Nelson-Miller Inc.

Quality Management System Manual QM-QUA-001

Nelson-Miller Inc.
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Los Angeles, Ca 90039

Revision	Date	Description of the Change
N/C	10/10/79	Initial release of documented inspection system
A	07/22/80	Deleted Chief Inspector from Executive Staff
B	10/01/84	Changes made in Executive Staff
C	01/10/87	Completely rewritten
D	01/17/89	Completely rewritten
E	07/14/92	Completely rewritten
F	05/07/98	Rewritten to reflect NNP's Quality Improvement Process (QIP) and Systems
G	8/10/99	Process revisions made to Sections: 1, 2, 4, & 11; Deleted Section 15 and renumbered the following sections
H	7/31/00	Rewritten to comply with ISO 9002
I	10/20/00	Section 8: "Substrates" to "Metal and adhesives." Page VI: "...all existing & new employees." to ". . . all mployees."Section 1: "15 steps" to "14 steps" APPENDIX A: Deleted
J	03/14/01	Quality Policy: Added "during" to training description. Section 2: Clarified scope of quality system. Section 9: Added Mil-A-8625 Type II compliance to special processes. Section 11: Clarified calibration source approval requirements. Section 17: Changed assessment schedule release period from July to the first quarter of each year. Section 18: Change "Personnel" to "Human Resources."
K	11/19/01	Revised to comply with AS9100.
L	10/27/03	Revised to comply with ***ISO 9001*** and **AS9100**
M	06/05/06	Changed "ECR" to "OFI". Added exclusions to the Scope of the Quality System as recommended during the 2004 TUV audit report (Opportunity for Improvement) – page 7.
N	03/28/07	Remove revisions from text for AS9100 and ISO based on TUV audit report
O	04/02/09	Modified Section 3, added "..as it is not required for our products.." is Section 7.5, and added Team Functions to Diagram #2.
P	09/24/09	Modified Section 5.3.
Q	01/05/10	Revised to reflect ISO 9001: 2008
R	11/01/2011	Revised to reflect name change, current practices and compliance to AS9100 revision C
S	01/12/12	Revised to improve conformance to AS9100 standard
T	02/15/13	Removed Section 7.5.1.4 from exception list and updated 7.5.1.4 to show "not applicable " at this time or where the action is addressed for each reference statement.

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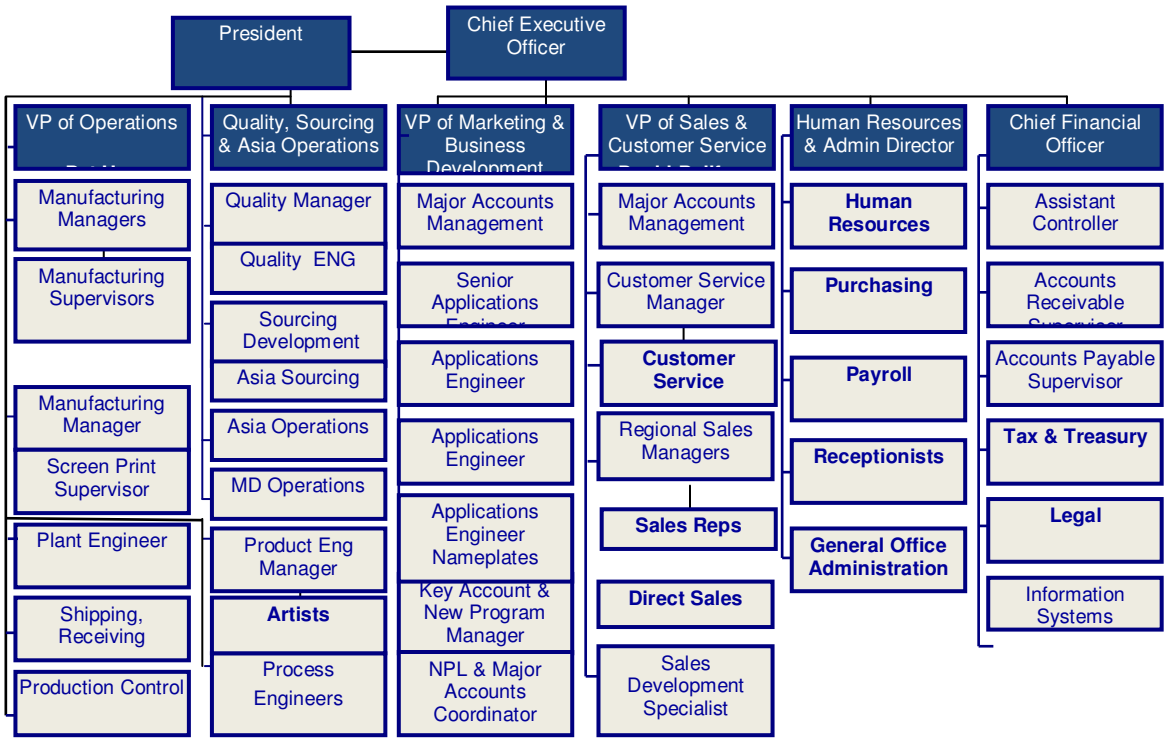
Nelson-Miller, Inc.



Section 1: Scope

1.1 General

Nelson-Miller developed and implemented the Quality Management System (QMS) to meet the requirements of the AS9100 Revision C described in this manual to improve our operational effectiveness and enhancing customer satisfaction by consistently providing products that meet customer and applicable regulatory requirements, and by continually improving the QMS.

1.2 Application

Nelson-Miller has determined that the following requirements are not applicable to the operations at this site and are documented as exclusions:

AS9100C Requirements EXCLUSION TABLE

Clause or Sub-clause	Exclusion	Justification
7.3	Design and Development	Product is manufactured using the customer drawing, no design and development is processed by Nelson-Miller.

