Quality Manual for North America

Revision	Reason	Date
A	Initial Issue	7/24/11
B	Company Re-Organization (+ Eldre Corp)	4/27/12
C	Company Re-Organization (Update Vital Stats)	6/7/12
D	Company Re-Organization (+El Paso, - Mfg. from Nbpt) New Quality Policy EURAM	2/28/14
E	Change of Scope for Kestrel A and B	3/3/15
F	Update to ISO 9001-2015 standard	1/17/17

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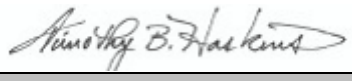
T.Haskins	
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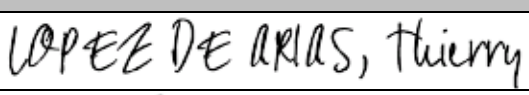
Th. Lopez de Arias	
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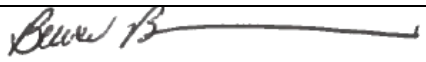
B. Brown	
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Contents:

1. General Presentation of Mersen, North America

History:
The Shawmut Fuse Wire Company was founded in 1885 and was based in Boston. The company merged with Chase & Co. in 1893, forming Chase-Shawmut. In 1905 the Chase–Shawmut company moved from Boston to its present site in Newburyport.

In 1953 I-T-E Circuit Breaker Company purchased Chase–Shawmut, retaining the name.

In 1976 Gould purchased ITE, changing the name from Chase Shawmut to Gould Shawmut.

In 1999 Carbone Lorraine acquired Gould Shawmut and merged the company with its Ferraz Division, renaming the combined company Ferraz Shawmut.

Ferraz was a company founded in 1928 to produce electric motor brush holders. Ferraz was acquired by Carbone Lorraine in 1950. When Ferraz was merged with Gould Shawmut in 1999 Ferraz was a significant presence in the European fuse and electrical equipment market. The combined company, Ferraz Shawmut, was now a major presence in Electrical Protection, worldwide.

In 2010 Carbone Lorraine, in an effort to consolidate all the various company names to a coherent single entity - renamed itself, and all its divisions, Mersen.

In 2013 Manufacturing locations in Newburyport MA were relocated to a new facility in El Paso TX, with some processes being transferred to the current facility in Juarez MX.

In 2015 Mersen EP was further defined into two divisions EPC and SPM.

Vital Statistics, Mersen North America (for reference only - as of Aug 2016):

	Newburyport	Toronto B	Juarez	El Paso
Manpower				
Direct	0	15	589	6
Indirect	121	67	105	9
Total	**121**	**82**	**694**	**15**
Square Feet				
Manufacturing	0	22,000	91,962	28,000
Office	51,500	13,000	11,162	1,000
Laboratory	13,500	0	0	0
Eng. Tech.	15,000	0	0	0
Shifts	1	1	2	1

	Newburyport	Toronto B	Juarez	El Paso
Products / Functions	Design and Engineering of Fuses, Surge Protection Devices and Fuse Accessories	+ Design, Engineering, Mfg., Distribution and Servicing of Custom High Power Switchgear as well as the Distribution of Enclosures and related products. + Distribution of fuses and fuse gear.	Mfg. of Fuses, Surge Protection Devices and Fuse Accessories	Mfg. of Fuse and Surge Product Components
Management	HQ – North America HQ – EPC	Reports to EPC	Reports to EPC	Reports to EPC
Certificates	ISO 9001 ISO 17025	ISO 9001	ISO 9001 ISO 14001 IAF 16949 - planned	ISO 9001 Planned

Testing Facilities:

- There are several testing facilities at different locations:
  Newburyport:
  - > High Power Test Lab
    - o One High Power Test Station with two 2 each 10 MVA generators capable of a maximum test of 1040 Volts single phase, and 38000 Volts three phase. The maximum current capabilities of the lab are 100,000 Amperes. Testing and data collection are available to outside customers for:
      - ✓ Fuses
      - ✓ Switches
      - ✓ Other electrical equipment:
        Test capability includes standard U/L tests as well as Arc Flash testing, with data recording, to the limits of the equipment.
    - o Fuse Cycling Testing Station
    - o Environmental Test Chambers
  - > Surge Lab with capability to test:
    - o U/L 1449 Nominal Discharge Test
    - o 200ka @ 8x20 ms
    - o 20ka @ 10x350 ms
  - > Low Power Test Lab
    - o Two Low Power Test Benches for Time Current Curve Testing
      - ✓ Thermal Heat Rise

- Cable Pull Out test equipment (2)
- Class L Fuse Thermal Testing Station
- Medium Voltage Thermal Testing Station
- Micro Scope Station
- Metal Hardness Test Stations
- Pull and Compression Test Stations (Standard Pull, Standard Compression, Spring)
- Ovens (2)
- Metal analysis equipment

> Other test facilities
- X-Ray Machine > low resolution, single axis
- Drop Tester
- IEC Test Station

Juarez:

> Low Power Test Lab
- One Low Power Test Bench for Time Current Curve Testing
  - ✓ Thermal Heat Rise
- Metal Hardness Test station
- Resistance testing
- Micro Scope Station

> Floor Area
- X-Ray Machine > High resolution, multi axis
- Optical Comparator

Toronto B
- X-Ray Machine
- One Low Power Test Bench for Time Current Curve Testing
  - ✓ Thermal Heat Rise
- Cycle Tester
- Laboratory Oven
- Resistance testing
- Micro Scope Station
- Coordinate Measuring Machine (CMM) (Kestrel A)

2 Management Statement

Mission Statement:
To strive, with our customers, for the world's safest and most reliable electrical solutions.

Values:
- **Customer Focus**: To listen, understand and respond.
- **Employee Commitment**: To develop, recognize and grow.
- **Continuous Improvement:** There's always room for improvement.
- **Integrity**: Conduct our business in an honest and ethical manner.

Vision:
To be the world's resource for electrical safety and reliability.

What it means:

- Continue to develop and strengthen customer focused operational excellence.
- Continue to capitalize on fuse and fuse gear product segment market consolidation
- Product portfolio management: Expansion and rationalization programs
- Focused sales and marketing initiatives in high growth markets
- Position the business in overcurrent protection with the convergence of protection – detection – breaking functions.

3 Structure and Control of the Quality Manual

3.1 Manual Structure

This manual is structured such that it follows the paragraph headings found in ISO 9001-2015

3.2 Manual Control

3.2.1 Review

The VP Quality Assurance conducts an annual review of the Quality manual with inputs from the other North American Quality Managers.

3.2.2 Updates

Each revision (update) is noted on each page of the manual in the heading.

3.2.3 Approval

Each revision is approved by the VP Quality Assurance, North America.

3.2.4 Control

The Master Copy of this manual is kept in a secure file controlled by the VP QA. The Public Copy, used for distribution, is found in the QA Public Intra Net folder:
S:\nb_qa_qa.pub\Quality Manual

3.2.5 Distribution

All copies printed from the Public Copy are watermarked as "Uncontrolled". It is the obligation of the user of the manual to insure the most recent revision is being referred to.

4. Context of the Organization

4.1 Under the organization and its context

Mersen has established and maintained a Quality Management System which is designed to meet the quality objective and policies defined by top management (see Section 2 and 4) and to meet the requirements of the ISO 9001 standard.

