



*SUPPLIER QUALITY ASSURANCE
MANUAL*

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INTRODUCTION

In today's lean, just-in-time manufacturing environment, product found to be nonconforming could cause serious disruptions within Electro-Motive Diesel. Electro-Motive Diesel requires its Suppliers to control the quality of material shipped to any of our business units.

PURPOSE

The purpose of this Supplier Quality Manual is to define the general requirements necessary to ensure successful management of the supply-chain activities.

EXPECTATIONS

It is EMD's expectation that the supplier provides product that is defect free, on-time delivery with the right quantity and on-time responsiveness to issues.

SCOPE

The information in this manual applies to all current and future Suppliers of Electro-Motive Diesel that supply production components or materials.

1 Quality System Requirements

1.1 Quality System

Electro-Motive Diesel, hereafter referred to as "EMD", recommends that each Supplier maintains an effective quality system that conforms to the ISO9000:2000 and/or AAR-M1003 requirements. Certification by an accredited certification body is required. In addition, the Supplier must meet all other requirements of this manual.

1.2 Quality Manual & Procedure

Upon request, the Supplier must furnish Electro-Motive Diesel with a controlled copy of the Supplier's Quality Manual and supporting procedures. The Supplier must notify Electro-Motive Diesel of any changes to the Supplier's quality system, top-level management, and/or quality management.



1.3 Control of Sub-tier Suppliers

The Supplier is responsible for the quality of materials and components provided by their sub-tier Suppliers and subcontractors.

Electro-Motive Diesel Suppliers must impose controls on their sub-tier Suppliers that provide quality results and documentation comparable to the controls applied to Suppliers by Electro-Motive Diesel. A **procedure** for control of sub-tier supplier is required.

Where appropriate, Electro-Motive Diesel performs the following:

- Specifies the sub-tier Suppliers that may be used.
- Evaluates and certifies the sub-tier Supplier's facilities.
- Assists the Supplier in controlling the sub-tier Supplier.

Typically, this occurs when the sub-tier Supplier is an essential component of the supply-chain process.

Electro-Motive Diesel reserves the prerogative to evaluate the quality system and records of such sub-tier Suppliers as necessary. In the event of Electro-Motive Diesel involvement, it does not absolve the Suppliers of the ultimate onus of responsibility of its sub-tier Suppliers and sub-contractors quality performance.

2 Supplier Approval Process

All Suppliers of production materials to Electro-Motive Diesel should be Approved Suppliers. EMD uses the Supplier Product Approval Process (SPAP) to document a supplier's compliance to EMD specifications and process capability to consistently meet those requirements during a production run. See the SPAP procedure on this website for the specific requirements.

If EMD Supply Chain Group determines that a potential Supplier fits within Electro-Motive Diesel supply chain needs; the Supply Chain Group initiates the Supplier Qualification Process. The Supply Chain Group requests that the Supplier complete a **Supplier Questionnaire and On-site Supplier Evaluation**. When the Supplier returns the questionnaire, a sourcing-agent reviews the questionnaire with the SQE (or Quality designee) to determine whether to proceed with approval of the Supplier and which approval elements are required.

2.1 On-Site Assessment (If Required)

The Sourcing Agent and/or SQE typically perform an on-site assessment of the Supplier's facility. Other Electro-Motive Diesel personnel may also participate. The Supplier will be given a minimum of 5 days notice of such assessments. These on-site assessments include the following components:

- Quality System audit - determines whether the Supplier's quality system is in place and functioning effectively.
- Business assessment - determines whether the Supplier has the needed financial resources, production capacity, and other business resources needed to fulfill Electro-Motive Diesel volume production needs and continuity of supply.
- Manufacturing assessment - determines whether the Supplier has the needed manufacturing processes controlled in a manner that prevents the shipment of defective product to EMD.



- Continuous Improvement assessment – determines whether the Supplier has a documented process and needed resources to drive continuous improvement throughout the organization.
- Technology assessment - determines whether the Supplier has the needed technical resources, including production and inspection equipment, facilities, engineering resources, electronic commerce capability, etc.

If the assessment team determines that the Supplier meets all of the Electro-Motive Diesel requirements, Electro-Motive Diesel awards the Supplier with Approved status. Approved Suppliers are eligible to bid on new business and supply production materials.

2.2 Supplier Product Approval Process (SPAP)

EMD uses the Supplier Product Approval Process (SPAP) to document a supplier's compliance to EMD design specifications and process capability to consistently meet those requirements during a production run. EMD has categorized all parts into a criticality matrix, Purchased Part Categorization. The Purchased Part Categorization will be updated annually (minimum) and is located on the website. If your part is not mentioned, it is assumed to be Standard Critical.

It is EMD's expectation that SPAP activities such as the Advanced Product Quality Planning (APQP) requirements are part of the supplier's normal operating procedures. The supplier must perform SPAP activities and obtain EMD approval in a manner that will not jeopardize the product delivery schedule set by EMD's Supply Chain Management. In other words, start this process prior to starting production. A **SPAP procedure(s)** is required at the supplier.

The supplier must perform the SPAP process and obtain EMD approval for the following:

- New production or service parts.
- Any change in the production process, method of manufacture or manufacturing location.
- Change in Process Controls initiated.
- Parts modified by engineering change, EMD or supplier.
- Correction to a discrepancy on material previously approved by EMD under Temporary Approval.
- Use of construction or material that was different than that used in a previously approved part.
- Tooling is new, modified, refurbished, replaced or transferred to other locations.
- Change of sub-contractor for parts or services.
- Parts not shipped to EMD for more than 24 months.