Section 2: Normative Reference

2.0 Quality Management System References

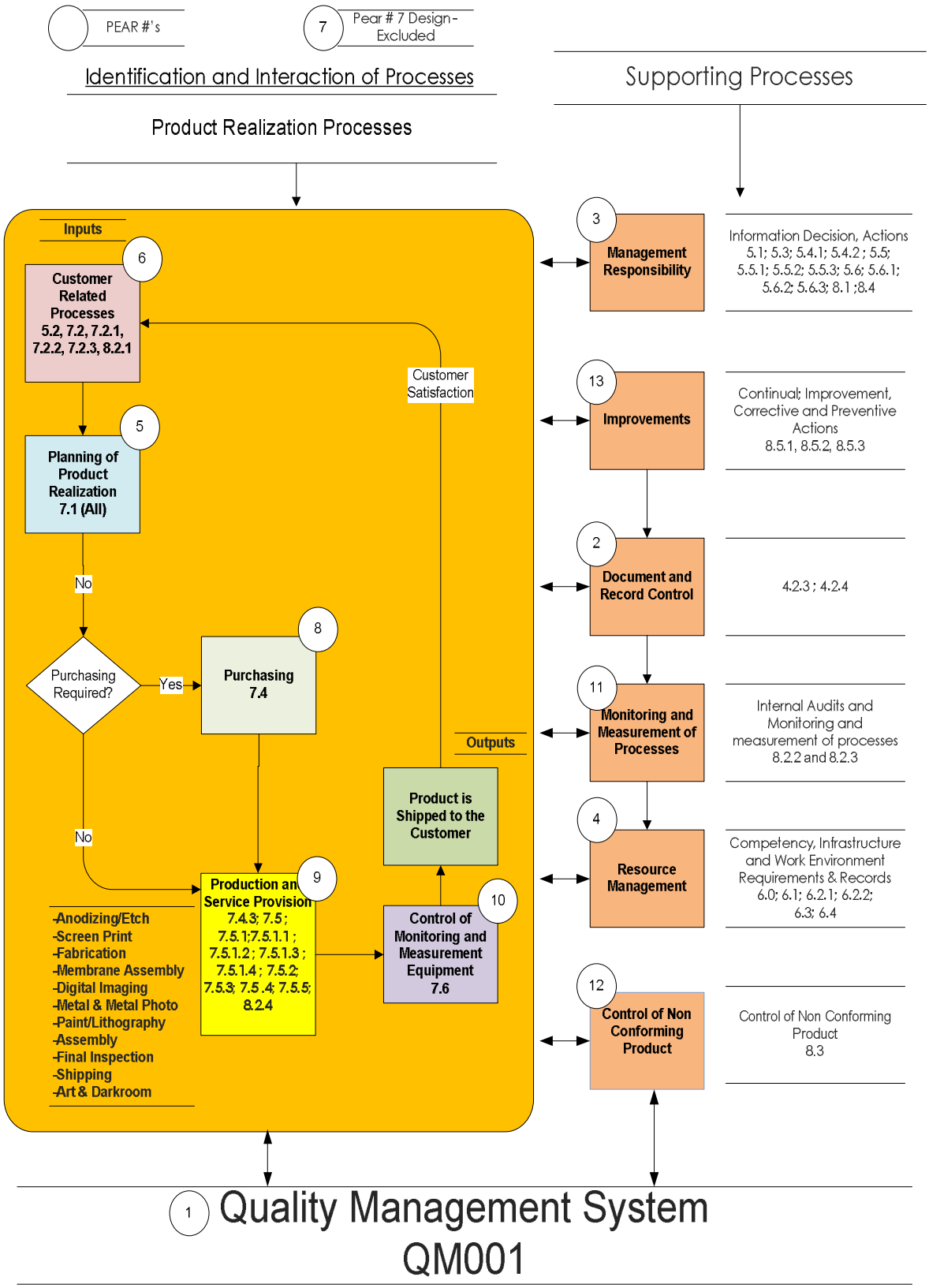
The following documents were used as reference during the preparation of the Quality Management System:

- ISO 9000-2005, Quality Management Systems - Vocabulary.
- ISO 9001-2008, Quality Management Systems – Requirements
- ISO 9004-2005, Quality Management Systems – Guidelines for performance Improvements
- SAE AS9100 Rev C (2009) - Quality Management Systems – Requirements for Aviation, Space and Defense Organizations
- SAE AS9101 Rev D (2010) - Quality Management Systems – Audit Requirements for Aviation, Space and Defense Organizations

Section 3: Definitions

3.0 Quality Management System Definitions

- **Customer owned property** - Any type of instrumentation, accessories or manuals that belongs to a customer.
- **Customer supplied product** - Any type of material supplied to be utilized in the manufacture, modification or repair of customer-owned property.
- **Product** – The end item result of meeting all contract terms and conditions. (eg: manufactured goods, etc.)
- **Quality Records** – Documentation of those activities wherein records of said activities must be maintained will be specified in the procedure or work instruction level documents, as applicable
- **Key Characteristics** - An attribute or feature whose variation has a significant effect on product fit, form, function, performance, service life or producibility, that requires specific actions for the purpose of controlling variation.
- **Risk** - An undesirable situation or circumstance that has both a likelihood of occurring and a potentially negative consequence.
- **Special requirements** - Those requirements identified by the customer, or determined by the organization, which have high risks to being achieved, thus requiring their inclusion in the risk management process. Factors used in the determination of special requirements include product or process complexity, past experience and product or process maturity. Examples of special requirements include performance requirements imposed by the customer that are at the limit of the industry's capability, or requirements determined by the organization to be at the limit of its technical or process capabilities.
- **Critical items** - Those items (e.g., functions, parts, software, characteristics, processes) having significant effect on the product realization and use of the product; including safety, performance, form, fit, function, producibility, etc.; that require specific actions to ensure they are adequately managed. Examples of critical items include safety critical items, key characteristics, etc.
- **Containment** - Action to control and mitigate the impact of a nonconformity and to protect the customer's operation includes correction, immediate corrective action, immediate communication, and verification that the nonconforming situation does not further degrade.
- **Objective Evidence Record (OER)** - A document recording objective evidence of the audit findings, including reference to the reviewed or observed procedures, records, products, processes, and associated NCR's and opportunities for improvement.
- **Process Effectiveness Assessment report (PEAR)** – A document stating results and providing evidence of determination on the effectiveness of a process.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Section 4 – Quality Management System

4.1 General requirements

Nelson-Miller has established, documented, and implemented a Quality Management System (QMS) in accordance with the requirements of AS 9100 and statutory and regulatory requirements. The system is maintained and continually improved with the quality policy, quality objectives, audit results, analysis of data, corrective and preventive action, and management review.