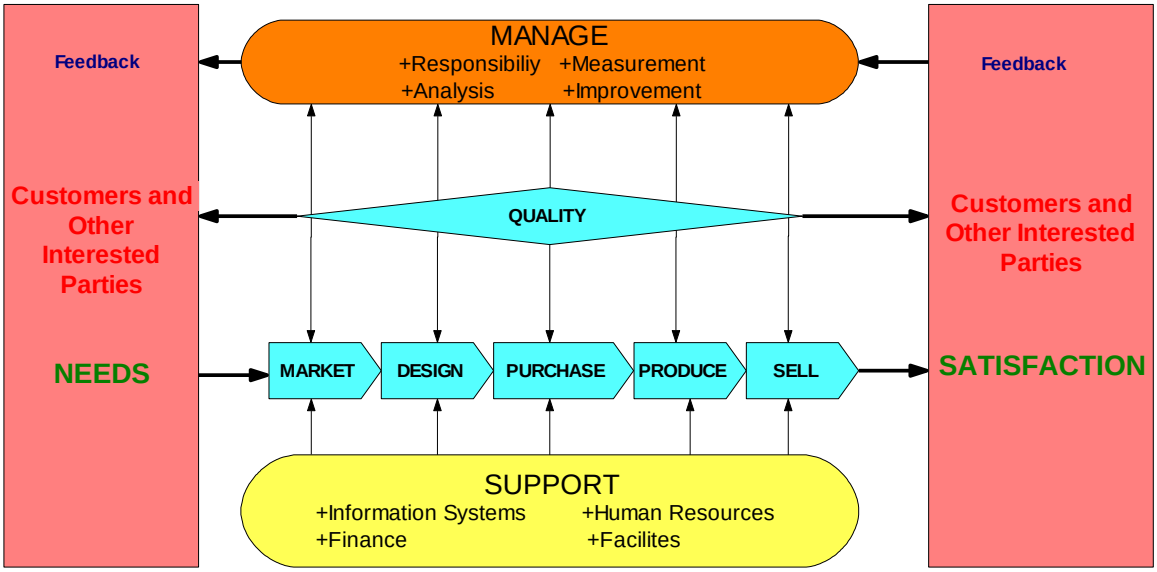
Our Quality Management System:

- Identifies our major / critical processes including management, resource allocation, product development, measurement, analysis and improvement actions
- Determine the sequence and interaction of these processes
- Determines the criteria and methods required for effective operation and control of these processes
- Determines the availability of information necessary to support the processes and monitor their outcomes to ensure they are effective
- Ensures the availability of resources necessary to support and monitor our processes
- Measures, analyzes and continually improves these processes.
- Implement the actions necessary to achieved the planned results and continually improve these processes.
- Ensures control over all outsourced processes that effect product conformity to requirements.
- Ensure that product and services provided to customers conform to all contractual, statutory and regulatory and quality management systems requirements that meet or exceed their needs and /or expectations.

The Quality Management System aims to satisfy the requirements of the following interested parties:

- Customers and End Users who need superior products and services
- Suppliers, who need a detailed description of our requirements in order to properly partner with us
- Our shareholders, for if our business and manufacturing processes are to operate in a cost-effective manner, they must be well defined, efficient and audited.

Our Quality Management System is organized into the following major/critical processes:



Each Process is managed and continually improved by the monitoring and supervision loops. These loops include measurement, data analysis, corrective, preventive or improvement actions / decisions and their review (effectiveness and measurement). The use activity, effectiveness and or efficiency measurement indicators scaled to the process concerned.

4.2 Understanding the needs and expectations of interested parties

4.2.1 General

The Management Team reviews the Quality Management System at planned intervals to ensure its continued suitability, adequacy and effectiveness. These reviews include the assessment of opportunities for improvement and the need for any other changes to the system, including the Quality Policy and Objectives.

The actions arising from these reviews are recorded and followed up.

4.2.2 Review Inputs

Management reviews the following items at the management review meeting:

- Results of audits (internal, customer and third-party)
- Customer feedback
- Process performance and product conformance
- Performance of Suppliers
- Status of Preventive and Corrective actions
- Follow-up actions from previous management review meeting
- Changes that could affect the quality management system
- Recommend improvements to the quality management system

Specific details for consideration are as follows:

- Status and results of quality objectives and improvement activities
- Status of management review action items
- Results of audits and self-assessment of the organization
- Feedback on the satisfaction of interested parties:
  - Customer complaints
    - Administrative
    - Technical
  - Customer satisfaction survey comments
  - e-mails
  - customer vendor rating reports (including both positive and negative feedback,)
- Market-related factors:
  - Technology, research and development
  - Sales Performance
  - Competitor performance
  - Commodity pricing
- Results from benchmarking activities
- Performance of suppliers
- New opportunities for improvement
- Control of process and product non-conformities
- Marketplace evaluation and strategies
- Status of strategic partnership activities
- Financial effects of quality related activities
- Other factors which may impact the organization, such as, social or environmental conditions and relevant statutory and regulatory changes
- Review of work environment (e.g. Manpower, Safety, Facilities, etc.)

4.2.3 Review Outputs

Results from the management review meeting include decisions and actions related to the following:

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

Specific details for consideration are as follows:

- Performance objectives for products and processes,
- Performance improvement objectives for the organization,
- Appraisal of the suitability of the organization's structure and resources,
- Strategies and initiatives for:
  - Marketing
  - Products
  - Satisfaction of customers and other interested parties,
- Loss prevention and mitigation plans for identified risks,
- Information for strategic planning for future needs of the organization.

4.3 Determining the scope of the Quality Management System
Scope:
This manual covers the North American locations and the processes and systems controlled by North America EPC.

4.4 Quality Management system and its processes
Quality Manual:
The Quality Manual details the processes and organization put in place to insure that the Mersen, Electrical Protection, North America Quality Systems meet the requirements of ISO 9001 and the needs of our customer base. The interaction between the processes and the quality management system is shown in the flow chart in Section 4.1.

Elements which do not apply:
The following elements from Section 8 of ISO 9001 are defined:

Newburyport:
8.5.1 Validation of Processes for Production and Service Provision
8.5.3 Customer Property

