GE Energy
Digital Energy

GENe GMS

Whether your generation control needs apply to a power plant or a full electric network, the GENe Generation Management System offers the most efficient and reliable tools on the market today. GENe GMS has a number of sophisticated applications that will assist you to monitor and control your generation resources.

Why choose GENe GMS?

GENe GMS provides solutions that ensure effective power supply reliability. GMS has proven flexibility for either controlling generation in a plant or in an interconnected network power system.

This premium generation control product includes a complete range of automatic generation and voltage control functions with our AGC and AVC applications. As well, it includes applications for determining and monitoring costs that provide comprehensive information to allow best value for your investment.

In addition, GMS provides numerous ways to interface with external systems and power market applications.

GENe GMS provides you with the following benefits:

- Power supply reliability
- Complete range of state-of-the-art control applications
- Solutions that are both secure and economically optimal
- Higher sustainability of generation assets
- Trustworthy and efficient controls
- A swift and intuitive environment

More elaborate displays can be built in GENe to seamlessly display information from different sources, such as SCADA and AGC.
The 21st century demands a new way of thinking—cost-effectiveness, conservation, and control are the watchwords as utilities go forth. Add GENe GMS to your utility’s platform and have the GMS applications like AVC work for you to bring the future into the present.

GENe GMS—the open choice

The GENe suite of GMS applications uses both a common architecture and a database that are fully expandable and scalable. Its data definition and exchange interfaces are designed to internationally established standards such as the IEC 61970 for Common Information Model (CIM).

GENe GMS conforms to all legal and market standards. Recognizing the governing authorities in a deregulated environment, the GMS applications have the capacity to meet all of the stringent regulation standards (including NERC CPS and UCTE), while at the same time, meeting energy interchange, power reserve, water conservation, and pollution control requirements.

GENe GMS applications

What makes the GENe GMS such an optimal product is the number of state-of-the-art applications that make up this system. The GMS applications are:

- Automatic Generation Control (AGC)
- Automatic Voltage Control (AVC)
- Economic Dispatch (ED)
- Production Cost Monitor (PCM)
- Reserve Monitor (RM)

Automatic Generation Control

SNC-Lavalin has identified three major control objectives: to control the power system’s frequency, to control the Net Interchange with neighbouring utilities, and to control the total MW production. Secondary objectives include correcting accumulated errors, both Inadvertent Energy Exchange and Time Error. These secondary objectives are met by adjustments to the area MW requirements.

The AGC application meets these objectives and maintains the generating values at optimum economic levels. Ensuring that the generating units operate within their specified limits at all times is of utmost importance. These objectives are achieved by the proper calculation of generating unit setpoints and transmitting these setpoints to corresponding generating stations or dispatch centres. An additional requirement is to have a mechanism for collecting and correcting accumulated errors. AGC does this correction through a conversion to area MW requirement adjustments.

Its field-proven unit control component is designed to effectively control all varieties of generating units. Within deregulated structures, it can control the generation at regional and plant levels, and work as a reliable component of a multi-authority control system ensemble. The types of units that can be controlled are: Thermal (including combined cycle or grouped) and Hydro.
Automatic Voltage Control

The AVC application controls the voltage of a bus section upon request by a user. The control can be carried out on individual generators or on a set of generators in collective mode. In the latter case, the control uses a Fuzzy Logic controller to bring a line or bus section's voltage to a user-determined setpoint while maintaining voltage or MVar equilibrium between the participating generators. This equilibrium is vital to avoid what is called “MVar Pumping,” which causes undesired circulating currents between generators.

AVC validates, monitors, and executes the user’s request. The validation verifies that the user’s request can be processed; the monitoring checks the generator responses and detects changes in network conditions that affect the execution of the control, and the execution determines and sends the commands to generators required to achieve the generator or the bus section voltage target.

Economic Dispatch

The ED application determines the real-time economic loading of generating units necessary to achieve the minimum production cost. This is accomplished by constructing generating unit cost functions and keeping them current. ED also calculates economic basepoints and participation factors for generating units, taking into account generation limits. It can import unit setpoints supplied by external systems, such as a power market application. In a network power system, when coupled with the Network Analysis and Security application, ED allows for full optimization of generation setpoints by taking into account other restrictions such as limits in transmission devices.

Production Cost Monitor

The PCM application calculates and monitors the real-time costs of both generation and operating constraints so as to be able to compare actual costs to the optimum production costs calculated by ED. These costs calculated by PCM are considered the target production costs for the advisory and closed loop dispatch.

The types of production costs monitored and calculated by PCM include:
• Actual Production Costs.
• Target Production Costs.
• Production Cost Differences.
• Accumulated Production Cost Differences between actual and target costs for the full day before and for the current day.
• Costs of Operating Constraints.

The calculated production cost differences are compared with user-entered limits and any violations are signalled with an alarm.

**Reserve Monitor**

The RM application calculates and monitors MW reserves within each control area. The reserves are calculated for each generator, taking into account its operating conditions. Reserves are calculated on a per plant, region, or operating area basis.

The MW RM calculates the following reserve quantities:

• Regulating reserve
• Emergency regulating reserve
• Spinning reserve
• Standby reserve

Each of the reserve values for the operating area is compared against user-entered limits and violations are signalled with an alarm.

**Contact us to find out how you can benefit from the innovative GENe GMS.**

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