OMTEC 2015

Drive Built-in-Quality Into Your Manufacturing Process

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Driving a Built-In-Quality Culture

June 17, 2015
Driving a Built-In-Quality Culture

Topics of Discussion

• Lean Manufacturing Overview
• Establishing a Quality Culture
• Built-In-Quality Concepts
• Visiting a BIQ Plant
• Leadership Roles and Responsibilities
• Summary
Driving a Built-In-Quality Culture

Presentation Take-Aways:

• An understanding of what the concept of Built-In-Quality is and how to apply it to your business environment

• How BIQ fits within Lean Manufacturing Principles

• BIQ can help improve a company’s operational and financial performance

• Think about the concepts:
  - How can I apply this idea to my business?
  - How can I make this work for my business?

• Everything discussed can be scaled to fit different organizations
Driving a Built-In-Quality Culture

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Lean Manufacturing ....

- High Precision/Clean Room Environment
  - Medical/Orthopedic
  - Automotive
  - Electronics

Hotel / Services

Heat Treating

Machine Shops / Short Runs

Transportation

Hospitals

...Applies to all Industries/Businesses/Services
ELEMENTS OF A MODERN LEAN MANUFACTURING SYSTEM

• Quality

• Speed

• Application of Best Practices / Common Processes

• Flexibility & Inter-buildability

• Applying required technology at appropriate levels

• Actively engaged workforce
Lean Manufacturing System

System for:

- Eliminating Waste
- Build Value
- Support for the Operator
"COMMIPW"”

- The key to eliminating waste is to identify it.
- LM categorizes waste into seven types.
An effective Lean Manufacturing System is:

- A single, common manufacturing system
- Integrated / Inter-dependent principles
- Scalable to fit the needs and size of the organization
Lean Manufacturing Principles

How Do All the Principles Fit Together?
Lean Manufacturing Structure

- For Every Principle There Are Supporting, Detailed Actionable Elements

- Each Element has Specific Requirements
People Involvement

Elements:

1. Company Vision, Values, & Cultural Priorities
2. Mission
3. Health and Safety Practices
4. Qualified People
5. Team Concept
6. People Involvement
7. Open Communication Process
8. Shop Floor Management
People Involvement

Element: Shop Floor Management

Definition: Management goes to where work is performed, to understand, support, and manage the operations.

Purpose: To ensure that decisions are made at the work location by utilizing factual, accurate, and first-hand information.
People Involvement

Element: Shop Floor Management

*Requirements:

- Communication boards are provided:
  - Displays performance information
  - Visual controls are implemented and maintained
  - Deviations from standards visible to everyone
  - Provide instruction and/or information to employees

* Requirements: Complete list not shown
People Involvement

**Elements**
- Engagement
- Communication
- Team concept
- Health and safety

![Communication Board]

![Job Flexibility Chart]

**Ref-2C**

Verify quadrants filled in have supporting documentation to match in JIT binder.

If the Actual does not meet the Plan, ensure the team has countermeasures written to close the training gap.

Ensure monthly reviews and sign-offs are occurring between TL & Elements - Engagement - Communication - Team concept - Health and safety

**ILQSolutions.com**
Standardization

Elements
- Workplace organization
- Standardized work

5S = Sift/Sweep/Standardize/Self-Discipline/Sustain
Built-In-Quality

**Elements**
- Process and product validation
- Quality standards
- Quality management system
- Quality feedback and feed forward
**Short Lead Time**

