Generator balancing

In addition to using electricity supplied from the grid, large industrial sites may also generate their own electricity from a local fuel supply. Where the available generation is in excess of the local load, power may be exported to the grid. By contrast, if the site is islanded from the grid, and local generation is insufficient to support the load, shedding may be necessary.

Where there are several local units, the balance of load between them should be controlled to ensure that reactive power generation is kept within limits, and that generation is at the cost-effective optimum. The operator must therefore ensure the right balance between import/export, control reactive power, and run the local generation efficiently, as well as being able to shed load quickly in abnormal conditions.

Our teams of expert control engineers can design and deliver an integrated solution to facilitate these controls.

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Solution

A PLC based system monitoring grid and generator supplies can operate the plant in the most cost effective manner. Base data for the PLC algorithms comes from accurate power measurements typically provided by modern intelligent relays. The grid links are controlled by switchgear with G59 protection to protect the grid from poor quality exported power, and data collected from these links will also be used.

The PLC provides the optimum balance between local generators and the grid supplies to minimise power costs. Correct balancing allows the reactive generation to be minimised, and where there is an excess of local generation, export is enabled if this is cost effective. The situation is monitored in real time to reflect demand of the local plant, and availability of generators.

When the available power reduces, due to outage of units, or loss of the grid connection, the PLC can also shed load in a controlled manner to minimise damage to the production and to the plant. Reaction to such changes is typically complete within 25ms provided suitable switchgear is available.

Such systems are usually provided with a Human Machine Interface to change the PLC parameters, and provide a local operational monitoring capability.

Benefits

The major benefits of such a system are:

- Optimum balance of generation taking into account the generation costs
- Maximise cost-effective export of power
- Rapid response to changes in demand
- Rapid response to changes in generation capability to provide controlled load shedding

Our capability

We are experts in the provision of PLC based systems for power control. Specific projects include control of power to large gas compression and storage plant, operated from a mix of imported power and several large generation units.

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