



*Presented by:*  
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## Future Force Capabilities Conference

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**Integrated Quality Management  
Reduces Risk for Armament, Robotic,  
and Munitions Manufacturers**

*Approved for Public Release*



# ***The Benefits of an Integrated QMS***

- ▶ Real-time Access to Quality and Manufacturing Data
- ▶ Control Over User Access
- ▶ Automate Critical Quality Processes
- ▶ Gain Visibility into Costs
- ▶ Effectively Collaborate with Suppliers
- ▶ Ensure Operational Excellence throughout Product Lifecycle
- ▶ Create a controlled environment where performance is repeatable and reliable.

# Facilitate Industry Compliance

## ► Compliance Auditing to Regulatory Standards

- Facilitate compliance with many regulatory requirements including ISO, ITAR, DFARS, FAA, AS9100D, MIL Standard.
- Measure against your established processes and procedures
- Using a QMS with supplier management capabilities, customers can effectively demonstrate compliance



MIL-SPEC

# ***Streamline Quality Inspections***

## ▶ Source Inspection

- Validate compliance with engineering drawings
- Test castings and forgings before firearm or robotic production begins

## ▶ First Article Inspection

- Test components against industry regulations

## ▶ Receiving Inspection

- Inspection steps can be revised and approved at the part number, part group, and commodity level
- Skip lot processing can be completed at the part/operation level



# Supply Chain Challenges

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# ***Supplier Ratings Address these Challenges***

- ▶ Inadequate or Totally Lacking Supplier Rating System
- ▶ Adversarial Relationship with Suppliers
- ▶ Non-Objective Supplier Evaluation/Rating
- ▶ Paper-based Supplier Report Cards
- ▶ Inclusion of Supplier Caused Production Assembly Failures into Supplier's Rating
- ▶ Inclusion of PO Delivery concepts prior to actual delivery
- ▶ Sub-tier Supplier Management
- ▶ Uncovers performance trends & helps Identify Root Cause

# ***Calculating Supplier Rating***

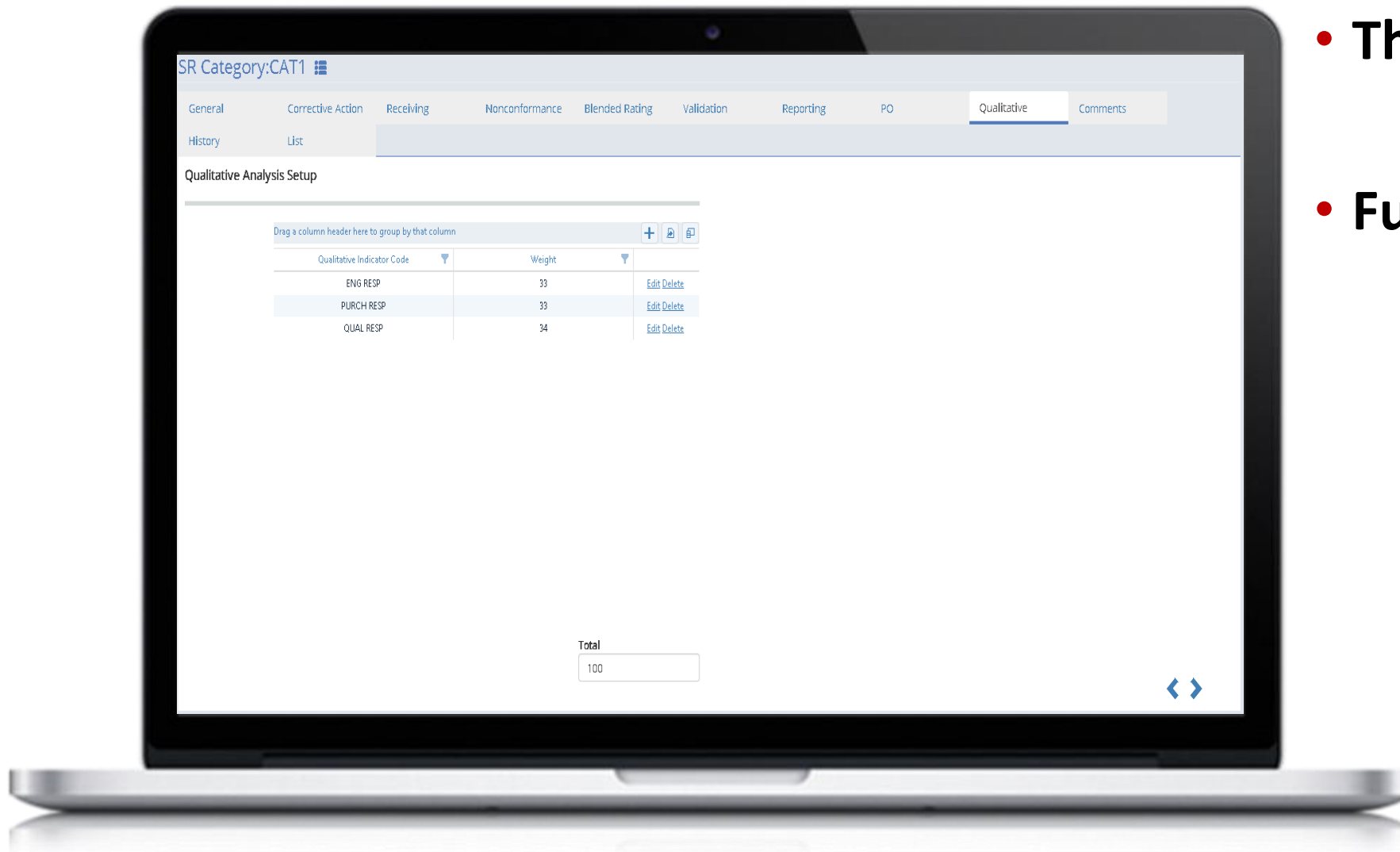
Understanding the individual components, how they are calculated, and how they can potentially impact the blended ratings is critical to effective supplier quality management.