**Elements**
- Simple process flow
- Supply chain management
- Scheduled shipping/receiving
- Lean containerization

Material Delivery Rack Locations

Job Element Sheet – Showing Color-coded Part-Cart Locations

<table>
<thead>
<tr>
<th>SEQ</th>
<th>STEP (What)</th>
<th>SYM</th>
<th>KEY POINT (how)</th>
<th>REF</th>
<th>REASON (why)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Select the proper colored buggy to buffer the downloaded parts into.</td>
<td>A</td>
<td></td>
<td>A</td>
<td>Helps prevent the bodies from being mixed.</td>
</tr>
<tr>
<td>2</td>
<td>Fill out and attach &quot;O.K. for Use&quot; tag to the buggy.</td>
<td></td>
<td>B</td>
<td>Will help ensure FIFO.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Place the buggy into the identified staging area for download/upload.</td>
<td></td>
<td>C</td>
<td>Will help minimize waste in motion.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Load or unload the buggy.</td>
<td></td>
<td></td>
<td>Will reduce and minimize nicks on the machined surface.</td>
<td></td>
</tr>
</tbody>
</table>

Symbol Legend (SYM):  
- Safety  
- Ergonomics  
- Quality  
- Knack  
- Critical  
- Doc. No.: DP-785

Material Delivery Rack Locations

ILQSolutions.com
Continuous Improvement

**PRIORITY CHECKS (Performed by all levels of the organization)**

1. Is the team member (TM) following the posted PPE requirements?
   - Present on workstation, current, and signed off. (Ref 1A or 1B)
   - Being adhered to by the operator. (safety glasses, gloves, no finger rings, non-slip shoes, etc) (Ref 1C)
   - Walkie Truck Pre-Op Inspection completed if applicable to area. (Ref 1D)
   - Take shelter evacuation map needs to be visually located in the work area. (team room) (Ref 1E & 1F)
   - Verify Lockout Placard is posted on operation, is current, reviewed on an annual basis and is understood by the operator. (Ref 1G)
   - SOP's are being used at the workstation, are listed on the PPE, and are posted at the job. (Ref 1H & 1I)
   - Verifying there is JIT documentation for each team member that supports the information posted on the flex chart. (Ref 2A, 2B, 2C)
   - Does the JIT have the required signatures: safety, quality, and production (Ref 2B)
   - Flex chart: sign-offs validating monthly reviews, bottom quarter of sheet filled in (target vs plan) (Ref 2C)
   - Verify if there are any countermeasures written under “People” on the level 5 board if training plans (target vs actual) are not achieved according to the flex chart. (Ref 2C)
   - Verify training (Bay City specific) has occurred for those people with full Harvey quadrants (documentation located with JITP sheets)

Reviewer: J. Craig Date: 1/26/11 Shift: 1st

**Elements**

- Problem-solving
- Process Verification
- Andon - call for help
- Layered Audits
- Business Plan Deployment
Driving a Built-In-Quality Culture

Topics of Discussion

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• Visiting a BIQ Plant

• Leadership Roles and Responsibilities

• Summary
Key Built-In-Quality Philosophy

Do not Accept Build Ship a Defect!
Quality Culture

- Employee Engagement
- Rewards & Recognition
- Processes
- Leadership Commitment
- Values
- Communication
- Training
- Team Structure
- Metrics & Measurement Systems (Visual Mgmt)
- Rewards & Recognition
Five Behaviors Required to Lead a Quality Culture

1. Leadership sets compelling, unifying direction and expectations
2. Engage everyone
3. Demonstrate a risk-reduction mindset
4. Encourage feedback and institutionalize learning
5. Be consistent when other factors conflict
# Quality Culture Driven By Leadership

<table>
<thead>
<tr>
<th>SAFETY</th>
<th>QUALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAFETY IS THE OVERRIDING PRIORITY</td>
<td>QUALITY IS A FUNDAMENTAL BUSINESS REQUIREMENT</td>
</tr>
<tr>
<td>ALL ACCIDENTS CAN AND MUST BE PREVENTED</td>
<td>DO NOT ACCEPT, BUILD OR SHIP DEFECTS</td>
</tr>
<tr>
<td>PLANTS SAFETY REVIEW BOARDS</td>
<td>DAILY QUALITY REVIEW</td>
</tr>
<tr>
<td>PLANT SAFETY OBSERVATION TOURS</td>
<td>LAYERED AUDITS</td>
</tr>
<tr>
<td>INCIDENT INVESTIGATIONS</td>
<td>PRACTICAL PROBLEM SOLVING (PPS)</td>
</tr>
<tr>
<td>SAFE OPERATING PRACTICES</td>
<td>STANDARDIZED WORK – MANAGEMENT BY TAKT AT ALL LEVELS</td>
</tr>
<tr>
<td>EMPLOYEE SAFETY CONCERNS PROCESS</td>
<td>PROBLEM VISIBILITY / GO-AND-SEE</td>
</tr>
</tbody>
</table>
Driving a Built-In-Quality Culture