The supplier is responsible to contact the EMD SQE when a SPAP is required. The EMD SQE and the supplier shall establish SPAP issues and schedule the approval process. For contact information for the assigned SQE, see the website.

New submissions require complete documentation as described in the Approval Process. Submission for all changes listed above; require only those documents affected by the change.



3 Manufacturing Control

3.1 Process Control

Electro-Motive Diesel Suppliers are required to control all manufacturing processes in accordance with the Inspection and Test Plan, which is approved during Supplier Product Approval Process.

3.2 Statistical Process Control

Where specified in the Inspection and Test Plan, the Supplier is required to apply effective statistical process controls. Effective controls must include:

- A Process Control chart that displays correctly calculated control limits. (Specification Limits may not be used as control limits.)
- A Process Control chart that is at the process area, visible to the operator, or persons who are responsible for controlling the process.
- Actions to be taken to bring the process back into control (for each out-of-control condition). These actions must be documented and maintained.

The sorting, scrapping, reworking, or dispositioning of all product produced during any out-of-control condition must be documented (via the Supplier's material review process) in a **procedure**.

3.3 Process Performance

Process Performance (P_{pk}) is the comparison of the actual process variation to the specification limits.

The following process performance requirements apply:

Critical Characteristics: A P_{pk} of at least 1.33 is required. Evidence of ongoing P_{pk} calculation and appropriate reaction plans must be maintained.

Any critical characteristic failing to meet the minimum requirement requires a containment and improvement plan

Other Characteristics: A P_{pk} of at least 1.00 is required.

The Supplier is not required to calculate and report process performance for non-critical characteristics, unless requested by the SQE (or Quality designee). When specified by the SQE (or Quality designee), other characteristics failing to meet the minimum requirement also require a containment and improvement plan.

3.4 Process Improvement

Out-of-control or unstable processes (which have assignable causes) and processes that do not meet the minimum C_{pk}/P_{pk} requirements must be identified and corrected. The Supplier must also improve processes with low yield rates.

3.5 Lot Control

A lot consists of product of one part number and revision that are made at the same time, under the same processing conditions, from the same lot of raw materials.

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- Identification - Each container of material shipped to Electro-Motive Diesel must be identified with the Supplier's lot number. Inspection records must be traceable to lot numbers. The primary purpose for identifying lots is to determine the scope of actions that must be taken when problems arise during further manufacturing or with customers.
- Lot Number Changes - The following are typical conditions that result in a change of lot numbers:
 - Change of part number or revision
 - Change of part number or revision of components
 - Interruption of continuous production (typically for more than a few hours)
 - Repairs or modification to the tooling or equipment
 - Tooling changes (other than minor adjustment, or replacement of consumable tooling)
 - Change to a different lot of raw materials
 - Change in shift
 - Significant process changes

3.6 Traceability

Traceability ties finished product back to the components used in the product. When traceability is specified, the traceability marking should be effective down to the individual component (i.e., lot code, batch, or serial should be identifiable at a customer rework station).

3.7 Workmanship

When workmanship standards are not referenced on Electro-Motive Diesel drawings or specifications, the Supplier is expected to follow industry-accepted standards. When in doubt, refer to the SQE (or Quality designee) for clarification.

3.8 Maintenance

The Supplier must maintain all facilities, manufacturing machines, tools, measuring devices, and other equipment in such a manner that the Supplier can support Electro-Motive Diesel production requirements, and the quality of material, parts, or assemblies manufactured for Electro-Motive Diesel are not degraded in any way. Preventative maintenance of equipment should be in line with manufacturer's instructions and recommendations.

3.9 Training

The supplier must have a documented **procedure** for training. The supplier must have the following:

- Defined requirements for education, skills, training and experience necessary to perform the work
- Provide the necessary training to ensure these requirements are met
- Maintain records of this training
- Evaluate the effectiveness of this training

3.10 Design Control (If Applicable)



If the supplier has design control of the product being supplied to EMD, the supplier must have a **procedure** for Design and Development of New Product.

4 **Internal & External Change Control**

4.1 External Drawing Change Control

The Supplier must have a documented **procedure** for assuring that the latest Electro-Motive Diesel drawings (which have First Articles approved by Electro-Motive Diesel) are in effect at their facility.

The Supplier's Quality Manual must contain a written **procedure** that includes a description of the following:

- The method used for receipt, review, distribution, and implementation of all changes to drawings and specifications.
- The method used to contain new or modified parts until approved by the customer.

In addition, there must be a **procedure** for addressing and eliminating obsolete drawings and specifications, coupled with defining which current drawings must be in place at each location in the Supplier's process.

4.2 Internal Process & Engineering Change Control

The supplier shall have a **procedure** to control and react to changes that impact the part. The effects of any change, including those by any supplier in the supply chain, shall be assessed, and verification and validation activities shall be defined, to ensure compliance with the EMD SPAP process. The supplier's **procedure** shall have the necessary systems in place to control changes to drawings, specifications, processes, or produced product. Systems should be capable of handling changes being requested by the customer, and also changes requested by the Supplier.

