Developing an Efficient Process FMEA

Planning For FMEA

1. Planning
   - Review Update/Process Flow
   - Link Design Characteristics to Process Steps

Gather:
- Design Input Special Characteristics
- Surrogate Process Flow
- Team:
  - Process Owner
  - Design Representative
  - PVT-Problem Data Person
  - Supplier
  - Process Contraries

- Process Flow Diagram
- Characteristics linked to Customer Satisfaction
- What Operations affect these Characteristics

Medium:
- New Technology
- Past Concerns
- Design Characteristics Affected

High:
- Safety to Operator
- Safety in Use
- Regulatory Requirement

Determine Which Steps require analysis
High / Med / Low

2. Enter all Process Steps and a description into far left Column

Note the low risk items and give reason why no analysis was necessary

Enter all Failure Modes one after another

Enter Effects of Failure and Select Severity

Types of Failures:
- Characteristics from Matrix (if applicable)
- Full Failure
- Partial
- Intermittent
- Unintended

- List up to 5 in the same box (grouped) per each failure mode
- Place severity # beside each effect in parenthesis ex: (4)
- Place largest severity of the group into severity column

Refer to Severity Chart for Scale
Developing an Efficient Process FMEA

IF Severity is 9 or 10?
Yes
No

IF Failure Mode be eliminated?
Yes
No

Review Severity, start at highest and go to lowest

Determine: What are the causes for the Failure Mode?

Enter the Causes Into FMEA Form

Refer to Occurrence Chart for Scale

Fault Tree Analysis

Root Causes For 9/10 SEV

Types of Causes:
- Man
- Method
- Material
- Environment
- Machine
- Noises

Note: Typically there are numerous causes, be sure to allow for space if completing FMEA on paper.

Add to Action Column
- Responsible Person
- Date of Completion

Take Action to Reduce Severity / Occurrence

IF SEV is 9/10 & OCC > 1, DET > 1?
Yes
No

IF SEV is 5 - 8 & OCC > 4?
Yes
No

Consider Process Controls

List Process Controls:
- Multiple Controls are likely
- Determine Detection value for each item record it in parenthesis ex: (5)
- Move the smallest item into Detect. column

Enter the Causes Into FMEA Form

Types of Causes:
- Man
- Method
- Material
- Environment
- Machine
- Noises

Note: Typically there are numerous causes, be sure to allow for space if completing FMEA on paper.

Refer to Occurrence Chart for Scale

Detection/Prevention
- D - Visual Inspection
- P - Mistake Proofing
- P - Proximity Switch
- P - Lock outs
- P - Line Interlock
- D - D & R chart

Calculate RPN
Risk Priority Number
SEV x OCC x DET
Pareto RPN

Top 20% of Failure Modes by RPN

Pareto RPN

Failure Modes

Determine: How probable is each cause as it contributes to the failure mode?
- Enter into Occur. Column

Determine Action to Reduce Occur. or Improve Controls

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Warning!
Do not select arbitrary RPN to be below
Based on 80/20 Rule

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