Topics of Discussion

• Lean Manufacturing Overview
• Establishing a Quality Culture
• Built-In-Quality Concepts
• Visiting a BIQ Plant
• Leadership Roles and Responsibilities
• Summary
What is the definition of Built-In-Quality?
What is the definition of Built-In-Quality?

For the Purposes of Today’s Discussion:

Defects Do Not Leave the Team

- Focus is on the workstation
Example Factory Process

Suspect parts
- Rework
- Repair
- Rework verification
- Scrap / disposition

*Operators responsible for quality of their parts
Example Factory Process

Example Departments / Operations:

- Grinding
- Welding
- Stamping
- Cut

- Polishing
- Assembly
- Welding
- Sew

Shop / Department A

Shop/Department B

Example Operations
Defects don’t leave the plant

Goal

Protect customer from ‘obvious defects’

---

**Levels**

<table>
<thead>
<tr>
<th>Definition</th>
<th>Defects don’t leave the plant</th>
</tr>
</thead>
</table>

---

**Inspection-Based Process**

(Containment)
Defects don’t leave the plant

**BIQ Basic**
(Detection & Containment)

**Levels**

<table>
<thead>
<tr>
<th>Definition</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defects don’t leave the plant</td>
<td>Protect customer from ‘obvious defects’</td>
</tr>
</tbody>
</table>

Minimize disruption to downstream processes

Defects don’t leave the shop

Built-In-Quality Level I - V
Built-In-Quality Level I - V

**Defects don’t leave the plant**

Goal: Protect customer from ‘obvious defects’

**Levels**

1. **BIQ Basic** (Detection & Containment)
   - Defects don’t leave the plant
   - Minimize disruption to downstream processes

2. **BIQ Intermediate** (Prevention & CIP)
   - Defects don’t leave the shop
   - Improve up-stream quality

- **Inspection-Based Process** (Containment)

- **BIQ Levels**
  - Level I: BIQ Basic
  - Level III: BIQ Intermediate
Defects don’t leave the plant

**BIQ**

**Vision**
(Avoid errors)

**Goal**
Protect customer from ‘obvious defects’

**Definition**
Defects don’t leave the plant

**Levels**
I

**BIQ Basic**
(Detection & Containment)

**BIQ Intermediate**
(Prevention & CIP)

**BIQ Advanced**
(Avoid error flow)

Defects don’t leave the station
Eliminate in-process repair

Defects don’t leave the shop
Improve up-stream quality
Minimize disruption to downstream processes
Built-In-Quality Level I - V

Levels

BIQ Basic
(Detection & Containment)

BIQ Intermediate
(Prevention & CIP)

BIQ Advanced
(Avoid error flow)

BIQ Vision
(Avoid errors)

Defects don’t leave the plant

Defects don’t leave the shop

Defects don’t leave the team

Eliminate in-process repair

Zero in-process waste

Minimize disruption to downstream processes

Improve up-stream quality

Defects are not created
(Avoid errors)

Goal

Defects don’t leave the plant

Protect customer from ‘obvious defects’

Inspection-Based Process
(Containment)
Defects don’t leave the plant

Defects don’t leave the shop

Defects don’t leave the team

Defects are not created

Reduce in-process waste

Minimize disruption to downstream processes

Eliminate in-process repair

Improve up-stream quality

Goal: Protect customer from ‘obvious defects’