The approval process is directed at a given part number for a specified revision level produced in a specific area of the manufacturer's facility. **Suppliers may not make any changes in their process, location, material, or to the product without written approval from the Electro-Motive Diesel SQE (or Quality designee).** The Supplier must formally request a process change on all Electro-Motive Diesel materials, parts, or assemblies.

4.3 Supplier Process Change Requests

The Supplier may request changes to a released part, process, drawing, or specification. The supplier must provide the following information to the SQE (or Quality designee)

- Drawing or part number
- Drawing or part title
- Description of problem or recommended change
- Reason for change or "rationale"
- Proposed effective date
- Signature of originator



After the SQE (or Quality designee) has completed the review, and concurs with the Supplier, the SQE (or Quality designee) documents the request on the appropriate Electro-Motive Diesel Engineering Change Request.

The request is processed and the Supplier is notified by the appropriate Purchasing personal.

The Supplier notifies the SQE (or Quality designee) to initiate the activities for the revised SPAP.

4.4 Supplier Request for Deviation

A Supplier is never permitted to knowingly ship product that deviates from the print, specification limits, or design intent without **prior written authorization** from the Electro-Motive Diesel SQE (or Quality designee). If such a condition exists, the Supplier may petition the Electro-Motive Diesel SQE (or Quality designee) responsible for the item in question to allow shipment of the product under a signed written deviation from Electro-Motive Diesel. See this website for the Deviation Approval Form.

If directed by the Electro-Motive Diesel SQE (or Quality designee), the Supplier must send samples of all nonconforming items to Electro-Motive Diesel for evaluation. The cost of any testing required in determining the acceptability of the product will be charged to the Supplier.

Representatives from the applicable Electro-Motive Diesel organizations will determine the item's acceptability and what actions (if any) are required beyond the deviation. The responsible Electro-Motive Diesel SQE (or Quality designee) will communicate this to the Supplier.

The deviation is only intended to be an interim action and is **not** to be construed as an engineering change. The Supplier must begin work immediately to correct the condition in question within the time frame stated on the deviation. Failure to comply with the mutually agreed upon closure date for the deviation, may result in the Supplier's rating being affected. In all cases, the Supplier must fully contain all product suspected of being nonconforming at the Supplier location. In addition, the Supplier may be required to sort any suspect product at Electro-Motive Diesel or be charged back for any and all costs for this sorting.

5 Packaging & Labeling

Each Supplier must adequately plan for packaging designed to eliminate shipping damage. Suppliers will provide expendable packaging, where appropriate, that provides for maximum density and protection from any damage that may occur. Packaging, labeling, and shipping materials must comply with the requirements of common carriers, in a manner to secure the lowest transportation costs. See the EMD website for additional information.

Electro-Motive Diesel encourages Supplier-initiated packaging improvements that have been validated by industry standard shipping tests (i.e., drop, vibration, crush....)



Expendable materials and packaging must be legal and safe for standard, industry disposal and/or recycling. Each package must contain the following information:

- Electro-Motive Diesel Part Number
- Electro-Motive Diesel Purchase Order Number
- Quantity
- Supplier's Name
- Manufacturing Facility (if Supplier has more than one facility)
- Lot identification

6 Corrective Action

The Supplier is required to establish a documented **procedure** for problem solving and identifying and eliminating root-causes. All EMD corrective actions are handled through the Quality Notice (QN) process.

6.1 General

QN's may be issued to address the following:

- Supplier-responsible part or material nonconformance through the warranty life of the part or material
- Supplier-responsible aftermarket packaging nonconformance (i.e. labelling issues)
- Issues and concerns with the shipping of production parts or material to EMD
- Delivery issues and concerns related to the quality of service as described in the service contract
- Supplier responsible warranty for special cause concerns
- Supplier responsible engineering design issues
- Procedural or process nonconformity: i.e., failure to communicate in a timely fashion, failure to comply to procedures, failure to meet deadlines
- Issues requiring supplier's assistance in root cause analysis for chronic failures including product that is out of supplier's warranty.

6.2 Types of QN's

6.2.a Supplier Fault (Includes Major Disruption, Lost Delivery and Stock Out) A Supplier Fault QN will be issued when EMD has verified that the supplier caused a nonconformance.

Nonconformances that may result in a Supplier Fault QN include, but are not limited to, discrepancies or problems with:

- Appearance
- Dimensions
- Welds
- Finish, i.e. burrs or flash
- Contamination
- Coating
- Part or Container labeling issues affecting the part identification
- Laboratory and metallurgy specifications
- Machining
- Functional Performance
- Parts not packaged to specification for aftermarket