In the event that Nelson-Miller elects to outsource any processes that affect the product conformity to the requirements, the process is controlled via the purchasing process.

To develop and implement the QMS Nelson-Miller has addressed the following:

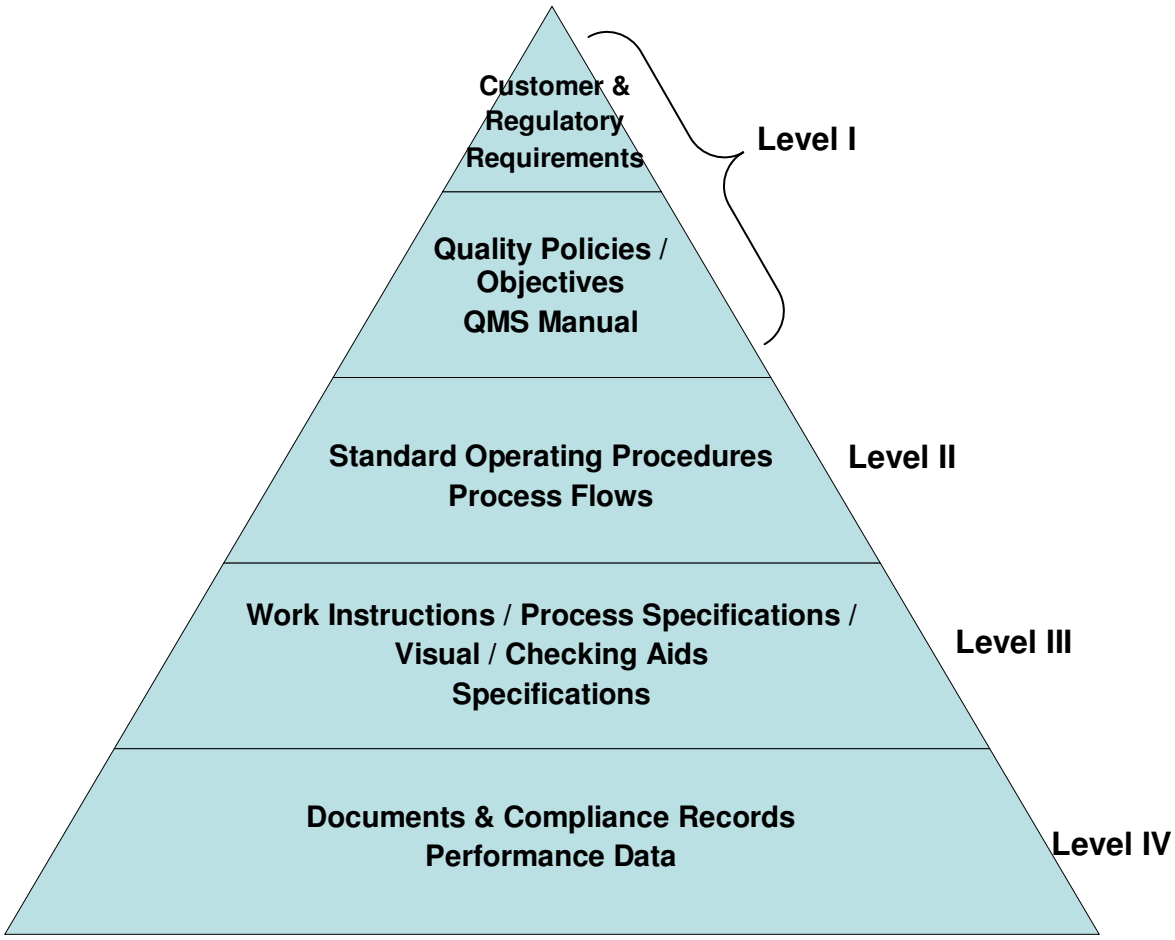
- Determined the processes needed for the QMS and their application throughout the organization and documented in the Process Flow Diagram "Identification and Interaction of Process".
- Determined the sequence and interaction of these processes, and illustrated them on the Process Flow Diagram
- Determined criteria and methods needed to ensure that the operation and control of the processes are effective, and documented them in the Process Effectiveness Matrix
- Ensured the continuing availability of resources and information necessary to achieve planned results and continual improvement of these processes
- Established systems to monitor, measure and analyze these processes, and
- Established processes to identify and implement actions necessary to achieve planned results and continual improvement of these processes

4.2 Documentation Requirements

4.2.1 General

Nelson-Miller maintains all required documentation to effectively sustain its quality management system. Management is responsible for implementation of procedures and records in their areas as required by the quality management system. The quality system documentation is comprised of a hierarchy of documents that flow from AS9100 and this quality manual.

QMS Documentation Scheme



Nelson-Miller maintains a secure intranet that allows authorized users to access documents as needed throughout the facility. Obsolete documents are identified as such and stored separately to prevent unintended use.

Documents and records determined to be necessary for effective planning, operation, and control of processes, unless otherwise directed by customer requirements are as follows:

- This Quality Manual
- Documented Procedures
- Customer Contract/Purchase Order
- Engineering Data
- Nelson-Miller's Shop Traveler (Job Jacket)
- Quality / Inspection Records
- Records required by statutory and regulatory authorities

- Vendor/Seller specifications

Top Management ensures that personnel have access to quality management system documentation and are aware of relevant procedures. While providing customer or statutory and regulatory authorities' access to quality management system documentation.

4.2.2 Quality manual

This Quality Manual has been prepared to describe Nelson-Miller's QMS. The scope and permissible exclusions of the QMS are described in section one of this manual. Each section of the manual references documented QMS procedures relating to the requirements outlined in that section. The Process Flow Diagram provides a description of the interaction between the processes of the QMS system. The relationship between the AS 9100 standard and documented procedure has been indicated by use of a numbering system that correlates to the AS 9100 standard.

