

Application of FMEA-FTA in Reliability-Centered Maintenance Planning

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Abstract:

The failure mode and effects analysis (FMEA) has been used in identifying and reducing risks of failures in systems, equipment, and components following a bottom-up approach. The technique has been criticized for being unintuitive and cumbersome. The fault tree analysis (FTA) follows a top-down approach to identifying the root causes of failures. We apply FMEA to a large-sized axial plunger pump in an Egyptian fertilizers production plant. We extend the analysis to using the FMEA outcomes to launch the FTA to support the evaluation of the potential failures modes. We argue that the two techniques; FMEA and FTA, can complement each other in support of equipment reliability and availability studies. Together, they can offer as the basis of a reliability-centered maintenance planning, a systematic means of cataloguing information about potential failures, and accumulation of better knowledge of potential problems and improvement actions besides possible maintenance cost reductions.