- 6.2.b Supplier Fault - Financial Only. We want to encourage suppliers to notify us as soon as possible when they detect or become aware of a potential nonconformance and to work with EMD to mutually resolve problems quickly and efficiently without interruption to our operations. We also want to account for extenuating circumstances and/or shared responsibility, which may not be totally under the supplier's control. To this end, we may at our discretion issue or revise a current QN to Supplier Fault – Financial Only. This QN is the same as the other Supplier Fault QN's with the exception that the quantity defective will not be used in the Percent Defective calculation for the supplier evaluation.
- 6.2.c Supplier Warranty - Supplier Warranty. QN's are the same as Supplier Fault QN's, but are used exclusively for Field Returns. The field return may be for Bad from Box or for failure during the supplier's warranty.
- 6.2.d Service/Delivery Complaint
A Service/Delivery QN will be issued when EMD has verified that a shipping or scheduling-related nonconformity was caused by the supplier. Non-conformances that may result in a Service/Delivery QN include, but are not limited to:
- Noncompliance to schedule requirements
 - Documentation noncompliance, i.e. missing or inaccurate shipping documents
 - Nonconformity, or nonconformance caused by transportation carrier
 - Nonconformity, or nonconformance caused by Logistical Service Provider
 - Electronic communication issues or problems
 - Premium shipment issues, i.e. prepayment, coordination, excessive use
- 6.2.e Packaging Complaint - Packaging non-conformances that do not result in part damage, or do not affect the salability of the part, are documented through a Packaging Complaint QN. Non-conformances that may result in a Packaging QN include, but are not limited to:
- Part or material that was inadequately secured in the container
 - Container was inadequately secured in the carrier vehicle
 - Container design and/or fabrication was inadequate
 - Container that has been damaged by improper handling
 - Mixed pallets built incorrectly
 - Labeling issues that do not affect part identification
- 6.2.f EMD Fault - EMD Fault QN's will be issued for the scrapping or return of material that has been determined to be EMD's responsibility. The supplier will not be debited for the material and will be paid for the repair or replacement of the material.
- 6.2.g Core Return for Rebuild - Core Return for Rebuild QN's will be issued exclusively when the material is being returned for use in the Rebuild program only and there is no question of fault or responsibility. These parts do not normally require immediate repair or replacement. Delivery of Rebuild or UTEX parts shall be in accordance with normal delivery releases.
- 6.2.h Satisfaction Complaint - A Satisfaction Complaint QN will be issued when EMD has verified that any other nonconformity, excluding pricing or other commercial issues, was the result of a supplier's action or inaction. NOTE: A Satisfaction Complaint QN can be issued to a supplying location with or without reference to a part number. The Quantity Nonconforming on a Satisfaction Complaint QN is zero. Nonconformances that can result in a Satisfaction Complaint QN include, but are not limited to failures regarding:
- Communication requirements for data or information
 - Lack of responsiveness, timeliness, or deadline issues (e.g. SPAP, QN Response)
 - Failure to submit requested documentation, test results, etc.
 - Procedural requirements
 - Failure to implement corrective action per QN response

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- 6.3 QN Issuance
- 6.3.a QN System - QN's shall only be issued in the Electro Motive QN System. Typically, EMD issues QN's, immediately after verification of who is at fault and responsible for the issue.
- 6.3.b Production Identification - The issuing location shall define, in sufficient detail, the problem being encountered. The following information should be gathered prior to issuing the QN:
- Supplier Code
 - Part number
 - Type of QN
 - Detailed description of non-conformance
 - Heat number, lot number, date code, serial number as applicable
 - Magnitude of the problem, i.e. Major Disruption
 - Reason for classifying the issue as a Major Disruption (added to the problem description)
 - Whether or not the supplier notified EMD of a possible nonconformance prior to receipt of the material at EMD location
 - Accurate quantities of the problem parts / materials.
 - Location of where the problem was found (Department, etc.)
- 6.3.c Verification of Responsibility - The issuing location shall verify that the nonconformance is the supplier's responsibility prior to issuing a QN to the supplier.

The issuing location should utilize appropriate expertise and resources (i.e. lab tests or dimensional checks) that are necessary to verify the nonconformance. Prior to issuing the QN, if possible, the issuing location should contact the supplier by telephone, notify the supplier of the problem, and discuss immediate actions if expedited containment is necessary.

- 6.3.d Suspect Material - The issuing location should gather and quarantine suspect parts or material. The issuing location should promptly return suspect material, if requested by the supplier. The supplier has 24 hours to provide a Return Material Authorization for suspect material to avoid potential return of material without Return Material Authorization Number (RMA #).
- 6.3.e Identification of Quantities for the QN - When a QN is issued to a supplier, the issuing location shall accurately record the total quantity nonconforming, the quantity to be used as is (on a Discrepancy Approval), the quantity returned, the quantity to be sorted or reworked at EMD and the quantity scrapped on the QN. When EMD, the supplier or a third party performs sorting – corrections must be made to the QN to accurately reflect the above quantities.
- 6.3.f QN Resolution - A QN is considered closed after EMD has moved the QN from an “Open or “Rejected” status to an Approved status. The initiating location should close the QN within 15 business days of receiving an acceptable final response from the supplier and approval of the final response.
- 6.3.g Corrections to a QN - If any information on a QN is found to be inaccurate, the issuing location must ensure that corrections are made. Corrections may be made only while the QN is Open, unless an appeal is pending. If the supplier contests any QN information, the issuing location must assist in investigating the details and then correct the information,



where applicable. Appeals by the supplier must be directed to the appropriate Supplier Quality Management or Materials Management (for Service/Delivery/Packaging QN types) at the EMD issuing location.

