APPLICATION OF MULTIVARIABLE CONTROL USING ARTIFICIAL NEURAL NETWORKS IN A DEBUTANIZER DISTILLATION COLUMN

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Abstract. *This work has as objective to develop a control strategy based on neural identification of a mutivariable input-mutivariable output (MIMO) process. The plant to control was simulated in software HYSYS as a classic debutanizer column. Debutanizer distillation column is used to remove the litht components from the gasoline stream to produce Liquefied Petroleum Gas (LPG). The quality control of the product taking away from the top of the tower is affected by the Outflow Control (FIC-100) and the Temperature Control (TIC-100).The process variables chosen are concentration of i-pentene existing in butanes stream and concentration of i-butene existing in C5+ stream. The manipulated variables chosen are reflux flow rate (the setpoint of FIC-100 in h/m3) and thermal load (the setpoint of TIC-100 in ^oC). The FIC-100 is responsible for the control of reflux and the TIC-100 for the control of the temperature in the debutanizer column, changing its thermal load to keeping the C5+ production at acceptable level. The purpose is to substitute two physical controllers, FIC-100 and TIC-100, by a neural control system. An important feature of this work is the use of a control strategy composed by two neural network structures: Neuroidentifier and Neurocontroller, responsible respectively for identifying and controlling the process.The software implementation of the artificial neural networks is made using Borland C++ Builder, and its communication with HYSYS is carried through the Microsoft Component Object Model (COM).*

Keywords*: Artificial Neural Networks, MIMO Control, Chemical Process Control, Intelligent Control.*