The following ratings can be considered and blended into a unified rating which can communicate the overall health of the supplier both internally and externally, as desired.

- ▶ Delivery Rating
- ▶ Receiving Inspection Quality Rating
- ▶ Nonconformance Rating
- ▶ Corrective Action Rating

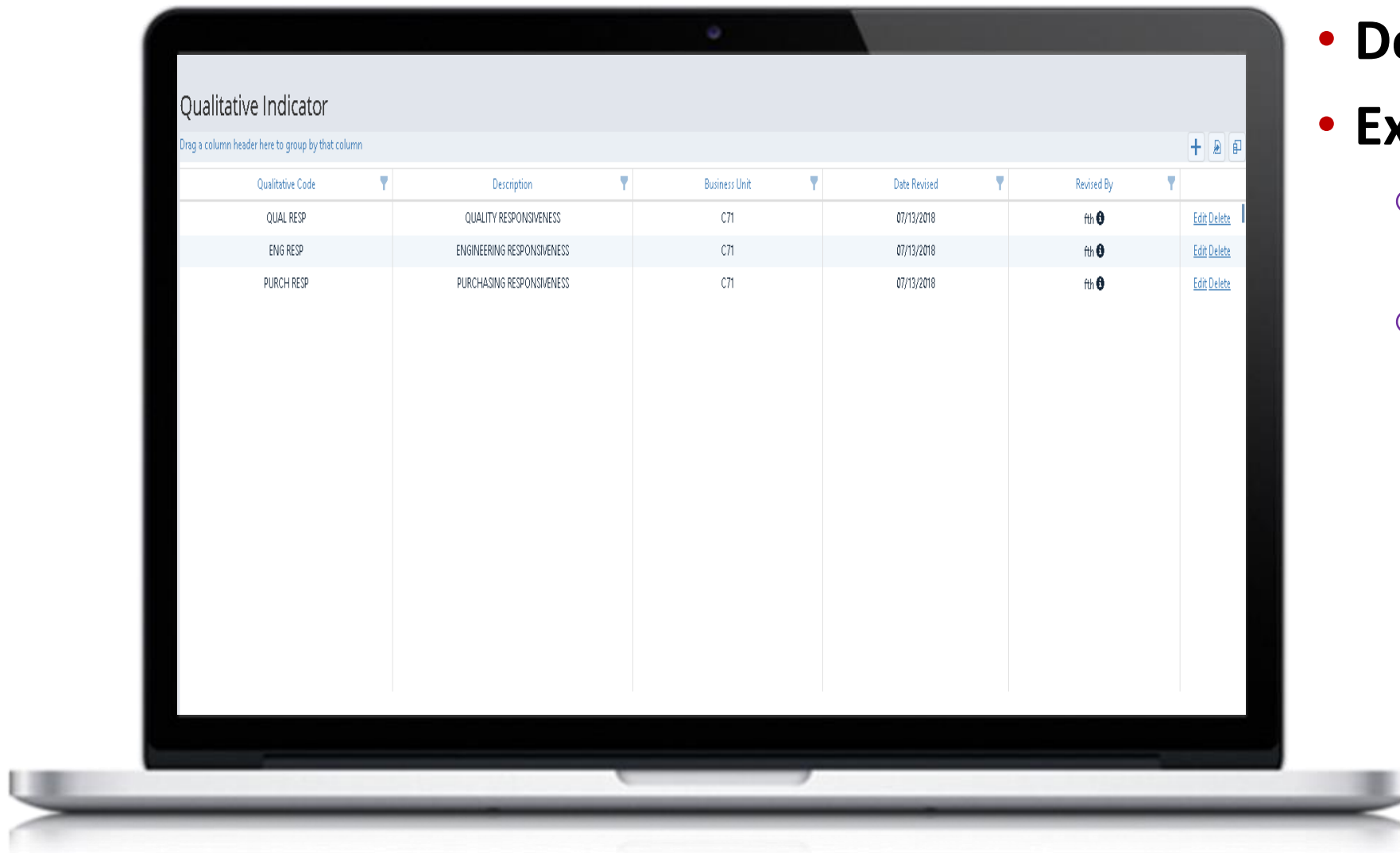
# Qualitative Ratings

- The “feel good” metrics
- Fuzzy logic





# Qualitative Indicators



Qualitative Indicator

Drag a column header here to group by that column

Qualitative Code	Description	Business Unit	Date Revised	Revised By	
QUAL RESP	QUALITY RESPONSIVENESS	C71	07/13/2018	fth	<a href="#">Edit</a> <a href="#">Delete</a>
ENG RESP	ENGINEERING RESPONSIVENESS	C71	07/13/2018	fth	<a href="#">Edit</a> <a href="#">Delete</a>
PURCH RESP	PURCHASING RESPONSIVENESS	C71	07/13/2018	fth	<a href="#">Edit</a> <a href="#">Delete</a>

- Defined by you
- Examples:
  - Engineering Responsiveness
  - RFQ Responsiveness

# Qualitative Analysis

Home > Supplier Master

Supplier: 52012 - Acme Computer Supplies, Inc.

Query General Address Rating History Survey Results **Qualitative Analysis** Supplier Recovery Process Capability Current Rating Status Update Report Setup Part Status

Commodity Status Part Certification Associated Docume... Associated Sub-tie...

Drag a column header here to group by that column

QIC Code	QIC Weight	Rank	Score
QUAL RESP	34	100	34
PURCH RESP	33	100	33
ENG RESP	33	100	33

Total Score: 100 Total Weight: 100

- Manual process
- Objective evidence?
- Suggestion
  - Utilize AM with a type linked to each of your Qualitative Indicators
  - Leverage the score as your input here.
  - Maybe average several?