6.4 Supplier Requirements

- 6.4.a General - The supplier shall promptly notify EMD whenever potential non-conforming product or material may have been shipped.
- 6.4.b Problem Identification - The supplier shall provide proactive participation in problem identification if requested. Note: On field issues with new locomotives (within one year of delivery), Supplier will identify Root Cause within three business days of receiving the defective part. EMD will work with the Supplier to make this happen.
- 6.4.c Initial Response - Within two (2) business days of the issuance of the QN, the supplier should provide an initial response consisting of the following information:
 - QN has been received and non-conformance defined
 - Nonconforming product is being contained at the supplier, in transit and at EMD
 - Good parts will be delivered by (date) and identified by (marking on parts) as requiredGenerally, suppliers will not be measured on the timeliness of their initial response.
- 6.4.d Problem Solving - The supplier shall promptly complete appropriate problem solving activities using a formal problem solving process. Five whys, three times is the recommended minimum analysis for all Final Responses. Why did process/quality planning not predict the defect? Why? Why? Why? Why? Why did the manufacturing process not prevent the defect? Why? Why? Why? Why? Why did the quality process not detect and contain the defect? Why? Why? Why? Why?
- 6.4.e Final Response - The supplier shall provide a final response within 30 calendar days of issuance of the QN using the QN Response Form. The final response shall include at a minimum:
 - Investigate and define the nonconformance
 - Contain the non-conformance at the supplier and EMD
 - Provide the delivery plan for conforming parts
 - Identify Root Cause using the 5 Whys, 3 times methodology (page 2 of the response form)
 - Implement Corrective Action
 - Evaluation and follow-up plan

After SQE approval of final response, the supplier is responsible for completing the follow-up plan including similar EMD products and processes.

6.5 QN Appeal Process

The supplier may appeal the issuance of a QN or specific information contained in the QN. To appeal, the supplier shall provide objective evidence, in writing, to the issuing location demonstrating rationale for the appeal. A request for change to a QN - MUST be submitted within 30 calendar days of issuance of the QN.

If the issuing location and the supplier do not agree, and the supplier wants to pursue the appeal further, the appeal should be directed to the applicable Supplier Quality Engineer or Supplier Quality Management for revision or change of fault.

6.6 Cost Recovery Process

- 6.6.a General - EMD uses the Cost Recovery process to recover costs incurred as a result of a supplier's nonconformance on issues occurring at EMD and for issues discovered after products are shipped to customers (warranty). EMD Cost Recovery requests shall have



- adequate supporting documentation regarding man-hours / downtime / products or units impacted. Warranty Cost Recovery requests shall have adequate supporting documentation regarding the issue. Typically, part cost, shipping costs, standard labor hours, and investigation cost may be used, along with the total number of claims, to determine the amount of the cost recovery. Material Cost will be at EMD's Sale Price. EMD shall provide, when issuing a cost recovery request, detailed explanations of any additional costs.
- 6.6.b Cost Recovery Response - The supplier shall provide a response to any cost recovery request issued to them.
- 6.6.c Appeal Process - The supplier may appeal a cost recovery request. If the EMD buyer and supplier agree on a revised cost, the cost recovery request shall be amended and the revised amount shall be debited or invoiced to the supplier. If no agreement is reached within eight weeks of issuance of the cost recovery request, and EMD has approved no extension, the original cost requested may be debited or invoiced to the supplier.
- 6.7 Supplier Product Improvement Process (SPIP)

At the discretion of EMD, based on serious field or production quality problems, a supplier may be placed on an active Supplier Product Improvement Process. This process will be used when other actions have not resulted in rapid closure and or prevention of problems that have resulted in our customer's dissatisfaction with our products or services.

Notification of the initiation of a SPIP will be through a formal Product Improvement Process letter. This letter requires an acknowledgement (signature) from the supplier's production and quality manager. The notification letter will include a brief outline of the reasons for the SPIP.

Suppliers placed on SPIP will also be placed on New Business Hold.

Once placed on a SPIP, the process will remain in effect until approved for closure by the EMD Manager of Supplier Quality.

Administration of the SPIP will be through the EMD SQE. Activities may include, but not limited to:

- Daily conference calls with the EMD resolution team.
- Use of an action item check list including person responsible and due date for tracking activities to closure. Distribution will include supplier's top management that signed the notification letter.
- Quality Improvement meeting at EMD, as necessary.
- Additional SQE visits including the of SQE audit check sheets to evaluate and identify quality system weaknesses that contribute to product defects.
- Review and re-evaluation of all SPAP documentation:
 - Confirm PFMEA high RPN action items are being improved
 - Confirm no changes to process flows
 - Confirm no changes to control plans
 - Confirm defective product communication plan
- Sub-supplier qualification reviews and audits
- Evaluation of all Quality Notices issued in the past year and an audit of corrective actions submitted for continual implementation and effectiveness

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- Supplier presentations to EMD's Supplier Quality Engineer/Manager focusing on rapid closure of any issues identified in the above activities and review of systemic corrective actions
- Implementation of Controlled Shipping third party certified inspectors.

The reason for the SPIP is to be highly responsive to our customer's needs and issues with respect to the products and services we provide them and to regain the lost satisfaction of our customers (and production plants) by reducing the time associated with providing good parts and implementing fail-safe processes and process controls to prevent future recurrence of defective parts not only for the current defect but for all experienced and potential defects.

7 Controlled Shipping

7.1 General

Controlled Shipping is a status whereby EMD requires a supplier to put in place a redundant inspection process to sort for a specific nonconformance, while implementing a root-cause problem solving process. The redundant inspection is in addition to normal controls and performed and/or verified by a 3rd Party Inspector at supplier's expense. The data obtained from the redundant inspection process is critical as both a measure of the effectiveness of the primary inspection process and the corrective actions taken to eliminate the initial nonconformance.

The problem solving activity, led or facilitated by the Controlled Shipping Coordinator, includes analysis of the primary and redundant inspection results – audits of processes, procedures, work instructions, inspection instructions and the associated documentation – and root cause analysis, corrective action determination and follow-up evaluation of the corrective actions.

