

Siwach Kaeowongsa 2014: The Application of FMEA to Reduce Errors in Piping Design of Petrochemical Plant. Master of Engineering (Engineering Management), Major Field: Engineering Management, Faculty of Engineering at Si Racha. Thesis Advisor: Mrs. Pensuda Phanritdum, D.Eng. 204 pages.

The objective of this thesis is to study the errors reduction which leads to reduce the reworks of piping design for petrochemical plant. The Failure Mode Effect Analysis (FMEA) was used as a major tool to analyze the error characteristics for piping design process. The study starts with problems and errors data collection from customer complaints on design quality. The brainstorming, investigation of relationship between problems and errors including the investigation of problems and responsible person were conducted in this study. The FMEA is further used to analyze and collect the errors. The Risk Priority Number (or RPN) from FMEA was evaluated by the engineering experts by considering the error severity, error occurrence and error detection. In case an error has a high score of RPN, the risk of error occurrence will be increased. The error correction is focused in case the errors are critical type, which has 9-10 severity score and the RPN is more than 100. The work standard, the error protection checklist and inspection form were used to correct the error. After the correction has been finished, the engineering experts considered the RPN. The RPN of errors is reduced when all RPN scores are below 100.

The results of the study showed that the error rates of piping design are reduced significantly. The average error rates of piping design before and after improvement are 3.94% and 1.24%, respectively. The average efficiency of piping design before improvement is 0.86 and after improvement is increased to be 1.18.

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Thesis Advisor's Signature

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