

Reliability of Chemical Process: Conceptual application of Uncertainty Propagation,  
Quantification and Sensitivity Analysis in the design state

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A Hybrid Digital Simulation System (HDSS) was created by connecting Matlab<sup>TM</sup> and Aspen Hysys<sup>TM</sup> software. Sensitivity Analysis (SA) is carried out by exploiting GSAT toolbox chemical process model. Besides SA, Uncertainty Quantification (UQ) were also performed. Here first generating a set of normally random variables in Matlab<sup>TM</sup> and propagating these random variables to the Hysys using HDSS environment. In this way, UQ and SA operation were carried out by analysing the effect of uncertainty present in the model. The model outputs were obtained in terms of distribution curves and sensitivity indices. A future direction is given to incorporate these uncertainties in the design state. This research was supported by a grant from the Gas Plant R&D Centers funded by the Ministry of Land, Transportation and Maritime Affairs (MLTM) of the Korean government and also was supported by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189).