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## Can Any Body Help Me for FMEA?

Posted by: **Michael Schlueter**

Posted on: **Monday, 14th July 2003, 3:52 AM.**

Hello Zubair,

FMEA is intended to document:

- a Failure
- its Mode
- its Effect
- by Analysis

in a cause-effect manner. You can find examples here:

- <http://users.compaqnet.be/fmea/Links/Example1.doc> (DC motor)
- <http://www.sematech.org/public/docubase/document/0963beng.pdf> (page 13+19, semiconductors)
- <http://www.amsup.com/fmea/index.htm> (FMEA roadmap)
- <http://main.isixsigma.com/forum/showmessage.asp?messageID=15024> (on rankings)

FMEA's basic idea is to spot risks and to initiate dedicated efforts to control or minimize risks. Knowing your risks can make your project plan more realistic. FMEA seems to work best, when a team documents its known knowledge about known cause- and effect-relationships.

I suggest to work out the timely sequence of failure events first, before entering results into a FMEA sheet. You can use, e.g. Ishikawa or flow diagrams to do this. Or just use cards or post-it notes to document and organise items into a logical sequence of events. Start with key functions your process/product has to perform (functions). Next identify ways to deteriorate those key functions (modes and causes).

Only few people seem to be able to anticipate unknown risks and unknown failure mechanisms. I suggest using AFD (Anticipatory Failure Determination) when you need to analyse subtle failure mechanisms or have to predict future failures from your process/product.

You need to stay very disciplined in cause- and effect-thinking to create strong FMEA-results. Unfortunately many available FMEA-sheets seem to puzzle its users.

Good example (1st link from above, DC motor example) states:

- component investigated is the Position Controller
- its function is to "receive a demand position"
- one failure mode is "loosing cable connection"
- which is caused by "wear and tear"
- this results in "motor fails to move"

This sounds very logical, even if we restate it in its correct timely order of events:

cable wears and tears => cable connection is lost => motor fails to move => function to receive a demand position is deteriorated.

(cause col.5) => (mode col.4) => (effect col.6) => (function lost col.3)

Please note the that many FMEA worksheets do not encourage timely order of events, as columns are ordered in a different way.

Less good example (2nd link from above) states on page 19:

- component investigated is a 16-inch color monitor
- its function is not stated explicitly, but rather indicated by the keyword "monitor" (a monitor can serve dozens of functions)
- one failure mode is "loss of video"
- which causes that "the operator is unable to display input"
- which is caused by a "CRT component failure"

In timely order of events:

a CRT component failes => video is lost => function to "display operators input" is deteriorated ...

(cause col.7) => (mode col.2) => (effect col.3) => ???

In contrast to aboves example we don't get much specific information from this FMEA, do we? What I find quite amusing (sorry) is the suggestion it makes:

- detect a "loss of video" (Potential Failure Mode)
- by checking for "loss of video" (Current Control)

It is not wrong; but can't we do better?

Finally, once you have good input to enter into your FMEA sheet identifying the ranks for severity, occurance probability etc. should be easy to do.

Best regards, Michael Schlueter

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