

Model Predictive Control of Condensate Recycle Process in a Cogeneration Power Station

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A model predictive control (MPC) system has been developed for application to the condensate recycle process of a 300MW cogeneration power station of East-West Power Plant, Gyeonggi-do, Korea. Unlike other industrial processes where MPC has been dominantly applied, operation mode of the cogeneration power station changes continuously with weather and seasonal conditions. Such characteristic makes it difficult to find the process model for controller design through identification. To overcome the difficulty, process models for MPC design were derived for each operation mode from the material balance applied to the pipeline network around the concerned process. The MPC algorithm has been developed so that the controller tuning is easy with one tuning knob for each output and the constrained optimization is solved by an interior-point method. For verification of the MPC system before process implementation, a process simulator was also developed. Performance of MPC has been investigated first with the process simulator against various disturbance scenarios.