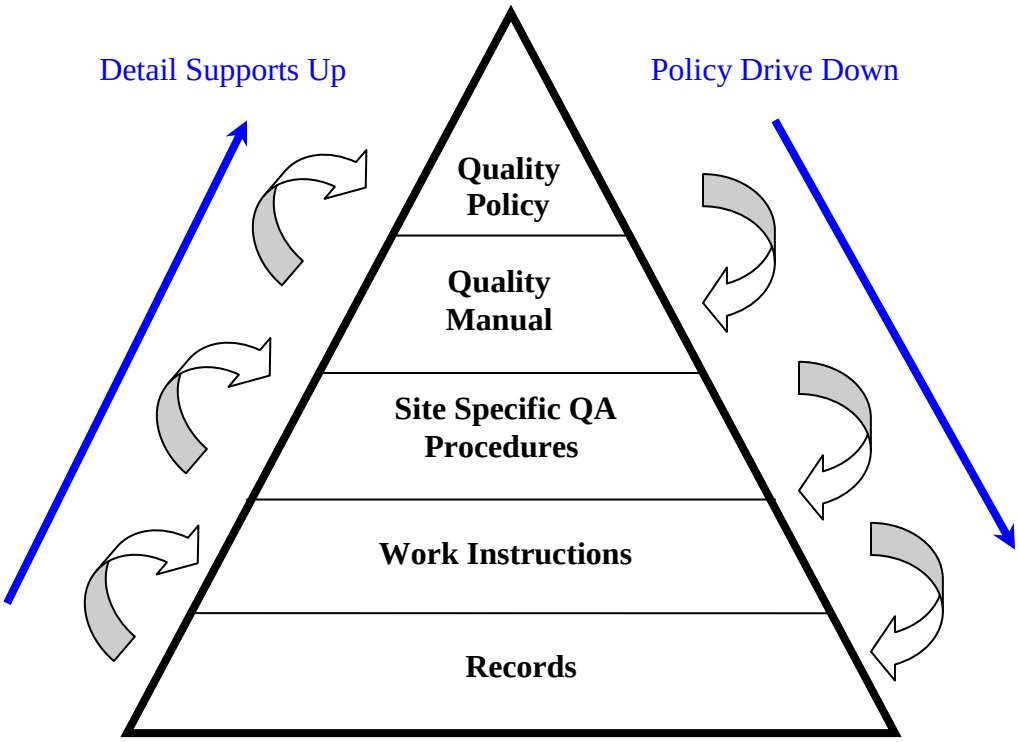
Juarez:
8.3 Design
8.5.1 Validation of Processes for Production and Service Provision
8.5.3 Customer Property

El Paso:
8.3 Design
8.5.1 Validation of Processes for Production and Service Provision
8.5.3 Customer Property

Exemptions:
The following products and processes are exemptions from the QMS in place at these locations:

Newburyport
The Testing Facilities, their processes, systems and operation are not covered by the ISO 9001 Quality Management System or manual > the Testing Facilities are certified separately under ISO 17025-2005 by U/L.

The Quality Management System documents hierarchy.



The Quality Management System in North America is a layered document system. While the Policy and Corporate Quality Manual are common to all locations, each site in North America EPC has its' own detailed procedures that further define how the quality system works at that location. These site specific quality instructions are further detailed by operator level Work Instructions and further yet by the records required at each site.

5. Leadership

5.1 Leadership and Commitment

Top management expresses its commitment to the development, implementation and continual improvement of the Quality management system through:

- Communication to the organization of the importance of meeting customer needs as well as statutory and regulatory requirements.
- A Quality Policy, approved by top management at Electrical Protection, which is communicated to all the personnel at all locations in the Group.
- Establishment of measurable objectives which are regularly reviewed by Top Management
- The conduct of regular Management Reviews that discuss quality and quality issues.

- The establishment of quality assurance organizations at each location with a budget adequate to the tasks and responsibilities of each location.

5.1.2 Customer Focus

Top management has implemented a customer driven organization supported by:

- Market Studies
- Product Needs Analysis
- Customer Satisfaction measures:
  - On Time Delivery
  - Administrative Error Tracking
  - Technical Error Tracking
- Partnerships with some customers for design of products
- Sales teams which monitor and report on customer needs and issues

The goal of these activities is enhancing customer satisfaction.

5.2 Quality Policy

Top Management has established a Quality Policy (see Section 4) which is appropriate to the organization as a whole and considers:

- Providing our customers with products and services that meet or exceed their needs and /or expectations for performance, reliability and safety at a competitive cost
- Standards requirements
- Necessary and available resources
- The need for continual improvement

The policy is issued and communicated to all Mersen personnel at the North American Electrical Protection division through multiple postings in each location and, our customers and the general public though the posting of the policy on the internet (company web site).

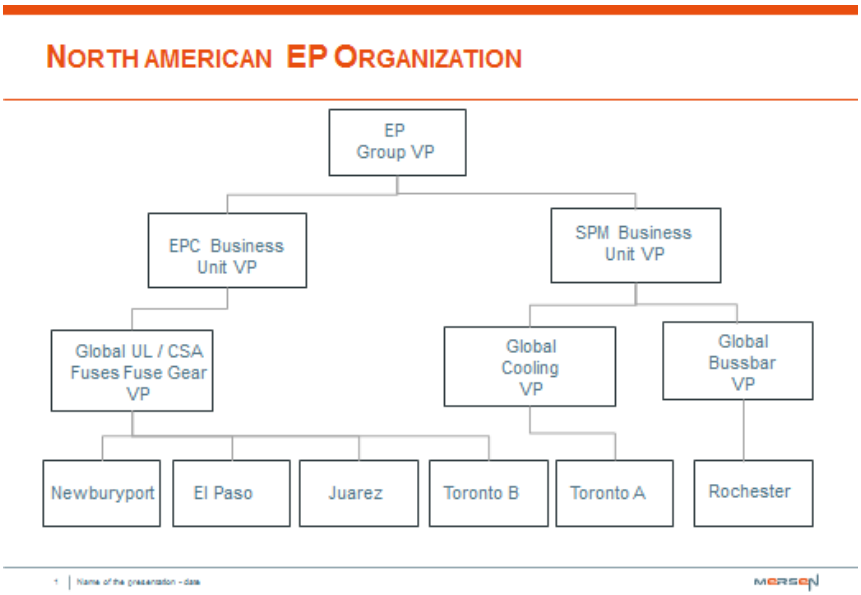
The policy serves as the framework for the quality systems at each location in Mersen North America and is reviewed annually to insure its applicability.

5.3 Organizational roles, responsibilities and authorities

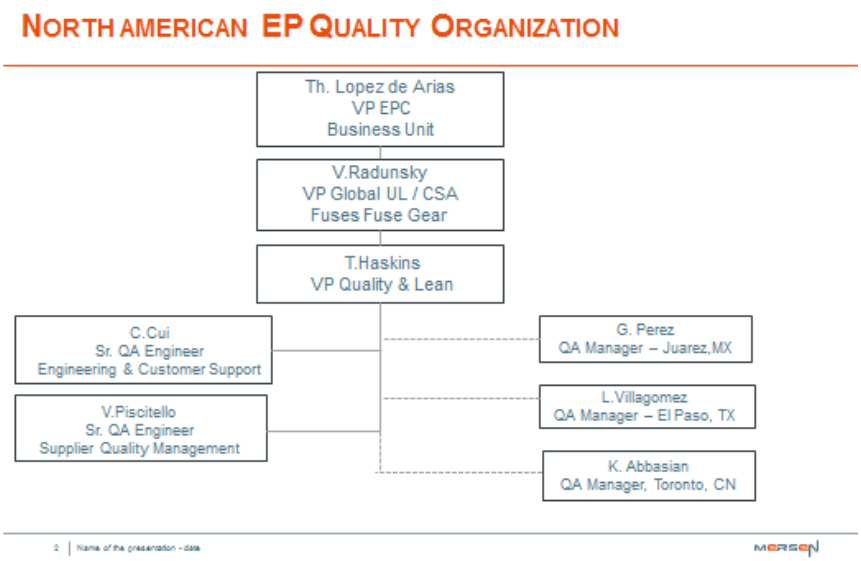
Management has defined the responsibilities and authorities of each function/position that affects quality in Job Descriptions, and the reporting lines in an Organization Chart. This information is communicated within the organization.

Mersen, Electrical Protection, North America has facilities in Newburyport, MA, El Paso, TX USA; Toronto, CN, & Juarez, MX Mersen Electrical Protection LLC also has a European and Asian division. The North American Quality system and manual are independent of the other geographical divisions.

