TRI MODELS INCORPORATED

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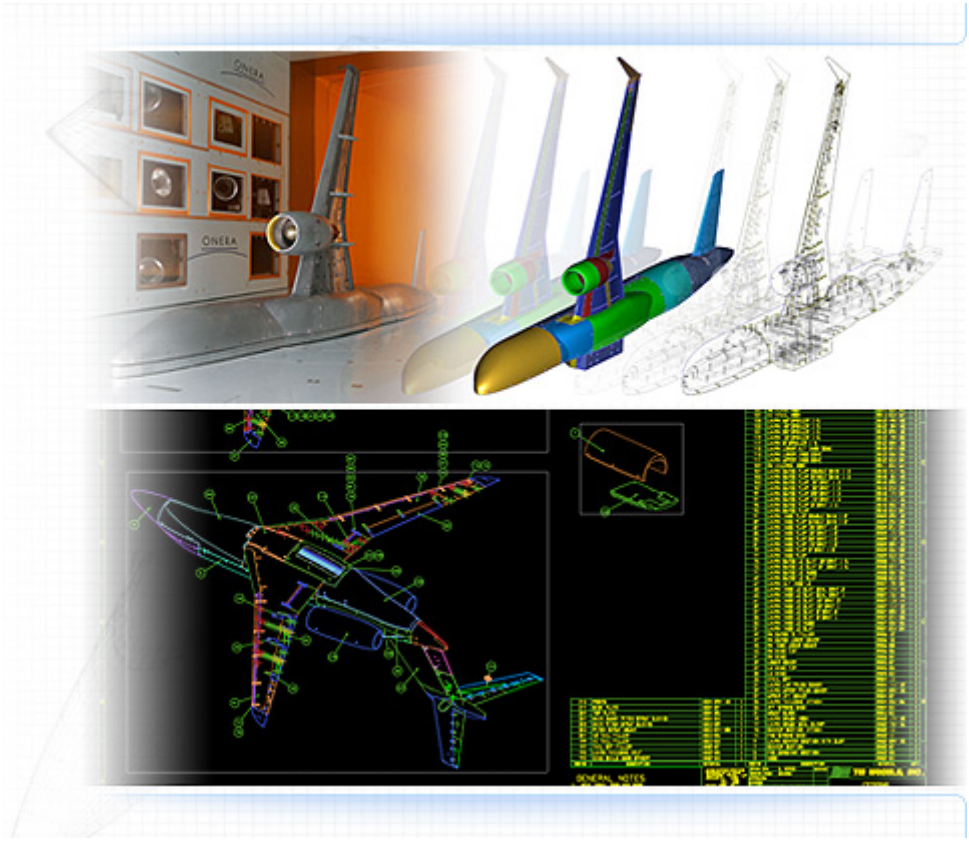


QUALITY MANUAL

Revision B - Published April 12, 2012

MISSION STATEMENT & QUALITY POLICY

MISSION STATEMENT

Tri Models is the premier provider of wind tunnel model, prototype and ground testing hardware for the aerospace industry. Our mission is to join seamlessly with our customers in their product development processes.

QUALITY POLICY

Fast, accurate translation of design concepts into testable models through:

- Specialized engineering staff to work intuitively with the customer's team
- Experienced & creative production staff for integrated, fast-track manufacturing
- Use of model-based-definition technology by all departments
- Stand-by services for quick turn-around changes and additions
- Continuous, real-time communication of project status

Compliance with customer, regulatory and statutory requirements

Registration to the ISO 9001 & AS 9100 quality standards

Continual improvements to technology, equipment, and expertise

We are the "best value in the market"

CONTENTS

DOCUMENT HISTORY

Rev. Level	Date	Affected Pages	Description	Approval
NC	1999	All	Quality Manual in compliance with ISO 9001 & AS 9100:1995.	P. Herzog
A	February 3, 2012	All	Upgraded Quality Manual to comply with ISO 9001:2008 & AS 9100:2009.	P. Herzog
B	April 13, 2012	Page 8 Interactions Chart Page 18 Training Page 31 FOD	Clarified inputs/outputs on interactions chart Clarified training requirements Added description of FOD program	P. Herzog

1. SCOPE OF QUALITY SYSTEM

This Quality Manual describes the quality management system at Tri-Models, Inc., a leading supplier of wind tunnel test models for the aviation and aerospace industry. The company designs and builds a wide range of models including force and momentum, pressure integration, propulsion integration, jet effects/STOVL powered lift, icing certification, radio cross section (RCS), and even hot firing engine models.

The quality management system at Tri Models has been in conformance with the requirements of the *MIL-I-45208, ISO 9001* or *ISO 9001/ AS 9100* since 1999.

The scope of the registration covers the design, fabrication, and instrumentation of wind tunnel test models and test support services. The scope includes all requirements of AS 9100.

2. REFERENCES

Compliance with the following quality standards, statutes, regulations, and guidelines are maintained:

- *ISO 9001:2008 – Quality Management Systems – Requirements*
- *AS 9100:2009 – Quality Management Systems – Aerospace- Requirements*
- *ISO 9000:2005 – Quality Management System – Fundamentals and Vocabulary*
- *ISO 9004:2000 - Quality Management Systems – Guidelines for Performance Improvements*
- *ISO 19011:2002 - Guidelines for Quality and/or Environmental Management Systems Auditing*
- *ISO 10012:2003 - Measurement Management Systems – Requirements for Measurement Processes and Measuring Equipment*
- *Defense Federal Acquisition Regulation Supplement - Clause 252.225-7014*
- *22 CFR Part 120 – 130 – International Traffic in Arms Regulations (ITAR)*
- Applicable state and federal Occupational Safety and Health Administration regulations
- Applicable state and federal Environmental Protection Agency regulations
- Applicable state and federal Department of Labor regulations and statutes

3. DEFINITIONS

The definitions contained in *ISO 9000:2005 – Quality Management System – Fundamentals & Vocabulary* are used. Listed below are explanations of how the terms "risks", "special requirements", "critical items", and key characteristics", are applied at Tri-Models, Inc.

3.1 RISKS

Conditions presenting "risks" or potentially negative outcomes to projects or to the company are defined as follows:

- Schedule risks – due to aggressive schedules, delays or changes in engineering, procurement of raw materials, or outside processing beyond Tri Models' control
- Producibility risks – due to the maturity of the concept or design being tested
- Company financial risks – due to quotations based on preliminary engineering

These conditions are evaluated during the quotation phase and declined if deemed to be "high risk" or beyond the scope of the company's expertise or ability to deliver in the expected timeframe. Risks, when accepted, are mitigated through the company's project management approaches, talent pool, and design/manufacturing technologies and equipment.

