Certified Steel Treating Corporation

Quality Management System Manual

AC7004E

Revision L - Dated: 11/28/11

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Approved By: 11/28/11

General Manager QA Manager Date

General

Introduction

Certified Steel Treating Corporation is a CCR Woman Owned Small Business, serving aerospace, military and government customers since 1947. Certified Steel Treating Corporation has more than sixty years of heat treating experience, in planning, processing and meeting the customers' requirements. The company's capability includes large and small batch atmosphere heat treating, carburizing and stress relieving. Certified Steel Treating Corporation has a reputation for outstanding performance, competitive cost and quick turn time.

Scope and Exclusions

Certified Steel Treating Corporation developed and implemented a Quality Management System that is continuously maintained for effectiveness and process improvements in accordance with the requirements of the Nadcap, Quality Management System, AC7004E, Military Standards, 10CFR50, Appendix B, ASME NQA-1, 10CFR21, customer and applicable statutory and regulatory quality management system requirements.

This Manual is the top-level document of the Certified Steel Treating Corporation, Quality Management System. It is designed and implemented, to the requirements of AC7004E, based on AS 9100. The purpose is to define and describe the quality management system, the authorities and responsibilities of the management personnel involved in the operation of the system, and provide general procedures for all activities comprising the quality system. As a heat treat processor, the design and development, and servicing requirements, of the AS 9100 standard do not apply.

Quality Policy

Our mission is to partner with our customers to accommodate their ever-changing needs, in order to provide excellent service, quality, timely delivery, competitive price, and continuous product and service improvement to maintain competiveness in a challenging environment.

Environmental Policy

We are committed to clean environment, prevention of pollution, and the minimization of the use of resources and the generation of waste in our products and operations. We are committed to meet and exceed all environmental regulatory compliance requirements promulgated by the Federal, State, County, and the City agencies. We are committed to pursue continuous improvement in our environmental management by establishing and monitoring objectives and goals and implementing employee training programs. Further, we encourage our peers, colleagues, suppliers, and community to follow our lead.

Safety Policy

The health, safety, and well-being of our employees are of primary importance and considerations in our operations, which are listed in the following order:

#1 Safety
#2 Quality
#3 Production

Our goal is to continually provide a safe and improved work environment that meets and exceeds California Occupational Safety and Health Standards for all employees and visitors. Each one of us has a duty to recognize, report, and act on unsafe situation before they can lead to injury or illness. Having a safe and healthful workplace will result in quality products and services, customer satisfaction, and profitability.

11/28/11

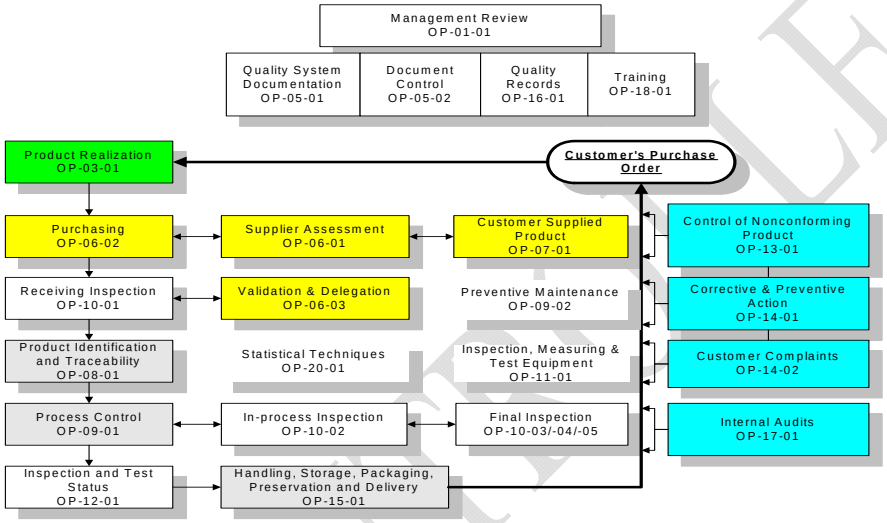
Jeff Davis – General Manager Date

Section 1
(Standard Section 4.1-4.2)
Quality Management System

Certified Steel Treating has established, documented, implemented and maintains a quality management system that continually improves to meet the requirements of Aerospace, Nadcap, Nuclear Regulatory Commission and Military Standard requirements.

1. The System Processes

1.1 Below is listed the quality system processes and their sequence and interaction. The Quality Manual and Operating Procedures define the foundation for this system.



1.2 Quality system documentation defines criteria and methods to support operations and system processes.

1.3 Operational Procedure OP-05-01, Quality System Documentation, explains in more detail how quality system processes are defined and documented.

2. Resources and Information

2.1 The Quality Assurance Manager defines the resource and information necessary to operate and monitor the quality system processes, and method of communicating to the Executive Management. Executive management is responsible for ensuring the availability of necessary resources and information.

3. Monitoring and Measurement

3.1 The performance of quality system processes is monitored to ensure their effectiveness and identify opportunities for improvement.

3.2 Product realization is usually monitored by measuring process parameters and/or product characteristics through data collection, observations, inspections and tests of product or service. Performance of processes is usually monitored through nonconforming, corrective actions, and internal quality audits.

4. Conformance and Continual Improvement

4.1 Quality System Processes are regularly reviewed during management review meetings, OP-01-01, Management Review and monthly reports showing the Cost-Of-Quality (COQ). Executive Management and departments review and identify any possible failures or breakdowns, as well as opportunities for improvement. Corrective and preventive actions and management improvement projects address actual or potential problems disclosed during these meetings.

5. Outsourced Processes

5.1 Special controls are implemented to ensure that purchased product conforms to specified purchase requirements.

5.2 Such controls may include, evaluation and pre-qualification of suppliers personnel or processes, assessment of realization processes and quality system; monitoring of supplier quality performance; requirements for inspection, testing or other records demonstrating product conformity. See OP-06-01 Supplier Assessment for details.

