Developing an Efficient Design FMEA

① Planning For FMEA

Planning
- Team Selection

Create Boundary Diagram

Create Interface Matrix

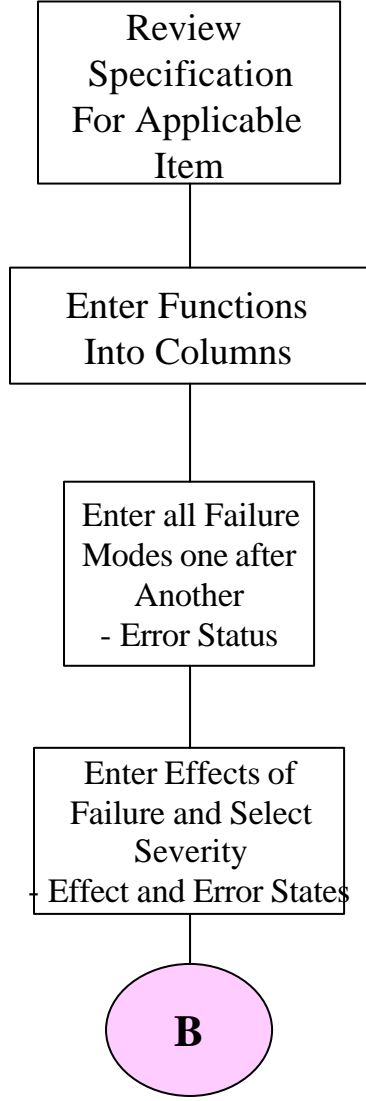**Create P Diagram**
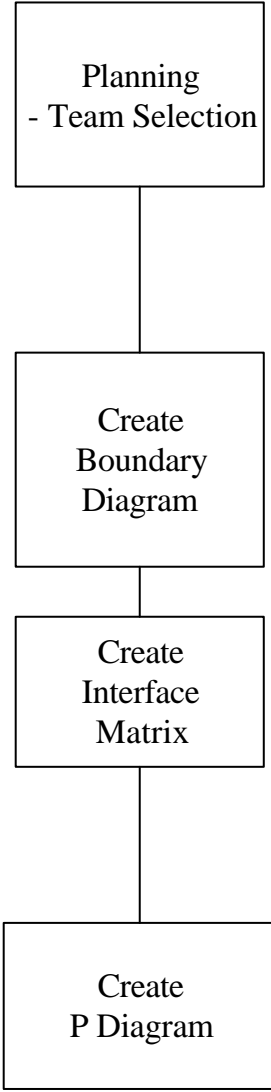
Gather:

- Data/Warranty Information (TGW)
- Team :
  - ✓ Design Owner
  - ✓ Process Representative
  - ✓ PVT-Problem Data Person
  - ✓ Supplier as appropriate
  - ✓ Design Contrarion
  - ✓ Process Representative

