### 2. Principal New Equipments

**Hybrid-type Power System Simulator**

**Purpose:** To vitalize power transactions and maximize the benefit under the electric power market, it becomes more and more important to establish stable operation scheme of a wide area power system. The hybrid-type power system simulator makes it possible to develop control schemes of a wide area power system by simulating the system dynamics of an actual power system precisely.

**Main Specifications:**
The hybrid-type simulator, which is a combination of analogue and digital simulators, makes it possible to simulate an actual power system precisely by adding the following devices to an existing analogue simulator.

- **(a) Real time digital simulator**
  - Computer system to simulate a part of power system with real time
  - Power system with about 10 generators can be simulated

- **(b) Connection interface**
  - Interface using two inverters with BTB configuration to connect between existing analogue simulator and the above (a) digital simulator

- **(c) Control equipment of generator station and substation**
  - Workstation system to simulate control equipment (8 sets) of generator station or substation

- **(d) Operation and monitoring equipment, communication system model**
  - Overall system operation and monitoring equipment model
  - Communication system model using LAN

- **(e) Load, shunt devices**
  - System load (150kW=50kW×3)
  - Shunt capacitor (70kVar), Shunt reactor (60kVar)

**Location and Date of Installation:**
System Engineering Research Laboratory, March 2004

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**Conductivity Examination Equipment of Cement Material**

**Purpose:** Conductivity mechanism of the cement material of saturation is solved.

**Main specifications:**

- **(1) Pressure vessel** 1MPa Three sets
- **(2) Three axes**
- **(3) Automatic measurement**
- **(4) Examination object size** φ10×15(cm), 15×15(cm)

**Location and Date of Installation:**
Civil Engineering Research Laboratory, December 2003