4.2.3 Control of documents

All of the QMS documents are controlled according to the Document and Data Approval Procedure **PR-QUA-001**. This procedure defines the process for:

- Approving documents for adequacy prior to issue
- Reviewing and updating as necessary and re-approving documents
- Ensuring that changes and current revision status of documents are identified
- Ensuring that relevant versions of applicable documents are available at points of use
- Ensuring that documents remain legible and readily identifiable
- Ensuring that documents of external origin are identified and their distribution controlled
- Preventing the unintended use of obsolete documents and to apply suitable identification to them if they are retained for any purpose and
- Obtaining customer / regulatory agency approvals when required by contract or statutory and regulatory requirements

4.2.4 Control of quality records

Quality records are maintained to provide evidence of conformity to requirements and of the effective operation of the QMS. The records, including those created by or maintained by suppliers, are maintained according to the Control of Quality Records Procedure **PR-QUA-024**. This procedure requires that quality records remain legible, readily identifiable and retrievable. The procedure defines the controls needed for identification, storage, protection, retrieval, retention time and disposition of quality records.

Related Procedures

Document #	Procedure Title	ISO 9001:2008/AS9100 C
QM-QUA-001	Quality Manual	4.1 General requirements
		4.2 Documentation requirements
		4.2.1 General
		4.2.2 Quality manual
PR-QUA-001	Document and Data Approval Control of Documents and Records	4.2.3 Control of documents
PR-QUA-024	Control of Quality Records	4.2.4 Control of records

Section 5 – Management Responsibility

5.1 Management commitment

Top Management and Management Review Committee are actively involved in implementing the quality management system (QMS). It has provided the vision and strategic direction for the growth of the QMS, and established quality objectives and the quality policy **(See PR-QUA-036).**

To continue to provide leadership and show commitment to the improvement of the QMS, management will do the following.

- Communicate the importance of meeting customer, statutory, and regulatory requirements.
- Establish quality objectives
- Establish the quality policy.
- Conduct semi-annual management reviews.
- Ensure the availability of resources.

5.2 Customer focus

Nelson-Miller strives to identify current and future customer needs, to meet customer requirements and exceed customer expectations **(See PR-QUA-035).**

Vice Presidents ensures that customer requirements are understood and met, by requiring compliance with documented process procedures and applicable work instructions – derived from customer requirements.

Customer requirements are determined, converted into internal requirements, and communicated to the appropriate people in our organization.

Product conformity and on time delivery performance are measured. Management ensures that action is taken if planned results are not achieved.

5.3 Quality policy

Top Management and Management Review Committee ensure that the quality policy is communicated to all employees **(see PR-QUA-015)**. The Policy is included in new employee training and training on the QMS, and is posted in prominent places throughout the facility to maintain high standards within our organization.

Management reviews the quality policy at each management review meeting to determine the policy's continuing suitability for our organization.

Quality Policy

Nelson-Miller will improve customer satisfaction by providing defect-free products delivered on time. We will continually strive to eliminate waste in all processes. Each day we will work on continuous improvement.

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5.4 Planning

5.4.1 Quality objectives

Quality Objectives are an evaluation of various processes within our Quality Management System. These differ from goals which measurements to obtain a growth to a specific level of performance.

Quality Objectives are a measure of that performance over time. They are not designed to obtain specific goals, but are used to monitor processes to determine if changes to the system will lead to improvement

Quality objectives are established to support our organization's efforts in achieving our quality policy and reviewed semi-annually for suitability. Objectives have been established for quality, delivery and customer satisfaction.

Quality objectives are measurable, and reviewed against performance goals at each management review meeting. Our metrics are addressed in **PR-QUA-034**.

5.4.2 Quality management system planning

The quality system has been planned and implemented to meet our quality objectives and the requirements of 4.1 of the AS 9100 standard. Quality planning takes place as changes that affect the quality system are planned and implemented.

5.5 Responsibility, authority and communication

5.5.1 Responsibility and authority

The organizational chart defines the basic management structure and shows the interrelation of personnel in the organization. In all cases, the appropriate person has been granted both the responsibility and authority for their position's duties, which are further defined within position specific job descriptions and PR-QUA-016. The organizational chart is reviewed and approved by Management Review Committee for adequacy. These documents are available throughout the organization to help employees understand responsibilities and authorities.

5.5.2 Management representative

The Management Representative is responsible for the reporting of the overall Quality Management System, the Quality Manager has been appointed by the President as management representative. Management representative will have the responsibility and authority for the following:

- Ensure that processes needed for the quality management system are established and implemented.

- Report to Management Review on the performance of the quality management system, and note needed improvements.
- Promote awareness of customer requirements throughout the organization.
- Act as a liaison with external parties such as customers or auditors on matters relating to the QMS and
- Resolve matters pertaining to quality issues
- Organizational freedom and unrestricted access to management to resolve matters pertaining to quality.

5.5.3 Internal communication

Processes are established for communication within the organization. Methods of communicating the effectiveness of the QMS include department and management meetings, management review, circulation of minutes of management review meetings, production meetings, staff meetings, and/or other routine business communication.

5.6 Management review

5.6.1 General

Top Management review the QMS quarterly at management review meetings. This review assesses the continuing QMS suitability, adequacy and effectiveness, identifying opportunities for improvement and needed changes. Records are maintained for each management review meeting (see PR-QUA-014).

5.6.2 Review input

Assessment of the QMS is based on a review of information inputs to management review. These inputs include the following:

- Results of audits
- Customer feedback
- Process performance and product conformity
- Company level quality data
- Status of preventive and corrective actions
- Follow-up actions from previous management reviews
- Planned changes that could affect the quality management system
- Recommendations for improvement
- Supplier Performance
- Infrastructure and Work Environment

- Risk Management

5.6.3 Review output

During these review meetings, management will identify appropriate actions to be taken regarding the following issues:

- Improvement of the effectiveness of the quality management system and its processes
- Improvement of product related to customer requirements
- Resource needs

Responsibility for required actions is assigned to members of the management review team. Any decisions made during the meeting, assigned actions, and their due dates are recorded in the minutes of management review.

Related Procedures:

Document #	Procedure Title	ISO 9001:2008/AS9100 C
PR-QUA-036	**Process for Internal Communications with Employees**	5.1 Management Commitment
PR-QUA-015	**Training Procedure**	5.3 Quality policy
PR-QUA-034	**Metrics and Objectives Procedure**	5.4 Planning
		5.4.1 Quality objectives
		5.4.2 Quality management system planning
PR-QUA-016	**Control of Organization Chart and Job Descriptions**	5.5 Responsibility, Authority and Communication
		5.5.1 Responsibility and Authority
		5.5.2 Management Representative
		5.5.3 Internal Communication
PR-QUA-014	**Management Review Procedure**	5.6 Management review
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Section 6 – Resource Management

6.1 Provision of resources

Nelson-Miller has implemented a Quality Management System that complies with the AS 9100 standard. This implementation was achieved with management commitment and with sufficient resources for the implementation. To effectively maintain and continually improve the system, management determines and provides necessary resources.

