News Release For Immediate Release



Hitachi Industrial Equipment Systems Launches Next-Generation Inverter System to Support Stable, Resilient Power Grids

New technology goes live at Narashino Works, helping prepare for a cleaner, more reliable energy future



Grid forming inverter equipment implemented at Narashino Works

Tokyo, April 17, 2025 - Hitachi Industrial Equipment Systems Co., Ltd. (HIES) has begun operating a next-generation power conditioner^{*1} called a Grid Forming Inverter (GFM), at its Narashino Works facility in Chiba Prefecture. This cutting-edge system helps stabilize electric power systems as global transition to renewable energy, by simulating the stabilizing effects once provided by large power plants.

As renewable energy becomes a bigger part of the power mix, older systems that relied on heavy rotating generators are retiring, but they also provided valuable "inertia" that kept the grid stable during power fluctuation between demand and supply. GFM technology helps recreate inertia, supporting a reliable power supply for the future.

*1 A device that converts DC power supplied from solar power generation systems, storage batteries, etc., into AC power that can be used in buildings, etc.

Why This Matters

Electricity must be supplied at a stable frequency to keep our power systems running smoothly -typically at 50 Hz or 60 Hz. Traditionally, large power plants helped maintain that frequency because their heavy turbines had "inertia," a natural resistance to sudden changes.

As more renewable energy sources like solar and wind replace thermal power plants using fossil fuels, that inertia in power system is decreasing. These newer systems can't stabilize frequency in the same way, increasing the risk of frequency fluctuations or even blackouts.

This is where GFMs come in. They simulate this lost inertia, helping to balance the grid and maintain a stable supply of electricity — even when demand suddenly changes, or renewable output fluctuates.

About Grid Forming Inverters (GFM)

Unlike conventional inverters that simply follow the power grid, GFMs can create and stabilize their own grid, working together with other units to form self-sustaining microgrids^{*2}. This makes them important for supporting local energy systems, improving grid resilience and enabling carbon neutrality.

*2 A system to develop small-scale power generation facilities within a facility or region and become self-sufficient in electricity

Powering Narashino Works

Narashino Works now runs on a system that combines solar energy, battery storage and inverter technology to reduce CO₂ emissions and keep operations required in the emergency event– even during blackouts of utility grid.

- 81.9 kW of solar power (54 kW new and 27.9 kW existing) is used for the system, expected to reduce greenhouse gas emissions by 39.2 tons of CO2 annually.
- A newly built AC microgrid, powered by paralleled three GFMs, keeps systems like water pumps (also made by HIES) and internal announce equipment running smoothly, even when solar power fluctuates.
- A DC microgrid uses solar energy more efficiently, stores surplus power in batteries and feeds it back into the plant, helping reduce conversion losses and saving energy.
- The system can operate independently during emergencies, strengthening Narashino Works' disaster resilience.

Since DC power supply has an advantage in environmental performance, this system was selected for a carbon reduction subsidy from Japan's Ministry of the Environment. *3

*3 Ministry of the Environment: Selected for a subsidy for carbon dioxide emission control measures in fiscal 2024

About Hitachi Industrial Equipment Systems Co., Ltd.

Hitachi Industrial Equipment Systems enhances productivity across various industries — including data centers, batteries, electronics and semiconductors and pharmaceuticals — through high-efficiency products such as compressed air systems, grid edge solutions, drives and coding and marking equipment. Our innovative solutions and services integrate digital technology to drive customer success and contribute to a more sustainable society. We support customers throughout the entire product lifecycle, from maintenance to recycling. For more information on Hitachi Industrial Equipment Systems, please visit https://www.hitachi-ies.com/

For inquiries, please contact

Yoji Ikeda Hitachi Industrial Equipment Systems Co., Ltd. Power Transmission and Distribution Systems Division, Alternating Grid Development Project ikeda-youji@hitachi-ies.co.jp

Reference Data

HIES GFM Specifications

model (e.g. of a vehicle)	HG910-165LF
Electrical method	Three-phase 3-wire 210V
Rated output	16.5kVA
Insulation method	Commercial frequency isolation system (separate installation)
DC input voltage range	DC0-450V
DC operating voltage range	DC240-400V

System configuration diagram



Inertia force verification waveform of GFM

Comparison of frequency transient response of two GFMs with different inertia constants



Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
