Application of six sigma in oil and gas industry: converting operation data Into business value for process prediction and quality control

ABSTRACT

This study is to develop a dynamic prediction tool for daily operation quality control in PETRONAS Kertih's refinery using Design for Six Sigma (DFSS) methodology. Catalytic reforming process was selected as the case study background where the relationship of operation parameters which influences the coke content deposited on the process catalyst was studied. The prediction model allows future estimation of the coke content on the catalyst and in turn assist in reducing future downtime of the unit which might cause RM20,000 per day of PONC (Price of Non Conformance). The related input-output operation data were obtained from the plant and 10 process operation parameters were categorized as key process input variables. Using Response Surface Methodology, dynamic modeling of the coke content was developed for prediction and analysis of the relationship between the coke content and the 10 process inputs. The prediction model passed the 2-sample 2-T Test, hence the prediction model was reliable where there was no statistically difference between the mean in actual and the predicted values.