North America is organized by location as follows:



The North American Quality department is organized as follows:



Formal organizational memos, available at each location, detail the current assignments within the organization. The functions of each member of the Quality Team are described in the Job Descriptions available in Human Resources at each location.

The VP Quality is management's representative for Newburyport, USA and the QA Managers in Toronto, CN, Juarez MX, & El Paso TX are the management representatives for their respective locations. The management representatives at each location are responsible for:

- Driving the development, implementation and continual improvement of the Quality Management Systems.
- Measuring and reporting Quality System performance
- Participating in the development of the Quality Policies and Objectives
- Acting as the official spokesperson for the company on the Quality Management System to external partners.
- Promoting awareness of customer requirements throughout the organization.

6. Planning

Every year Electrical Protection, North America, reviews its' action plans against the strategic plans established by the companies Top Management. As part of our Integrated Business Process (IBP) objectives are brought into line with the strategic plans and the available resources. Goals are set and measures established and tracking mechanisms put into place. Monthly meetings are held to discuss risks and opportunities in the following content:

- Demand
- Supply Chain
- Reconciliation
- Executive Review

6.1 Actions to address risks and opportunities

Actions are taken to address risk prior to the occurrence of a non-conformity and act to reduce or eliminate the possibility of a non-conformance actually happening.

Zero Defect Audits (Error Proofing), Product and Process FMEA (Risk Management) are good examples of Preventative Actions > as they determine a potential cause, evaluate the need for actions to prevent the potential cause and take actions to insure the potential cause (or risk) is neutralized prior to a non-conformity occurring.
The following risk assessments are required for PAC (product approval committee)

- Technical Risk
- Marketing Risk
- Financial Risk
- Quality Risk

All actions:

- Determine the potential nonconformity and its possible causes
- Evaluate the need for action to prevent the occurrence of a non-conformity
- Determine the implementing action needed
- Implement the actions selected
- Record the results on the action

- Review the actions effectiveness and change as necessary.

6.2 Quality objectives and planning to achieve them

The Management has established a number of key Quality Objectives. They are chosen to be measureable, in line with the Quality Policy, and serve to direct the Company's focus onto information that measures the effectiveness of the Quality Management System and the Company's processes.

It is the responsibility of Management to ensure that the Quality Policy and Quality Objectives are communicated to and understood by all employees.

Each location Quality manager (see Section 5.5.1) draws up his own action plans and Quality Goals; based on the strategic plan, capital budgets and available manpower and the requirements of the location. Top Management reviews these goals and approves them for each location.

6.3 Planning changes

Top management ensures:

- The planning of the quality management system is carried out in order to meet the requirements of Section 4 as well as the quality objectives.
- The integrity of the quality management system is maintained when changes are planned and implemented.

7. Support

7.1 Resources

The resources requirements for each process are determined annually through the budget, investment and corporate action plans. The budgets provided through this process include the resources necessary to the Quality Management System to allow it to continually improve performance and to insure customer satisfaction by exceeding customer expectations.

7.1.3 Infrastructure

Management determines the infrastructure necessary to achieve conformity to product requirements. This includes:

- Process Equipment
  - Hardware
  - Electronic / Software
- Supporting Services
  - Transport In and Out of the Manufacturing System at all levels
  - Information Systems Access where needed

  - Communication systems
- Resource Requirements
  - Air
  - Power
  - Water

7.1.4 Environment for the operation of processes

Management determines the work environment necessary to achieve conformity to product requirements.
This includes:

- Building Requirements
  - Lighting
  - Heating / Cooling / Humidity Controls
  - Noise Levels
  - Cleanliness
  - Proper Air Quality
- Safety Equipment
  - Clothing requirements where applicable:
    - Steel toe shoes
    - Safety Glasses
    - Other as necessary
  - Equipment requirements:
    - Guarding
    - Lift assist
    - Alarms
    - Other as necessary

7.1.5 Monitoring and Measuring Resources

Metrology, or the control of monitoring and measuring equipment, is managed separately by each site in North America using information systems that track tools by number, the tools calibration requirements and the calibration status. All tools are identified upon receipt, marked with the required calibration interval / current status, and entered into the calibration system with a calibration schedule by tool number.

Calibration equipment and tools are adjusted as necessary and are safeguarded against operator adjustments that would invalidate results.

A record of all tools and calibrations is kept at each site and, where necessary, calibrations are traceable to the national standards. Tools that are sent to calibration or storage are protected from damage and deterioration.

When an instrument is found to be out of calibration, either during use or at calibration, the organization determines the impact the out of calibration condition on the product certified by the tool that was found to be out of tolerance.

Measurement equipment is purchased to a level that is an order of magnitude more accurate than the requirements of the product. This, and a multiple level of inspections, prevents an out of calibration tool from seriously affecting the output of a process.

7.2 Competence

Mersen, North America, Electrical Protection ensures that those personnel whose work affects a product's conformity to customer requirements are competent on the basis of their skills, training, experience and education.
All positions in the company have a Job Description, which defines the skills, education, conformity to product requirements and experience expected for each position in the company.

In order to achieve our goal of continual improvement and to have the necessary competency in all our personnel, Mersen uses the following methods**:**

- Training Plans
  - Outlines the past training of each employee
  - Outlines the proposed training for the coming year
- Annual Performance Reviews > for Indirect associates
  - Evaluates each employee's performance against the annual goals set by management for the employee.

All employees receive specific training on their role in, and the importance of, the Quality Management System as a part of their new employee training.

Each employee has a training record, kept in Human Resources, with evidence of the completion and effectiveness of the employee's training.

7.4 Communication

Internal communications concerning the quality system are dictated by top management and include:

- Internal posting of the Quality Policy
  - Framed at various locations throughout the facilities.
  - Available from the company website, see "Compliance"
  - Included in this manual, (see Section 4)
- Every incoming employee is given a Quality training briefing

  Quality measures are posted at various locations throughout the facilities and updated on a regular basis.

7.5 Documented Information

7.5.1 General

Quality and Environmental Policy for Mersen Electrical Power

Quality and Environment policy reflects the vision of MERSEN Electrical Power. Management and every individual's goal aims to sustain and develop a profitable business growth and create value for stakeholders.

Customer Oriented:

- Satisfy our external and internal customers' needs and expectations.
- Make commitments we fully understand and believe we can meet.
- Meet all commitments to external and internal customers on time.

Performance Driven:

- Check, benchmark and continuously improve our business, products and services, organization, processes and employees' performance.

Socially, legally, environmentally responsible:

- Comply with all legal and applicable requirements.
- Maximize continuously positive impact on our local environment and society.
- Improve working conditions and safety.

People development focused:

- Develop leadership competences for managers.
- Focus on people development to improve efficiency and reach our business targets.

These four points form the basis for our Quality & Environment program. Everyone needs to commit on developing them, at every level of operations, and at all levels of our organization – It's a condition for success.

7.5.2 Creating and updating

Quality Manual Review and Update:
The Quality Manual is reviewed by the VP Quality and / or his staff on an annual basis. Revisions to the manual are made as they are required and are recorded on the manual as a letter revision with an effective date code.

Approval:
The North American Quality Policy is signed by the Top Management of the Mersen Electrical Protection group, to include the Group Vice President, Electrical Protection (Top Management of Electrical Protection, Worldwide), the Vice President and General Manager of North America (Top Management of Electrical Protection in North America) and each site manager in North America.