BIQ Levels:
- **Level I**: Basic (Detection & Containment), Defects don’t leave the shop
- **Level II**: Intermediate (Prevention & CIP), Defects don’t leave the team
- **Level III**: Advanced (Avoid error flow), Defects don’t leave the station
- **Level IV**: BIQ Vision, Defects are not created (Avoid errors)

BIQ Vision: (Avoid errors)

Zero in-process waste

35
Defects don’t leave the plant

Protect customer from ‘obvious defects’

Goal

Defects don’t leave the shop

Minimize disruption to downstream processes

Definition

Defects don’t leave the station

Improve up-stream quality

BIQ Intermediate (Prevention & CIP)

BIQ Basic (Detection & Containment)

BIQ Advanced (Avoid error flow)

BIQ Vision (Avoid errors)

Defects are not created (Avoid errors)

Zero in-process waste

Levels

Levels

Levels

Will use BIQ III – Defects Don’t leave the Team as example to explain the process
Built-In-Quality Level I - V

Built In Quality Elements

- Product Quality Standards
- Manufacturing Process Validation
- In Process Control and Validation
- Quality Feedback / Feed Forward
- Quality System Management

Lean Manufacturing principle # 2
## BIQ Level III Requirements – Built-In Quality

<table>
<thead>
<tr>
<th>Built-In-Quality Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Quality Standards</strong></td>
<td>- PQS developed /common / understood implemented</td>
</tr>
<tr>
<td><strong>Product and Process Validation</strong></td>
<td>- PFMEA risk reduction</td>
</tr>
<tr>
<td></td>
<td>- Process and Product validation</td>
</tr>
<tr>
<td></td>
<td>- Change control product trial run (PTR)</td>
</tr>
<tr>
<td><strong>In Process Control and Verification</strong></td>
<td>- Process Control Plans in Place / Utilized</td>
</tr>
<tr>
<td></td>
<td>- Error Proofing</td>
</tr>
<tr>
<td></td>
<td>- Effective Quality Checks</td>
</tr>
<tr>
<td><strong>Feedback / Feedforward</strong></td>
<td>- Product Verification Stations (VS)</td>
</tr>
<tr>
<td></td>
<td>- Alarm and Escalation</td>
</tr>
<tr>
<td><strong>Quality Management System</strong></td>
<td>- Quality Data Systems in place and utilized</td>
</tr>
</tbody>
</table>
How Do LMS Principles Support Quality In Station?

Operator Work Station

- Qualified People
- Team Concept
- Shop Floor Management
- Workplace Organization
- Standardized Work
- Layered Audits
- Product Quality Standards
- PFMEA's
- Process Controls & Error Proofing
- Equipment & Process Validation
- FIFO Process
- Container Design
- Material Presentation to Operator
- Andon
- Problem Solving
Driving a Built-In-Quality Culture

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What Does a Built-In-Quality Plant Look Like?
Built-In-Quality Level I - V

**BIQ Vision**
- **(Avoid errors)**

**BIQ Advanced**
- **(Avoid error flow)**

**BIQ Intermediate**
- **(Prevention & CIP)**

**BIQ Basic**
- **(Detection & Containment)**

**Inspection-Based Process**
- **(含ainment)**

**Levels I**
- **Defects don’t leave the plant**
- **Goal**
  - Protect customer from ‘obvious defects’

**Levels II**
- **Defects don’t leave the team**
- **Minimize disruption to downstream processes**

**Levels III**
- **Defects don’t leave the station**
- **Improve up-stream quality**

**Levels IV**
- **Eliminate in-process repair**

**Levels V**
- **Defects are not created**
- **Zero in-process waste**
What would you expect to see when visiting a BIQ Level III plant:

- The 5 BIQ Operating Tools are in place
- An Effective Team structure
- Plant Staff Has a Strong Focus and Approach to Quality
- Plant Quality Results (metrics) are a result of BIQ actions