3.2 SPECIAL REQUIREMENTS

The company is especially cognizant of the customer's "special requirements". Examples of "special requirements" are:

- Use of specialized processes and exotic materials
- Key characteristics and critical items in the customer's design or statement of work that must be translated into the test model
- Special identifications, markings or packaging
- Compliance with U.S. export control laws

3.3 CRITICAL ITEMS

Critical items are "special requirements" or "key characteristics" in the customer's statement of work affecting form, fit, or function of the part.

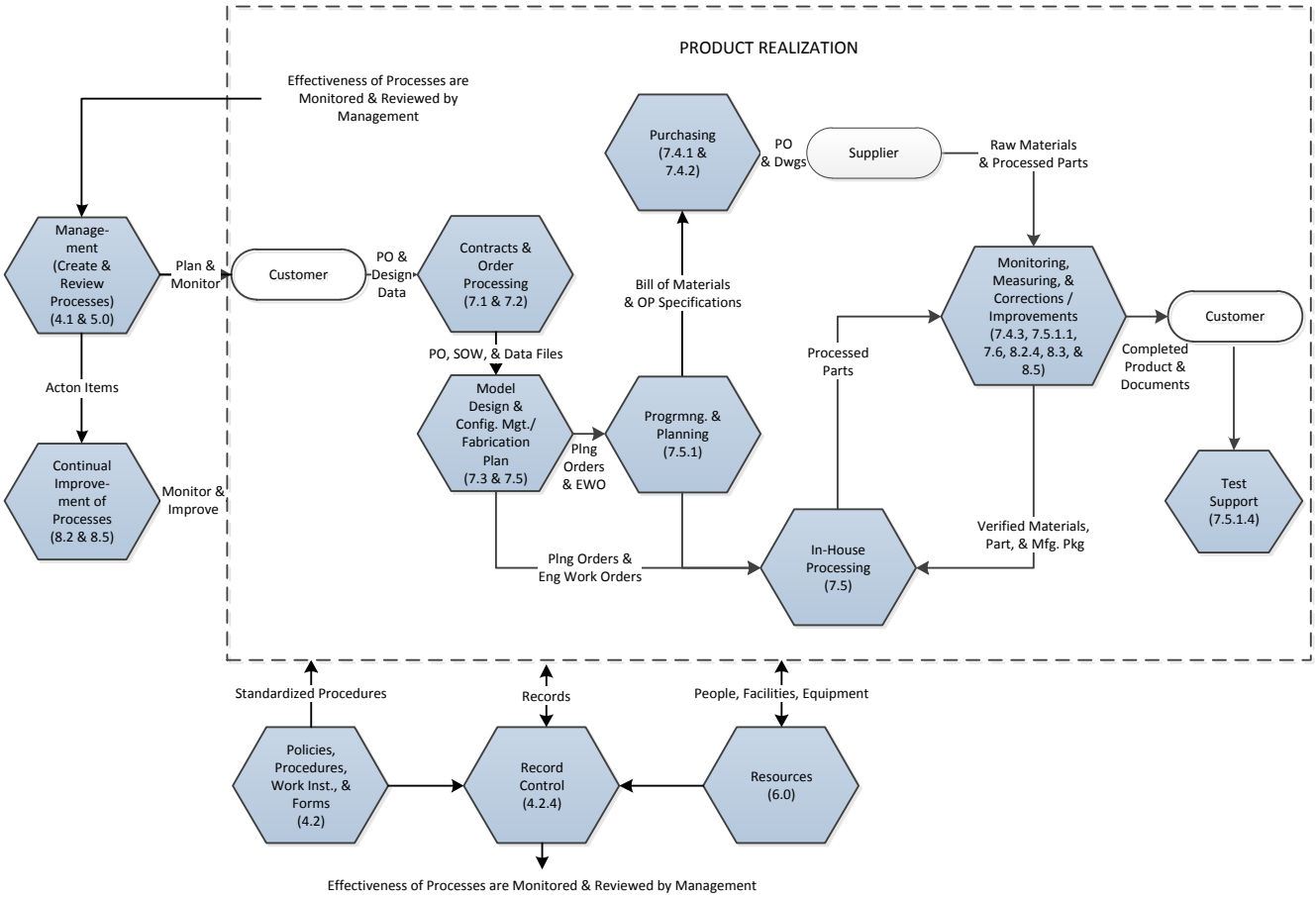
3.4 KEY CHARACTERISTICS

Key characteristics are identified by customers as well as Tri Models' engineering department. Key characteristics are monitored throughout product realization to ensure their conformance to requirements.

4. QUALITY MANAGEMENT SYSTEM

4.1 GENERAL REQUIREMENTS

The President and Quality Manager are responsible for the planning, implementation, and continual improvement of the quality management system. The primary focus of the system is to ensure that customers' needs are served through effective customer service, product quality and on-time deliveries. **The quality management system also addresses special customer requirements and statutory/regulatory requirements.** The processes needed for product realization and quality management are outlined below.



Each process leader is responsible for:

- Determining the criteria and methods for ensuring control of the processes.
- Providing the necessary resources
- Monitoring, measuring, and analyzing the processes for which they are responsible and,
- Taking corrective, preventive, and general improvement actions necessary, to achieve planned results

The quality system is managed in accordance with the requirements of *ISO 9001* and *AS 9100*. Outsourced activities are controlled by the Tri-Models purchase order, as described in Section 7.4 of this manual. The types of outsourced processes are: heat treating and metal finishing processes such as plating, chemical films, and anodizing. Destructive/non-destructive testing or inspections are also outsourced.

4.2 Documentation Requirements

4.2.1 General

The quality system is described through the following documents:

- Quality policy statement & quality objectives
- This quality manual summarizing the policies and processes of the quality management system
- Documented procedures required by *AS 9100* and the company
- Documented work instructions and forms for recording necessary information
- Records required by *AS 9100* and the company
- Other documents imposed by statutory and regulatory authorities

Documents are maintained in printed and digital formats. **Employees are provided the documents and information that are necessary for their jobs. Each manager is responsible for ensuring that employees are aware of procedures that are relevant to their responsibilities.** Access to manufacturing records is provided to customers and government/regulatory authorities by the CEO, President and Quality Manager, when necessary.

4.2.2 Quality Manual

The scope of the quality management system is provided in Section 1.0 of this quality manual. Documented procedures are referenced in the sections to which they apply. The interactions between the various processes are shown by process charts or flow diagrams. The "command media" (documentation) is structured as shown below:

Structure of Command Media

Quality Policy & Quality Policy Manual	Describe the company's commitment to quality management and the processes that result in products and services creating customer satisfaction.
System Operating Procedures (SOP)	Describe the sequence of actions, responsibilities, authorities, and the criteria for process effectiveness.
Work Instructions (WI)	Provide additional, more detailed directions on how to perform processes.
Records	Are evidence of "events" and results of processes. This evidence is recorded on standardized forms whose formats are controlled.