The North American Quality Manual is signed by the Top Management of the Mersen Electrical Protection for North America, to include the VP of Quality and the VP/GM of North America.

Procedures have been established to ensure that:

- Documents are approved prior to use and are reviewed updated and re-approved as necessary as per the needs of each process.
- Documents are maintained so that they are legible, readily available and retrievable.
- Obsolete documents are systemically destroyed or overwritten and deleted, as required.
- Documents of external origin are identified and distributed according to the relevant procedures.

Distribution:
A signed master copy of the quality manual is kept in the Newburyport QA Library. An electronic master copy is stored on the intranet in the Newburyport QA Private folder. Access to this electronic version is limited to by Information Systems permissions.

Read / Print Only (write permissions are restricted to authorized individuals only) versions of this manual are posted to the company intra-net under the Newburyport QA Public file heading and are available to anyone within the company.

Documents related to the QMS can be accessed by any employee with access to the company intranet. Any employee that does not have access to the intranet can contact his/her supervisor for the documents

The manual is also posted on the companies' internet site for free access by any customer or other interested parties.

Documents and Records are managed in a tiered system as shown in Section 4.2.1. The system starts with the Quality Manual, which lays out the general policies of the QMS. Procedures from the other departments add detail and implementation details to the Quality Manuals' policy statements.
At the base of the pyramid are the user documents (actual instructions on what to do) and the records that show the instructions have been followed. These documents specify the Actions that associates must take in order to be in compliance with our QMS.

All documents are annotated with a revision number or date and an authorizing agent. Copies signed (originals) controlled by the department responsible for them.

When documents are kept digitally, the controlled access permissions necessary to manage the documents are specified and managed.

7.5.3 Control of documented Information

Records are maintained to demonstrate conformance to specified requirements and the effective operation of the QMS. Records are defined in the various procedures and maintained according to

those procedures. Retention periods are specified as are conditions of storage, protection, retrieval and disposition. All records must be identifiable, retrievable and legible.

8. Operation

8.1 Operational planning and control

Mersen, North America, Electrical Protection will plan and develop its product realization processes in order to achieve the Quality Objectives and to increase Customer satisfaction.
The product planning process includes:

- Quality Objectives and requirements for the product, project or contract include Consideration of aspects such as:
  - Product and personal safety
  - Reliability, availability and maintainability
  - Producibility and inspectability
  - Suitability of parts and materials used in the product
  - Selection and development of embedded software, and
  - Recycling or final disposal of the product at the end of its life
- Processes and process documentation, to include:
  - Monitoring and measurement
  - Inspection and test activities
- The resources and facilities needed to support the use and maintain the product or service involved
- Verification of Design
- Validation of Design
- Acceptance criteria
- Appropriate records for design confirmation

8.1.1 Project Management

Company shall plan and manage product realization, as appropriate in a structured and controlled manner to meet requirements at acceptable risk, within resources and schedule constraints.

8.1.2 Risk Management

Company shall establish, implement and maintain a process for managing risk to the achievement of applicable requirements that include, as appropriate, and to the organization and product:

- Assignment of responsibilities for risk management
- Definition of risk criteria
- Identification, assessment and communication of risks throughout product realization

- Identification, implementation and management of actions to mitigate risks that exceed the defined risk acceptance criteria, and
- Acceptance of risk remaining after implementation of mitigating actions.

8.1.3 Configuration Management

Company shall establish, implement and maintain appropriate to the product:

- Configuration management planning
- Configuration identifications
- Change Control
- Configuration status accounting, and
- Configuration audit.

8.1.4 Control of Work Transfers

Company shall establish, implement and maintain a process to plan and control the temporary or permanent transfer of work (e.g., from one organization facility to another, from Company to Supplier, from one Supplier to another Supplier) and to verify the conformity of the work to requirements.

8.2 Requirements for products and services

8.2.1 Customer communication

Communication includes new product designs to the market, possible amendments to any contracts for a specific product and customer feedback on the product, including complaints

Product information is provided via various media (e.g.: paper or electronic) for customers.

When amendments to a contract or a tender are necessary an acknowledgement of the order is sent to the customer to signify our agreement includes amendments.

Customer complaints are logged as:

- Technical
- Administrative.

Both types are logged and reviewed by top management. Customers are informed of the resolution of Technical complaints, which can include credit notes or replacement product.

Both types of complaints are considered valid forms of customer feedback, along with satisfaction surveys and data provided to Mersen on delivered product quality levels.

8.2.2 Determination of requirements for products and services.

Product requirements are based on customer needs, both stated and, more importantly, unstated. The stated and/or unstated needs can / do include standards imposed by outside organizations, particularly Underwriters Laboratories (U/L), Canadian Standards Association (C.S.A) and International Electrical Commission (IEC) as well as other requirements that can include delivery

and post delivery activities, environmental considerations (RoHS) and statutory and regulatory requirements.

Determination of product requirements includes all phases of product development, from the start of the design process through delivery and post delivery, with tracking at all stages of the process.

8.2.3 Review of the requirements for products and services

Before acceptance of contracts or orders Mersen North America, Electrical Protection ensures the following:

- Product requirements are defined
- Contract or order requirements differing from those previously expressed are resolved
- Mersen has the ability to meet the defined requirements.

Records of the results of these formal requirement reviews, and actions arising from the reviews, are maintained.

When the customers provide no documented statement of requirements (as with catalog orders or electronic sales) the customer requirements are be reviewed by insuring the information presented by Mersen in its catalog, advertising material and/or website is reviewed and accurate.

8.3 Design and development of products and services

8.3.2 Design and development Planning

Design and Development planning is a controlled process. The process is based on several stages that include a review of customer needs, verification of engineering developed designs and validation of customer requirements. Each stage is the responsibility of a given group within the organization who has the authority to continue, change or terminate the process.

Top management shall manage the interfaces between the different groups involved in the design and development phases to ensure effective communication and clear assignments of responsibilities are maintained.

Design and Development plans are reviewed and updated as the design and development process progresses. These plans cover the Design Inputs and Outputs, the Reviews, Verification and Validation criteria.

The different design and development tasks to be carried out shall be based on the safety and function objectives of the product in accordance with customer, statutory and regulatory requirements.

8.3.3 Design and development of inputs

Inputs for the design planning come primarily from the customer. Tools like “Voice of the Customer” “Quality Function Deployment (QFD)” and “Criniflex” are used to determine customer

requirements beyond the requirements that were established by previous designs, stated by the customers or required by the standards (commonly: U/L, CSA and IEC). Inputs to the design process are reviewed for adequacy – to insure that they are complete, unambiguous and not in conflict with each other.

8.3.4 Design and development of controls

Formal documented reviews by representatives of all cross-functional teams are made of the design results at various stages of the design process. The ability of the design results to meet requirements is assessed > as are any design issues. Actions to resolve issues and to insure the customer needs are met are assigned at these reviews.

Participants in the review of a particular design stage will include representatives of all groups concerned with that particular design and development stage. Records of design reviews are maintained in the project files.

8.3.4.1 Design and Development Verification
Design verification is the process of determining if the design inputs have been met by the design outputs (the product does what Engineering said it should do). This Verification is conducted by the project team and is based on objective evidence obtained from the product and process testing.