# Blended Ratings

SR Category: CAT1

General Corrective Action Receiving Nonconformance **Blended Rating** Validation Reporting PO Qualitative Comments

History List

Delivery Settings	Quality Settings	Overall Settings
Receiving Delivery Rating Weight 75	Qualitative Analysis Rating Weight 20	Receiving Delivery Rating Weight 50
PO Line Delivery Rating Weight 25	RI Quality Rating Weight 0	PO Line Delivery Rating Weight 0
Total 100	Final NC Rating Weight 40	Qualitative Analysis Rating Weight 0
	Final CA Rating Weight 20	RI Quality Rating Weight 0
	Defects per Million Rating Weight 20	Final NC Rating Weight 35
	Total 100	Final CA Rating Weight 15
		Defects per Million Rating Weight 0
		Total 100

<>

- Delivery Blending
- Quality Blending
- Overall Blending

# Genealogy/Configuration Management

- ▶ Enforcement of Requirements  
(*Serial Number, Lot Code, UID, etc.*)
- ▶ Ensure All Issues are Resolved Before Product Release
  - All inspections completed
  - All Nonconformances resolved
  - All deviations approved
- ▶ Ability to Rapidly Identify Suspect Material for Recalls



# Audit Management

- ▶ Enables electronic supplier self audits and surveys
- ▶ Displays audit list and results for supplier audits completed internally and by the supplier
- ▶ Only audits pertinent to the specific supplier are displayed

Home » Audit Management

Sequence : 19 | Audit Status : C | Assigned To : [icon]

Audits | Audit Identification | Audit Results

Drag a column header here to group by that column

Supplier	Site Code	Audit Type	Sequence Number	Date of Next Audit	Date Started	Date Completed	Audit Status	Supplier Name	Project	Location Code	Factory Code	Pass or Fail	Completed By
111	ORD2	SUPPLIER	80	10/1/2008	4/2/2010	3/1/2018	C	BRAMPTON PROCESSING				P	grd
111		SUPPLIER	19	8/11/1999	7/22/2002	3/1/2018	C	BRAMPTON PROCESSING				P	grd
111		SUPPLIER	149	9/1/2018			W	BRAMPTON PROCESSING					
111		SUPPLIER	2	7/11/1999	7/12/1999	7/12/1999	C	BRAMPTON PROCESSING					rnf
111	ORD2	SUPPLIER	160	9/1/2018			W	BRAMPTON PROCESSING					
111		SURVEY	161	3/8/2022			W	BRAMPTON PROCESSING		RENTON WING LINE			
111		SURVEY	111	8/28/2014	2/23/2012	3/1/2018	C	BRAMPTON PROCESSING		RENTON WING LINE		P	grd
111		SURVEY	151	3/1/2021	9/13/2018	3/8/2019	C	BRAMPTON PROCESSING		RENTON WING LINE		P	grd
111		SURVEY	108	9/30/2011	8/28/2011	8/28/2011	C	BRAMPTON PROCESSING				P	grd

# Manage Your Supply Chain

An effective QMS will allow you to map your supply chain by giving you the ability to indicate primary and sub-tier supplier relations.

This provides the ability to build a standardized approach to managing supplier information.