Section 2
(Standard Section 4.1 – 4.2)
Documentation and Record Requirements

1. Document Requirements

1.1 The following documentation comprises the quality system:

- Quality manual (including a documented quality policy);
- Operational procedures;
- Work instructions;
- Standards and other technical reference materials;
- Engineering documents, including drawings, specifications, procedures, product realization and control plans, and other documents defining products;
- Customer engineering documents; and
- Applicable regulatory quality system requirements, see OP-05-01 Quality System Documentation for details.

1.2 The organization shall ensure that personnel have access to, and are aware of relevant quality management system documentation and changes.

2. Quality Manual

2.1 The Quality Manual is the foundation document, defining the overall quality management system and policies; it defines the scope of the quality system, including details of and justification for any exclusion and sets the foundation for all other documents.

3. Document Control

3.1 Certified Steel Treating has paper and electronic documentation. Both systems are currently used, and are defined in Procedure OP-05-02, Control of Documents.

3.2 All documents are reviewed and approved prior to issue. New documents and document changes may be initiated by anyone in the organization, but may only be issued, by an authorized agent, rules governing the issue of documents are defined in procedures OP-05-01, Quality System Documentation, and OP-05-02, for the Control of Documents.

3.3 Documents are distributed to personnel and locations where they are used. When appropriate and relevant, documents display a distribution list. Electronic documents are available on the network and are accessible at relevant terminals and computers.

3.4 Obsolete documents are removed from points of use. Retained masters or copies of obsolete documents are properly marked and are kept separate from active documents. Obsolete electronic documents retained, are stored in directories identified as archive documents.

3.5 All changes that affect customer and/or regulatory agencies are coordinated with the customer and/or regulatory agency.

4. Control of Quality Records

4.1 Quality records are established and maintained to provide evidence that:

- The quality system is implemented, maintained and effective
- Product designs satisfies design input and customer requirements;
- Materials, components, and processes meet specified requirements;
- Finished products conform to specifications: and
- The quality system is operated in accordance with documented procedures that are effective.

4.2 Personnel performing the task, and operations establish required records. Records are identified with a date, and reference to the person and task performed.

4.3 The lifetime of the product, customer contract, regulatory requirements, determine the retention periods, but in no case, shall, the duration, of record retention be less than 10 years, except for records identified, in OP-16-01.

4.4 Records required by international standard and quality system requirements imposed by applicable regulatory authorities

4.5 Records created and retained by suppliers are available for review by customers and regulatory authorities in accordance with contract/purchase order requirements. Right of Entry clause on the purchase order authorizes the review of these records by customers and regulatory authorities.

4.6 Product configuration management is appropriate for the products and customer contract requirements.

4.6 For details of record control see Operational Procedure OP-16-01, Control of Quality Records. The list identifies specific types of records for each category; their storage location; and retention period.

Section 3
(Standard Section 5.1-5.6)
Management Responsibility

1. Responsibility and Authority

1.1 Departments, groups and functions within the company, and their interrelations, are defined in the organizational chart enclosed at the end of this section and Form CST0105, Authorities & Responsibilities Matrix.

1.2 All departments and functions in the company are responsible for implementing, maintaining, and improving the quality system. The following specific responsibilities and authorities are assigned:

1.3 The President/General Manager of Operations determines the quality objectives and the Management Review Team will review progress, formulate action plans, and report on the performance of the Quality Objectives, Procedure OP-01-02, Quality Objectives.

1.4 CST quality organization comprises of departments:

- Personnel / Office Manager
- Quality Assurance
- Operations
- Sales & Marketing

1.5 Responsibilities

President/General Manager

- Formulates the quality policy.
- Determines the quality objectives
- Provides resources necessary to maintain the system.
- Conducts management reviews of the quality system.

Personnel / Office Manager

- Defines personnel qualification requirements.
- Implements measures to motivate personnel.
- Conducts indoctrination training.

Plant Superintendent
* Determines production personnel and equipment requirements.
* Train and qualify personnel for processing and verification functions
* Controls and monitors processes.
* Defines workmanship standards.
* Maintains production equipment and storage areas.
* Audits implementation and effectiveness of the quality system
* Maintain trained production personnel.

Marketing & Sales
* Conducts market research and analysis and annual mail-in surveys
* Advertises and promotes the company's services emphasizing quality aspects.
* Monitors the quality of competitors.
* Carries out contract and order reviews.
* Provides customer liaison and service.
* Handles customer complaints and perform annual mail-in/electronic surveys.

Purchasing
* Controls and monitors suppliers, products and services.
* Prepares and approves purchasing documents.
* Verifies on time delivery, quality and quantity has been received.

Quality Assurance and Quality Control
- Establishes and maintains the quality management system
- Defines personnel qualification requirements
- Develops quality plans and control plans
- Initiates corrective and preventive actions
- Maintains the calibration, measuring, inspection and test system
- Carries out supplier quality surveys and audits
- Identifies the need for the use of statistical techniques
- Handles nonconforming products
- Coordinates document control activities
- Establishes Planning (Shop Card/Traveler)
- Maintains, or coordinates the maintenance of quality records
- Coordinates collection of quality performance data
- Provides required training for its personnel.

Quality Engineer
* Performs inspections and testing
* Establishes Planning (Shop Card/Traveler)
- Maintains quality records
- Audits implementation and effectiveness of the quality system
- Identifies opportunities for improvement of the quality system

Process Engineer
- Performs receiving inspection
- Prepares Production plans (Writeup)

EHS Coordinator
- Subcontracted
- Administer and maintain the Environmental Health and Safety Program

2. Management Representative

2.1 Certified Steel Treating appoints the Quality Assurance Manager as the management representative with the authority and organizational freedom and unrestricted access to top management to implement the quality management system, freedom to resolve matters pertaining to quality and maintain continuous improvement;

- Ensure that the requirements of Nadcap AC7004E, are established, implemented and maintained;
- Promotes awareness of customer requirements throughout the organization;
- Resolve quality management issues.
- Report annually, a review of the performance of the Quality Management System to senior management and any need for improvement and maintain records of those reviews; and
- Interface with customers, Government and regulatory agencies on matters relating to the Quality Management System.

