MIMO CONTROL DESIGN (LEVEL AND PRESSURE) FOR DEAERATOR USING DECOUPLER

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Abstract

A deaerator is a device that is widely used for the removal of air and other dissolved gases from the feedwater to steam-generating boilers. In particular, dissolved oxygen in boiler feedwaters will cause serious corrosion damage in steam systems by attaching to the walls of metal piping and other metallic equipment and forming oxides. The process of eliminating these gases is by entering the steam as a heater which will vaporize the gases in the water. Level and Pressure Control in deaerator should be controlled to maintain a stable water supply to the boiler. Change set point level affecting pressure output. That interacting make the model of system become MIMO (multi input – multi output) system. With setpoint 0.9 m at the level input and 5 psi on pressure input, hen the Kp and Ki values obtained respectively 200 and 5 for controller level. And for controller pressure equal to 100 for Kp and 1 for Ki. Response characteristics of the output signal level obtained, maximum overshoot = 0.2, Error = 0.02 (2%), Time settling = 220 second, Time rise = 25 second. Response characteristics of the output signal pressure obtained, maximum overshoot = 0, Error = 0.02 (2%), Time settling = 13 second, Time rise = 0.3 second.

Keyword: Deaerator, MIMO (multi input-multi output), Decoupler