Quality Control - GENERAL PRINCIPLES

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We should work on our process, not
The outcome of our processes.

W. Edwards Deming
Quality Control Discussion Points

1. Overview RSC Operations.
2. Continuous Improvement Teams
   A. PEQ (Production, Engineering & Quality)
   B. Team DNA
3. Definition of Noncompliance
4. RSC QC Compliance Methods
5. High-level Ops Process Flow
   A. Batch Verification
   B. Ops In process Verification
   C. Manufacturing Sample Inspection
   D. BOM Verification
6. Statistical Process Control
   A. Liquid Fill
   B. CO2 / R134A Propellant
A Family Owned/Private Business - Established in 1924. Company-wide, we produce over 600 products for automotive, heavy duty, hardware, and export markets.

- 400,000 Square Foot Operations
- ISO 9001-2008 Certified
- SAP (ERP) Software
- Fully Staffed R&D Laboratory
- Fully Staffed Marketing Graphics Dept.
- Equipped with Lean Mfg. Production Lines
  - Aerosol Lines
  - Liquid Pour Lines
  - Dedicated Brake Fluid Line
  - Bulk Filling Lines
- 3PL fulfillment & global distribution services
- Onsite tank farm (100+ tanks)
- Rail Spur Access
- RSC manages 12 receiving docks and 24 finish goods shipping docks.
Continuous Improvement Teams

PEQ – Product, Engineering & Quality

Bi-weekly cross functional team meeting.

Chaired by different team member annually.

Team objectives:
1.) Safety
2.) 5S
3.) Reduce Waste
4.) Reduce Downtime
5.) Improve Throughput
6.) New Equipment
Continuous Improvement Team DNA

Understand Your Team!

Team DNA Profiles provides you with a "self look" at your teams ability to solve problems.

Cross functional teams carry the DNA of:

1.) Analyzer
2.) Taskmaster
3.) Participator
4.) Energizer

The objective to is to assemble a well balanced team.
Energizer DNA

My DNA suggests that I prefer working at a fast pace while you juggle multiple priorities.

Brainstorming, new ideas and "what if" scenarios are strengths.

My DNA suggests I’m able to persuade others.

Negative energy, i.e., "what I do not prefer or enjoy," is people, situations and activities, which move at a slow pace and which involve excessive detail and maintenance.
Define Noncompliance

Types of Problems
- Any deviation from the standard
- Gap between actual and desired results
- Unfulfilled customer need

Classify problems into three categories
- Standard not achieved
- Standard achieved but a high standard is now desired
- Performance to the standard varies
RSC Tools and Methods Which Support QC Compliance

• **Quality Management System** @ RSC is ISO 9001:2008 certified.
  – Document Control / Record Control
  – Process Control via workflow
  – Internal Process Audits
  – 8D Discipline Approach to “Root-Cause” Problem Solving

• **Real Time Mfg. Data** Collection and traceability

• **Control Plans**
  – In-process documents listing the product and process characteristics that must be monitored during the manufacturing process, including measurement methods and necessary reaction plans for deviant conditions

• **PEQ Peak Performance Team** (CI Team – Production, Engineering & Quality)
  – RSC Continuous improvement team meets weekly to address CI opportunities in MFG.

• **Facility Wide 5S**
Manufacturing High Level One Page Summary

Quality Control

   - Sample Approval
   - Input
     - Receiving Inspection
     - Formula Verification
     - Flushing
     - Batch Verification

2. Mixing & Blending
   - Tank Farm Storage
   - Mix room Blend
   - Sample Approval
   - Batch Tickets

3. Gasser
   - 12 Samples
   - Liquid Fill Level
   - CO2/R134A
   - Correct Raw Materials
   - Date Code Traceability

4. Process Verification
   - Control of Data
   - Process Output

5. Product Assembly
<table>
<thead>
<tr>
<th>OPS LOCATION</th>
<th>QC CONTROL METHOD</th>
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<tbody>
<tr>
<td>DEPALLETIZATION</td>
<td>BOM Verification, Start of shift, 12 samples hourly - 899 Aerosol Component and End of the Line Check Sheet.</td>
</tr>
<tr>
<td>CAN CODER</td>
<td>12 SAMPLES HOURLY - VISUAL Start of shift. 899 Aerosol Component and End of the Line Check Sheet.</td>
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<td>FILLING</td>
<td>12 SAMPLES HOURLY - Real time data collection via IT; Bom Explosion - 473 Aerosol Gas and fill weight checks.</td>
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<td>VALVE INSERTION</td>
<td>12 SAMPLES HOURLY - Real time data collection; Doc. 899 Aerosol Component and End of the Line Check Sheet.</td>
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<tr>
<td>CRIMP</td>
<td>12 SAMPLES - Real time data collection; 475 Aerosol Crimp Stem Vacuum Data Capture if system is down</td>
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<tr>
<td>GASSING</td>
<td>12 SAMPLES HOURLY - Real time data collection; Doc. 473 Aerosol Gas and fill weight</td>
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<tr>
<td>Pressure Test</td>
<td>12 SAMPLES HOURLY - Start of shift. Real Time Data Collection via IT; Doc. 1000 Pressure Check Form.</td>
</tr>
<tr>
<td>Rejecter (A-3 Only)</td>
<td>Ref: Doc. 21204 (A3) Filtec Setup Requirements</td>
</tr>
<tr>
<td>Alarm Rejecter @ QC</td>
<td>Ref: Real time data collection via IT; Doc. 473 Aerosol Gas and fill weight checks.</td>
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<tr>
<td>WATER BATH</td>
<td>START OF SHIFT. Real time data collection via IT; Nitrite Corrosion Protection Log # 492</td>
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<tr>
<td>CAPPER</td>
<td>Ref: Real time data collection via IT; Doc. 899 Aerosol Component and End of the Line Check Sheet.</td>
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<tr>
<td>TUBE TAPER</td>
<td>Ref: Real time data collection via IT; Doc. 899 Aerosol Component and End of the Line Check Sheet.</td>
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<tr>
<td>CASE SEALER/TAPER</td>
<td>Validate Paper Tear</td>
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<tr>
<td>CASE CODER</td>
<td>START OF SHIFT - HOURLY Doc. 899 Aerosol Component and End of the Line Check Sheet.</td>
</tr>
<tr>
<td>END OF LINE</td>
<td>12 SAMPLES HOURLY - Doc.899 Aerosol Component and End of the Line Check Sheet.</td>
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<tr>
<td>Online Inspection</td>
<td>Continuous</td>
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RSC Statistical Process Control

SPC is applied in order to monitor and control a process. Monitoring and controlling the process ensures that it operates at its full potential.

CPK measures how close a process is running to its specification limits. You must have a Cpk of 1.33 [4 sigma] or higher to satisfy most customers.

PPK measures if the process is capable to meet Customer CTQs (requirements).
Sample of metrics used to monitor quality and customer satisfaction.

- In process DPPM = 1,387
- % Scrap To Sales = .02%
- OTD = 99%
- Fill Rate = 98%
- Customer DPPM = 15
General principles of quality control
• Document / Record Control
• Acceptance Sampling
• Data Monitoring
• In process Controls
• Obtainable Metrics
• Continuous Improvement Initiatives
• Team Building
Thank You!