3. Internal Communication

3.1 The management communicates all system and product requirements throughout the organization through meeting, training, shop travelers and written instructions.

4. Management Representative

4.1 The Management Representative is responsible for implementing this commitment by promoting awareness of customer requirements throughout the organization. The Management Representative has the organizational freedom to resolve matters pertaining to quality.

5. Management Reviews

5.1 During management review meetings the Executive Management periodically reviews the quality management system to ensure its continuing suitability, adequacy, and effectiveness. The input and output information and process for conducting management reviews is defined in Operational Procedure OP-01-01, Management Review.

6. Resources

6.1 Executive Management is committed to providing resources necessary for establishing, implementing, and improving the quality management system. Reference Op-14-02, Customer Satisfaction.

7. Customer Focus

7.1 Marketing is responsible for developing indicators of customer satisfaction, and for defining methods for collecting and analyzing the information.

7.2 Information and data pertaining to customer satisfaction are collected and analyzed, some are:

- Customer feedback and surveys,
- Awards and recognitions,
- Product returns,
- Customer ratings, and
- Market share.

7.3 Operational Procedure OP-14-02, Customer Satisfaction, defines the system for collecting and analyzing the pertinent information and data, and for reporting results to the Executive Management.

8. Customer Feedback and Surveys

8.1 Customer complaints, expressions of satisfaction, and unsolicited customer feedback are collected. These activities are defined in Operational Procedure OP-14-02, Customer Feedback and Complaints. This data is analyzed by the Customer Service, and is presented in the Cost of Quality report (COQ) at monthly and/or management review meetings.

8.2 Customer communications in relation to complaints, product information, enquires, contracts, order handling, amendments and feedback are delivered to Sales or Quality Assurance for evaluation and determination of applicable action.

9 Awards and Recognitions

9.1 We encourage customers to rate our performance, and to participate in customer and supplier award and recognition programs.

10 Product Returns and Warranty Claims

10.1 Product returns and warranty claims are recorded as and processed as nonconforming, OP-13-01 and/or corrective action, OP-14-01 and analyzed in COQ reports.

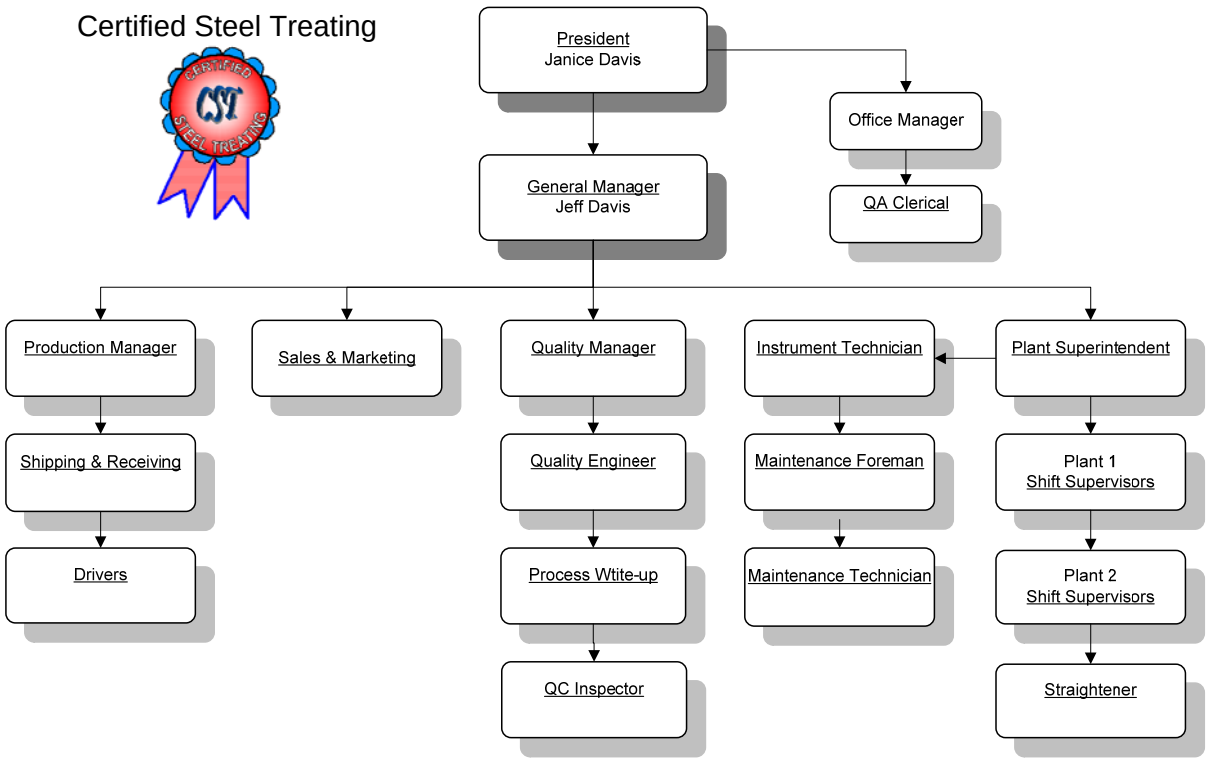
11 Repeat Customers

11.1 Sales records are analyzed to identify repeat customers their ordering frequencies and patterns. The ratio is one of the most important indicators of customer satisfaction.

12 Market Share

12.1 Marketing collects and analyzes data regarding competition, competitive products, and market share. This data is analyzed and presented at management review meetings.

Organization Chart



See Posted Organization Chart for Names

Section 4
(Standard Section 6.1-6.4)
Resource Management

1. Resource Requirements

1.1 Quality Assurance manager and department managements involved in the quality system are responsible for determining resource requirements for implementation and improvements of the system. Operational Procedure OP-01-01, Management Review, explains this process.

1.2 Marketing manager is responsible for determining resource requirements for addressing customer satisfaction.

2. Provision of Resources

2.1 Executive management has the responsibility and authority for provision of resources.

2.2 Resources allocation for activities is integrated with the process of defining and initiating the activity. It can be in the form of personnel assignments, allocation of space or equipment, training, procurement decisions, budgets, etc.

