

Rujira Pandech 2015: Development of Expert System and AHP for Decision Making of Metrology Instruments Selection in Petrochemical Industry. Master of Engineering (Engineering Management), Major Field: Engineering Management, Faculty of Engineering at Si Racha. Thesis Advisor: Assitant Professor Chaiwat Numthong, D.Eng. 171 pages.

Decision making for selection appropriate metrology instrument to meet specification, quality, safety and cost is an important process in petrochemical plant design. Instruments selection criterion is based on the international standard and specification of each plant requirement. Types and technical specifications of instrument have been defined by the instrument engineering experts, who have skills and experiences to compare and pick the instruments from many vendors. However, the performance of experts is limited for selection the many instruments of a large petrochemical plant project. Therefore, time and cost are the constraints to be determined for selecting the instruments of this phase. This research presents the integration of the expert system (ES) and analytic hierarchy process (AHP) to support the measure instruments selection for petrochemical plant. The expert system is developed to specify the type and spec of instruments based on the petrochemical plant design while AHP is used to draw comparison of both quantitative and qualitative factors of each instrument with many vendors. The knowledge of instrument engineer experts is stored and managed in term of rule-based system. The developed system can reduce time, cost, and human error from instrument selection in petrochemical plant design.

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Student's Signature

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Thesis Advisor's Signature