

# Pengendalian tekanan kompresor dan suhu steam reformer pada pabrik biohidrogen dari biomassa menggunakan model predictive control (mpc) berdasarkan reidentifikasi sistem

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## Abstrak

[<b>ABSTRAK</b><br>

Hidrogen merupakan salah satu zat/gas yang sangat banyak kegunaannya, terutama dalam industri kimia. Banyaknya unit pada sebuah pabrik membuat banyak gangguan yang akan terjadi pada suatu proses pabrik, gangguan tersebut akan berdampak kepada keefektifan dan kestabilan operasi pabrik tersebut yang juga berpengaruh kepada lingkungan sekitar. Kompresor dan steam reformer merupakan unit-unit yang penting dalam pabrik biohidrogen dari biomassa. Kompresor berguna untuk mencapai tekanan tinggi pada kondisi operasi selanjutnya sedangkan Steam Reformer merupakan proses utama dari pabrik ini yang berguna untuk menghasilkan gas H<sub>2</sub>. Model Predictive Control (MPC) merupakan suatu pengendali yang dapat bekerja dengan basis model yang diharapkan akan menghasilkan kinerja yang lebih baik daripada pengendali lainnya. Pemodelan proses dilakukan dengan menggunakan model empirik sedangkan proses optimasi dilakukan dengan penyetelan terhadap parameter-parameter pengendali MPC seperti waktu sampel (T), prediction horizon (P), dan control horizon (M). Hasil pengendalian tekanan kompresor dan suhu steam reformer adalah pengendali MPC memiliki kinerja yang lebih baik dari pada pengendali PI dengan melakukan reidentifikasi sistem untuk mendapatkan pemodelan yang sesuai.

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Hydrogen is one of the substances / gases that used by people, especially in the chemical industry. The number of units in a factory making many distractions that will occur in a process plant, the interference will affect the effectiveness and stability of the plant's operations that also affect the surrounding environment. Compressors and a steam reformer are the important units in biohidrogen from biomass plant. The compressor is useful for achieving high-pressure operating conditions while Steam Reformer next is the main process of this plant are useful to produce H<sub>2</sub> gas. Model Predictive Control (MPC) is a controller that can work with the base model is expected to has better performance than other controllers. Process modeling is done by using the empirical model while the optimization process is done by setting the parameter-MPC controller parameters such as sample time (T), prediction horizon (P), and the control horizon (M). The results of the compressor pressure control and temperature control of steam reformer is the MPC controller has better performance than the PI controller by performing system reidentification to obtain appropriate model.;

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