2.3 Management review of the quality system is the principal forum for allocation of resources for the operation and improvement of the system. Actions initiated by the review are supported by allocation of specific resources necessary for their implementation.

3. Competence, Awareness and Training

3.1 Human Resources department is responsible for identifying training needs and awareness programs, such as: general orientation, rules and regulations, quality system, safety, and other company-wide needs.

3.2 Departmental managers are responsible for identifying competency requirements and training needs, and to establish departmental training programs.

3.3 Departmental training is primarily focused on operating equipment and processes, conducting inspections and testing skills. Department Managers also use analytical and statistical techniques, as necessary.

3.4 Training needs are often identified in response to corrective or preventive action requests (CARs) and Cost Of Quality Reports (COqaQ).

4. Awareness and Training Programs

4.1 Certified Steel Treating provides company-wide, departmental training and awareness programs such as:

- General orientation and quality system awareness training - Explains how the product is used and how the quality system works to ensure product quality. Provided to all employees.
- Positive Re-enforcement Training Exercise- An approach instituted by CST to assist in the training and cross training of all employees in the various functions and systems.
- Safety training - Instructs in safe working practices, use of personal protective equipment, first aid, etc. Provided to all employees.
- Use of company-wide computer systems – On the job training, is provided for employees involved in write-up, purchasing, process controls, administration, accounting and record keeping.
- External training - External seminars, conferences, and courses. Provided to individual employees on as-needed basis.
- Self-study - Reading magazines, books, and reports. While all employees are encouraged to broaden their knowledge through reading, in some cases self-studying may be required as formal training.
- On-The-Job Training - Skill training in engineering, Manufacturing, and quality control, departmental training in specific skills is mostly provided as on-the-job-training.
  See Operational Procedure OP-18-01, Training and Awareness for more details.

5. Effectiveness of Training

5.1 Effectiveness of training is evaluated using the following approaches:

- Follow-up performance evaluation of trained employees
- Review of the overall employee performance;
- Consideration of competency and training when investigating causes of quality system failures and product or process nonconformities; and
- A global review of all training and awareness programs, conducted within the framework of management reviews of the quality system.

5.2 Operational Procedures OP-18-01, Training and Awareness, and OP-01-01, Management Review, prescribe more specific methods for categories of training and awareness programs.

6. Training Records

6.1 Training records are established for all types of training. Records are normally established and maintained by the department that provides the training. Human Resources maintain application and resume, and may also have copies of some departmental training.

7. Infrastructure

7.1 Planning of new, and/or modification of existing infrastructure and facilities is usually conducted in conjunction with product or process changes; capacity and/or work force expansions; and other such events. Facilities may also be expanded or modified to improve productivity and/or quality, or to improve the work environment.

7.2 Departmental managers are responsible for identifying the need and requirements for new, and/or modification of existing infrastructure and facilities in their departments. Requests for significant changes and/or expansions of facilities are submitted to the Executive Management for review and approval.

7.3 When relevant, Quality Assurance reviews the proposed facilities or changes to ensure that they enhance the achievement of product conformity and quality.

7.4 Supporting Services and Maintenance of Facilities: Supporting services required by Certified Steel Treating include transportation, communication, and IT services.

- Outside Processes – The requesting department that needs outside processing is responsible for the tracking and coordination of supporting functions involved. When applicable, engineering and/or quality is part of the purchase order contract to define the specifications, standard requirement and acceptance criteria.
- Transportation Services – are usually purchased from parcel delivery, courier services, and from trucking transportation companies. Purchasing of these services are managed by Shipping,
- Communications – Various telephone, wireless, and Internet access companies provide communication services. The requesting Department and Purchasing is responsible for administrating and coordinating these contracts.
- IT Systems – are designed and implemented by external consultants, and are operated internally by IT Engineering.
- EHS Coordinator monitors and controls utilities and supplies (e.g .. water, compressed air, electricity. chemical products) to the extent they affect conformity to product requirements. 16 &

8. Work Environment

8.1 Maintenance of buildings and facilities: external contractors perform Maintenance. This includes regularly scheduled maintenance of lighting systems, air conditioning and heating systems, landscaping, and cleaning. Repairs of buildings and other such facilities are contracted as needed. Purchasing is responsible for coordinating and managing maintenance contracts.

8.2 Process equipment maintenance: Key process equipment, machines, hardware, and software are regularly maintained in accordance with Departmental Managers, with plans specified by equipment manufacturers. Requirements for the maintenance of manufacturing equipment are specified in Operational Procedure OP-09-02, Equipment Maintenance.
8.3 Human factors: Human Resources and Departmental Managers are responsible for workplace conditions. Such aspects include interaction and communication between employees, employee harassment, conflict resolution, etc. Workplace policies are implemented through training and awareness programs and, when necessary, disciplinary actions.
8.4. Physical factors: Manufacturing, Service and Quality Assurance are responsible for identifying operations where extreme environmental conditions could impact conformity of product and/or performance of personnel. When necessary limits of exposure and/or acceptance criteria shall be defined and implemented for these operations.
8.5 Certified Steel Treating Corp. maintains total environmental, health, and safety compliance with federal, wastewater discharge, stormwater pollution runoff, hazardous material and hazardous waste management, city's building codes, equipment and operation safety.
8.6 All our equipment and processes are permitted through local agencies such as South Coast AQMD, CUPA (L.A. County Fire HazMat Division), DTSC, EPA, etc. All equipment and processes are evaluated for compliance with Cal/OSHA safety standards. All employees are regularly trained to ensure operational safety and the safety of our employee.

Section 5
(Standard Section 7.1-7.4)
Product Realization

1. Product Realization
1.1 Product Realization is derived form customer requirements and verified through the manufacturing process. This process is planned within procedures OP-02-01, Quality Management System and Planning, OP-03-01, Contract Review, WI-09-15, Quality and Process Planning and accomplished per procedures OP-09-01, Process Control and WI-09-05, HT Operators Instructions.