4.2.3 Control of Documents

The documents required for the quality management system are controlled as shown in the following table and according to the procedures listed below it:

AS 9100 REQUIREMENT 4.2.3	TYPES OF DOCUMENTS & HOW THE AS 9100 REQUIREMENTS ARE MET		
	Company Policies, Procedures & Forms (Including Machine Programs & Engineering Documents)	**Customer Drawings, Data, & Specifications (Printed or Digital)**	**Industry Standards & Specifications**
Approve documents for adequacy prior to use	QMS Documents - Reviewed & Approved by CEO, President, Treasurer, & Quality Manager Engineering Drawings – Reviewed & Approved by Engineer	Reviewed & Accepted by Dir of New Business Development during Quotation or Contract Review or subsequently by Engineering Manager	Accepted as provided by outside sources by Dir of New Business Development, Engineering Manager or Quality Manager (as applicable)
Review & update as necessary & re-approve	QMS Documents - Reviewed & Approved by CEO, President, Treasurer, & Quality Manager Engineering Drawings – Reviewed & Approved by Engineer Machine Programs – Verified by verification modules of program or first articles or test pieces.	Not Applicable	Accepted as provided or posted on industry sites.
Identify changes & current revision status	Revision History & Status are shown in Document History	As provided	As provided
Provide documents at their points of use	Company Drive & at point of use	In Engineering Drive or digitally to users	Provided as required in printed or digital format
Maintain legibility & identification	Verified by Internal Audits	Verified by Internal Audits	Verified by Internal Audits
Identify & control distribution of external documents	Not Applicable	Controlled by Engineering Department; issued in printed or digital format.	Identified & issued as received; current revision is verified on publisher's site if necessary.
Prevent unintended use of obsolete documents & apply suitable identification of retained documents	Obsolete documents are deleted & replaced.	Obsolete documents are deleted & replaced, or identified as "Obsolete" & kept in customer's folder.	Obsolete documents are deleted & replaced, or identified as "Obsolete" & retained for history.

Related Documents

SOP 4.2.3-1 Control of Quality System Documents

SOP 7.1.3 Configuration Management

Each process leader is responsible for creating and maintaining documented procedures sufficient to communicate process responsibilities and performance criteria. The Quality System Administrator is responsible for maintaining the *Document Register*. All employees are responsible for using the current version of policies, procedures, work instructions, and forms in their work.

Document changes are coordinated with customers and regulatory authorities in accordance with the contract by the Quality Manager.

4.2.4 Control of Records

Records that provide evidence of product conformity and the operation of the quality management system are retained according to:

Related Documents
SOP 4.2.4 Control of Records

The "*List of Quality Records"* in S*OP 4.2.4* provides a complete list of the records that are maintained. Records stored in electronic form are backed up and stored offsite.

Records are available for review by customers and regulatory authorities as specified in contracts and statutory requirements. The CEO, President, or Quality Manager are authorized to release records to external authorities when required.

5. MANAGEMENT RESPONSIBILITY

5.1 MANAGEMENT COMMITMENT

Commitment to the quality management system is evidenced through the daily verbal communications and interactions between the top management team (CEO, President, and Treasurer) and employees. Published documents such as the quality policy and objectives, formal management reviews of the system, training events, and employee meetings also demonstrate management's commitments to a system-based approach to quality assurance.

5.2 CUSTOMER FOCUS

Customer focus is maintained through accurate translation of customer requirements into the internal documents used to produce the product. The expectations of each customer and each job's requirements are documented and reviewed prior to the start of the job. The company's managers maintain frequent communication with customers during the fabrication of the model to ensure customer expectations are understood and addressed. Product conformity and on-time delivery are measured and actions are taken if the planned results are not achieved.

5.3 QUALITY POLICY

See the *Quality Policy* at the beginning of this manual. The *Quality Policy* is posted in work areas and discussed with the employees. The policy is reviewed at least once every two years to ensure its continuing viability. The reviews are documented in the minutes of management reviews.

5.4 PLANNING

The quality management system has been planned according to the management model provided by *AS 9100.* Changes to the system require the review and authorization of the CEO, President, Treasurer, and Quality Manager to ensure alignment with company objectives. Continuity of management controls is maintained when changes are implemented.

5.4.1 Quality Objectives

The company's objectives for quality, delivery, and competitive pricing are achieved through supporting sub-objectives for the various company processes. These objectives are stated as "*Criteria for Effectiveness*" in the documented procedures. The effectiveness of the processes is evaluated by the internal audits and reported to management. The objectives are adjusted as needed.

5.4.2 Quality Management System Planning

The quality management system is planned and documented. The *Product Realization Interactions Chart* in Section 4.1 provides an overview of the interactions between the core processes. The integrity of the quality management system is maintained when changes are made.

5.5 Responsibility, Authority & Communication

5.5.1 Responsibility & Authority

The responsibilities and authorities for each position are defined in employee job descriptions and the *Organization Chart*.

5.5.2 Management Representative

The Quality Manager is the Management Representative. As such, the Quality Manager is responsible to:

- Ensure that processes needed for the quality management system are established, implemented, and maintained
- Report to top management on the performance of the quality management system
- Implement improvements
- Ensure all personnel are aware of customer requirements
- Resolve all matters pertaining to quality and product conformity

5.5.3 Internal Communication

The effectiveness of the company's processes is discussed on a day-to-day basis as needed. The following formalized meetings are used to maintain focus on customer requirements and prevent problems:

INTERNAL COMMUNICATION SYSTEM

Type of Meeting	Purpose	Participants
MERB (Manufacturing Engineering Review Board)	**At Least Twice A Week:** Coordinate and assign actions to meet fabrication goals **Prior to Launch of the Job (Kick Off Mtg):** Review details of new projects. Define risks and mitigations Define project plan **As Required:** Review & disposition nonconformances, take corrective actions, and determine system improvements. Document "cost of scrap".	CEO, President, Treasurer, Quality Manager, Dir of New Business Development, & Engineering Manager (Required Attendance Depends on the Topics to be Discussed)
Management Reviews	**Annually:** Review results of internal audits, customer feedback, process performance, product conformity, preventive & corrective actions, follow-ups on previous actions, changes affecting the quality management system, improvement recommendations, resource needs	CEO, President, Treasurer, Quality Manager, Dir of New Business Development, & Engineering Manager
"All-Hands" Meetings	**Periodically as Determined by CEO or President:** Direct communication between the CEO or President and employees regarding the state of the company	All Employees

5.6 MANAGEMENT REVIEW

5.6.1 General

A documented review of the quality system is conducted as shown in the table in *"Section 5.5.3 - Management Review"* to ensure the continuing suitability and effectiveness of the system. The topics shown in the following paragraphs are discussed. Records of the reviews are maintained by the Quality Manager.

