Renewal of the Generator Simulator of CRIEPI's Power System Simulator

Background

CRIEPI's Power System Simulator is a large analog simulator comprising components that simulate large generators, transmission lines and other power system components. It is capable of simulating generator responses and system-level phenomena that can occur after a system fault such as a lightning strike, and is useful for studying such phenomena and for developing and verifying countermeasure technology. As important parts of this simulator, we have renewed the unit control panel and generator operation panel of the simulated nuclear power plant unit (hereafter "nuclear unit") and the full set of the simulated thermal power plant unit (hereafter "thermal unit").

Outline

The nuclear unit and the thermal unit are equipped with a frequency control system (speed governor), and also with ΔP input type and ΔP+Δω input type power system stabilizers (PSS) that control power swing using signals of the active power deviation (ΔP) and the generator rotating speed deviation (Δω). Moreover, the nuclear unit is equipped with a multi-input PSS that surpasses the above-mentioned PSS in its capability to suppress long term swings.

Specifications

- Common specifications
  Rated terminal voltage: 220 V, Rated frequency: 50 or 60 Hz, Automatic synchronous parallelization apparatus: Speed governor (thermal unit), ΔP input type: PSS, ΔP+Δω input type: PSS
- Nuclear No.1 and 2 Unit
  Rated capacity: 100 kVA, Rated output: 90 kW,
  Multi-input MPSS, Speed governor (hydro, diesel, combined cycle), Plant control simulator (thermal, combined cycle),
  Step-out detecting relay, Cross current compensator
- Thermal No.4 Unit
  Rated capacity: 60 kVA, Rated output: 54 kW
- Thermal No.5 Unit
  Rated capacity: 90 kVA, Rated output: 81 kW

Nuclear unit control panel

[Location and date of installation]
Koma area / Feb. 2014 (Nuclear Unit),
March 2015 (Thermal Unit) / System Engineering Research Laboratory

The full set of the thermal No.4 and 5 unit

Generator operation panels