2. Product Requirements and Quality Objectives
2.1 Product requirements and quality objectives for product are defined and communicated in drawings and specifications, contract documents, internal and external standards, product samples and workmanship standards.
2.2 Sales, Manufacturing and Quality Assurance review these specifications before acceptance of the contract.
2.3 Review customer specified requirements, including:

- Delivery and post delivery activities,
- Requirements not stated by the customer but necessary for specified or intended use, where known,
- Statutory and regulatory requirements related to the product, and
- Any additional requirements considered necessary.

3. Product Realization Planning
3.1 Configuration management, the processes and controls required to meet the functional and physical characteristics, of the product, as defined, in specifications and technical documents, which includes, as applicable:

- Definition and evaluation of manufacturing operations and processes,
- Development of adequate and capable processes,
- Identification of special processes and consideration of associated risks and consequences,
- Establishment and implementation of appropriate process control measures,
- Development of instructions and training for process operators, and
- Requirements for records necessary to demonstrate process conformity.

3.2 Product realization plans are established between Production, Process Engineer, and Quality Assurance. The plans are defined in various types of documents, process flowcharts, shop traveler, computer programs, control plans, operator instructions, process validation reports, etc.

4. Product Verification and Validation Planning

4.1 Product verification and validation plans determine the inspection and testing for a product, and materials and components incorporated into the product. This includes:

- Identification of inspection and testing points,
- Inspection and testing, frequency, and method,
- Acceptance criteria, and
- Requirements for records necessary to demonstrate product conformity.

4.2 Quality Assurance and the Process Engineer are responsible for development of product verification plans. The plans are defined in documents, drawings and specifications, shop traveler/card, purchasing documents, inspection and testing procedures, etc.

4.3 Operational Procedures OP-10-01, Receiving Inspection; OP-10-02, In-Process Inspections, OP-10-03, Final Inspection, OP-10-04, Hardness Testing and OP-10-05, First Article explain how output, of product verification and validation planning, is used.

5. Customer Communication, Product Information

5.1 Marketing develops the content and format for company's brochures, catalogs, Internet site, and other form of promotional and product information material.

5.2 Master copies of documents containing product information are controlled. They are reviewed before release, and are identified by an issue date. Superseded and obsolete materials are phased out.

6. Inquiries and Order Handling

6.1 Sales department is responsible for receiving customer inquiries and orders. The Sales Manager reviews inquiries and orders for custom products. Programming Engineer, Manufacturing, Purchasing, and Quality Assurance may be called to assist with the review of orders for custom products.

6.2 Amendments to orders are handles as an original order. Amendments are reviewed to verify what new or modification to the original order is needed, customer confirmation is required.

6.3 Operational Procedures OP-03-01 instruct how to handle inquiries, orders, and amendments for products.

7. Customer Feedback and Complaints

7.1 Customer Service is responsible for receiving and processing customer feedback and complaints. All received customer communication is recorded in the customer complaints log.

7.2 Customer feedback and complaints data is classified into categories and analyzed. Every complaint is communicated, acted on. Customer Service, the responsible department, and Quality Assurance decide how to respond to the customer and, when appropriate, what corrective or preventive actions are implemented internally.

8. Purchasing

8.1 Supplier Assessment: All new suppliers are evaluated with regard to their quality management system and process capability. The suppliers are entered on the approved supplier list. Records of the initial supplier evaluation are maintained and updated every three years.

9. Supplier Quality Performance Monitoring

9.1 Quality performance of suppliers is monitored. Suppliers showing inadequate performance may be asked to implement corrective actions, and may be downgraded to a PROVISIONAL rating. If the requested corrective actions are not implemented and there is no improvement, the supplier is removed from the approved supplier list. Records of supplier monitoring and reevaluations are maintained. See Procedure OP-06-01, Supplier Evaluation for details.

10. Approved Supplier List

10.1 Purchasing maintains an approved supplier list, Form CST0602. Orders may only be placed with suppliers that are on the list.

10.2 Authorization to issue a conditional approval for an unapproved supplier is covered by procedure OP-06-01, when there is an immediate requirement and no approved supplier is on the approval list.

11. Purchasing Information

11.1 Purchasing documents are prepared by Purchasing. The documents clearly and completely describe ordered products, precise product identification and quality requirements. Purchasing documents are reviewed before release. The preparation, review, and approval of purchasing documents are explained in Procedure OP-06-02, Purchasing.

12. Verification of Purchased Product

12.1 All purchased products are subject to receiving inspection.

12.2 Quality Assurance is responsible for selecting appropriate methods for receiving purchased products. Operational Procedure OP-10-01, Receiving Inspection defines the requirements for receiving inspections.

12.3 When verification of purchased product is to be performed at supplier's premises, purchasing documents specify the intended verification arrangements and method of product release are given with the purchase order.

12.4 Only personnel authorized by Certified Steel Treating can accept, drop ship or release product. Designated personnel are issued a letter of delegation. Operational Procedure OP-06-03, Validation and Delegation, defines the requirements for validation and delegation.

13. Production Provisions

13.1 Product and Process Information: Specific product characteristics are flown-down to operations in the form of drawings, specifications, samples, instructions, Shop Traveler and product-specific templates and other tooling.

13.2 Product and process information required by process operators is communicated through the Shop Traveler or is included in work instructions. Supporting documents such as engineering drawings and specifications may be enclosed with the Shop Traveler. Operational Procedures OP-05-01, Document Control, and OP-09-01, Process Control, explain how to establish and use these documents.

13.3 Production provision are planned, carried out and controlled as follows;

- Information available that describes the characteristics of the production, e.g., drawings, parts lists, materials and process specifications.
- work instructions, including process flow charts, production documents (e.g ., manufacturing plans, travelers, routers. work orders, process cards) and inspection documents available, as necessary.
- Use, of suitable equipment, including product specific tools (e.g., jigs, fixtures, molds) and software programs.
- The implementation and use of monitoring and measuring equipment.
- Implementation, of product release, delivery and post-delivery activities.
- Accountability, for all product, during production (e.g., parts quantities, split orders, nonconforming product).
- evidence that all production and inspection/verification operations have been completed as planned, or as otherwise documented and authorized,
- provision for the prevention, detection and removal of foreign objects.
- monitoring and control of utilities and supplies (e.g .. water, compressed air, electricity. chemical products) to the extent they affect conformity to product requirements. And
- criteria *for* workmanship, specified in the clearest practical way (e.g .. written standards, representative samples, illustrations).