6.2 Human resources

6.2.1 General

To ensure competence of our personnel, job descriptions have been prepared identifying the qualifications required for each position that affects product quality. Qualifications include requirements for education, skills and experience. Appropriate qualifications, along with required training, provide the competence required for each position (see **PR-QUA-016**).

6.2.2 Competence, awareness and training

Qualifications are reviewed upon hire, when an employee changes positions or the requirements for a position change. The Human resource function maintains records of employee qualifications. If any differences between the employee's qualifications and the requirements for the job are found, training or other action is taken to provide the employee with the necessary competence for the job. The results are then evaluated to ensure that the competence has been achieved. Training and evaluation are conducted according to the Resource Management procedures (**PR-QUA-011**, **PR-QUA-015**, **PR-QUA-022**, **PR-QUA-025**).

All employees are trained on the relevance and importance of their activities and how they contribute to the achievement of the quality objectives.

6.3 Infrastructure

To meet quality objectives and product requirements Nelson-Miller has determined the infrastructure needed per **PR-QUA-006**. The infrastructure has been provided, and includes buildings, workspace, utilities, process equipment and supporting services. As new infrastructure requirements arise, they will be documented in management reviews. Existing infrastructure is maintained to ensure product conformity. Maintenance requirements are documented in:

- Preventive maintenance records
- Applicable preventive maintenance procedures as necessary

6.4 Work Environment

A work environment suitable for achieving product conformance is maintained per **PR-QUA-006**. Requirements are determined during initial planning and may be documented in the management review results. The work environment is managed for continuing suitability. Data from the quality system is evaluated to determine if the work environment is sufficient for achieving product conformance, or if preventive or corrective action related to the work environment is required.

Related Documents

Document #	Procedure Title	ISO 9001:2008/AS9100 C
PR-QUA-011 PR-QUA-015 PR-QUA-022 PR-QUA-025	**Basic Quality Concepts Training** **Training Procedure** **Additional Training Procedure** **Orientation Training Procedure**	6.1 Provision of Resources
		6.2 Human Resources
		6.2.1 General
		6.2.2 Competence, awareness and training
PR-QUA-006	**Production Planning**	6.3 Infrastructure
		6.4 Work Environment

Section 7 – Product Realization

7.1 Planning of product realization

In planning the processes for product realization (**PR-QUA-006**), management has ensured that the processes are consistent with the requirements of the other processes within the quality system. Planning includes the following:

- Quality objectives and requirements for the product;
- The need to establish processes and documents, and to provide resources specific to the product;
- Required verification, validation, monitoring, measurement, inspection, and test activities specific to the product and the criteria for product acceptance;
- Records needed to provide evidence that the realization processes and resulting product meet requirements;
- Configuration management appropriate to the product;
- Resources to support the use and maintenance of the product.

The output of the planning is the shop traveler, related drawings, inspection packages, operator check sheets, and specifications that show dimensions, characteristics, tolerances, and any key characteristics identified by Nelson-Miller or the customer. Likewise, these instructions define any processes, documents or resource requirements specific to the product. Inspection, testing and other monitoring steps will also be defined in the shop traveler.

7.1.1 Project Management

Management assigns responsibility for project management and ensuring that product realization is planned and managed in a controlled manner, meeting requirements at acceptable risk, within resource and schedule constraints.

7.1.2 Risk Management

Risk management is essential in meeting customer requirements. Managers, or their delegates, communicate with customers, obtaining information that may not be stated in contracts or purchase orders. The information obtained is used in risk management.

Management is responsible for risk management and taking action to mitigate risks. Factors such as labor, equipment, material, scheduling, and outside processing are identified throughout contract review, purchasing, planning, production, and inspection processes. Documents are created or revised, and meetings are held as needed to address and communicate risks that have been identified. Internal preventive and corrective action is closely integrated into risk management. As risks are identified these actions may be used to mitigate/resolve risks. See 8.5.2 and 8.5.3.

Prior to acceptance of contract or purchase order, relevant risk criteria are assessed to identify risk and determine feasibility. Criteria may include but are not limited to:

- Engineering data (e.g., drawings, models, specifications, etc.) are made available,
- Customer supplied quality requirements and/or vendor manual,
- Configuration plan,
- Quantity and delivery schedule,
- Requirement for customer approved suppliers,
- Lead time and cost for raw material and/or hardware items,
- Lead time and cost of outside processing (as required),
- Cost of any non-recurring changes, if any,
- Labor hours and skill,
- Equipment (e.g., tooling, fixtures, and resources),
- Inspection and test plans,
- Any special requirements and expectations not stated in request.

7.1.3 Configuration Management

Configuration management is defined in, Planning for Product Realization procedure. The procedure defines the process for:

- Configuration management planning
- Configuration identification
- Change control
- Configuration status accounting
- Configuration audit

Contracts for new products and changes to existing products are processed in accordance with section 7.2. Part configuration is provided in the customer's blueprint or other specifications. Configuration is identified on the shop traveler document. When the product requirements change, the manufacturing plan is revised and appropriate personnel are informed of the change. This process is further defined in section 7.5. Configuration is controlled through verification during manufacturing. Evidence of verification is recorded on shop travelers and inspection records as defined in section 8.2.4.

7.1.4 Control of Work Transfers

When planning to temporarily transfer work Nelson-Miller defines the process to control and validate the quality of work per the customer requirements.

- The outsourced service provider must be an approved, evaluated supplier according to the requirements of section 7.4
- The supplier is required to notify Nelson-Miller of any process changes, any nonconformity, or other issues.
- The supplier will be subject to the corrective action system, as defined in section 8.5.2.
- Work must be conducted on the article(s) according to any specifications listed on the purchase order.