5.6.2 Review Input

- Results of audits
- Customer feedback
- Process performance
- Product conformity
- Preventive and corrective actions
- Follow-ups on previous actions
- Changes affecting the quality management system
- Improvement recommendations

5.6.3 Review Output

- Improvements to the quality management system
- Improvements to the product
- Resource needs
- Need for changes to quality system, including *quality policy* and/or *objectives*

6. RESOURCE MANAGEMENT

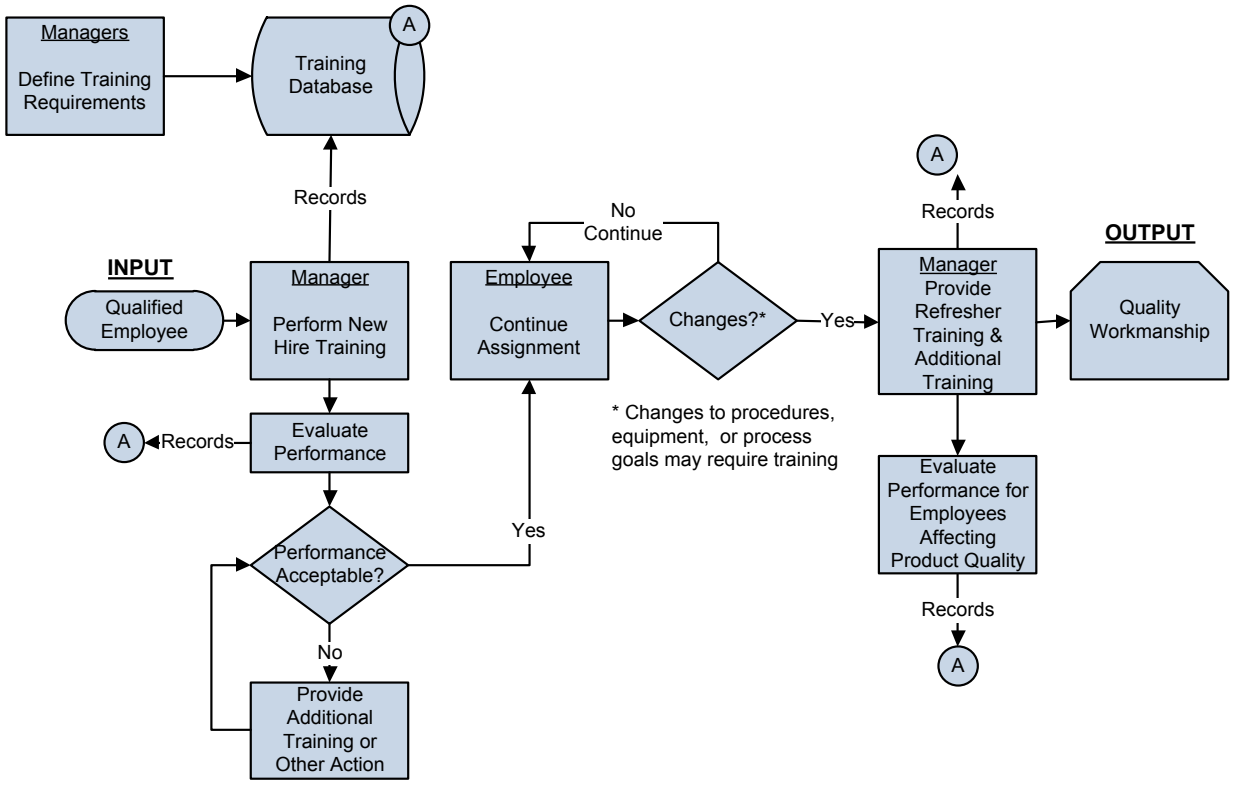
6.1 GENERAL

Resources to maintain the effectiveness of the quality system are provided through assignment of trained staff and through provision of appropriate facilities, equipment, tools, and infrastructure.

6.2 HUMAN RESOURCES

6.2.1 General

The company is staffed by employees with the training, education, and experience to meet the performance requirements of their assigned tasks. The citizenship status of employees is verified to ensure a qualified workforce for U.S. government projects. The process for orienting, developing, and maintaining a skilled workforce is shown below. The *Quality Policy* and an orientation to the quality management system are provided to each new employee.



6.2.2 Competence, Awareness & Training

Training is provided to employees prior-to and during work assignments. The effectiveness of the training or other interventions is evaluated by observing the employees' work, through internal audits, and by monitoring process performance. A training record is maintained for each employee. As a minimum, evidence of training or certification is required for the following positions:

- Welding
- Welding Inspector
- Forklift Operators

Other training is provided and recorded on an "as needed" basis.

Related Documents
SOP 6.2.2 Employee Development

6.3 INFRASTRUCTURE

The building and work areas include

- Office and meeting spaces for the following activities: administrative, planning, purchasing, programming, and inspection
- Manufacturing facility to include machining, assembly and welding centers
- Temperature & humidity controlled inspection laboratory
- Tool crib
- Shipping/Receiving areas
- Material storage areas

A secure telecommunications infrastructure is installed. Access to sensitive technical information is monitored and controlled. Both printed and electronic data are protected through controlled storage and handling procedures. Electronic data is protected and back-ups are stored offsite. Production, inspection, and material handling equipment are maintained according to established procedures. Compliance with city, state, and federal statutes for prevention of water contamination, control of hazardous and non-hazardous waste, fire protection, and pest control is maintained.

Entry to the facility is restricted to employees and authorized visitors.

6.4 WORK ENVIRONMENT

The work is performed in a job shop environment with safeguards to protect the products and employees. Personal protective gear (such as ear/eye protection, gloves, and smocks/aprons) and material handling equipment are provided.

Hazardous chemicals are labeled and stored according to the manufacturer's instructions. *Material Safety Data Sheets* are maintained.

