Quality is killing us
The impact of Loss of Competence
Quality is killing us – The impact of Loss of Competence

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Effect of Competence on Quality
George Zener, P.E.
Defects Found During Construction

- “Assembly” is mainly “not built to print” but also encompasses flange makeup and sometimes welding
- Test failure usually rooted in supplier quality
- Preservation procedures not being followed
- Competence is a common theme
Defects at Handover

- Engineering is the major driver
- Engineering defects are harder to fix
- Purchased Equipment (including packages) is the second largest contributor

Defect Categories

- Detailed Design
- Procured Equipment
- System Design

NCR

Defect Categories
What is Competence?

- Skills – Johnny can’t weld.....
- Knowledge
  - Design context
  - Specifications not transmitted
  - Instructions unclear
  - Language barrier
  - Product familiarity
Demographics

Population ages 15-64 (% of total population)

Source: OECD
The “Good Old Days”

- Nearly all operations under one roof
- Engineers are “hands on” with the product every day
- Long tenured, highly skilled work force
- But……
  - Expensive
  - Inflexible
  - Hard to scale
Supply Chain Expansion

- Globally distributed production
- Flexible & Scalable
- Communication is more challenging
- Mission is less clear
- Interaction between engineering and production is greatly reduced
Solutions

- Worker competence programs
- Known suppliers
- Supply chain knowledge flow
- Automotive & Aerospace vs. Heavy Construction

Diagram:
- Owner
  - Tier 1 Contractor
  - Construction Yard
  - Supplier
  - Sub-Supplier
  - Sub-sub-supplier

Text:
- Design Specifcation and Context
- Process Validation and Clarification
What is killing us and what can we do
Terry Tuggle
**ISSUE**
Changes During Design Phase

**MITIGATION**
Track Changes and Costs Associated

**COMMENTS**
Engineering Metrics Showing Revisions
**ISSUE**

Loss of Seasoned Engineering

**MITIGATION**

Establish Training and communicate the progress

**COMMENTS**

Develop Specific modules that deal with each aspect of engineering
ISSUE

Build knowledge from within

MITIGATION

Allow new hires to explore opportunities and take ownership of their careers

COMMENTS

Develop internal program for advancement and professional development
ISSUE

Special Designs and one-offs

MITIGATION

Design with the end in mind. Buy off the shelf

COMMENTS

Performance and ease of operation
ISSUE
Cost of Rework

MITIGATION
Fabrication has a more consistent process

COMMENTS
Craft is a revolving door
ISSUE

Carry over work. Punch lists

MITIGATION

Ensure plan allows time to finish with float

COMMENTS

Schedules are always compressing
ISSUE
Operators often push the intervals to gain more production time

MITIGATION
Stick to maintenance plan

COMMENTS
Modify plan on known data
Asset Life Cycle Management & Quality
Randy Pound
Asset Life Cycle Management

- Mindset . . . that turns into
- Structure . . . that turns into
- Processes . . . that turn into
- Learning . . . that turns into
- Improvement . . . that turns into
- Profitability . . . that turns into
- Sustainable competitive advantage

Diagram: Ongoing Operations | EPC Company

- Document Feasibility & Business Case
- Analyze Alternatives
- Develop Detailed Scope
- Design & Engineer
- Procure
- Build or Fabricate
- Construct & Install
- Ensure Operational Readiness
- Commission & Startup
- Operate
- Maintenance, Reliability, Inspection, & Asset Integrity
- Improve or Modify Assets
- De-commission
What are the solutions?

1. Train all senior leadership, and then the organization, about Asset Life Cycle Management. Earn their proper mindset.

2. Ensure that the organizational structure and the specific leaders in that structure support success.

3. Adopt the “Reliability Model” approach to analysis and improvement.

4. Ensure that all Key Performance Indicators (KPIs) and annual performance reviews support success. Share KPIs properly.

5. Edit capital program, project management, financial, and operating processes to support the Asset Life Cycle approach.

6. Add discipline and process to Organizational Learning. If processes, procedures, SOPs, specifications, product recipes, and training systems are not being edited, organizational learning is not occurring.

7. Improve training, coaching, and mentoring at all levels.

8. Obtain excellent talent from all available sources, internally and externally. Eliminate the “Not Invented Here” mindset. It never worked.

9. Implement disciplined benchmarking and best practices to continually learn and improve from other companies and industries.

10. and more . . . . .
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