

FMEA Delivers Value

Doug Lehr, P.E.

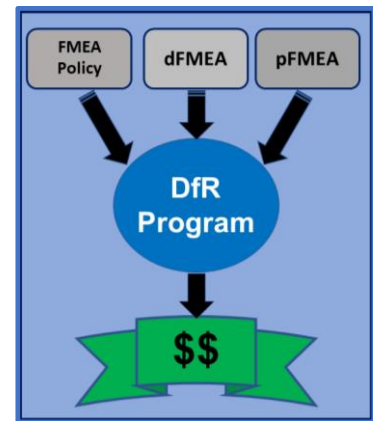
This is the 9th in a series of articles on Critical Equipment design for offshore completions.

1 Fundamentals	Refer to Article 7 for the expansion joint project. This project had progressed – perhaps beyond lab testing - before it was realized that the design could not meet ASME LRFD criteria. LRFD was considered necessary for reliability. The engineering manager had to consider a redesign.
2 TRL	
3 Materials	
4 TempDeration	
5 DfR	Missing the LRFD may have resulted from not conducting a design failure modes and effects analysis (dFMEA). FMEA is a risk discovery process that elevates reliability. Discovering and mitigating design risks early elevates reliability and delivers value by avoiding redesigns and schedule delays.
6 Using Industry Stds	
7 FS & ASME LRFD	
8 M & S	A “check the box” dFMEA (CTB) may also explain the miss. A CTB FMEA is usually completed to achieve the appearance of due diligence. A CTB FMEA delivers little value because typically:
9 FMEA	
10 Lab Test Programs	

- One project member completes the entire FMEA template.
- Controls reflect tribal knowledge, not documented practices.
- There are few recommended actions (a perfect product!).
- The recommended actions are vague and un-auditable.
- Initial and final RPNs (if recorded) are all low risk.
- The template is submitted at the end of the project.

To realize value, FMEA must be conducted correctly. Here are some key elements of a value generating FMEA program:

- FMEA program documents exist to promote consistency.
- A senior product SME provides FMEA program oversight.
- A group of SMEs are trained to facilitate FMEAs.
- FMEA requirements are relaxed or modified for high [TRLs](#).
- FMEA is conducted with small teams of SMEs (4 to 8) who can anticipate design risks.
- dFMEA is conducted by the end of design; pFMEA is conducted by the end of lab test.
- A document workflow exists for approval and implementation of recommended actions.
- Metrics exist for measuring the effectiveness of the FMEA program.



A sustained focus on FMEA drops \$\$ to the bottom line

Reduce your design risk as much as possible using an FMEA program. And remember that a sustained focus on FMEA is indicative of an [organizational culture](#) that values high reliability.

TRUTH: When conducted correctly, FMEA delivers measurable value to the OEM.

[Integris Technology Services LLC](#) can help your engineering team develop internal standards for FMEA. Send your inquiry to info@integris-llc.com.

Copyright © (2021) Integris Technology Services LLC

(713) 449-2246 | info@integris-llc.com | integris-llc.com | The Woodlands, Texas USA 77381