- Time does not allow for detailed discussion
Built-in-Quality Migration Strategy

Levels

BIQ Basic
(Detection & Containment)

BIQ Intermediate
(Prevention & CIP)

BIQ Advanced
(Avoid error flow)

BIQ Vision (Avoid errors)

Levels

Inspection-Based Process
(Containment)

Defects don’t leave the plant

Defects don’t leave the shop

Defects don’t leave the station

Defects are not created (Avoid errors)

Create Customer Enthusiasm

“The Perfect Process”
Zero in-process waste

Behaviors/Skills

Culture

Goal

Manage daily business
Reactive
Centralized control
No strategy
Leadership style directive “I decide”
Little communication
No team concept

Repair before ‘pass to sales’

Repair before end of line

Minimize disruption to downstream processes

Strong follow up on activities
Leadership style: less directive “let’s talk, but I decide”
Forming teams, not yet functional

Repair for Team

Contain in Team

Improve up-stream quality

Focus on time and goals
Leadership style: coaching, directive & supportive “let’s talk, we decide”
Functioning team

Containment

Eliminate in-process repair

Eliminate in-process repair

Defects are not created (Avoid errors)

Defects are not created (Avoid errors)

BIQ Vision (Avoid errors)

Defects don’t leave the shop

Satisfy Your Customer

“Create Customer Enthusiasm”

Zero in-process waste

Behavior/Skills

Behaviors/Skills

Satisfy Your Customer

Create Customer Enthusiasm

“Create Customer Enthusiasm”

Zero in-process waste

BIQ Vision (Avoid errors)

“Create Customer Enthusiasm”

Zero in-process waste

BIQ Vision (Avoid errors)
Built-in-Quality Migration - Comparison

Levels

<table>
<thead>
<tr>
<th>Culture</th>
<th>Goal</th>
<th>Behaviors/ Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Defects don’t leave the plant</td>
<td>Repair before ‘pass to sales’</td>
</tr>
<tr>
<td>Protect customer from ‘obvious defects’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defects don’t leave the team</td>
</tr>
<tr>
<td>Contain defects in Team</td>
</tr>
<tr>
<td>Improve up-stream quality</td>
</tr>
<tr>
<td>•Focus on time and goals</td>
</tr>
<tr>
<td>•Leadership style: coaching, directive &amp; supportive</td>
</tr>
<tr>
<td>•Building team relationships</td>
</tr>
</tbody>
</table>

- **Levels**
  - I
    - Culture
      - Defects don’t leave the plant
    - Goal
      - Repair before ‘pass to sales’
    - Behaviors/ Skills
      - Protect customer from ‘obvious defects’
  - III
    - Defects don’t leave the team
    - Contain defects in Team
    - Improve up-stream quality
    - •Focus on time and goals
    - •Leadership style: coaching, directive & supportive
    - •Building team relationships
# Built-in-Quality Migration Strategy

<table>
<thead>
<tr>
<th>Levels</th>
<th>Internal (Inspection/Repair)</th>
<th>External (Inspection/Repair)</th>
<th>Customer’s Perception of Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Defects don’t leave the plant</td>
<td>• Flow defects to Offline repair</td>
<td>• Deteriorating Brand Quality Image impacting the entire business</td>
</tr>
<tr>
<td></td>
<td>• Flow defects to Offline repair</td>
<td>• Excessive Repair / Warranty Return cost</td>
<td>• Low Brand Quality Image difficult to reverse negative press</td>
</tr>
<tr>
<td></td>
<td>• Excessive Offline repair resources (real estate, people, overtime)</td>
<td>• High Return /Warranty Return costs</td>
<td>• Purchase incentive based on pricing and design</td>
</tr>
<tr>
<td></td>
<td>• High number of parts waiting rework/repair</td>
<td>• Low DRR &lt;70%</td>
<td>• Purchase incentive based on pricing and design</td>
</tr>
<tr>
<td></td>
<td>• Low DRR &lt;70%</td>
<td>• High Inspection Costs IRC Offline, CARE</td>
<td>• Moderate Brand Quality Image</td>
</tr>
<tr>
<td></td>
<td>• High Inspection Costs</td>
<td></td>
<td>• Purchase based on quality, reliability, design and price</td>
</tr>
</tbody>
</table>