7.2 Controlled Shipping Criteria

EMD makes the determination whether the supplier can effectively correct the nonconforming material situation through the QN process and isolate EMD from the problem. One or several of the following issues may be considered for implementation of Controlled Shipping:

- Repeat QN's
- Supplier's current controls are not sufficient to ensure conformance to requirements
- Duration, quantity, and/or severity of the problem
- Internal/External Supplier data
- Major Disruptions
- Quality Problems in the field
- Supplier Quality Measurement Score

7.3 Assessment

- EMD Manufacturing/Assembly centers or SQE make a request for Controlled Shipping, referencing the non-conformances/QN's, observations at the supplier, the supplier's internal /external data, or other criteria for application.

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- SQE reviews the request/documentation to ensure it complies with the criteria for application, and if applicable, makes the decision to place the Supplier in Controlled Shipping. This decision may also involve a Supplier Quality Supervisor.

7.4 Controlled Shipping Coordinator

The supplier must provide a qualified Controlled Shipping Coordinator. The Controlled Shipping Coordinator is the single point contact between EMD and the supplying facility on the Controlled Shipping issues. The Controlled Shipping Coordinator is to lead or facilitate all of the problem solving activities including analysis of the primary and redundant inspection results – audits of processes, procedures, work instructions, inspection instructions and the associated documentation – and root cause analysis, corrective action determination and follow-up evaluation of the corrective actions. The supplier is responsible for the inspection analysis, audits and all of the problem solving activities.

The Controlled Shipping Coordinator is to maintain communication with EMD, provide status updates and report results of the above inspection analysis and audits.

7.5 Redundant Inspection

The Redundant Inspection is to be performed or verified by a certified 3rd Party Inspector. The selection of the 3rd Party must be approved by the SQE. The actual inspection may be done by the supplier's inspectors, but must be verified by the 3rd Party. The supplier must provide trained, qualified inspectors and supporting resources for the redundant inspections, as required. This includes a place to do the inspections, tools, gauges, handling equipment, etc. Inspection records must be kept in accordance with the Controlled Shipping Entry letter and guidance from the SQE.

The 3rd Party Inspector must be currently certified by an appropriate certifying organization such as the American Society for Quality, Registrar Accreditation Board, American Society for Non-destructive Testing, Association of American Railroads and / or equivalent certifying authorities within the country of origin. Any of the following certifications are preferred – for others, or for specific types of issues, check with the EMD SQE.

- Certified Quality Inspector / Technician / Engineer / Auditor / Manager
- Certified Welding Inspector (mandatory for welding issues)
- Certified NDT Level III for test method used (mandatory for NDT issues)
- Certified ISO Quality Auditor
- Certified Six Sigma Black Belt
- Certified Red X Journeyman (or higher)

The redundant inspection procedures and instructions must be verified and approved by the SQE.

7.6 Controlled Shipping Entry/Implementation

- The SQE verbally notifies the supplier that:
 - Supplier is being placed on Controlled Shipping.
 - Containment must be initiated immediately, in order to protect EMD.
 - Entry letter will follow.
- SQE sends formal confirmation to the supplier via a Controlled Shipping Entry letter, addressed to the supplier's Top Management.

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- Supplier selects 3rd Party Inspector and obtains SQE's approval.
- Supplier returns confirmation reply as required.
- SQE and the 3rd Party Inspector hold a kickoff meeting or conference call with the Supplier's Controlled Shipping Coordinator, Quality Manager and Plant Manager, if necessary, to establish the scope of the 3rd Party Inspector's activities.
- Supplier and/or 3rd Party Inspector performs a redundant inspection of all suspect nonconforming products per the agreed upon process to ensure defect free parts. 3rd Party verifies the redundant inspection.
- Supplier notifies additional EMD facilities that use the same part, informs them of the nonconformance, and provides containment activities as necessary.
- The Controlled Shipping Coordinator reviews the redundant inspection results of all suspect non-conforming products per the agreed upon process to ensure defect free parts are delivered to EMD.
- The Controlled Shipping Coordinator analyses and reports the results of the normal and redundant inspections to SQE and supplier management.

7.7 Containment Guidelines

The intent of the Controlled Shipping containment guidelines is to outline and describe a rigorous process that insulates the EMD assembly plant from the receipt of nonconforming parts and material. The Controlled Shipping containment guidelines are as follows:

- Containment area must be highly visible and properly lighted, equipped, etc.
- Containment area must have well defined efficient material flow including clearly identified areas for incoming and outgoing parts/material.
- Repairs will not be done in the containment area.
- Containment area must be independent of the supplier production process.
- Problem solving must be formal, data driven and documented.
- Containment operators must have available to them proper job instructions, quality standards, boundary samples, tools, and equipment, etc.
- Inspectors must be properly trained.
- Preventive maintenance must be employed if required.

7.8 Monitoring and Check Phase

- Supplier and/or 3rd Party Inspector continues the redundant inspection of all suspect non-conforming products per the agreed upon process to ensure defect free parts are delivered to EMD. 3rd Party Inspector verifies the redundant inspection.
- Supplier audits the normal inspection processes and appropriate related processes, procedures, work instructions and documentation and provides reports for SQE and supplier management.
- Supplier conducts a daily management meeting to review the inspection results, ensure the corrective actions taken are effective, and plan required changes
- SQE monitors supplier's containment data.
- Supplier determines and demonstrates the root cause to the SQE.
- Supplier develops implements and validates the permanent corrective actions, along with improved process controls (i.e., error proofing, layered audits, setup checklists, standardized work, operator training and certification program, etc.)