Easily Identify and Categorize Suppliers

Authorized Distributor

Franchised Distributor

Independent Distributor

Open Market

OCM/OEM

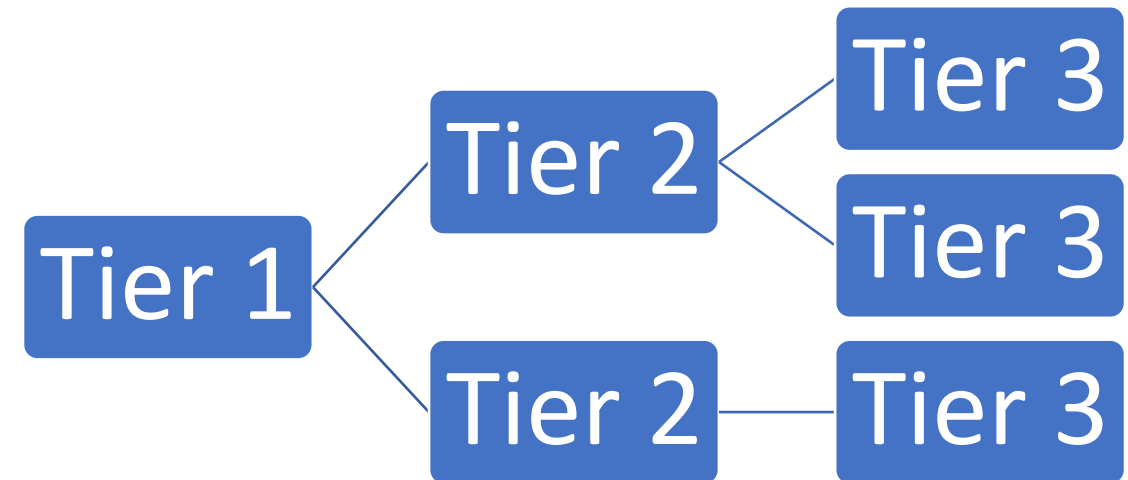
# Effective Supply Chain Quality

## ► Manage the Entire Supply Chain

- Delivery
- Price
- Quality

## ► All Levels

- Tier 1 Suppliers
  - Suppliers to Tier 1 “N” Tier
- Tier 2 Suppliers
  - Supplier to Tier 1
  - Suppliers to Tier 2 “N” Tier
- Tier 3 Suppliers
  - Suppliers to Tier 2
  - Suppliers to Tier 3 “N” Tier
- And next level and beyond....





# Supplier Approvals & Certifications

## ▶ Supplier and N-Tier Capabilities

- Approval Management
  - Supplier, Part, Commodity, Process Capability
  - Special Processes
- Supplier Approval and Certification Supported by Audit Results
- Supplier and Part Level Certification
- Comprehensive ASL Approved Supplier List with Host Integration
- Certified Parts management including automation
- Inspection Planning

### ERP Integration:

- Supplier Approval Status
- Part Certifications
- ASL Part Status
- Process Capabilities

# Benefits for Supplier

Interact/collaborate with supporting data and documentation

The image displays two overlapping screenshots of the TIP SQM software interface. The background screenshot shows the 'Audit Results' page for Sequence 137, Audit Status C, assigned to jmb. It lists criteria (CC01-CC06) with descriptions, pass/fail status (all PASS), and criteria status (all COMP). Below this, it shows the instruction 'Certificates available for inspection', the result 'Certs were available and current', revision 5, and date revised 03/12/2018. The 'Auditor's Remarks' section states 'All documentation has been reviewed and is complete. All areas covered.' The 'Pass or Fail' is P, 'Date Completed' is 03/12/2018, 'Revised By' is aeh, and 'Completed By' is Al Hamilton. The 'Audit Score Totals' section shows a Total Possible Score of 90, Total Score of 57, Total Possible Weighted Average Score of 2100, and Total Weighted Score of 510.

The foreground screenshot shows the 'View Monthly Results' page for Supplier 02002, Electromax Inc. It displays a table of monthly results for the year 2018, grouped by month. The table includes columns for Supplier, Site Code, Rate Year, Rate Month, RI Activity, RI Delivery Rating, RI Quality Rating, PO Activity, NC Activity, and various quality metrics (Quality 1 Month through Quality 12 Month, Overall 1 Month, Overall 12 Month, Overall 1 Year, Overall 12 Year).