Related Documents
SOP 6.3 Preventive Maintenance

7. PRODUCT REALIZATION

7.1 PLANNING OF PRODUCT REALIZATION

The product realization process is planned and described in *Section 7.5* of this manual and its related procedures. The following factors are considered in the planning of product realization:

- Quality objectives and product requirements
- Processes, documents and resources that are required
- Verification, validation, inspection, and test activities that are required
- Records that are needed to provide evidence that product realization has resulted in products that meet the customer's requirements
- **Configuration management**
- **Resources needed to support the testing of the product, including modifications during the tests**
- **Statutory and regulatory requirements**

7.1.1 Project Management

Each customer's order is considered to be a "project". **The internal, and outsourced, processes required for each job are planned, based on the type of model to be produced. The Director of New Business Development, Engineering Manager, Quality Manager, and President are the primary project managers. Together, they are responsible for maintaining open communications with customers and coordinating activities to result in the desired deliveries.**

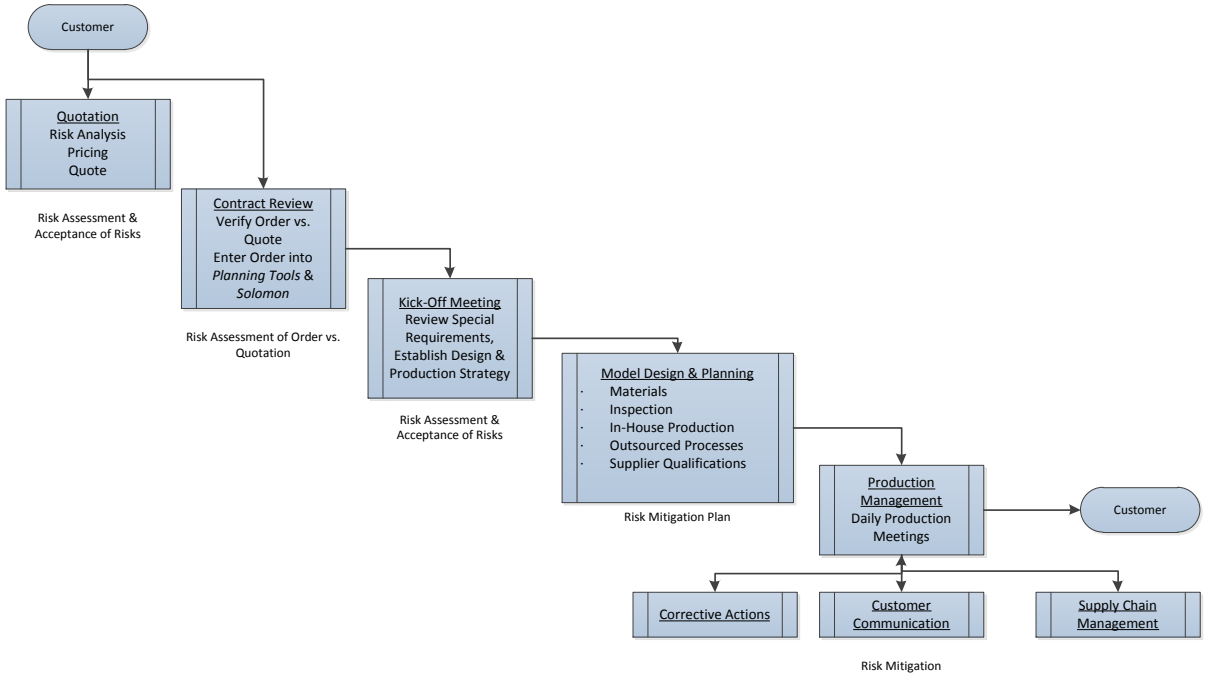
7.1.2 Risk Management

Project risks are initially considered when requests for quotation are received. Such risks include:

- **Schedule risks – due to aggressive schedules, delays or changes in engineering, procurement of raw materials, or outside processing beyond Tri Models' control**
- **Producibility risks – due to the maturity of the concept or design being tested**
- **Company financial risks – due to quotations based on preliminary engineering**

The risks involved in building the model are reflected in the quotation response.

If a bid is won, the risks are reviewed again through a detailed review of the contract by the Director of New Business Development. Following this, a kick-off meeting is held to discuss the customer's special requirements and key characteristics/ critical items of the design. This review involves the various functions responsible for producing the part. The crafting of each model is controlled through each stage, from design to completion, by a team of experienced model makers and Tri Models' owners, who are leaders in the industry of wind tunnel test models. Producibility issues are resolved on-the-spot; risks of failure are managed through the expertise of the staff and joint problem solving with customers' engineering teams. An overview of risk management at various stages of product realization is shown in the flowchart below.



7.1.3 Configuration Management

The configuration of products is controlled by the data provided by customers and through the drawing release process established by the engineering department. Inspections at various stages of product realization verify that the correct configuration is produced. The configuration management process is monitored through internal audits to ensure its adequacy.

Related Documents
SOP 7.1.3 Configuration Management

WI 7.1.3-1 Drawing Distribution Overview

WI 7.1.3-2 File Transfer from EWO to Mastercam

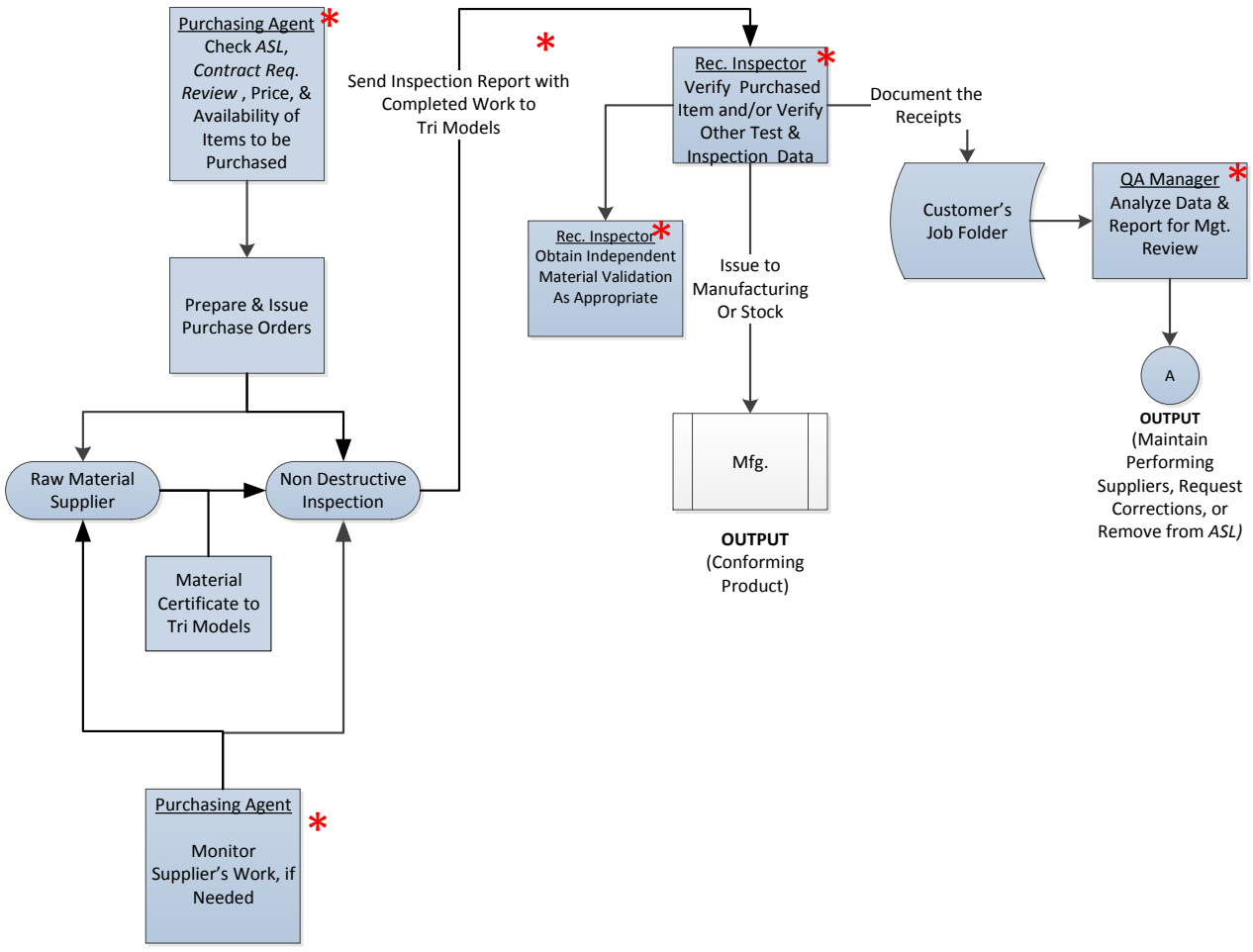
WI 7.1.3-3 Engineering Directory Structure

