

Is 99.9 Error Proof good enough?

- 99.9% Error free could result in
 - 2,000,000 Documents lost by IRS
 - 16,000 Pieces of mail lost every day
 - 22,000 Wrongly debited / credited checks per hour
 - 1,314 Wrongly connected phone calls per minute
 - 20,000 Incorrect drug prescriptions per year
 - 12 Newborn babies given to wrong parents
 - 2 Unsafe landings every day at O'Hare Airport
 - 32,000 Missed heartbeats per person each year

Is 99.9% good enough?

Examples of Defects

- Wrong or inappropriate material
- Wrong or non-functioning components
- Wrong dimensions or tolerances
- Missing components
- Foreign matters or contamination
- Damaged product or components
- Wrong paperwork or wrong product shipped
- Non-functioning or malfunctioning product
- Wrong shipping or wrong billing

Examples of Errors

- Poor design decisions
- Omitted or wrong processing
- Missing / extra parts or wrong parts
- Omitted or wrong adjustment / testing
- Wrong equipment set-up or loss of set-up
- Wrong material, components or assemblies
- Wrong communication, instructions, procedures, or methods
- Inexperience, lack of training, wrong training, lack of retraining

Mistakes will not turn into defects if errors are discovered & eliminated before they occur.

- Fail Safing
- Fool Proofing
- Error Proofing
- Poka Yoke
- Zero Quality Control (Zero Defects)
- Design for Manufacture and Assembly

**Let us not argue the merits of these names.
Let us decide what we want to achieve.**

Where Lean Thoughts can become Reality

"Unless you try to do something beyond what you have already mastered, you will never grow."

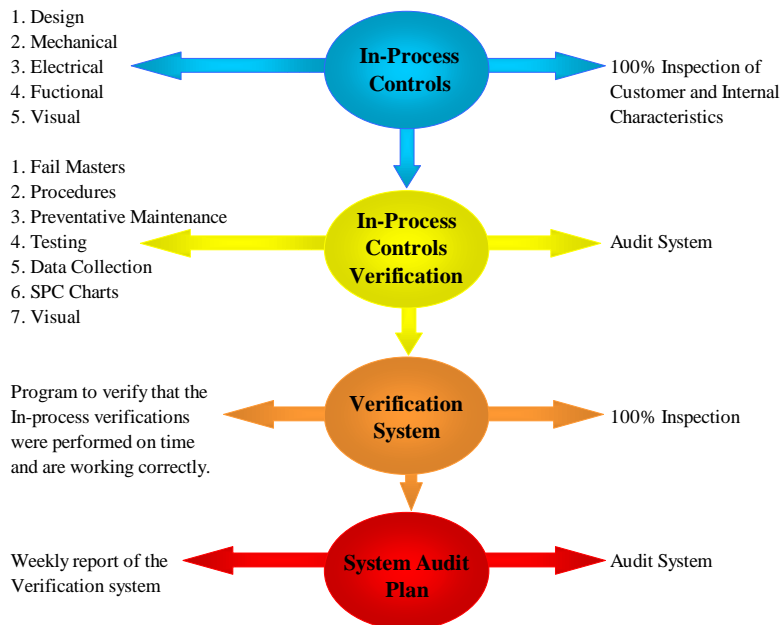
Ronald. E. Osborn

Error Proofing

Error Proofing and LEAN

- Lean insists on one piece flow
 - If one piece is defective, flow is disrupted
- Lean insists on limited inventory
 - If inventory is defective, lines can stop
- Lean means eliminating waste
 - Defects & corrective actions are wastes
- Lean requires that equipment is ready & functions when needed
 - Error Proofing the tools, fixtures, set-ups, methods & documents ensures equipment effectiveness

In Process Control Systems



Essential Steps towards Error Proofing

- Identify opportunities for errors (critical factors)
- Prioritize potential errors for Error Proofing
 - Must prevent defects
 - Provide containment & study further
 - May be tolerated within predefined limits
- Identify root causes of the errors
- Develop & evaluate Error Proofing options
- Select & design the Error Proofing System
- Implement - plan, install, document, train, monitor
- Periodically assess the performance & improve