| II      | Defects don’t leave the team | • Batch & Hold minimized | • Iconic Brand Quality |
|         | • Defects are repaired on line | • Significantly reduced Warranty costs | • Purchase based on quality, reliability, and design – pricing is secondary |
|         | • Manageable Float <150 | | |
|         | • DRR consistently 85% | | |
|         | • High Inspection costs | | |
|         | • Start to reallocate inspection based on risk | | |

| III     | Defects don’t leave the station | • DRR > 95% | • Warranty costs minimized |
|         | • Defects are repaired by team member | • Inspection resources further reduced | |
|         | • No online repair people | | |
|         | • Float challenged daily – most vehicles repaired same day | | |
|         | • DRR 85 – 95% | | |
|         | • Inspection resources reduced based on risk | | |

| IV      | Defects don’t leave the station | • No Batch & Hold | • Low Warranty costs |
|         | | • Low DRR <70% | |
|         | | | |

| V       | Defects are not created | • Defects are minimized and seldom leave the station | • DRR > 95% |
|         | | • No repair float - Vehicles are repaired on the same shift | |
|         | | • Inspection resources further reduced | |
|         | | | |

- **Levels**:
  - I: Defects don’t leave the plant
  - II: Defects don’t leave the team
  - III: Defects don’t leave the station
  - IV: Defects are not created
  - V: Defects are not created
## Built-in-Quality Migration - Comparison

<table>
<thead>
<tr>
<th>Levels</th>
<th>I</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Defects don’t leave the plant</td>
<td>Defects don’t leave the team</td>
</tr>
</tbody>
</table>
| Internal (Inspection/Repair) | • Flow defects to Offline repair  
• Excessive Offline repair resources  
(real estate, people, overtime)  
• High number of parts waiting rework/repair  
• High Inspection Costs | • Defects are repaired online  
• Manageable Repair Float  
• High Inspection costs  
• Start to reallocate inspection based on risk |
| External (Inspection/Repair)   | • Product on Shipping Hold  
• Excessive Repair / Warranty Return cost | • Product Holds minimized  
• Significantly reduced warranty costs |
| Customer’s Perception Of Quality | • Deteriorating Brand Quality Image impacting the entire business  
• Purchase incentive based on price | • Moderate Brand Quality Image  
• Purchase based on value pricing and design |
### Built-In-Quality Elements

<table>
<thead>
<tr>
<th>Level III</th>
<th>Level IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Defects don’t leave the team</strong></td>
<td><strong>Defects don’t leave the station</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product Quality Standards</th>
<th>Quality Standards meet Customer Expectations</th>
<th>Some quality standards exceed customer expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing Process Validation</td>
<td>PFMEA &amp; RPN reduction for all high risk processes Focused on process capability and stability</td>
<td>PFMEA &amp; RPN reduction focused on improved levels of variation reduction</td>
</tr>
<tr>
<td>In Process Control and Verification</td>
<td>Main focus on containment at the Verification Station (VS)</td>
<td>Main Focus on containment at the team level</td>
</tr>
<tr>
<td>Quality Feedback/Feedforward</td>
<td>VS Alarms are based on severity and frequency</td>
<td>VS Alarms are based on an occurrence of 1 discrepancy</td>
</tr>
<tr>
<td>Quality System Management</td>
<td>Appropriate organization structure is in place for quality related functions (Q Eng/Q. Ops/ Q. Assurance)</td>
<td>Greater portion of Q. organization focused on prevention</td>
</tr>
</tbody>
</table>
## Built-In-Quality – Supporting Principles