13.4 Planning considerations, as applicable:

- appropriate processes to manage critical items, induding process controls where key characteristics have been identified are established, implemented and maintained,
- design, manufacture and use tooling to measure variable data, when required
- identifying in-process inspection/verification points when adequate verification of conformance cannot be performed at later stages of realization. And
- special processes, as necessary

13.5 Control of Production Process Changes

- Personnel authorized to approve changes to production processes are identified, in OP-09-01.
- Changes affecting processes, production equipment, tools, or software programs are controlled and documented.
- Changes to production processes are assessed to confirm that the desired effect has been achieved without adverse effects to product conformity.

14. Measuring and Monitoring Equipment

14.1 Manufacturing and Quality Assurance determine Requirements for measuring and monitoring equipment. Measurement requirements for product acceptance shall be documented and shall include:

- criteria for acceptance and for rejection,
- where in the sequence measurement and testing operations are performed.
- required records of the measurement results (a\ a minimum. indication of acceptance or rejection), and
- any specific measurement instruments required and any specific instructions associated with their use.

14.2 The control system for measuring and monitoring equipment is defined in Operational Procedure OP-11-01, Measuring and Monitoring Equipment.

14.3 Production equipment, tools and software programs used to automate and control/monitor product realization processes, shall be validated prior to release for production and shall be maintained, see OP-15-01.

15. Process Monitoring and Control

15.1 Processes are monitored and controlled through variety of approaches, activities and techniques. The system is designed to control:

- Information, material and human (operator) input into the process;
- Technology, tools and suitable equipment used;
- Process environment and performance; and
- Process output.

16 Product Release and Delivery

16.1 Products are released for delivery only after all specified activities have been satisfactorily completed and conformity of the product has been verified. Operational Procedure OP-10-03, Final Inspection, define the system for final product verification and release.

17. Validation of Process for Production

17.1 Where the resulting output cannot be verified by subsequent measurement or monitoring are designated as special processes.

17.2 Manufacturing and Quality Assurance are responsible for identifying, validating, and documenting special processes. This includes revalidation and documenting, process changes

17.3 Special processes are validated and controlled by methods, such as destructive testing of product samples, equipment and personnel qualification, and work instructions and approved process procedures.
17.4 Special process records are established and maintained. Depending on the control measures implemented, these records may include process qualification, validation reports, equipment qualification, maintenance records, SPC charts, first article inspections and tests, operator qualification, training records, and so forth.

18. Identification and Traceability
18.1 Product identification is maintained thought-out the product life.
18.2 Purchased products are traceable to the source of purchase and per customer contract. The identification is in accordance with engineering drawings, specifications, purchase orders, etc. Purchased products are identified to the purchase order and job number. For details see Operational Procedures OP-08-01, Product Identification and Traceability.
18.3 The Shop Traveler number maintains Identification throughout all stages of operations, and during split-orders.
18.4 Final products are identified by drawing or customer requirements, as applicable.

19. Inspection Status Identification
19.1 Following every inspection or test, products are identified as pass or fail. This is to prevent nonconforming product from being inadvertently used or shipped. When a location is designated it can be used as inspection status staging area.
19.2 All personnel are responsible for maintaining the identification of each order's inspection status. See OP-12-01 Inspection and Test Status for details.

20. Customer Property
20.1 Customer-supplied property is received, inspected, and maintained following the same procedure that applies to purchase products, unless specified otherwise by the customer, e.g., Operational Procedure OP-07-01 Customer Property. In the event the supplied products fail receiving inspec6ion, or are not suitable for any other reason, the customer is contacted.
20.2 Customer's software, documents, and other property are protected to prevent damage and deterioration.
20.3 Customers are contacted in the event of loss, damage, deterioration, or suitability of their products.

21. Preservation of Products
21.1 Products are preserved to maintain cleanliness and when systems are open to prevention from entering and removal of foreign objects. Markings, to identify special conditions and warnings are affixed when appropriate or required by customers and/or regulatory agencies.
21.2 Shelf life and rotation scheduling is maintained for applicable items. Hazardous Materials are handled with extreme care.
21.3 The following procedures define the handling and preservation of products:
- OP-07-01, Customer Supplied Product;
- OP-08-01, Product Identification and Traceability;
- OP-15-01, Handling, Storage, Packaging, Preservation and Delivery.
- OP-21-01, Environmental Health and Safety

21.4 Production is responsible for product handling and preservation; and ensuring that containers holding products are suitable and are in good condition. Equipment used for internal transportation of products shall be maintained and properly operated, and adequately protected to prevent damage. Procedure OP-15-01, Handling, Storage, Packaging, Preservation and Delivery, describes the process.
21.5 When specified in a contract, special handling instructions will be added to the Shop Traveler.

22. Storage

22.1 Stockrooms and storage, staging and holding areas. Only products that are properly identified and that have passed required inspections are authorized to enter and leave the stockrooms. Every six months the stockrooms are inspected to assess the condition of stock.

22.2 When special storage conditions are specified (for example, temperature or humidity), products are stored in special rooms, boxes, or containers where the specified conditions can be continuously maintained. These special conditions are monitored to ensure that they are maintained without interruption and that the product is not compromised at anytime.

22.3 Products with limited shelf life are identified with expiration dates. These perishable products are also rotated in the stockroom to ensure that the oldest product is used first.

22.4 Material and finished product stockrooms are controlled using an inventory management system. The system can report available in stock quantities, product location, and turnover times.

22.5 The system is used to optimize and minimize inventory levels. Procedure OP-15-01, Handling, Storage, Packaging, Preservation and Delivery, governs the operation of stockrooms and storage, staging and holding areas.

