Quality Systems Overview
Supplier/Buyer Training

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Supplier Quality Systems Overview

- Expectations
- Supplier Quality Standard (OQA-3932)
- What has Changed for NSA and their Suppliers?
- First Article Inspection Report (FAIR)
- Change Control
  - Critical Part Management
  - CE! Management
  - Process of Record
- Non-Conformance Management
  - NCR (Lam Reported Problems)
  - QDR (Customer Reported Problems)
  - Problem Reports
- Supplier Quality Scorecard
Expectations – SMT Sr. Management

Today’s training …
- Provide information to establish a solid foundation of knowledge relative to Lam’s quality business processes
  - Lam Supplier Quality Standard (1-oqa3932)
- Have a clear understanding of what has changed for Deposition suppliers / Quality systems
  - Working knowledge of First Article Inspection Report (FAIR) process
  - Change Control: Critical Part Management - CE! Management - Process of Record
- A working knowledge of Lam’s Supplier Portal
  - Supplier Dashboard, MyLam
- An understanding of your roles and responsibilities relative to quality business processes

Future …
- Apply today’s learning and nomenclature to your discussions with your suppliers and colleagues
- Read and understand the Lam Supplier Quality Standard
SMT Mission & Vision

SMT Mission:
- **Supplier Material & Technology** is dedicated to the development, management, alignment and continuous improvement of supplier technology and processes to optimize product quality, delivery and total cost.

SMT Vision:
- #1 supply chain organization of our industry
- World Class organization delivering superior product quality and services at the lowest total cost
- Best in class innovation in manufacturing technology, materials, & supply chain design
- Strategic alignment with customers and suppliers on product requirements
SMT Responsibilities

Supplier Materials and Technology (SMT)
- Assess Capability (QMS)
  - Technical
  - Manufacturing
  - Quality
- Tracking and Improvement
  - Quality scorecard
  - PFMEA
  - Process of Record Audit (POR)
  - First Article Inspection (FAi); IQA
  - Failure Analysis (FA)
  - SCAR
  - Purge management
  - Supplier induced NCR, QDR
  - Closed loop (lessons learned)
- Improvements
  - Internal Processes
  - Training
  - Process Development

Global Supply Chain Management (GSCM)
- Assess Capability (QMS)
  - Financial
  - Delivery
  - Growth/ Planning
  - Internal processes
- Tracking and improvement
  - OTD
  - Supplier health
  - Responsiveness
  - Capacity development
- Pricing
- NDA/ IP/ GPA / Quality Standard
- Business process CIP
- Overall decision

Engineering and Business Core Competencies Combine to Manage Suppliers
Thoughts on Quality ..... 

Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives.
GPA and Lam Supplier Quality Standard are the agreements which govern supplier expectations:

- Lam Global Purchase Agreement: Lam and supplier purchase agreement terms and conditions
- Lam Supplier Quality Standard: Quality Requirements for purchasing and accepting new and/or repaired Fabricated and Original Equipment Manufacturers ("OEM") products

GPA and OQA-3932 together govern respectively the business and quality expectations of Lam suppliers.
OQA-3932 Supplier Quality Standard is supported by requirements outlined in the OQA Document Hierarchy structure.

**OQA-3932: Supplier Quality Standard**

OQA-3932 supporting documents define responsibilities, method, timing, and measurement requirements
Supplier quality management systems are defined in OQA-3932 and other referenced OQA documents
OQA-3932 Lam Supplier Quality Standard: Key elements

- Specific Quality Requirements – Process of Record Critical Parts:
  - Process of Record
  - Process Control
  - Change Control
  - Certificate of Conformance
  - Subcontracting (Critical Components)
  - Traceability

- Revision Record

Understanding of Supplier Quality Standard is fundamental to being a Lam Preferred supplier

Study and understand OQA-3932 Supplier Quality Standard
Quality Systems
Changes and Details
What has changed in Quality Systems?

- Quality Notifications now NCR, QDR, and PR
- First Article Inspection Report (FAIR) is required for the first time shipment of a fabricated part and revision 45PO (production)
- Process of Record required for Critical POR parts
- New terms
  - First Article Inspection Report (FAIR)
  - Non Conformance Report (NCR)
  - Problem Report (PR)
    - Supplier Request for Deviation (SRD) - type of PR
    - Authorized Supplier Action (ASA)
  - Process of Record (POR)
  - Quality Defect Report (QDR)
- Supplier Portal
  - Supplier Dashboard
  - MyLam

New terms and systems but same high expectations for suppliers
SAP Quality Notifications mapped to Lam QMS

Novellus Standalone Quality Notifications

(Q3) Purge
(Q6) Supplier Request for Deviation
(Q7) Supplier Corrective Action Request
(Q8) Manufacturing Deviation Waivers
(R1) R&D issues
(R2) Service exchange return requests
(Q9) Corrective action / preventive action

(F2) First Article Inspection
(F3) Defects found in Manufacturing
(Q2) Discrepant Material
(MI) Manufacturing Improvements

(F1) Defects found on field returned items
(F4) Field service returns defects

(Q4) Defects found during system installation
(Q5) Failure Analysis Request
(QS) Defects found with spare parts
(QR) Reliability failures

(Q0) Audits

Lam Quality Management System

Problem Report (PR)

Non Conformance Report (NCR)

Return Authorized Materials

Install Notification Quality Defect Report (QDR)

Audit SharePoint

Supplier Interaction
What has stayed the same in Quality Systems?

