Enhancement of MIMO H₂S Gas Sweetening Separator Tower Using Fuzzy Logic Controller Array

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Abstract : Natural gas sweetening process is a controlled process that must be done at maximum efficiency and with the highest quality. In this work, due to complexity and non-linearity of the process, the H_2S gas separation and the intelligent fuzzy controller, which is used to enhance the process, are simulated in MATLAB – Simulink. The new design of fuzzy control for Gas Separator is discussed in this paper. The design is based on the utilization of linear state-estimation to generate the internal knowledge-base that stores input-output pairs. The obtained input/output pairs are then used to design a feedback fuzzy controller. The proposed closed-loop fuzzy control system maintains the system asymptotically-stability while it enhances the system time response to achieve better control of the concentration of the output gas from the tower. Simulation studies are carried out to illustrate the Gas Separator system performance.