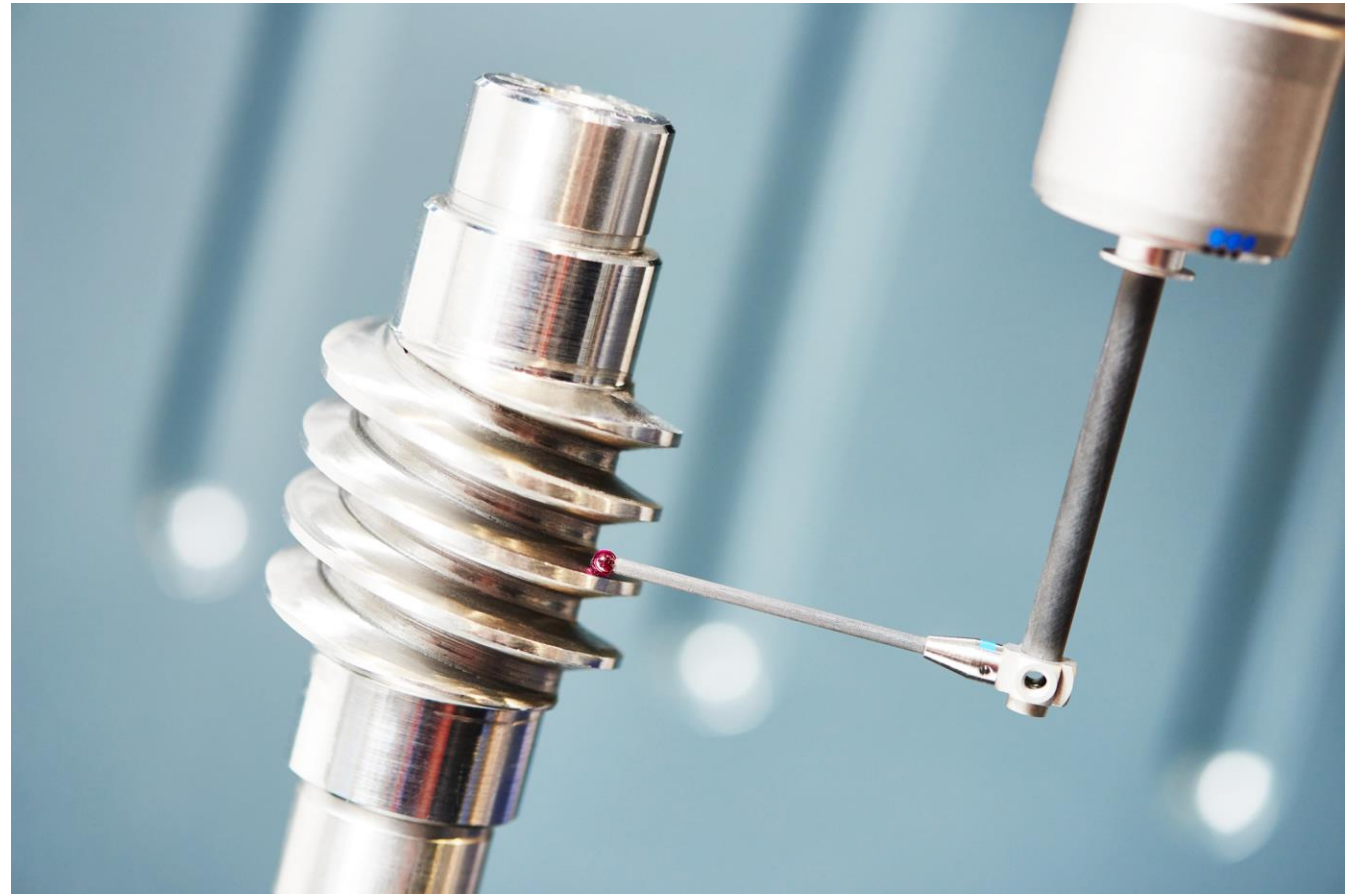
Supplier	Site Code	Rate Year	Rate Month	RI Activity	RI Delivery Rating	RI Quality Rating	PO Activity	NC Activity	Quality 1 Month	Quality 3 Month	Quality 6 Month	Quality 12 Month	Overall 1 Month	Overall 12 Month	Overall 1 Year	Overall 12 Year
02002	01	2018	3	R	93.48	100	N	N	15	15	15	15	15	15	42.39	42.39
02002	01	2018	2	R	83.87	93.55	N	N	15	15	15	15	15	15	38.23	38.23
02002	01	2018	1	R	0	93.33	N	N	15	15	15	15	15	15	4.67	4.67
02002	01	2017	12	N	0	0	N	N	15	15	15	15	15	15	0	0
02002		2018	3	R	93.48	100	N	N	15	15	15	15	15	15	42.39	42.39
02002		2018	2	R	83.87	93.55	N	N	15	15	15	15	15	15	38.23	38.23
02002		2018	1	R	100	100	N	N	100	100	100	100	100	100	100	100
02002		2017	12	N	0	0	N	N	15	15	15	15	15	15	0	0