7.2 Customer-related processes

7.2.1 Determination of requirements related to the product

Nelson-Miller determines customer requirements before acceptance of an order. Customer requirements include those:

- Requested by the customer
- Required for delivery and post-delivery activities
- Not stated by the customer but necessary for specified use or known and intended use
- Statutory and regulatory requirements related to the product
- Additional requirements determined by Nelson-Miller

Customer requirements are determined according to **PR-SLS-001 and PR-SLS-002.**

7.2.2 Review of requirements related to the product

Nelson-Miller has a process in place for the review of requirements related to the product. The review is conducted before the order is accepted. The process ensures that:

- Product requirements are defined
- Contract or order requirements differing from those previously expressed are resolved
- Nelson-Miller has the ability to meet the defined requirements
- Records are maintained showing the results of the review and any actions arising from the review
- Where a customer does not provide a documented statement of requirement, the customer requirements are confirmed before acceptance
- Contractual requirements are reviewed and special product requirements are determined
- When product requirements are changed, Nelson-Miller communicates changes to relevant personnel and amends relevant documents per **PR-SLS-003**
- Risks (e.g., new technology, short delivery time scale) have been evaluated.

7.2.3 Customer communication

Nelson-Miller has implemented an effective procedure for communicating with customers in relation to:

- Product Information

- Enquiries, contracts and order handling, including amendments per **PR-QUA-035**
- Customer Feedback, including customer complaints

7.3 Design and Development

7.3.1 Design and Development has been excluded from the scope of the AS9100 QMS System.

7.4 Purchasing

7.4.1 Purchasing process

Documented procedure **PR-PUR-002** is followed to ensure that purchased product conforms to the specified purchase requirements. **PR-QUA-001** The procedure outlines the extent of control required for suppliers. Suppliers are evaluated and selected based on their ability to supply product in accordance with requirements.

Responsibilities and criteria for selection, evaluation and re-evaluation, status and status change and risk analysis are documented in **PR-QUA-001**. Records of the evaluation and any necessary actions are maintained as quality records. The organization is responsible for the quality of all products purchased from suppliers, including customer-designated sources.

7.4.2 Purchasing information

Purchasing information describes the product to be purchased, including where appropriate:

- Requirements for approval of product, processes and equipment
- Requirements for qualification of personnel
- Quality management system requirements outlined in the Purchasing Process Procedure **PR-PUR-002.**
- All applicable requirements for design, test, inspection, verification, statistical techniques, test specimens, notification of nonconforming product, process changes, records retention and right-of-access for Nelson-Miller or its customers.

The purchasing documents are reviewed to ensure the adequacy of requirements before orders are placed with the supplier.

7.4.3 Verification of purchased product

PR-QUA-012 describes the process used to verify that purchased product meets specified purchase requirements. Purchased product is not used or processed until it has been verified as conforming to specified requirements unless it is released

under positive recall procedure. If test reports are used to verify purchased product, the data must meet applicable specifications.

When verification activities are delegated to the supplier the requirements are defined, and a register of delegations is maintained.

If Nelson-Miller or the customer performs verification at the supplier's premises, the verification arrangements and method of product release are documented in the purchasing information. Where specified in the contract, the customer or the customer's representative is given the right to verify at the suppliers premises and organization's premises that product conforms to specified requirements

7.5 Production and Service Provision

7.5.1 Control of production and service provision

Nelson-Miller plans and carries out production and service provision under controlled conditions according to documented procedure **PR-QUA-006**. Controlled conditions include, as applicable:

- The availability of information that describes the characteristics of the product includes customer drawings, parts lists, material, process specifications. etc.
- The availability of work instructions can include production documents, process flow charts, manufacturing plans, job jackets, routers, inspection documents, etc.
- The use of suitable equipment
- The availability and use of monitoring and measuring equipment
- The implementation of monitoring and measurement
- The implementation of release, delivery and post-delivery activities
- accountability for all product during manufacture (e.g., parts quantities, split orders, nonconforming product), part accountability to ensure bad parts have been destroyed
- 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 such as water, compressed air, electricity and chemical products to the extent they affect product quality, and criteria for workmanship, which shall be stipulated in the clearest practical manner (e.g., written standards, representative samples or illustrations).

Planning considers, as applicable:

- The establishment of process controls and development of control plans where key characteristics have been identified,
- The identification of in-process verification points when adequate verification of conformance cannot be performed at a later stage of realization,
- The design, manufacture, and use of tooling so that variable measurements can be taken, particularly for key characteristics, and
- Special processes (see 7.5.2).

7.5.1.1 Production Process Verification

Production processes are verified via a First Article Inspection **(PR-QUA-012)** using a representative item from the first production run of a new part or assembly to verify that the process and tooling are capable of producing conforming parts. Verification is repeated when changes occur that could invalidate the original results.

7.5.1.2 Control of Production Process Changes:

Authorized people for approving changes to production processes or job jacket are identified in **WI-QUA-020.** Nelson-Miller applies appropriate controls and documents changes affecting processes, production equipment, tools and software programs.

The results of changes to production processes are assessed to confirm that the desired effect has been achieved without adverse effects to product quality.

7.5.1.3 Control of Production Equipment, Tools and Software Programs:

Production equipment, tools and programs are validated prior to use and maintained and inspected periodically according to documented **PR-MNT-001**. Validation prior to production use includes verification of the first article produced to the design data/specification. Storage requirements, including periodic preservation/condition checks have been be established for production equipment or tooling in storage.

7.5.1.4 Post delivery support

- Collection and analysis of in-service – Not applicable at this time.
- Actions to be taken, including investigation and reporting, when problems are detected after delivery – Addressed as indicated in Section 8.3.
- Control and updating of technical documentation – Addressed as indicated in Section 4.2.3.
- Approval, control and use of repair schemes – Not applicable at this time.
- Controls required for off-site work – Not applicable at this time.

7.5.2 Validation of processes for production and service provision

Validation of processes and product can be performed during the testing process, although the final validation of the product is performed by the customer since Nelson-Miller does not have in most cases a complete product in its final form.

7.5.3 Identification and traceability

Nelson-Miller identifies the product throughout product realization according to **PR-QUA-010**.