7.1.4 Control of Work Transfers.

Work performed outside the facility is controlled through the terms of the purchase order. This process is shown in the flowchart below and further described in:

Related Documents

SOP 7.4.1 Supply Chain Management



* = Points at which supplier risks are monitored & managed.

7.2 CUSTOMER-RELATED PROCESSES

7.2.1 Determination of Requirements Related to the Product

The order fulfillment process begins with the evaluation of the customer's request for quotation (RFQ). The solicitation for- and submissions of- quotations is handled by the Director of New Business Development. The following factors are evaluated:

- Product requirements, including delivery dates and post-fabrication test support
- Unstated requirements necessary for intended uses, when known
- Applicable statutory and regulatory requirements
- Any additional requirements necessary for accurate order fulfillment

Release of the quotation to the prospect is indication that the risks inherent to the potential job have been reviewed and accepted.

7.2.2 Review of Requirements Related to the Product

Once a purchase order is received by phone, fax, or email, it is reviewed again by the Director of New Business Development to:

- Ensure all requirements are defined and understood
- Resolve any differences between the order and the quotation
- Evaluate the company's ability to fulfill the order under current circumstances (i.e., changes in price, material availability, shop capacity, or customer's delivery schedules)
- Understand the customer's special requirements
- Identify security, regulatory, and statutory requirements associated with the product and their risks

When changes to orders are received, the "change" order is reviewed in the same manner as the original order and affected documents are modified. Change orders obtained during the process or design or fabrication are first reviewed and processed by the engineering department prior to documentation in the contracts folder.

7.2.3 Customer Communication

The Director of New Business Development and company owners are responsible for marketing the company's services and handling orders. Together, they obtain and

analyze feedback from customers and make necessary changes. The Quality Manager is responsible for handling "escapes" and customer complaints.

Related Documents
SOP 7.2 Sales & Order Processing

7.3 DESIGN & DEVELOPMENT

The design and development of models and the instrumentation necessary for testing is based on requirements expressed in the customer's statement of work (SOW). The design process is sequenced and controlled through reviews and verifications at stages established by customers and Tri Models. Design changes are controlled.

Related Documents
SOP 7.3 Design & Development

SOP 7.1.3 Configuration Management

WI 7.1.3-1 Drawing Distribution Overview

WI 7.1.3-2 File Transfer from EWO to Mastercam

WI 7.1.3-3 Engineering Directory Structure

7.4 PURCHASING

7.4.1 Purchasing Process

Suppliers are selected by evaluation of their capabilities **and associated risks.** Most of the company's suppliers were engaged prior to registration to *AS 9100*. Evidence of their qualification is maintained in the supplier files. New suppliers are surveyed using the *Supplier Capabilities Survey*. **Suppliers and the scope of service for which they are approved, are listed on the *Approved Source List*.**

Suppliers are required to meet established goals for quality to be retained on the *Approved Source List.* A *Corrective Action Request* is issued to suppliers whose performance is not acceptable. The Quality Manager is responsible for assessing supplier risks and approves / disapproves the use of sources. The performance of suppliers is formally reviewed annually and documented in the minutes of a management review meeting.

Customer-approved sources are used where required by both Tri Models and its sub-tier suppliers.

Tri Models retains responsibility for the conformity of materials and processes procured from outside sources.

Related Documents
SOP 7.4.1 Supply Chain Management

7.4.2 Purchasing Information

Product requirements are defined on purchase orders to sub-tier suppliers **by name/product description, applicable drawings and specifications.** Other quality requirements such as need for certifications, and use of approved processes, equipment, etc**.,** are identified on the purchase order and detailed in the *Purchase Order Quality Clauses*. Examples of topics addressed by the *Quality Clauses*:

- **Right of entry by Tri Models, Tri Models' customer, and regulatory authorities**
- **Certificate of Conformance**
- **Domestic Specialty Metals**
- **Controls for the protection of export-controlled technical data**
- **Quality System**
- **Required test, inspection and related instructions for acceptance by Tri Models**
- **Required test specimens**
- **Notification of Nonconforming Product and requirements for Tri Models' approval**
- **Changes in Product or Process Definition**
- **Hazardous Material**
- **Segregation of Product**
- **Packaging and Preservation**
- **Use of customer-approved special process sources**
- **Records**

Orders to sub-tier suppliers are placed by the Purchasing Agent. The adequacy and accuracy of the orders are verified prior to placement by the Quality Manager.

7.4.3 Verification of Purchased Product

Purchased products are verified according to:

Related Documents
SOP 7.4.3 Receiving Inspection

Purchased products are not released for use prior to completion of all required verifications.

When test reports are used to verify purchased product, the data in the reports are verified per their applicable specifications. The test reports for purchased raw materials are periodically validated by a qualified materials testing facility.

Although sampling inspection techniques generally do not apply to the quantity of materials and products procured by Tri Models, the plans are based on *ANSI Z1.4, Sampling Procedures and Tables for Inspection by Attributes* when they are used. The acceptance of purchases is documented in the *Receiving and Inspection Log*.

Inspections are not delegated to suppliers.

Verifications of sub-tier work are generally not performed at the suppliers' premises. However, should this be required, the requirements are specified in the purchase order.

Arrangements for the customer or the customer's representative to verify product at the sub-tier supplier's premises are made by the Quality Manager, when required. Verification by the customer is not used as evidence of effective quality control by the company.