### Level III

**Defects don’t leave the team**

<table>
<thead>
<tr>
<th>People Involvement</th>
<th>Roles and responsibilities are documented, standard tasks for quality are defined in procedures</th>
<th>Continuous improvement is performed in most tasks at all levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardization</td>
<td>Layered Audit initiated</td>
<td>Layered Audit institutionalized</td>
</tr>
<tr>
<td>Short Lead Time</td>
<td>Packaging process has clearly documented and visualized parts handling requirements</td>
<td>Conduct PFMEA assessment and validation on all packaging operations</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>Problem solving process has tracking and escalation</td>
<td>Business Plan Deployment (BPD) in place with strong focus on methods to achieve objectives</td>
</tr>
</tbody>
</table>
Where is The focus To Drive BIQ Improvement?

Product Engineering
- DFMEA
- Designed in
- Preventive
- Low life cycle cost
- Warranty

Manufacturing Engineering
- PFMEA
- Process Control
- Error Proofing
- Warranty

Plant
- Leadership
- Culture
- Standardized Work
- Engagement

Customer
- Customer Feedback
- Reduced Rework
- Reduced Warranty
- Prevent Loss of sale
- Delighted Customer
Built-In-Quality Level I - V

Defects don’t leave the plant

Protection customer from ‘obvious defects’

BIQ Vision
(Avoid errors)

BIQ Advanced
(Avoid error flow)

BIQ Intermediate
(Prevention & CIP)

BIQ Basic
(Detection & Containment)

Defects don’t leave the station
Eliminate in-process repair

Defects don’t leave the shop

Minimize disruption to downstream processes

Improve up-stream quality

Defects are not created
(Avoid errors)

Zero in-process waste

So, Where is Your Company?
Driving a Built-In-Quality Culture

Topics of Discussion

• Lean Manufacturing Overview
• Establishing a Quality Culture
• Built-In-Quality Concepts
• Visiting a BIQ Plant
• Leadership Roles and Responsibilities
• Summary
Leadership Requirements For Successful BIQ Implementation

• A Quality Culture that has evolved and is in place which drives all plant behavior in support of quality, second only to safety.

• Effective Team concept in place

• Team members are able and capable of supporting shop floor processes

• Standardized work is established and followed throughout the process

• Defect prevention is achieved through strong team based problem solving

• Daily review and reaction to critical plant performance quality metrics to help identify issues which are aggressively contained and resolved

• Leadership is very knowledgeable of their product internal / external quality issues and aggressively pursuing resolution
Lean Manufacturing: Role of Leadership

• Provide leadership to achieve specific objectives

• All Senior staff members must become knowledgeable and help lead Lean Manufacturing Principles

• Leaders must become teachers

• Establish / maintain and communicate vision and strategy

• Establish an environment where raising issues and concerns is required and encouraged

• Do not penalize people making mistakes using LM Principles
Lean Manufacturing: Role of Leadership

• Leaders must be visible on the floor:
  - monitor
  - coach and teach
  - listen more – talk less

• Establish your own personal standardized work to in support of LM principles and to reinforce importance to others

• Use visual management to make you LM plan visible

• Help eliminate barriers to LM implementation

• Ensure Best Practices are converted to common systems/procedures

• Reinforce that journey LM is a journey that never ends
Driving a Built-In-Quality Culture

Topics of Discussion

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BIQ Summary /Results

– Actively engaged workforce
– Reduced Operator / Process Variation
– Quality Focused Culture
– Improved efficiency
– Reduced Cost / Unit
– Reduced warranty costs
– Enhanced customer satisfaction
– Increased profitability
Thank You!

About Joe Mazzeo

- Owner of Integrated Lean and Quality Solutions, LLC
- Broad global experience in manufacturing and quality
- Providing Leadership, Lean Manufacturing and Quality Management services
- Member of: ASQ / SME / SEMA

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