- Nelson-Miller maintains the identification of the configuration of the product in order to identify any differences between the actual configuration and the agreed configuration (see **PR-SLS-001**).
- Product is identified with respect to monitoring and measurement requirements per **PR-QUA-013**.
- When acceptance authority media such as stamps, electronic signatures or passwords are used Nelson-Miller establishes and documents controls for the media per **PR-QUA-013** .
- According to the level of traceability required by contract, statutory and regulatory, or other established requirement, Nelson-Miller system provides for:
  - Identification to be maintained throughout the product life;
  - All the products processed from the same batch of material or from the same manufacturing batch to be traced (if applicable), as well as the destination (delivery, scrap) of all products of the same batch;
  - For an assembly, the identity of its components and those of the next higher assembly to be traced;
  - For a given product, a sequential record of its production / processing to be retrieved.

7.5.4 Customer property

Nelson-Miller exercises care with customer property while it is under the organization's control or being used. **PR-QUA-008** outlines the controls, verification, protection and safeguarding of customer property provided for use. If any customer property is lost, damaged or otherwise found to be unsuitable for use, this is reported to the customer and records maintained. NOTE Customer property can include intellectual property, including customer furnished data used for design, production and/or inspection.

7.5.5 Preservation of product

Nelson-Miller preserves the product during internal processing and delivery to the intended destination. Details outlining how this is accomplished can be found in **PR-QUA-005**, **PR-QUA-031 AND PR-QUA-032**. This preservation includes

identification, handling, packaging, storage and protection. Preservation also applies to the constituent parts of a product.

Preservation of product also includes, where applicable in accordance with product specifications and/or applicable regulations, provisions for:

- Cleaning;
- Prevention, detection and removal of foreign objects;
- Special handling for sensitive products;
- Marking and labeling including safety warnings;
- Shelf life control and stock rotation;
- Special handling for hazardous materials.

7.6 Control of monitoring and measuring equipment

Job jackets, inspection procedures and manufacturing work instructions identify the monitoring and measurements needed to provide evidence of conformance. PR-QUA-004 outlines the process used to ensure that monitoring and measurement is carried out in a manner that is consistent with the monitoring and measurement requirements.

Nelson-Miller maintains a register of these monitoring and measuring equipment. The process used for their calibration is defined in procedures, work instructions and equipment manuals and includes details of equipment type, unique identification, location, frequency of checks, check method and acceptance criteria.

Nelson-Miller ensures that environmental conditions are suitable for the calibrations, inspections, measurements and tests being carried out.

Where necessary to ensure valid results, measuring equipment shall

- be calibrated, verified or both at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards.
- be adjusted or re-adjusted as necessary
- be identified to enable the calibration status to be determined
- be safeguarded from adjustments that would invalidate the measurement result
- be protected from damage and deterioration during handling, maintenance and storage
- be recalled according to a defined method when requiring calibration

In addition, Quality assesses and records the validity of the previous measuring results when the equipment is found not to conform to requirements. Nelson-Miller takes appropriate action on the equipment and any product affected. Records of the results of calibration and verification are maintained

When used in the monitoring and measurement of specified requirements, the ability of computer software to satisfy the intended application is confirmed. This is undertaken prior to initial use and reconfirmed as necessary.

Related Documents

Document #	Procedure Title	ISO 9001:2008/AS9100 C
PR-QUA-006	**Planning for Product Realization**	7.1 Planning of product realization
		7.1.1Project Management
		7.1.2 Risk Management
		7.1.3 Configuration Management
		7.1.4 Control of Work Transfer
		7.5.1 Control of Production / Service Provision
PR-SLS-001 PR-SLS-002 PR-SLS-003 PR-QUA-035	**Nelson-Miller Sales Proposal** **Order Acceptance and Job Entry** **Nelson-Miller Order Amendment** **Customer Focus**	7.2 Customer-related processes
		7.2.1 Determination of requirements related to the product
		7.2.2 Review of requirements related to the product
		7.2.3 Customer Communication
PR-PUR-001 PR-PUR-002	**Supplier Approval and Monitoring** **Purchase Procedure**	7.4 Purchasing
		7.4.1 Purchasing process
		7.4.2 Purchasing information
PR-QUA-012 PR-QUA-006 PR-QUA-010 WI-QUA-020 PR-QUA-008 PR-MNT-001 PR-QUA-005 PR-QUA-031 PR-QUA-032	**Inspection and Test** **Production Planning** **Identification and Traceability** **Changes to Job Jackets** **Control of Customer Supplied Property** **Preventive Maintenance** **Material Handling and Storage** **Shipping Procedure** **Packaging Procedure**	7.4.3 Verification of Purchased Product
		7.5 Production and Service Provision
		7.5.1 Control of Production and Service Provision
		7.5.1.1 Production Process Verification
		7.5.1.2 Control of Production Process Changes
		7.5.1.3 Control of Production Equipment, Tool and Software Programs
		7.5.1.4 Post Delivery Support
		7.5.2 Validation of Processes for Production and Service Provision
		7.5.3 Identification and Traceability
		7.5.4 Customer Property
		7.5.5 Preservation of Product
		8.2.4 Monitoring and Measurement of Product
PR-QUA-004	**Control of Monitoring and Measuring Equipment**	7.6 Control of Monitoring and Measuring Equipment

Section 8 – Measurement, Analysis and Improvement

8.1 General

Nelson-Miller plans and implements the monitoring, measurement, analysis and improvement processes as needed

- To demonstrate conformity of the product,
- To ensure conformity of the quality management system, and
- To continually improve the effectiveness of the quality management system.

These processes are identified in documented procedures and include determination of applicable methods, including statistical techniques, and the extent of their use.

Statistical techniques may be used to support process control activities:

- Selection and inspection of key characteristics
- process capability measurements
- statistical process control
- sampling plans
- Failure Mode and Effect Analysis (FMEA)

8.2 Monitoring and Measurement

8.2.1 Customer Satisfaction

As one of the measurements of the performance of the quality management system, Nelson-Miller monitors information relating to customer perception as to whether the organization has met customer requirements. The methods for obtaining and using this information are determined and outlined in **PR-QUA-035**. Nelson-Miller collects feedback from customers using one or more of the following methods to monitor and measure customer satisfaction:

- corrective action requests
- customer complaints
- customer-provided performance data
- on-Time delivery
- product conformity

Nelson-Miller has developed and implemented a plan for customer satisfaction improvement that addresses deficiencies identified by the above evaluations, and assesses the effectiveness of the results. See 5.6 Management Review.