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- Supplier updates all applicable documentation, (i.e. Process Inspections and Test Plan showing the manufacturing process steps and inspection / test steps used to produce the part, Work Instructions, etc.)
- Controlled Shipping Coordinator communicates the action plan, inspection status, and results of problem resolution activities to the SQE in a format and with a frequency agreed to by the SQE.
- SQE verifies supplier's root cause analysis and corrective actions.
- SQE verifies the supplier has a documented process control validation program in place (such as job setups, setup error proofing, process error proofing, layered auditing, operator training & certification etc.)
- Supplier begins follow-up evaluation of the corrective actions including similar parts, processes and procedures for EMD parts throughout the facility.

7.9 Exit criteria

Exit criteria must:

- Include clear and measurable elements.
- Be specific and relevant to the nonconformance issues to be addressed.
- Require documentation to demonstrate corrective actions taken are permanent.
- Remain constant for each nonconformance.
- Defined time period for no nonconforming parts received by EMD.
- Documentation showing the root cause was identified and verified.
- Documentation indicating that corrective action was implemented and validated.
- Copies of all documentation revised as required (Process Inspections and Test Plan showing the manufacturing process steps and inspection / test steps used to produce the part, work instructions, inspection instructions, etc.)
- Documentation indicating that every effort was taken to implement error proofing.
- All Quality Notices must be answered.

7.10 Verification for Exit

- Supplier requests exit from Controlled Shipping and provide supporting documentation and assessments on performance and corrective actions to the SQE.
- SQE may conduct appropriate Quality Audits.
- SQE verifies that the supplier has met all exit criteria. The supplier is removed from Controlled Shipping after all exit criteria are met and the established time has expired without further non-conformances at EMD facility or coming out of the supplier's process.
- SQE notifies the supplier verbally that they have met the exit criteria and that they will be removed from Controlled Shipping upon receipt of the Controlled Shipping exit letter.
- SQE issues a Controlled Shipping exit letter to the supplier for official notification that they have been removed from Controlled Shipping.
- Supplier continues follow-up evaluation of the corrective actions including similar parts, processes and procedures for EMD parts throughout the facility.



8 DOCK-TO-STOCK

Electro-Motive Diesel has instituted a DOCK-TO-STOCK program to reduce the problems associated with receiving nonconforming product from Suppliers, while minimizing Receiving Inspection and speeding up the process of moving product to production. Electro-Motive Diesel administers the DOCK-TO-STOCK program on a product-by-product basis.

DOCK-TO-STOCK applies to all material and components purchased for use in full-volume, released product at all Electro-Motive Diesel locations. DOCK-TO-STOCK does *not* include pre-released parts and SPAP parts.

8.1 DOCK-TO-STOCK Requirements

To be considered for DOCK-TO-STOCK the product must meet the following requirements:

- The Supplier must be an Electro-Motive Diesel Approved Supplier.
- The part must not have any Supplier-caused QNs as determined by the SQE (or Quality designee).

Electro-Motive Diesel may audit the Supplier for compliance to the Supplier's Inspection and Test Plan and may audit the Supplier's Quality System. Any open issues must be resolved, including drawing/specification dimensioning and tolerances, process capability, and open QN's requiring Supplier action.

When received by Electro-Motive Diesel, DOCK-TO-STOCK material is moved directly into inventory, bypassing Receiving Inspection.

8.2 DOCK-TO-STOCK Suspension

The Supplier's DOCK-TO-STOCK status is put on suspension when any of the following conditions occur:

- The part fails Receiving Inspection for a lot or an ad hoc lot sampling.
- A Supplier-caused QN is initiated for the part.
- The Supplier fails a Quality System Audit.
- An audit shows the Supplier is not following their approved Inspection and Test Plan.

The suspension process is as follows:

- a. Electro-Motive Diesel notifies the Supplier that a Supplier's DOCK-TO-STOCK status is put on suspension.
- b. Electro-Motive Diesel issues a QN (if a QN has not already been issued) to the Supplier and works with the Supplier to correct the problem.
- c. Suspension continues until Electro-Motive Diesel is satisfied that the "root cause" of the problem has been identified and corrected, the corrective action has been implemented and is effective, and the QN requiring Supplier action is closed.



- d. Implementation may be verified at the Supplier's facility, or by documentation sent by the Supplier, and normally includes confirmation by Receiving Inspection of acceptable lots.

When the Supplier's DOCK-TO-STOCK status is returned to good standing, Electro-Motive Diesel notifies the Supplier that the Supplier has been returned to DOCK-TO-STOCK status.

If a Supplier does not implement effective corrective action, or if the Supplier is put on suspension repeatedly, Electro-Motive Diesel determines whether the Supplier's DOCK-TO-STOCK status should be discontinued. This decision may also include a determination to divert the business to an alternate Supplier.

9 Supplier Monitoring

Electro-Motive Diesel continually monitors its Suppliers to ensure they continue to meet Electro-Motive Diesel requirements, and to ensure that the Supplier continues to ship acceptable material, parts, or assemblies. This monitoring may consist of:

- Supplier's performance rating
- A Quality System surveillance audit at the Supplier's facility.
- An audit of the Supplier's Inspection and Test Plan.
- A normal Material Quality Verification of a lot.
- Source Inspection of product at the Supplier's facility.
- Review of Supplier-furnished Data Packages.

