

# Prevent surprises and shorten time.

Flex Power Grid Lab for research and testing of future distribution grids.



Sustainable energy supply is driven by stringent environmental targets, a deregulated electricity market, increasingly complex grids and the emergence of distributed energy sources. Its success depends on proper control and management of the power flows. The question is how you could integrate them in time without facing unpleasant surprises.

## **Varying electric currents**

One-way energy flow, which is hierarchically controlled, continues to decline. More or less autonomous grids, supplied by numerous large and small generating plants, are emerging. These grids provide time-varying electric currents in all directions within a power grid. This is due to the fluctuating nature of the (renewable) energy source itself. The complexity of constantly balancing supply and demand is increasing while the assets are simultaneously being utilized to their limits.

Power electronics based conversion systems will become indispensable in the grid of the future. It is precisely these components that can enhance the control and management of power flows. This will lead to smarter use of grids, preventing instability and failure.

Grid converters for decentralized generators such as domestic micro-CHP, wind turbines, solar cells and even electric vehicles increases intelligent intervention on a local level.

## **Managing the risks**

Network operators simply can't risk a blackout or brownout by introducing a component with harmonics-generating inverters. Certifying Distributed Energy Resources equipment reduces this risk.



The increasing application and penetration of grid-connected power electronics inevitably raises the demand for research and testing of the behavior of the equipment and its interaction with the power grid. To minimize the risks for both manufacturer and grid operator, the Flex Power Grid Lab has been realized. This innovative lab provides unprecedented opportunities for research and testing of such emerging equipment.

#### **The Flex Power Grid Lab:**

- Reduces field-testing time when integrating new controls of any kind
- Prevents field installation surprises, preventing unplanned outages, lost production dollars, lost man-hours and negative publicity
- Shortens DG integration time
- Insures effectiveness of new controls and operating guidelines prior to full-scale deployment, avoiding lost man-hours and negative returns on capital expenditures, preventing millions of lost dollars.

#### **Center of excellence**

The Flex Power Grid Laboratory is the ideal test environment to develop and perform state-of-the-art tests under controlled conditions for grid operators, manufacturers, researchers and students.

The lab targets manufacturers active in a variety of different sectors, ranging from the energy and traction industries to the marine and shipbuilding industries as well as universities, research centers and governmental bodies.

#### **Flexibility**

The Flex Power Grid Lab is an independent laboratory capable of creating a multitude of electrical circuit configurations and delivering or absorbing power. Flexibility defines the facility. It offers all facilities to allow for smooth assembly and connection of a large variety of research objects and devices.

The Flex Power Grid Lab is capable of supplying industrial medium-voltages (up to 24 kV) at a continuous high power rating (1 MVA) combined with complex realistic conditions on a 'bad grid' (DC up to 75 Hz AC, in four-quadrant operation), with pre-programmable distortion (harmonics up to 2.4 kHz or dynamic network phenomena).

#### **What do we offer?**

The Flex Power Grid Lab enables you to realistically test:

- *whether your distributed generation equipment will not disturb proper functioning of the grid*
- *your (distributed generation) equipment under severe future grid conditions to ensure efficiency and proper functionality*
- *whether your grid will operate reliable and stable under severe circumstances (high penetration of certified DG's)*
- *your filters and conditioners abilities to compensate 'grid inconsistencies' to protect 'loads'*
- *reproduce grid events for the investigation of abnormal operation*

*BEFORE connecting to the grid.*

#### **For more information:**

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