7.5 PRODUCTION & SERVICE PROVISION

7.5.1 Control of Production & Service Provision

The Engineer/Planner plans the fabrication processes and establishes the controls, verifications, tooling, and special processes that are required.

- The *Planning Order* controls the sequence of fabrication operations, **including in-process verifications**
- Process work instructions are provided as necessary
- The shop is equipped with both numerically controlled and conventional mills, lathes, electrical discharge machines (EDM), welding equipment, and bench tools
- Calibrated measuring equipment is used for inspections
- Inspections are performed upon receipt of materials and parts, at various points during manufacturing, and after manufacturing has been completed

- Parts are cleaned, protected, packaged, and shipped only after their release has been authorized
- **Accountability for part quantities, including losses due to nonconformities, is maintained**
- **The completed inspection report is evidence of completion of manufacturing and inspection activities**
- **Prevention, detection, and removal of foreign objects are accomplished through visual inspections and cleaning of parts as appropriate**
- **Compressed air, chemicals (such as machine lubricants, cutting oils, coolants, paints, adhesives, and solvents) and other supplies such as welding wire and gases are monitored and controlled**
- **The criteria for workmanship are provided through machine programs, process instructions, industry standards/specifications, and engineering shop aids**
- **Models are crafted under the supervision of specially qualified personnel**

7.5.1.1 Production Process Verification

First article inspections are performed to verify the ability of the process, equipment, tooling, and documentation to meet requirements when applicable or appropriate. First article inspections are repeated when changes invalidating the original results are made (example: engineering, manufacturing processes, or tooling).

7.5.1.2 Control of Production Process Changes

The CEO, President, Quality Manager and Engineering Manager are authorized to make and approve changes to manufacturing processes. Changes that require customer or regulatory approvals are identified and obtained prior to their implementation in accordance with contract requirements.

The results of changes are assessed by inspection to confirm that the desired effect has been achieved.

7.5.1.3 Control of Production Equipment, Tools, & Software Programs

Production equipment is validated through test runs and calibrations, as appropriate, when installed. Software programs are validated, when necessary, to the extent possible or financially feasible. CNC programs are checked by the programmer prior to sending to the machines.

Production equipment is cleaned and fluids are checked and replenished daily. Preventive maintenance is performed through an outside service, if required.

Production equipment and tools are cleaned and stored in the work centers where they are used monitored to prevent unintentional damage and deterioration.

7.5.1.4 Post Delivery Support

Post delivery support, in the context of work performed by Tri Models, means providing support while models are in test chambers, or returned for retrofitting or changes.

- **Rework or remake activities are planned in the same manner as new jobs on the *Planning Order,* where possible. However, in circumstances of urgency, modifications are permitted under the direct verbal supervision of a model maker or the customer's team. Evidence of conformity to the customer's requirements is available through the resulting inspection or test reports.**
- **Data regarding post delivery nonconformities due to Tri Models' errors are summarized as "escapes"**
- **Corrective actions are taken according to the processes described in S*OP 8.3, Control of Nonconforming Product* and *SOP 8.5.2, Corrective Action***
- **Control and approval of the rework methods is determined by the disposition of the nonconformity. Repair schemes, if required, are provided or authorized by the customer and/or Tri Models' engineering department**
- **Support at test facilities is provided as a part of the customer's team. Planning and other documentation from Tri Models is not required for work performed at the test facilities. Such work is controlled by the customer.**

7.5.2 Validation of Processes for Production & Service Provision

Special processes such as heat treating, plating, and application of other chemical coatings are outsourced to certified processors. The requirements for special processes are communicated through the purchase order to include, as appropriate:

- Criteria for review and approval of the process
- Qualification and approval of the process prior to use
- Approval of equipment and qualification of personnel
- Use of specific methods and procedures, including **procedures for control of significant operations according to documented specifications**

- Requirements for records
- Use of customer-mandated sources

Such processes are validated by test data provided by the processor. The data are then reviewed against the relevant specifications during receiving inspection or through independent testing. Welding is a **"special process" performed at Tri Models under NADCAP certification and is performed by specially qualified and trained personnel. Records of personnel qualifications/training, equipment calibrations and maintenance, manufacturing sequences, and inspections are retained. If required, specimens are sent for independent testing and validation.**

7.5.3 Identification & Traceability

The constituent parts of a model are identified by their inscribed part numbers or by tags and by their related inspection documentation so that differences between the actual and agreed configuration can be ascertained.

The inspection status of products is identified by the sequence of completed inspection reports in the job folder. The completion of inspection is identified by the inspector's stamp or signature.

Inspection stamps are controlled by the Quality Manager. A stamp control log, showing stamps and their users, is maintained.

Traceability of the material used to construct a model is maintained such that materials are traceable to their source as well as ultimate destinations, including delivery and scrap. The relationship and identity of components of different assembly levels are identified and traceable when applicable.

Export-controlled items are identified according to contractual or regulatory requirements.

A record of the model's fabrication is retrievable from the job files.

7.5.4 Customer Property

Customer furnished prints, parts, materials, inspection tools and fixtures are identified through their original identification and preserved throughout model fabrication. Customer data and prints are controlled.

Customer furnished equipment is kept in the work centers where they are used or stored. In the event that customer property is lost, damaged, or found to be otherwise unsuitable for use, it is reported to the customer by the Quality Manager. Records of incidents related to customer property are maintained.

Related Documents
WI 7.5.4-1 Government Property Management Instructions

Customer account information is protected and accessible only to those with a "need to know".

Technical information controlled by *22CFR 120-130, International Traffic in Arms Regulations (ITAR)* or *15CFR 730-774, Export Administration Regulations (EAR),* are identified and protected. Tri Models is registered with the Directorate of Defense Trade Controls.

Related Documents
SOP 7.5.4-2 ITAR/EAR Controls

7.5.5 Preservation of Product

Products are preserved during internal processing and delivery in the following ways:

- **Cleaning and protection during handling and application of preservative oils as necessary to prevent foreign object damage. The FOD (foreign object damage) prevention program is implemented through daily housekeeping, cleaning of equipment and materials/parts, careful handling and protection in transit, and forklift training. All employees are trained in FOD procedures.**
- **Use of material handling equipment to prevent damage**
- **Marking and labeling as appropriate**
- **Shelf life control & stock rotation as appropriate. Materials, such as rubber goods, paint, seals, and adhesives, that are incorporated into products, are identified with date of expiration when received. Materials used only to make tooling are identified as "Tooling".**
- **Special storage, handling and disposal of hazardous materials**
- **Other environmental controls as necessary**

The documentation that accompanies the product at delivery is prepared and protected against loss and deterioration by the Inspector.