Design verification methods employed are as follows:

- Holding and recording design reviews.
- Undertaking qualification tests and demonstrations.
- Checking product against customer and engineering specifications as the product evolves

8.3.4.2 Design and Development Validation
Design validation is the process of determining if the output of the design and development effort meets the customer's "intended use" requirements (irrespective of whether or not they meet the Engineering or Input requirements). The design validation is conducted by the project team and is based on objective evidence obtained from product testing.

Design validation methods employed are as follows:

- Undertaking qualification tests and demonstrations with the customer
- Testing the product against the defined customer needs, stated and unstated (see section 8.3.3)

8.3.5 Design and development of outputs

Outputs must match the inputs with clearly defined acceptance criteria, provide for down stream support and include any needed application and safety information.

Design planning is monitored and problems resolved by regular reviews.

Design output will satisfy the following criteria:

- Meet Design Input requirements
- Provide adequate information to allow other groups to implement the designs:
  - Purchasing
  - Research and Development
  - Operations
  - Field Service
- Meet the requirements of any product acceptance criteria specified
- Conform to appropriate statutory and regulatory requirements when applicable.
- Conform to customer defined specifications – as applicable
- Define those design characteristics that are crucial to safety and proper product or service use, and
- Specify, as appropriate, any critical items, including key characteristics and specific actions to be taken for these items.

8.3.5.1 Design and development of controls

Where tests are necessary for verification and validation, these tests shall be planned, controlled, reviewed and documented to ensure and prove the following

- Test plans or specifications identify the product being tested and the resources being used, define test objectives and conditions, parameters to the recorded, and relevant acceptance criteria
- Test procedures describe the method of operation, the performance of the test and the recording of the results
- The correct configuration of the product is submitted for the test
- The requirements of the test plan and the test procedures and observed, and
- The acceptance criteria are met.

8.3.6 Design and development of changes

Design and development changes shall be identified, documented, reviewed, verified, validated and approved by authorized personnel prior to implementation in accordance with the Configuration Management Process (See 7.1.3). The impact to constituent parts and existing Finished Goods shall be evaluated. Records of the changes shall be kept.

8.3.6.1 Design and Development Verification and Validation Documentation

At the completion of design and development, the Company shall ensure that reports, calculations, and test results demonstrate that the product definition meets the specification requirements for all identified operational conditions

8.4 Control of externally provided processes, products, and services.

The Company shall develop a clear, concise and complete process to control the purchasing of materials, product, services and finished goods from Suppliers, including product from sources defined by the customer.

Quality shall define the processes, responsibilities, required authority and conditions for supplier approval status and will determine and manage quality system risk when selecting and using suppliers.

Purchasing interfaces with the other Mersen groups to ensure the suppliers managed by the purchasing process deliver compliant components, products and services, in the amounts needed, when they are needed, where they are needed, at the agreed price.

The criteria for supplier selection, evaluation and re-evaluation shall be based upon the criticality and classification of the products or services to be purchased, for their ability to deliver product to Mersen's specifications and schedule requirements, on-time and defect free.

The Company shall purchase only from approved Suppliers from the Approved Suppliers List / Register for any materials that become part of, or affect the quality of our products.

Suppliers shall be periodically reviewed for performance. The results of these reviews shall be used as a basis for establishing the level of controls to be implemented and define the necessary actions to take when dealing with suppliers that do not meet requirements.

8.4.1 Information for external products

Purchase Orders contain a clear description of the requirements, including:

- Part Number
- Drawing Number (if applicable)
- Quantity
- Specification and Requirements, as necessary:
  - The identification and revision status of specifications, drawings, process requirements, inspection / verification instructions and other relevant technical data
  - Requirements for design, test, inspection, verification, use of statistical techniques for product acceptance and related instructions for critical items including key characteristics
  - Requirements regarding the need for the supplier to notify the Company for non-conforming product, approval for the disposition of non-conforming product, changes in product and /or process, changes of suppliers, manufacturing facility location changes and flow down to the supplier chain
- Due date
- Quality Requirements, to include, as necessary:
  - Approval of the Product, Process and Equipment used
  - Qualification of vendor personnel
  - Verification of the vendors Quality Management System

Purchase Orders are reviewed for adequacy prior to approval and release.

8.4.2 Information for external providers

All incoming materials and product are verified against the Purchase Order to ensure conformance. Quality Assurance performs inspection of critical raw material and purchased components as required by the vendor's supplier status. Certified Suppliers (dock to stock) are used where practical.

We will state on the Purchase Order if Mersen or our Customer intends to verify product conformity at the Supplier's facility.

8.5 Production and service provision

8.5.1 Control of production and service provision.

The Company shall control and document changes affecting processes, production equipment, tools, or software programs.

Personnel authorized to approve changes to production processes shall be identified.

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

The Production Process Includes the management of:

- **Manufacturing Processes for:**
  - Components
  - Finished Goods
- **Logistics Operations to deliver the output of the Manufacturing Processes:**
  - To specific Locations
  - To a defined Schedule
  - In acceptable condition
- **Plant Maintenance**
  - Manufacturing Equipment
  - Buildings
  - Support Equipment

With the support of the following functions:

- **Marketing**
  - to define the customer needs / requirements
  - to establish the economic requirements
- **Engineering**
  - to define what is required to meet the customer's technical requirements
- **Purchasing**
  - To provide component and parts from vendors that meet all drawing requirements and materials specifications
  - To provide services which meet the requirements of the component / product drawing and material specifications.
- **Quality**

  - to verify the technical requirements are met
  - to validate that the customer needs / requirements are met
- **Human Resources**
  - to provide the staff competencies required by the processes

A set of controlled conditions has been established, under which the Mersen plans and executes the Production Process. These controlled conditions include:

- Information is available that describes the characteristics of the product.
  - Drawings
  - Bills of Materials
- The availability of suitable equipment for the processing of components or finished goods.

  The availability of work instructions, such as:
  - Job Travelers (for product produced by job control)
  - Station Work Instructions (for product produced by cell control)
- The availability of suitable inspection instructions, such as:
  - Job Travelers
  - Station Inspection Instructions
- The availability of suitable monitoring and measuring equipment, such as:
  - Inspection tools appropriate to each station

8.5.1.2 Production Process Verification

The Company shall use a representative item from the first production run of a new part or assembly to verify that the production processes, production documentation and tooling are capable of producing parts and assemblies that meet the customer requirements. This process shall be repeated when changes occur that invalidates the original results (e.g., engineering changes, manufacturing equipment changes and /or manufacturing process changes).

8.5.1.3 Control of Production Equipment, Tools and Software Programs

Production equipment, tools and software programs used to automate and control / monitor Product realization processes, shall be validated prior to release for production and shall be maintained.

Storage requirements, including periodic preservation / condition checks, shall be defined For production equipment or tooling storage.

8.5.1.4 Validation of processes for production and service provision

Mersen North America, Electrical Protection Division does not have any processes that can not be validated by subsequent monitoring or measuring.

8.5.2 Identification and traceability

Traceability is a function of the customer requirement for the specific products.

All finished products are marked with the product catalog number. Additional traceability can be implemented as required by the customer and can include:

- Date Code
  - On the product and on the packaging
  - On the packaging only
- Other traceability codes or requirements are by contract with specific customers or part of the design input.
- When acceptance authority media are used (e.g., stamps or electronic signatures), the Company shall establish appropriate controls for the media.

All component material within Mersen, North America used for the processing of customer orders is marked and/or accompanied by a document stating the identity.