8.2.2 Internal Audit

Nelson-Miller conducts internal audits at planned intervals to determine whether the quality management system

- Conforms to the planned arrangements (see 7.1), to the requirements of this International Standard and to the quality management system requirements established by the organization
- Is effectively implemented and maintained.

An audit program has been designed and implemented and identifies an audit schedule based on the importance of the areas to be audited, as well as the results of previous audits. The audit criteria, scope, frequency, methods, responsibilities and requirements for planning and conducting audits, and for reporting and maintaining results, are defined and documented in the Internal Audit procedure **PR-QUA-019**.

The management responsible for the area being audited is responsible for ensuring that actions are taken without undue delay to eliminate detected nonconformities and their causes. Follow-up activities include the verification of the actions taken and the reporting of verification results.

8.2.3 Monitoring and measurement of processes

Nelson-Miller applies suitable methods for monitoring and, where applicable, measurement of the quality management system processes (see **PR-QUA-034**). These methods demonstrate the ability of the processes to achieve planned results. When planned results are not achieved, correction and corrective action is taken, as appropriate, to ensure conformity of the product. In the event of process nonconformity, the organization follows the Control of Nonconforming Product procedure **PR-QUA-018** and:

- Takes appropriate action to correct the nonconforming process,
- Evaluates whether the process nonconformity has resulted in product nonconformity,
- Determines the scope of the process nonconformity, and
- Identifies and controls the nonconforming product in accordance with clause 8.3.

The process for identifying and carrying out the required monitoring and measuring of processes is documented in the Internal Audit procedures **PR-QUA-019**.

8.2.4 Monitoring and measurement of product

Nelson-Miller monitors and measures the characteristics of the product to verify that product requirements are fulfilled (See PR-QUA-012). This is carried out at appropriate stages of the product realization process identified in Monitoring, Measuring and Analysis of Product Realization Processes. Evidence of conformity with the acceptance criteria is maintained.

Measurement requirements for product or service acceptance are documented. This documentation is part of the production documentation, and includes:

- Criteria for acceptance and/or rejection,
- Where in the sequence measurement and testing operations are performed,
- A record of the measurement results, and
- Type of measurement instruments required and any specific instructions associated with their use.

When key characteristics have been identified, they are monitored and controlled. When the organization uses sampling inspection as a means of product acceptance, the plan is statistically valid and appropriate for use.

Product is not used until it has been inspected or otherwise verified as conforming to specified requirements, except when product is released unless it is identified and recorded to allow recall and replacement if it is subsequently found that the product does not meet requirements.

Records indicate the person authorizing release of product, and provide evidence that the product meets requirements.

All documents required to accompany the product prior to delivery will be assembled as outlined in **PR-QUA-031**.

8.3 Control of Nonconforming Product and Process

Nelson-Miller ensures that product which does not conform to product requirements is identified and controlled to prevent its unintended use or delivery. The controls and related responsibilities and authorities for dealing with nonconforming product are defined in the Control of Nonconforming Product procedure PR-QUA-018. This process includes:

- Appropriate action to eliminate the nonconformity
- Disposition of the nonconforming material
- Taking action to control the material, precluding its original use
- Taking appropriate action when nonconforming product is detected after delivery

Product dispositioned for scrap is conspicuously and permanently marked, or positively controlled, until physically rendered unusable.

In addition to any contract or statutory and regulatory authority reporting requirements, Nelson-Miller system provides for timely reporting of delivered nonconforming product that may affect reliability or safety. Notification includes a clear description of the nonconformity, which includes as necessary parts affected, customer and/or organization part numbers, quantity, and date(s) delivered.

Use-as-is disposition is only used with authorization by a representative of the design. The organization also does not use dispositions of use-as-is or repair, unless specifically authorized by the customer, if

- The product is produced to customer design, or
- The nonconformity results in a departure from the contract requirements.

8.4 Analysis of Data

Nelson-Miller determines, collects and analyses appropriate data to demonstrate the suitability and effectiveness of the quality management system and to evaluate where continual improvement of the quality management system can be made. The process for determining, collecting and analyzing this data is defined in the Management Responsibility procedure. Appropriate data includes data generated as a result of monitoring and measurement and from other relevant sources.

The analysis of data provides information relating to:

- Customer satisfaction
- Conformance to product requirements
- Characteristics and trends of processes and products including opportunities for preventive action
- Suppliers

8.5 Improvement

8.5.1 Continual improvement

Nelson-Miller continually improves the effectiveness of the quality management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review. Management monitors the implementation of improvement activities and evaluates the effectiveness of results.

8.5.2 Corrective action

Nelson-Miller takes action to eliminate the cause of nonconformities in order to prevent recurrence. Corrective actions are appropriate to the effects of the nonconformities encountered. A documented procedure **(PR-QUA-003)** defines requirements for

- Reviewing nonconformities (including customer complaints),
- Determining the causes of nonconformities,
- Evaluating the need for action to ensure that nonconformities do not recur,

- Determining and implementing action needed,
- Records of the results of action taken (see 4.2.4), and
- Reviewing the effectiveness of the 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, and specific actions where timely and/or effective corrective actions are not achieved.
- Identification of additional nonconforming product

8.5.3 Preventive action

Nelson-Miller determines action to eliminate the causes of potential nonconformities in order to prevent their occurrence. Preventive actions are appropriate to the effects of the potential problems.

A documented procedure **(PR-QUA-003)** defines requirements for:

- Determining potential nonconformities and their causes
- Evaluating the need for action to prevent occurrence of nonconformities
- Determining and implementing action needed
- Records of results of action taken
- Reviewing the effectiveness of the preventive action taken

Related Documents

Document #	Procedure Title	ISO 9001:2008/AS9100 C
PR-QUA-035 PR-QUA-019 PR-QUA-034 PR-QUA-012 PR-QUA-031	**Customer Focus** **Internal Audit** **Metrics and Objectives** **Inspection and Test** **Shipping Procedure**	8.2.1 Customer Focus 8.2.2 Internal Audit 8.2.3 Monitoring and Measurement of Processes
PR-QUA-018	**Control of Non Conforming Product**	8.3 Control of Nonconforming Product
PR-QUA-003	**Corrective and Preventive Action**	8.5.1Continual Improvement 8.5.2 Corrective Action 8.5.3 Preventive Action