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IT- 'A'

### Failure Mode and Effect Analysis: (FMEA)

In this method, various parts or components of the system and modes of failure are studied. The causes of failure or the inter-relationships between the components are not studied. Successful FMEA implementation requires relevant knowledge and insight as well as engineering judgement.

FMEA is defined as a systematic tool to

- (i) identify possible failure modes in the product / process.
- (ii) to ~~study~~ understand failure mechanisms.

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- (iii) risk analysis
- (iv) plan for action on eliminating failure modes.

Steps to conduct FMEA:-

1) Product / Process and its function must be understood first.

2) Block diagram of product / process is created.

3) Header on FMEA form is completed.

4) Based on block diagram, items / ~~parts~~ functions are listed logically.

5) Identification of failure modes.

6) Identifying relationship between failures of different components.

7) Effects of failure mode are described. Ex: injury to user, environment, equipment, etc.

8) Causes of failures are identified.



9) Probability of occurrence of failures is calculated; 1 indicating 'not likely' and '10' indicating 'inevitable'.

10) Design or process mechanism has to be identified, which can prevent cause of failure before reaching the customer.

11) Risk Priority number (RPN) is calculated as

$$RPN = \text{Severity} \times \text{Probability} \times \text{Detection}$$

12) Recommended actions are determined to address potential risks or failures with high RPN.

FMEA Document:

Model No FMEA team					Prepared by Origin FMEA date:					Responsibility Date of revision		
Design/ Production	Cause	Effects	Severity	Class	Cause of failure	Occurrence	Current Process Control	Detection	RPN	Recommended Action	Responsibility Target Date	Action results

- 1) Model No: Includes name and identification no. of system or components
- 2) Prepared by: Details like name, phone number, address of personnel.
- 3) Responsibility:- Team incharge of design or process should be included. Also includes the company or department of person or group responsible for preparing the document.
- 4) FMEA team: Names of responsible individuals and departments that have authority to perform tasks are included.
- 5) FMEA date: Date of original FMEA compiled should be entered.