7.6 CONTROL OF MONITORING & MEASURING DEVICES

An inventory of monitoring and measuring devices is maintained.

The instruments are recalled and calibrated at established intervals, against international measurement standards or prior to each use. Calibration of inspection tools is outsourced to qualified suppliers or performed in-house by experienced technicians.

Discrepant measuring tools are identified and the impact of its nonconformity is determined, and corrected. The validity of previous measurements is verified. Customers and regulatory authorities are notified if nonconforming products resulting from discrepant tools have been shipped. Computer software used for verifications is controlled.

The guidance of *ISO 10012:2003 - Measurement Management Systems – Requirements for Measurement Processes and Measuring Equipment* is used to make decisions regarding the management of the company's inspection tools.

Related Documents
SOP 7.6 Calibration Program

8. MEASUREMENT, ANALYSIS & IMPROVEMENT

8.1 GENERAL

The quality system, processes, and products are monitored and measured through planned audits and product inspections to demonstrate:

- Conformity of products to their requirements
- Conformity of the quality management system
- Continual improvement of the quality management system

8.2 MONITORING & MEASUREMENT

8.2.1 Customer Feedback

Customer perceptions are monitored by the company owners, Director of New Business Development and the Quality Manager and analyzed to improve the company's services. **The feedback program includes the periodic conduct of surveys, evaluation of customer report cards, documentation of customer's verbal feedback, monitoring of "escapes" and documenting customer complaints.**

8.2.2 Internal Audit

The internal audit program determines if the quality system conforms to its established requirements and is effectively maintained. **Internal audits are also performed according to contract and/or regulatory requirements.** The Quality Manager is responsible for the Internal Audit program and maintains records of the audits and any resulting improvements.

Related Documents
SOP 8.2.2 Internal Audits

8.2.3 Monitoring & Measurement of Processes

The Quality Manager monitors the processes of the quality management system to ensure the system's reliability.

In the event of process nonconformities, a *Corrective Action Request* is issued and the problem is corrected. Process nonconformities are investigated to determine if they have caused product nonconformities and whether they have affected other processes or products. Such nonconforming products are identified and controlled.

8.2.4 Monitoring & Measurement of Product

Materials and outsourced products are verified when received. The verification methods are described in the following procedures:

Inspection data, including dimensional measurements, are documented on the *Tri Models Inspection Report*. The following information is traceable:

- **Criteria for acceptance and/or rejection**
- **Where, in the manufacturing sequence, the measurements were taken**
- **Measurement results**
- **Type of measurement instruments used**

Critical or key characteristics are controlled and monitored.

Products produced by Tri Models are currently inspected 100%. However, should sampling methods be utilized, the methods will be based on *ANSI Z1.4, Sampling Procedures and Tables for Inspection by Attributes*.

Product is not released for manufacturing or to the customer prior to completion of all required inspections.

The signature of the Inspector on the *Tri Models Certificate of Conformance* authorizes release of the product for delivery to the customer.

The *Tri Models Certificate of Conformance*, inspection reports, the sub-tier certificates, and other documents are provided in a data package as evidence to customers that defined requirements have been met. These documents are delivered to customers with the products.

The inspection reports are retained in the contract folders as a record of product conformity when the job is complete.

8.3 CONTROL OF NONCONFORMING PRODUCT

Nonconforming products (including product returned by the customer) are segregated, identified, and controlled. The following procedure describes the process for controlling nonconforming materials and product.

Related Documents
SOP 8.3 Control of Nonconforming Product

Nonconforming products are reviewed and dispositioned by the Quality Manager or other staff who are assigned disposition authority.

Nonconformities that can be resolved within permissible tolerances are reworked according to instructions provided by the management team. Nonconformities that cannot be so resolved are submitted to the customer or Tri Models' engineering for disposition or scrapped and remade. **Products dispositioned as scrap are defaced until physically unusable, tagged, permanently marked, and controlled.**

The effect of the nonconformity on other products or processes are evaluated and controlled.

When nonconforming products are corrected, they are re-inspected to ensure their conformity to the original requirements.

If nonconformities are detected after delivery or use have started, the Quality Manager notifies the customer and/or regulatory authorities (as well as other affected organizations) as soon as possible or as contractually required. If the product is known to affect test validity, reliability or safety, notification is given immediately so that appropriate actions can be taken.

Nonconformities detected by customers are recorded and responded-to on customer forms. In addition, an internal *Corrective Action Request* number is for added visibility. Records of nonconformities are maintained in each product's job folder as well as in the *Discrepancy Database.*

8.4 ANALYSIS OF DATA

Data pertinent to customer perceptions, product conformity trends, process performance, and supplier performance are collected, analyzed and reported to the CEO. Preventive actions are taken to contain risks or potential problems that are revealed through the analysis of data. Records of the results of the analysis are retained in the company's share drive.

8.5 IMPROVEMENT

8.5.1 General

The *Corrective Action Request form* is used to document the need for correction or improvement. This form is also known as the *CAR*. **The implementation and effectiveness of improvements can be traced through the *CAR system.***

8.5.2 Corrective Action

Corrective actions are requested when

- A major product nonconformity occurs (determined by President and QA Manager based on type of discrepancy or cost)
- There is an accumulation of minor product nonconformities of similar character
- There is a recurring problem with a process, a work operation, or supplier
- A noncompliance is observed during an internal, customer, or third-party audit
- There is a customer complaint or "escape"
- Supplier problems
- Any other condition that does not comply with the documented quality system is identified

The following procedure describes the process for defining, implementing, recording, reviewing, and maintaining records of corrective actions.

Related Documents
SOP 8.5.2 Corrective Actions

The Quality Manager is responsible for the corrective actions program.

Corrective actions that are the responsibility of suppliers are flowed to them.

Specific actions when timely and/or effective corrective actions are not achieved are described in S*OP 8.5.2*.

The Quality Manager determines if additional nonconforming products exist prior to closure of dispositions / corrective actions to ensure that all nonconformities are corrected.

8.5.3 Preventive Action

The following procedure guides the company in its detection and elimination of potential causes of nonconformities.

Related Documents
SOP 8.5.3 Preventive Actions

The *Preventive Action form* is used to document and track preventive and continual improvement actions.

Routine preventive actions are part of the quality management system. Examples are:

- Review of customer orders to ensure they are understood and the company is able to fulfill them
- Product identification to prevent any misuse confusion and wrong processing
- Preventive maintenance of equipment
- Continuous inspection of the product
- Use of properly calibrated inspection, and measuring equipment Identification, segregation, and disposal of nonconforming material
- Prompt handling of customer complaints
- Internal audits with trained auditors to identify potential weaknesses
- Employment of competent personnel

The CEO or President may request additional preventive actions based on his reviews of the system.

Preventive actions are commensurate with the magnitude of the problem and the risks involved.