8.5.3 Property belonging to customers or external providers

It is not the policy of Mersen to use or incorporate a customer's physical property into our products. However, if a case should arise where that had to be considered, it would be considered as part of the contract negotiation.

When customer property is in the custody of Mersen, North America, care is taken to identify, verify, protect and safeguard the material or intellectual property. Customer property lost, damaged or otherwise found to be unsuitable for use is reported to the customer and records maintained.

8.5.4 Preservation

Mersen, North American has the facilities to provide the space and proper conditions for the handling and storage of material during all production and storage stages - from receiving to shipping.

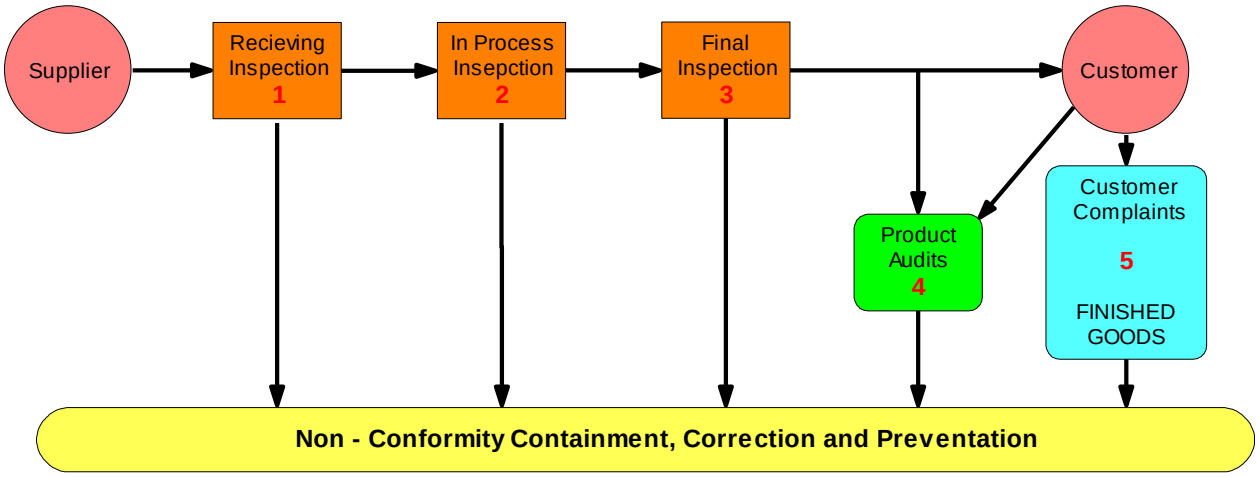
As appropriate, preservation shall include identification, handling, packaging, storage and protecting. Preservation shall also apply to both completed assemblies and constituent parts.

Preservation of product shall also be, where applicable, in accordance with product specifications and applicable statutory and regulatory regulation provisions.

Personal have been instructed in how to prevent damage or loss.

8.6 Release of products and services

The state of the conformance of products characteristics to their design criteria are monitored by inspection actions at key points in the build process:



Action	Frequency
1	As per the Inspection Instructions
2	As per the Work / Inspection Instructions
3	As per the Work / Inspection Instructions
4	As per the facility Quality Control Instructions
5	As per the facility Quality Control Instructions

Product characteristics are defined in the design phase, documented in the drawing package and measured. Product performance is defined by techniques such as:

- Quality Function Deployment (QFD), also referred to as "Voice of the Customer", which derives the Critical to Quality (CTQ) attributes of the product (this includes critical items, including key characteristics that have been identified by the customer) that must be present to achieve acceptable levels of customer satisfaction.
- Criniflex specifies the need of the customer(technical marketing expenses, customer spec…) defining the functions of the product in terms of criteria, levels, & flexibility.
- Sampling inspections as a means of product acceptance, the sampling plan shall be justified on the basis of recognized statistical principals and appropriate for use
- Where product is released for production use pending completion of all required measurement and monitoring activities, it shall be identified and recorded to allow recall and replacement if it is subsequently found that the product does not meet requirements.

Product characteristics that are determined to require inspection are then checked at one or more of the following check points:

- Receiving inspection ensures incoming products that are not certified for dock to stock, meet the deliverable requirements and shall not be allowed to progress into production, inventory or storage until the required verifications and tests have been completed, the necessary test reports have been received and verified as acceptable.
- In process inspections and tests are conducted by qualified operators using calibrated equipment. And shall be accomplished at hold points identified with the Quality Plan and in accordance with documented procedures and relevant instructions. Work in process shall also be monitored to ensure good workmanship standards and specification compliance is being maintained.
- Non-conformities are segregated, identified and recorded.
- Where specified, final inspection and test consists of checking, to the maximum extent feasible, that all customer requirements have been met prior to shipping.
- Product Audits, which are conducted from product stock, prior to and after delivery to the customer
- Customer complaint investigations

Only qualified persons can inspect and/or identify the status of the product, thus authorizing release to the next process step.

Inspection and test records as defined in the facility process definitions, document conformity of the product to the accepted criteria.

The monitoring and measurement requirements for each process are determined by the process documentation, with the intent of providing evidence of conformance of the product to the planned arrangements (inspections) and the customer's requirements prior to the release of the product to the customer.

8.7 Control of nonconforming outputs

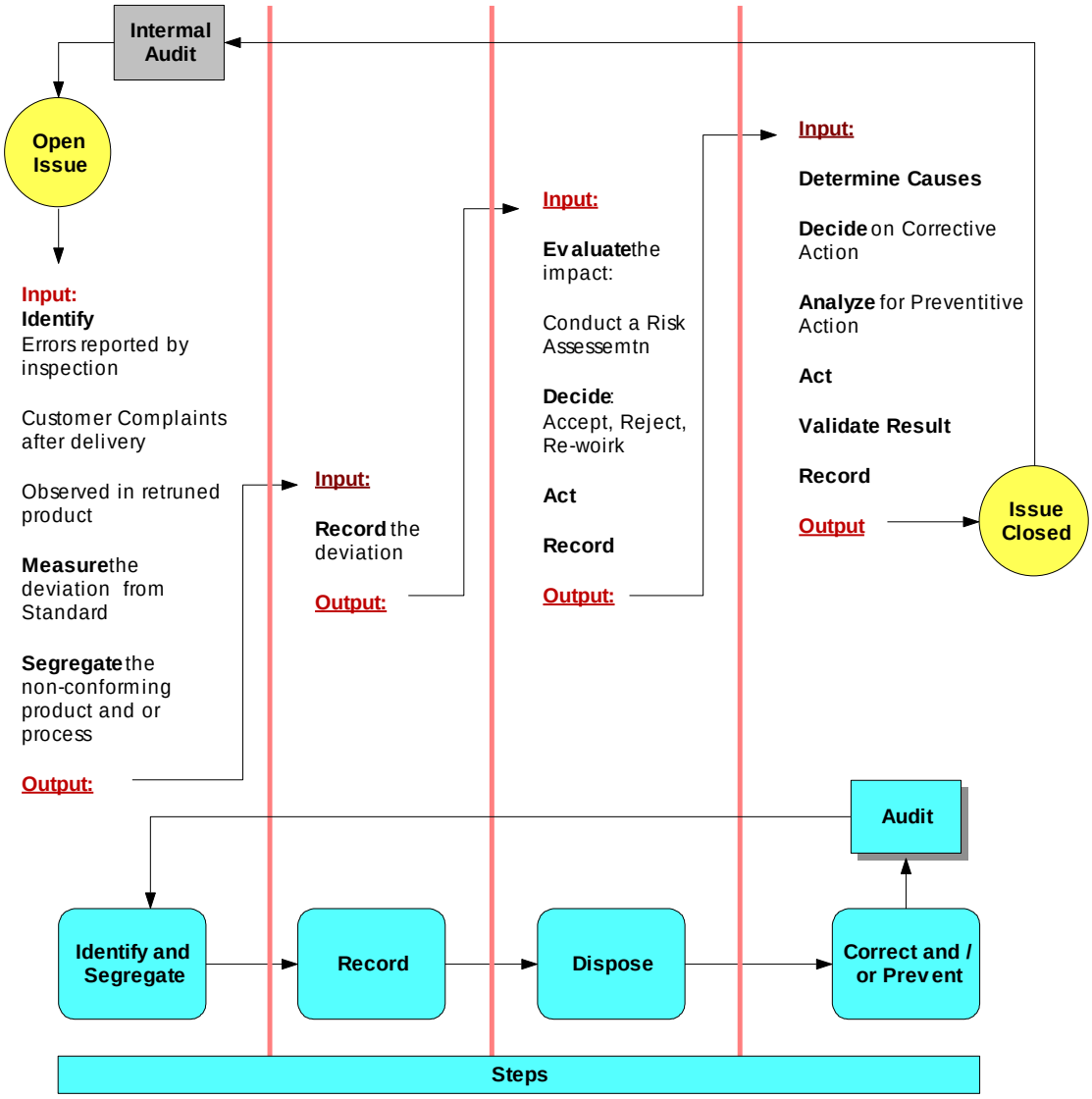
When processes produce product that is not in compliance with the drawing package or process documentation or customers' expectations, the resulting product is identified to prevent its delivery to the customer.

