



# EPICENTRAL

A Newsletter from Epicenter Development Group highlighting ideas that improve organizations

Welcome to Epicenter Development Group's newsletter, EPICentral. The purpose of this newsletter is to highlight fundamental ideas that have helped organizations develop and maintain great manufacturing and service operations. We hope that you find our EPICentral newsletter helpful, and we would welcome your comments on its content.

## **FMEA - Preventing Potential Issues BEFORE They Happen - Part I**

Have you ever said to yourself "That's an accident waiting to happen?" That's probably a sign that you are aware of a potentially dangerous situation that hasn't yet occurred. This month's featured tool, Failure Modes and Effects Analysis (FMEA), was initially developed by the US military in the 1940's as a structured approach to help prevent those "accidents" from happening. Since then, the tool has been successfully used within a variety of industries from healthcare to manufacturing to software development.

Essentially, the goal of the FMEA process is to guide a team through a series of questions to identify those key processes that need to be focused upon and controlled to eliminate critical product or service issues. Once the team has identified the key processes, the tool also acts as the basis for documenting the control systems and ongoing process improvements. Today's article will focus upon the first part of the process where the Risk Priority Numbers (RPNs) are generated.

### **FMEA Process - Part I - Identifying RPN's**

**Risk Priority Numbers** (RPNs) are a metric for gaging the likelihood and impact of a potential issues. The higher the number, the more likely it is that a severe issue will occur. RPNs are generated using the following process:

Step	Description	Considerations	Examples
1	Identify the Process to be Analyzed	Prioritize on high value operations that are strategically important to your business with a high cost of failure	Manufacturing of critical product; patient care in a hospital
2	Identify Steps of the Process to be Reviewed	List your steps of the process from beginning to end.	Receive Parts-> Load Machine -> Bore Hole -> Assemble -> Pack -> Ship Product
3	Brainstorm Potential Failure Modes for Each Step	What COULD go wrong that would lead to an issue?	Purchase part quality defects; machine breakdowns; improper seating of brackets; poor welds; misdiagnosis of patients; undercooked meat
4	Identify Potential Effects From the Failure Modes Identified	What are the potential consequences of the failures identified?	Quality defects; medical complications; poor product taste; sickness or death
5	Rate the Severity of Each Potential Effect	If the effect occurs, how severe would it be to your organization?	"1"= Low (Nuisance), "10"= High (Death)
6	Identify the Potential Causes for Each Potential Effect	Brainstorm and list each potential cause separately.	Poor supplier controls; inadequate operator training; lack of standard operating procedures; inadequate equipment maintenance
7	Rate the Expected Frequency of Occurance	How often could this happen based upon the process (historical or estimated)?	"1"= Low (Rarely), "10" = High (Often)
8	List the Monitoring and Control Systems for Each Potential Failure Mode	How do you currently monitor and control the process to eliminate and detect failures?	Use of standard processes, audits, gages, checklists, visual systems.
9	Rate the Detectability of Failure	Based upon the systems in place, how likely is it that you will detect a failure?	"1" - Low (Easy to Detect), "10" - High (Difficult to Notice)

Once you have collected this information into a spreadsheet, the RPN number is simply the:

**Severity (#5) x Frequency of Occurance (#7) x Rate of Detectability (#9)**. In our example, the worst RPN score would be "1000" or 10 x 10 x 10.

**Example Application: Very Severe** issues that occur **Moderately Frequently** and **Require Gaging to Detect** might be an RPN score of 432 (9 x 6 x 8).

**Next month, we will continue with the discussion of the FMEA process and how the RPN scores are used to reduce risk and/or improve processes.**

### Considerations:

- Although this article only covers the use of FMEA for processes, the tool can also be used to evaluate product designs and organizational issues.
- As always, practice makes perfect. Try the tool and, if it is of value to your organization, incorporate it into your standard processes for developing products, designing operations and/or improving operations.
- The FMEA process should be part of a continuous improvement process. As actions are taken to reduce risk, the team should revisit the FMEA analysis to identify new processes to focus upon.
- More information on the FMEA process is available at Wikipedia with the following [LINK](#).

- For more information on Epicenter's capabilities in the area of process design and improvement, please visit us at [www.epicentergroup.com](http://www.epicentergroup.com).

## Next Steps

If you would like more information on this topic or other similar types of tools, please contact Bill Proctor with your request at [wproctor@epicentergroup.com](mailto:wproctor@epicentergroup.com) or 216-702-0952. You can also find previous issues of EPICentral at [Newsletters](#).

Mr. Proctor also speaks on a variety of problem-solving and system design topics that can help companies significantly increase the success and profitability of their businesses. If you are interested in having Bill speak at one of your upcoming meetings/events or would like more information on any of the speaking topics, please visit [Speaker Services](#) or you can email [sales@epicentergroup.com](mailto:sales@epicentergroup.com).

Epicenter Development Group is a unique consulting firm that seamlessly integrates the disciplines of Systems Engineering and Organizational Analysis & Development to create practical design solutions to your toughest challenges. It is on the cutting edge of problem-solving solutions and the creator of a unique process called GreenRoom Engineering. This process adds greater value and cost savings for clients as compared to traditional engineering methods.

William Proctor, Epicenter's founder and president, has provided services around the country to more than 100 companies consisting of a variety of organizations; and Epicenter continues to grow as a resource for firms of all sizes.

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