

ABSTRAK
SISTEM EKSITASI PADA GENERATOR SINKRON 3 FASA
GAS TURBIN GENERATOR PADA PT PUSRI

(2026: xv + 50 Halaman + Daftar Gambar + Daftar Tabel + Lampiran)

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Sistem eksitasi pada generator sinkron berfungsi untuk mengatur arus medan sehingga tegangan keluaran generator tetap stabil meskipun terjadi perubahan beban. Penelitian ini bertujuan untuk mengetahui pengaruh perubahan daya beban terhadap perubahan tegangan keluaran generator, mengetahui besarnya perubahan tegangan keluaran generator yang diatur oleh Automatic Voltage Regulator (AVR), serta mengetahui besarnya pengaturan eksitasi generator oleh AVR pada Gas Turbine Generator Unit 4006 PT Pupuk Sriwidjaja Palembang. Penelitian dilakukan dengan metode observasi dan pengambilan data operasi generator yang meliputi daya aktif, daya reaktif, tegangan, arus, faktor daya, serta data sistem eksitasi. Berdasarkan hasil perhitungan dan analisis, diperoleh bahwa daya aktif generator selama pengamatan berkisar antara 9,4 MW sampai 9,5 MW dan daya reaktif berkisar antara 8,5 MVAR sampai 8,6 MVAR. Perubahan beban tersebut menyebabkan perubahan arus generator dari 535 A sampai 543 A sehingga mempengaruhi tegangan terminal generator yang berada pada rentang 7.973 V sampai 8.002 V. Sistem AVR mampu merespons perubahan tersebut dengan menjaga persentase pengaturan tegangan pada kisaran 5,6% sampai 5,8%. Hasil penelitian menunjukkan bahwa perubahan beban mempengaruhi tegangan keluaran generator, sedangkan sistem eksitasi dan AVR mampu mempertahankan kestabilan tegangan generator sehingga operasi generator dapat berlangsung dengan aman dan andal.

Kata kunci: Generator sinkron, sistem eksitasi, Automatic Voltage Regulator (AVR), tegangan keluaran, perubahan beban.

ABSTRACT
EXCITATION SYSTEM IN A 3-PHASE SYNCHRONOUS GENERATOR
GAS TURBINE GENERATOR AT PT PUSRI

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The excitation system in a synchronous generator functions to regulate the field current so that the generator output voltage remains stable even though there is a change in load. This study aims to determine the effect of changes in load power on changes in generator output voltage, to determine the magnitude of changes in generator output voltage regulated by the Automatic Voltage Regulator (AVR), and to determine the magnitude of generator excitation regulation by the AVR on the Gas Turbine Generator Unit 4006 PT Pupuk Sriwidjaja Palembang. The study was conducted using observation methods and collecting generator operation data which include active power, reactive power, voltage, current, power factor, and excitation system data. Based on the results of calculations and analysis, it was obtained that the active power of the generator during the observation ranged from 9.4 MW to 9.5 MW and reactive power ranged from 8.5 MVAR to 8.6 MVAR. The change in load caused a change in generator current from 535 A to 543 A, thus affecting the generator terminal voltage which was in the range of 7,973 V to 8,002 V. The AVR system was able to respond to these changes by maintaining the voltage regulation percentage in the range of 5.6% to 5.8%. The results of the study show that changes in load affect the generator output voltage, while the excitation system and AVR are able to maintain the stability of the generator voltage so that generator operation can take place safely and reliably.

Keywords: Synchronous generator, excitation system, Automatic Voltage Regulator (AVR), output voltage, load changes.