Actions taken include, but are not limited to:

- Segregation of the non-conforming material
- Evaluation of the non-conformity by a Material Review Board for judgment of the severity of the non-conformity and proposed course of action.
- Act on the evaluation to:
  - Accept – by authorization
  - Dispose / Scrap
  - Rework
- As soon as possible, eliminate the root cause of the non-conformity (if applicable).
- Stop shipment to prevent delivery of any in-process material to the customer
- Non-conforming materials will be noted in the appropriate records and will be reviewed on a regular basis.

If there is a concern about the safety of a product being manufactured, it is within the authority of > and is the responsibility of > any employee of Mersen to shut down the production line concerned - until the perceived safety risk is retired.

The following diagram summarizes the management of non-conformities and the resulting actions as concerns the Quality System:



Should non-conforming product be delivered to the customer, a product recall will be considered, taking into account the effects or potential effects of the non-conformity.

Actions that correct non-conforming products will be re-verified to insure conformity to the documentation and re-validated to insure conformity to customer requirements.

9. Performance evaluation

9.1 Monitoring, Measurement, analysis and evaluation

Mersen North America uses various processes to monitor, measure, analyze and improve our processes to ensure the products produced conform to requirements, the quality management system, and meet our goals of continual improvement.

Examples of these processes include, but are not limited to:
- Product Audit Program
- Scrap Rate Monitoring
- Customer Complaint Tracking

9.1.1 General

Mersen North America monitors the performance of the Quality Management Systems processes through the monthly reporting of scrap rates, internal and external audit status, On Hold products by site. The performance of the various sites against these measures is measured against annually agreed goals.

9.1.2 Customer Satisfaction

Customer satisfaction is measured through a variety of means:
- On Time Delivery Performance
- Back Order Status
- Customer Complaint Tracking
- Technical Customer Complaints
- Third Party Customer Surveys
- Product Conformity

9.2 Internal audits

Internal Audits are essential to insure the systems are working as designed and are meeting the objectives set be management and the expectations set by our customers.

Audits are conducted in such a manner as to insure auditor:
- Independence
- Training
- Background in the company

Audits are planed to consider:
- The status and importance of processes
- The results of previous audits
- The importance of the activity to the Mersen strategy
- The risk associated with the process and / or product

Internal Audits are compliant to ISO 19011 and /or ISO AS9100 and are conducted on an annual basis to insure, at a minimum, a complete audit of the entire Quality Management System every 3 years. Audit status is part of the Management review, Section 9.3 of this manual.

Records of Internal Audits, their outcomes and the follow up to Corrective / Preventative Actions generated by the Internal Audits are kept at each location**.**

Each site is also responsible for managing and monitoring the corrective actions required when planned goals are not met.

Records of corrective actions will be maintained.

9.1.3 Analysis and evaluation

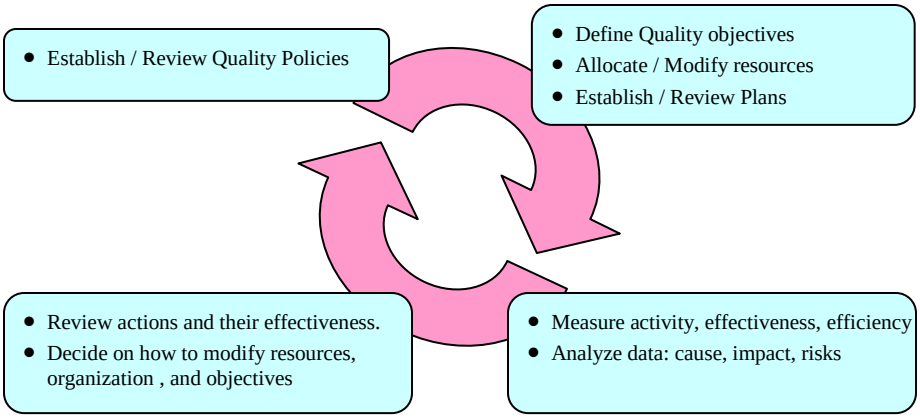
Mersen collects appropriate data for the purposes of demonstrating the suitability and effectiveness of the Quality Management System and to evaluate where continual improvement of the effectiveness of the QMS can be made. This shall include data generated as a result of monitoring and measurement and from other relevant sources. Data analysis is done for, but not limited to:

- Conformity of products to customer requirements
- Product trends to include the need for Preventative Action analysis
- Process trends for continual improvement opportunities
- Supplier performance
- Customer Satisfaction Surveys
- Results from Internal Audits
- Results from Suppliers
- Results from Returned Product

10. Improvement

Measurement loops are established to monitor the quality management systems performance and product conformity to customer requirements. The objective is to continually improve the quality management system.

Continual improvement in Quality is an ongoing process.



The Quality Management System uses the Quality Policy, challenging annual Quality Objectives set by management, audit results, Corrective and Preventative Actions to insure the overall quality system is under constant challenge and continual improvement.

10.2 Nonconformity and corrective action

Corrective actions prevent a re-occurrence of a non-conformity**.**

Each location has a methodology to deal with corrective actions to:

- Review of the Non-Conformity
- Determining the root cause of the Non-Conformity
- Evaluating the actions to prevent recurrence
- Implementing actions selected
- Recording the results or output of the actions taken
- Reviewing the effectiveness of the actions
- Flowing down corrective action requirements to a supplier when it is determined that the supplier is responsible for the non-conformity
- Specify actions when timely and / or effective corrective actions are not achieved
- Determine if additional non-conforming product exists, based on the causes of the non-conformities, and taking further action when required.