9.1 Supplier Performance Rating

The Supplier's performance will be monitored monthly and year to date. The rating will consist of four categories:

- Quality (50 points)
- Delivery (50 points)

At any time where the supplier's rating falls below 80, a formal corrective action will be issued. Those suppliers below a rating of 80 for 3 months in a year will be placed on SPIP.

9.2 Supplier Audits

The Supplier must make their facility available for on-site process verification by the Electro-Motive Diesel SQE (or Quality designee) at any time, with a minimum of 15 days notice. Other representatives from Electro-Motive Diesel may support the SQE (or Quality designee) when conducting the verification audit.

9.3 Quality System Audit

Periodically, Electro-Motive Diesel may audit the Supplier's Quality System. This may be a full or abbreviated documentation and on-site audit. The purpose of this audit is to evaluate any changes that may have occurred in the Supplier's quality system, and to assess the Supplier's continuing commitment to quality improvement.



9.4 Inspection and Test Plan Audit

Periodically, Electro-Motive Diesel may audit the Supplier's continuing conformance to the Supplier's Inspection and Test Plan.

9.5 Inspection at the Supplier's Facility

Electro-Motive Diesel may inspect product at the Supplier's facility, to detect potential problems prior to shipment to Electro-Motive Diesel. Electro-Motive Diesel may also inspect product at the Supplier's sub-Suppliers.

9.6 Supplier Submission of Lot Data

Electro-Motive Diesel may require the Supplier to provide inspection, test, process performance, or other quality data with each shipment to ensure that the product meets Electro-Motive Diesel requirements.

When data submission is required, the data must be e-mailed to the Electro-Motive Diesel Receiving Inspection department (or other specified location) at the same time the lot is shipped.

All documentation must be clearly identified with the Electro-Motive Diesel part number, and the Supplier's lot number.

When specified by the SQE (or Quality designee), the Supplier must submit via email monthly data packages to the SQE and/or designee. Data packages typically consist of copies of control charts and Cpk & Ppk calculations for specified characteristics. Other data may be requested by the SQE (or Quality designee).

A Supplier may request elimination of the data submission, if the records show that characteristic consistently satisfies Electro-Motive Diesel requirements for process stability and process performance, and if the characteristic has caused no problems in Electro-Motive Diesel production or in the field. The Electro-Motive Diesel SQE (or Quality designee) determines whether data submission must be continued.

10 **Terms and Definitions**

10.1 Controlled Shipping Coordinator

The Controlled Shipping Coordinator is the single point contact between EMD and the supplying facility on the Controlled Shipping issues. The Controlled Shipping Coordinator is to lead or facilitate all of the problem solving activities including analysis of the primary and redundant inspection results – audits of processes, procedures, work instructions, inspection instructions and the associated documentation – and root cause analysis, corrective action determination and follow-up evaluation of the corrective actions.

10.2 Electro Motive Quality Notice (QN) Response Form

Suppliers will be required to submit to their QN's using a web-based corrective action process. Those suppliers needing access are required to contact your SQE. This process is used for initial and final response to QN's.



- 10.3 **Field Return**
A special cause product deficiency in the field that results in either a field campaign or recall and where the supplier responsibility has been determined or the product is out of Supplier's warranty, but requires Supplier's assistance in root cause analysis for a chronic failure issue.
- 10.4 **Issuing Location**
This is the EMD location that issued the QN.
- 10.5 **Major Disruption**
A Major Disruption is a supplier responsible incident causing a severe negative impact to EMD's ability to manufacture or ship product or a supplier responsible field return that results in either a field campaign or recall.
- 10.6 **Non-conformance**
This is a product, material, or logistical service that does not conform to EMD specifications.
- 10.7 **QN (Quality Notice)**
A record issued in a standard format to:
Quantify and describe problem(s) encountered by EMD
Define the magnitude of the problem
Identify the supplier by Vendor Code
Identify the part number, if applicable
Identify key EMD contact(s) name, phone number and email address
Define status and material disposition
Record Supplier's corrective action plan
Identify how solution will be institutionalized across the supplier's facility
- 10.8 **QN Response**
A formal process that identifies a specific failure mode, containment method, and ensures corrective action and documentation updates are implemented for immediate and similar issues for all EMD parts across a facility/Division/Company. The process includes:
Identification of failure mode
Containment of non-conforming product
Delivery of conforming parts to meet EMD's manufacturing and field replacement needs
Determination of root cause and corrective action implementation
Revision of supplier processes, process flow and/or Inspection and Test Plan
Identification of similar products / processes
Incorporation of the corrective action
Revision of processes, process flow and/or Inspection and Test Plan for each similar process
Documentation of Process Improvements
- 10.9 **Supplier**
This is a direct provider to an EMD or associate facility of:
Production parts/materials
Pre-production or service parts/materials
Heat treating, plating, painting or other finishing processes services
Logistical services (e.g. re-binning, labeling, conveyance, warehousing, sequencing, transportation, control of empty containers etc.) to a customer facility



- 10.10 Suspect Material
Suspect Material is any material or product that may contain a defined nonconformance.

- 10.11 Vendor Code
The Vendor Code is a unique supplier identification number that is issued by EMD and appears on Purchase Orders. It is used to identify a supplier contract location.

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