# ***Standardize Workflow***

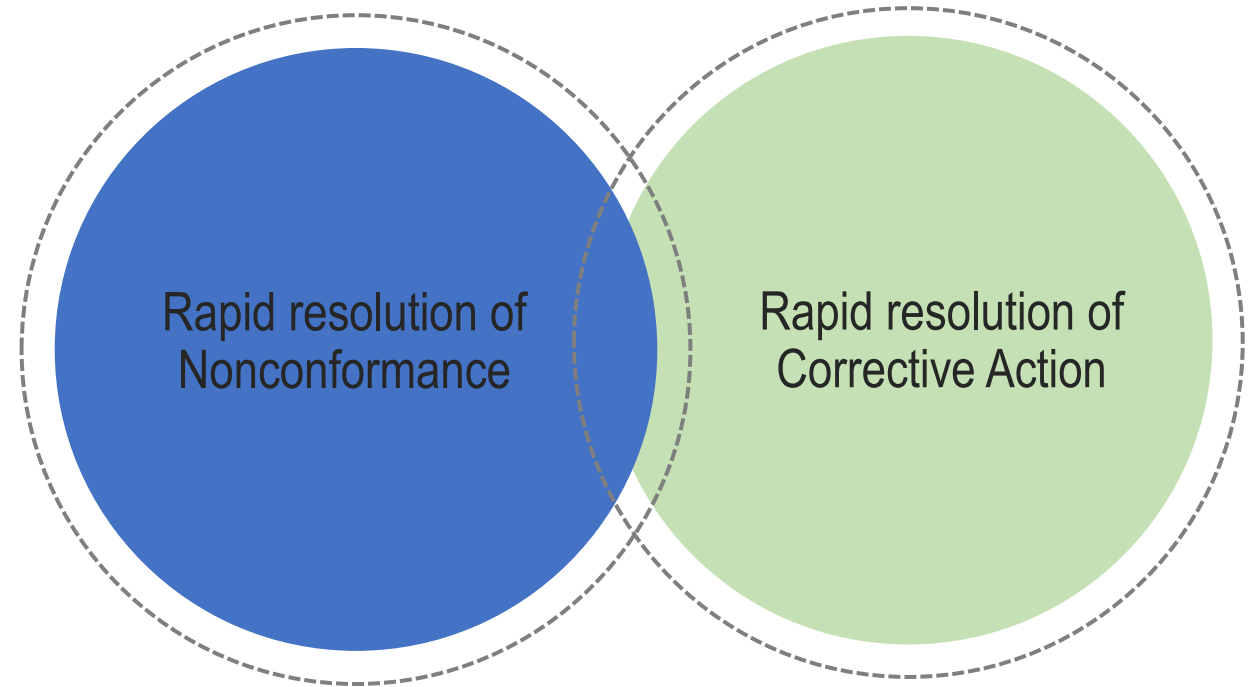
- ▶ Statistical Process Control (SPC)
  - Categorize issues using measurable codes
  - Instantly react to variations
  - Identify Trends
  
- ▶ Eliminate Paper-based records
  
- ▶ Reduce scrap and rework

# Manage Tool Usage

- ▶ Alert users about tools due for calibration
- ▶ Track possession of tools
- ▶ Automate calibration recall
- ▶ Reproducibility analysis
- ▶ Complete audit trail



# ***Achieve Real-time Collaboration Throughout the Supply Chain***



Closed-loop CAPA process tracks issues from initiation through disposition and corrective action.

# ***Seamless ERP Integration***

- Real-time access to quality and manufacturing data
- Supports real-time process control
- Provides the flexibility to respond quickly to changes in inventory levels, production status, and regulatory updates
- Reduces the complexity of multi-site infrastructure
- Actionable data and enhanced operational visibility allows better decisions across the enterprise



# Thank You!

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