23. Packaging, Labeling, Shipping and Delivery

23.1 Product packaging and labeling are defined in drawings, specifications and artwork. Personnel involved with these processes are provided with work instructions and/or special training.

23.2 Shipping department is responsible for packaging and labeling. The specifications are compatible with requirements of commonly used carriers, customer requirements, and for intended means of delivery (ground, sea, air). Packaging specifications are documented the Shop Traveler. See procedure OP-15-01 Handling, Storage, Packaging, Preservation and Delivery.

23.3 The Shop Traveler initiates shipment of the finished products. Only orders that have been authorized to ship by the shipping manager can be shipped.

See procedure OP-15-01, Handling, Storage, Packaging, Preservation and Delivery for more details.

24. Monitoring and Measuring Equipment

24.1 The calibration control system extends to the measuring and test equipment, comparative reference hardware (such as gauges and templates), and test software used for:

- Setup and monitoring of Operations processes;
- Monitoring of environmental conditions;
- Verification of product conformity; and
- Operations where defined accuracy of a measurement is required to assure product acceptance.

24.2 Equipment used for other purposes may be exempted from calibration. Such equipment is labeled with “For Reference Only”.

25. Measurement Identification and Selection of Equipment

25.1 Measurements to be made and the tolerance of the measured characteristics are defined in control plans, shop travelers, work instructions and/or in product drawings and specifications.

25.2 Gauges, instruments, and other measuring and monitoring equipment are selected on the basis of their capability to meet tolerance requirements. Quality is responsible for selecting appropriate measuring and monitoring equipment.

26. Equipment Calibration and Maintenance

26.1 Quality Assurance is responsible for calibrating and maintaining measuring and monitoring equipment.

26.2 Measuring equipment is calibrated using written instructions, unless calibration is simple and obvious. Only calibration instruments and standards having known relationship to the nationally recognized standards are used for calibrating measuring and test equipment.

26.3 Equipment is labeled with a calibration sticker. See procedure OP-11-01, Measuring and Monitoring Equipment for more details.

27. Validation of Software
27.1 When used to accept product In-house software and hardware is validated. Commercial software purchased will have certificates stating the conformance to claimed specifications.

QAM section 6
(Standard Section 8.1-8.5)
Measurement, Analysis and Improvement

1. Monitoring and Measurements
1.1 Engineering specifications, drawings, shop travelers, inspection and testing procedures define product conformity.
1.2 The Quality System is monitored by internal audits, corrective actions, nonconforming reports, and customer complaints and satisfactions. These reports are presented during management review meetings and are used to identify opportunities for improvement.

2. Statistical Techniques
2.1 Statistical techniques may be applied to:
- Validation of the product;
- Set up times;
- Testing results;
- Control of process;
- Sampling plans; OP-20-01, Statistical and Sampling Techniques
- Evaluation of measurement systems;
- Analysis of performance;

2.2 Departmental managers are responsible for identifying the need for using statistical techniques. Quality Assurance may be called upon to assist other departments in selecting and documenting specific techniques.

3. Internal Audits
3.1 The Quality Assurance Manager establishes an internal audit plan and schedule in accordance with Procedure OP-17-01, Internal Quality Audits. Every area is audited at least once a year. Specific areas may be audited more frequently, depending on their importance and quality performance history.
3.2 Only personnel independent of the audited activities are assigned to conduct internal audits. Normally, Quality Assurance manager leads the audit team except when QA activities are being audited. The Quality System Coordinator audits Quality Assurance activities.
3.3 Auditors prepare for audits by reviewing past audit findings, applicable standards and procedures, and establishing questionnaires and checklists. Selection of auditors and preparation for the audit are explained in Procedure OP-17-01, Internal Quality Audits.
3.4 Conducting the audit, auditors seek objective evidence indicating whether the audited activities comply with the requirements of the documented quality system. Nonconforming conditions are documented and recorded.

4. Monitoring of Quality System Processes
4.1 Quality system processes are monitored by a variety of approaches and techniques, as appropriate for a particular process and its importance, to demonstrate the ability to achieve planned results. These include:
- Conducting internal audits of the quality system;
- Monitoring trends in corrective and preventive action requests;
- Analyzing product conformity and other quality performance data and trends;
- Measuring and monitoring customer satisfaction;

4.2 Response actions: When a quality system process does not conform to requirements, Quality Assurance may request the manager responsible for the process to implement a corrective action, in accordance with Operational Procedure OP-14-01, Corrective and Preventive Action.

5. Monitoring and Measurement of Product

5.1 The shop traveler: Defines the method and requirements for monitoring and measuring, for inspection and testing.

5.2 Verification of purchased product: All purchased products are subjected to a receiving inspection, See Operational Procedure OP-10-01, Receiving Inspection (Verification of Purchased Product) for details.

5.3 First article inspection: When first article inspection is mandatory, it will be referenced as such, in the Purchase Order/Contract. In the absence of any contractual requirement, compliance is not mandatory. First Article Inspections shall be performed to operational procedure OP-10-05, First Article Inspection.

5.4 Operators or QC Inspectors: Perform In-process inspections. See Operational Procedures OP-10-02, In-process Inspections for more details.

5.5 Final inspection: Finished products are subjected to the final QC inspections. Only products that pass final inspection can be shipped. Procedures OP-10-04, Hardness Testing and OP-10-03, Final Inspection, defines the rules. Reference OP-12-01, Inspection and Test Status and CST1201, Stamp Log, for inspector identification..

5.6. Inspection, Test and Monitoring Records: Results of inspections and tests are indicated on the shop traveler.

6. Product Release

6.1 CST can only release product for shipment, that have passed final QC Inspection and have all documents that are to accompany the product, are present.

6.2 The customer can authorize an emergencies release. The person releasing the product will sign and date the shop traveler, with reference to the emergency release note.

6.3 Operational Procedure OP-10-03, Final Inspection and OP-15-01, Product Handling, Storage, Packaging, Preservation and Delivery, defines specific methods for product release and documentation required.

7. Control of Nonconforming Product

7.1 Documentation of Nonconformance: Product and process nonconformities are documented, regardless of how insignificant they seem to be or how easily they can be repaired or reworked and action to contain effect of the nonconformity on other product or process, are evaluated.