- Build to the specification for the part number and revision in the PO
- Notify Lam if you can’t ship a part to specification
- Expected to be good problem solvers
- Adhere to CE! requirements
- Partner with Supplier Engineer

Suppliers are expected to have quality built into their systems
Supplier Quality Requirements

- **Supplier Quality Standard (oqa-3932)**
  - Critical Part/CE! Change Control
  - POR Requirements
  - SPC Expectations

- **Packaging/Labeling**
  - 603- packaging spec applies on all Purchase Orders
  - Lam required serialized part must have barcode with at least part number and serial number

- **Part current rev and PO Part Rev**
  - Build part to the Rev on the PO
  - Drawings available on MyLam
  - Pay attention to any special notes

- **First Article Inspection Report (FAIR)**
  - Required for all first time shipments (part/rev) of production (45PO) fabricated parts
  - Supplier Dashboard flags PO that require a FAIR
  - Email FAIR using defined syntax before shipping the part

- **Process of Record (POR)**
  - Documented method and controls to build a part
  - Do not change until you get approval from Lam via Problem Report (PR)
  - Required for all C1-C3 critical

*Expectation to transition to Supplier Quality Requirements within 2 Quarters*
**First Article: Supplier Dashboard**

- **Cri: Critical Classification**
  - (C1-C3) Process of Record (POR) can’t be changed without Lam approval via Problem Report (PR)
  - (CxS) Critical Safety part – verification required with First Article Inspection Report (FAIR)

- **CE!: Copy Exactly!**
  - (Y) Follow CE! requirements. Use Problem Report (PR) to get approval to make changes.

- **FA: First Article Inspection Report (FAIR)**
  - (Y) FAIR must be sent electronically to Lam before shipment.
  - (E) FAIR has been electronically received by Lam but has not been verified. It is **OK** to ship.

**PO flags need to trigger follow-on actions at Supplier**

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First Article: Supplier Dashboard – Continued

- **PO Rev**: Revision of Part in PO and shipped to Lam
- **Part Rev**: Current Revision of Part

PO Rev should match Part Rev Shipped to Lam
Critical/CE! Part Management System

- In many cases, severe impact if requirements are not met
- Supplier POR is important component of Critical Part Management Systems
- FAIR is important component of both CE! and Critical Part Management Systems
- Slight variations within Lam specifications can negatively impact customer semi-conductor manufacturer processes
  - Customers want no surprises (CE! “Copy Exactly”)
  - Part level tests do not fully replicate actual usage in a customer tool
- Good change for a supplier might not be a good change for Lam’s customer
- Cost for Lam to qualify and implement changes to /CE! or Critical POR parts is substantial
- Supplier must get Lam approval to make any changes to CE! or Critical POR parts
- Lam must get Intel approval for any changes to CE! parts

When in doubt, submit PR **before** making any changes
Process of Record

- Process of Record (POR) is the total set of documentation that the supplier uses to describe and control the manufacturing and test steps to make their product.

- What makes a good POR?
  - Process described in the POR is thoroughly documented
    - Accounts for and controls parameters that affect the quality or performance of the part
    - Can be used as a training guide for a new employee
    - Sufficiently monitors or tests to detect mistakes or process drifts
  - Documentation is under change control
  - Don’t forget packaging
  - Don’t forget sub-tier suppliers

- Submit a PR to get changes to POR approved

POR ensures a supplier can consistently make a part that does not negatively affect Tool performance
Non-Conformance Management: Part and Quality Data Flow

Remote Factory

Supplier

STS? No

Yes

IQA

Spares

Warehouse / Manufacturing

NCR

Insp. Rec. NCR

NCR

System Installation
Warranty
Post Warranty

PR System

NCR & SQA Database

SAP Notifications
QDR

MyLam (Supplier)
Non-Conformance Management: Overview

- MyLam displays all non-conformances (NCR and QDR)

- RCCA is expected on every “High Impact” non-conformance but reasonable effort must be made to identify the root cause(s) for each non-conformance

- Supplier Corrective Action Request (SCAR) will be created for all supplier systems problems that have executive level visibility or cause a major impact to Lam customers

- Never return a unrepaired part back to Lam on the 41 (Rework) PO unless you get approval from Lam
Non-Conformance Management: Problem Reports

- **Problem Reports (PR)** is the official method for a supplier to report problems that are preventing them from manufacturing or shipping a part to specification.

- **Reasons for Supplier Submitted Problem Reports include**
  - Design Issues
    - Can’t Build Part to Print
    - BOM or Spec Error
  - Supplier Operations
    - Additional Supplier
    - Manufacturing Process Change
  - Supplier Request for Deviation

- Supplier can submit PR via MyLam and add comments
  - Email notification whenever someone adds additional comments
  - Email notification whenever status changes

**Suppliers should always submit a PR when they can’t ship a part to spec**
Overall Scorecard – Quality is a part of it

- Balanced measurement approach
- Reflects Lam’s priorities
- Driven by events, data, and subjective feedback
- Provides clear expectations to supplier
- Drives supplier performance (lower score)
- Guides sourcing decisions
- Ensure suppliers drive continuous improvement
- Respond quickly and effectively to quality excursions at Lam or at Lam’s customers

- Sufficient Capacity
- Technology
- Responsiveness
- Purchasing Agreement
- Business Continuity Plan

Procedure is OQA-3012
# Quality Scorecard: Components

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<th>Description</th>
<th>Report Memory</th>
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* Normally remains on scorecard for 1 month after RCCA has been implemented but report memory is at discretion of the SE