② FMEA Development

Review Specification For Applicable Item

Enter Functions Into Columns

Enter all Failure Modes one after Another - Error Status

Enter Effects of Failure and Select Severity - Effect and Error States
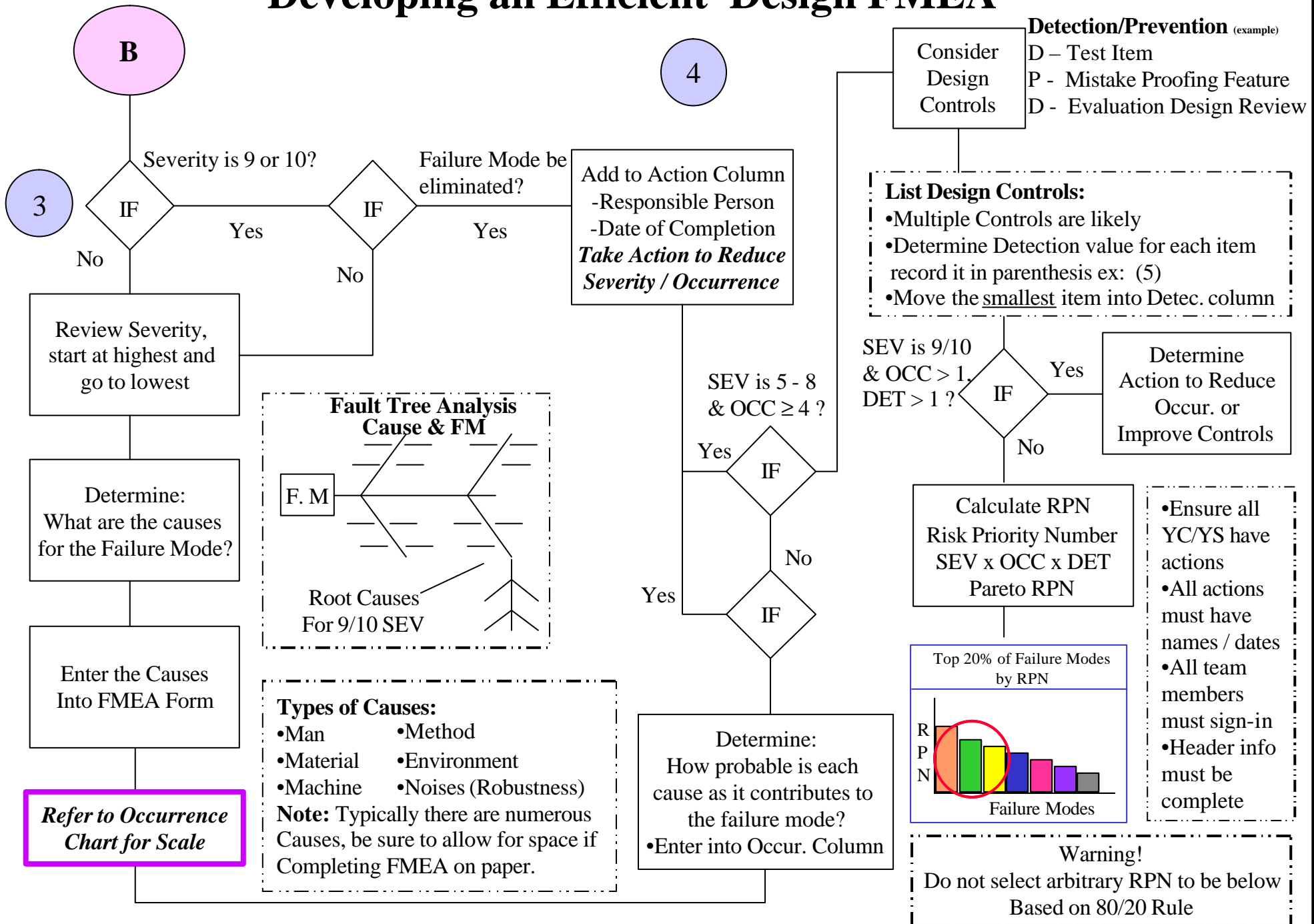
B

Note:
- If on paper leave plenty of space for further analysis

Types of Failures:
- Error Status
- 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*

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B

3

4

Detection/Prevention (example)
D – Test Item
P - Mistake Proofing Feature
D - Evaluation Design Review

Consider Design Controls

Severity is 9 or 10?

IF — Yes — **Failure Mode be eliminated?** IF — Yes —

No

No

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

Add to Action Column
-Responsible Person
-Date of Completion
Take Action to Reduce Severity / Occurrence

Review Severity, start at highest and go to lowest

SEV is 9/10 & OCC > 1, DET > 1 ? — IF — Yes — Determine Action to Reduce Occur. or Improve Controls

No

SEV is 5 - 8 & OCC ≥ 4 ?

Yes

IF

Fault Tree Analysis Cause & FM

Determine: What are the causes for the Failure Mode?

F. M

No

Root Causes For 9/10 SEV

Yes

IF

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

- Ensure all YC/YS have actions
- All actions must have names / dates
- All team members must sign-in
- Header info must be complete

Enter the Causes Into FMEA Form

Top 20% of Failure Modes by RPN

R P N

Failure Modes

Types of Causes:
- Man   • Method
- Material   • Environment
- Machine   • Noises (Robustness)

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

Refer to Occurrence Chart for Scale

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

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

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QFD: ☐		APQP: ☐	
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