicate ownership. Loss, damage, or unsuitability of a customer's product is recorded and reported to the customer.

Appropriate handling, storage, and preservation methods are implemented to prevent product damage or deterioration. Receipt and dispatch to and from storage areas are controlled. The condition of products in stock is regularly assessed. Product packaging materials and methods are specified and controlled.

Reference Documents: QCI-06-04 (Material Supplier Evaluation), QCI-07-01 (Customer-Supplied Product), QCI-08-01 (Product Identification and Traceability), QCI-09-01 (Special Processes), QCI-09-04 (Maintenance of Process Equipment), QCI-09-05 (Process Change Request System), QCI-09-08 (Production Traveler), QCI-09-09 (Work Instructions), QCI-10-10 (Final Inspections), QCI-12-01 (Inspection and Test Status), QCI-13-01 (Non-Conforming Product - PCIR), QCI-15-01 (Product Handling and Preservation), QCI-15-02 (Storage Areas), QCI-15-03 (Packaging), QCI-15-04 (Shipping and Delivery).

*SECTION 7.6 - CONTROL OF MONITORING AND MEASURING EQUIPMENT

*Appropriate measuring and monitoring **equipment is** maintained and selected to ensure that measurement capability is consistent with the measurement requirements. Equipment used for assuring product conformity is calibrated **or verified** using calibration standards traceable to the national standard. Calibration status of measuring equipment is identified with calibration stickers. Measuring equipment is properly maintained, and its placement and use are controlled.

Reference Documents: QCI-11-01 (Calibration System).

SECTION 8 - MEASUREMENT, ANALYSIS, AND IMPROVEMENT

SECTION 8.1 - GENERAL

*Measurement and monitoring activities required to **demonstrate conformity to product requirements**, and to achieve improvements, **that** are planned and defined. When applicable, statistical techniques are used for analyzing measurement data.

*Reference Documents: QCI-13-01 (Nonconforming Product - PCIR), QCI-13-03 (Customer Feedback/Returned Material), QCI-20-01 (Statistical Techniques).

SECTION 8.2 - MONITORING AND MEASUREMENT

Customer satisfaction is the principal objective of the Quality System, and the level of customer satisfaction is an important measure of the effectiveness of the Quality System. Customer satisfaction is measured by collecting and analyzing direct customer feedback, and by measuring secondary indicators of customer satisfaction. Customer satisfaction data is used by the top management to identify opportunities and priorities for improvement.

All activities and areas relevant to the Quality System are audited at least once a year. Audits are scheduled on the basis of the status and importance of the activity. Internal auditors are independent of those having direct responsibility for the audited activity. Identified nonconforming conditions are brought to the attention of the responsible managers and corrective actions are implemented in response to audit findings.

Quality System processes are monitored to ensure that they achieve planned results. Relevant product characteristics are measured through inspections, tests, and other product verification activities, as specified in Quality Plans. If planned results are not achieved, appropriate action shall be taken. Evidence of product conformity is recorded. Products are released for delivery only after all specified activities have been satisfactorily completed and verified.

Reference Documents: QCI-10-10 (Final Inspections), QCI-12-01 (Inspection and Test Status), QCI-12-03 (Release of Material for Shipment), QCI-13-01 (Nonconforming Product - PCIR), QCI-13-03 (Customer Feedback/Returned Material), QCI-14-01 (Corrective Action), QCI-17-01 (Internal Quality Audits).

SECTION 8.3 - CONTROL OF NONCONFORMING PRODUCT

Nonconforming product is identified, documented, evaluated, and segregated as appropriate to prevent unintended use or shipment. Repaired or reworked products are reinspected. Appropriate actions are taken when product nonconformity is identified after delivery. When appropriate, corrective and preventive actions are implemented to prevent recurrence of identified nonconformities.

Reference Documents: QCI-10-10 (Final Inspection), QCI-13-01 (Nonconforming Product - PCIR), QCI-14-01 (Corrective Actions), QCI-14-02 (Preventive Actions).

SECTION 8.4 - ANALYSIS OF DATA

Wah Chang collects, compiles, and analyzes information and data required for evaluating the suitability and effectiveness of the Quality System and for identifying opportunities for continual improvement.

*Reference Documents: QCI-01-01 (Management Review), QCI-14-03 (Continual Improvement).

SECTION 8.5 - IMPROVEMENT

Wah Chang top management deploys continual improvement philosophy throughout the entire organization. The improvement effort is driven by the Quality Policy and Quality Objectives. Improvement opportunities are identified by analyzing quality performance data and information. Improvement projects are defined and implemented through the system of corrective and preventive actions and management review actions.

Causes of identified nonconformities are investigated and, where appropriate, corrective actions are implemented to ensure that nonconformities do not recur. Preventive actions are implemented to eliminate the causes of potential nonconformities. Corrective and preventive actions taken are recorded, and are followed up to ensure that they have been properly implemented and that they are effective.

Reference Documents: QCI-01-01 (Management Review), QCI-14-01 (Corrective Actions), QCI-14-02 (Preventive Actions), QCI-14-03 (Continual Improvement).