7.2 Nonconforming Report: The Nonconforming report process is explained in Operational Procedure OP-13-01, Control of Nonconforming Product.

7.3 Nonconforming Product: To prevent nonconforming product from being used or shipped, the product is identified as REJECTED and segregated.

7.4 Nonconformity Review and Disposition: Quality manager, quality engineer and/or general manager may make the disposition decision for a nonconforming product when it is obvious that the product must be scrapped, or reworked and re-inspected to meet specification. Only the customer is authorized to disposition their product for repair and/or salvage or use as is. Rules for disposition decision are provided in Operational Procedure OP-13-01, Control of Nonconforming Product.

7.5 Re-Verification of Repaired or Reworked Product: Repaired or reworked products are re-inspected, to the same requirement that rendered the part rejected. (Refer to Procedures OP-10-01, Receiving Inspection (Verification of Purchased Product); OP-10-02, In-process Inspections; OP-10-03, Final Inspection and OP-10-04, Hardness Testing, as applicable).

7.6 Product Returns: Returns are controlled to the requirements of OP-13-01, Control of Nonconforming Product..

7.7 Recalls: In Recall situations when the nonconformity is suspected to be a safety or other hazard, the product shall be recalled. Only the General Manager or Quality Manager can authorize a recall decision.

8. Analysis of Data

8.1 Data and information recorded in quality records are compiled and analyzed periodically to determine trends in the performance and effectiveness of the quality system and to identify opportunities for improvement.

8.2 Quality Assurance is responsible for coordinating these activities, and for reporting conclusions and trends to the Executive Management. This is usually done within the framework of management reviews of the quality system, in accordance with Operational Procedure OP-01-01, Management Review.

8.3. Following is some information and data that is recorded, compiled and analyzed for lost time and labor:

- Process performance variations
- Cycle times
- Unscheduled downtime
- Scrap, rework, and repair rates.
- Late and On-time delivery performance
- Supplier quality performance
- Customer satisfaction levels
- Customer complaints
- Stability of the operating system

9. Continual Improvement

9.1 Quality performance is determined by analyzing information about customer satisfaction, records of product and process nonconformity, results of internal audits, and other data and information relevant to quality performance.

9.2 The Company's quality performance is evaluated by management reviews of the quality system. For details see, Procedures OP-14-01, Corrective Action, and OP-01-03, Measurement, analysis and Improvement.

9.3 Management reviews identify improvement opportunities based on feedback form activities data collection. Employees are encouraged to present ideas for improving products, processes, systems, productivity, and the working environment. These improvement opportunities are evaluated and prioritized by Quality Assurance and, where appropriate, are implemented though the corrective and preventive actions process.

9.4 Where appropriate, improvement projects may be also initiated by management directives, such as policy statements, announcements, memorandum, and so forth.

10. Corrective and Preventive Actions

10.1 Application: The distinction between corrective and preventive action is that corrective action deals with actual nonconformities and preventive action deals with trends or potential nonconformities. This procedure does not differentiate between the two and refers to both as corrective actions.

10.2 Procedure: OP-14-01, Corrective and Preventive Action, has been established to define and implement the requirements for Corrective Actions. Requirements include:

- Reviewing nonconformities (including customer complaints)
- Determining the causes of nonconformities
- Evaluation the need for action to ensure that nonconformities do not recur
- Determining and implementing action needed
- Records of the results of action taken
- Reviewing corrective action taken
- Flow down of the corrective action requirement to a supplier, when it is determined that the supplier is responsible for the root cause

- Specific actions where timely and/or effective corrective actions are not achieved.
- determining if additional nonconforming product exists based on the causes of the nonconformities and taking further action when required.

10.3 Corrective Actions: The need for corrective action is determined on the basis of identified actual nonconformities and appropriate to the effects encountered and . Corrective action requests are typically triggered by such events as a failed inspection, customer complaint and/or product return, nonconforming delivery from a supplier, or a quality system audit finding.

10.4 Preventive Actions: The need for preventive action is determined on the basis of information and data regarding capability and performance of processes, product nonconformity rates, experience feedback, customer complaints, and quality system audit findings. Such information and data are collected and analyzed to detect unfavorable trends that, if not checked, will increase the risk of nonconformities.

10.5 Processing of Corrective and Preventive Actions: Preventive and corrective actions are initiated, processed and followed up using Corrective Action Database, CST1403 or customer supplied form. The form documents the unsatisfactory condition and the corrective or preventive action to be taken, and is used to record the verification and closure of the action.

10.6 Open CARs: Open CARs are reviewed regularly to ensure that the actions are implemented and followed up in a timely manner. Procedure OP-14-01, Corrective and Preventive Action, explains how to use the CAR system.

10.7 Continual Improvement: Continual improvement actions are often defined as corrective and preventive actions. This is especially true for preventive actions. Operational Procedures OP-14-01, Corrective and Preventive Action and OP-01-01, Management Reviews, explain how the corrective and preventive action system is used for facilitating continual improvement.

Revision History

Revision	Change	Date
–	Original Issue	12/15/00
A	Complete revision to AS9100	05/31/01
B	Revised to AS9100, Rev. A	04/20/02
C	Added (PRST) requirement	05/06/02
D	Revised and updated the Organization Chart	06/25/02
E	Complete revision to the requirements of AS9003-2001-10	11/05/02
F	Revised to include the requirements of PRI AC7004 questionnaire	12/06/02
G	Included 10CFR50, Appendix, ASME N QA-1 and 10CFR21 requirements	03/20/03
H	Revise the Quality Policy	10/20/03
I	Added OP-02-1 to Section 2, paragraph 1.2 and Section 9, paragraph 3.3, replaced plant superintendent with production manager	05/05/04
J	Revised Organization chart on page 3, And changed back to plant superintendent	09/28/04
K	Revised sections 2, 3, 4, 5, 6, 9 and 16, to correct various procedure names.	06/01/06
L	Complete revision to meet AC7004, Rev. E, Quality Management System Checklist.	11/28/11