VLPGO

Very Large Power Grid Operators

VERY LARGE POWER GRID OPERATOR (VLPGO) ASSOCIATION

October 2010

History

Very Large Power Grid Operator (VLPGO) is a forum created in 2004 by the world's major electricity system operators in response to a series of black-outs which occurred in different countries the previous year. In 2009, with the aim of reinforcing the organizational structure, their members drafted and approved an internal procedure and they formed an association. The number of actual members is set to be increased at this year's annual meeting, with the inclusion of the South African company ESKOM.

With these changes, VLPGO, which until then had been a forum for sharing common initiatives aimed at guaranteeing the security of the system, became a catalyst destined to guide the transition of the energy industry towards the power grid of the 21st century.

Objectives

The objectives put forward by the association in their internal procedures are based on three axes:

- **Innovate thinking.** To promote international consensus on strategic issues challenging the electricity system, that is to say, large operators and market agents.
- **Technology advancement.** To find a common vision which identifies the best technologies and best social and environmental practices required to address the strategic issues of the sector.
- **Industry leadership.** Through a common Communication Policy, to facilitate the implementation of a common vision through information exchange, collaborative projects and cooperation with other international organizations.

Key strategies

VLPGO members have agreed five key strategic lines in which work is needed to guarantee the security and the reliability of the electricity systems.

- **Emerging technologies.** To identify new technological trends, to assess about the impacts they generate and to develop agreed solutions to the problems derived from their use.
- **Common approaches and solutions.** To develop common engineering specifications across technology suppliers and to establish the necessary guidelines for common requirements to guarantee the reliability of the electricity system.
- **Best practices.** To share “best” ideas and practices developed by the members of the association, to create methodologies for evaluation and complex situation analysis and to officially record the form in which each case has been solved.

- **Shared learning.** To identify key risks to the system, to share after-the-fact analysis of incidents and to learn from the accumulated experience of each company.
- **Industry influence.** To develop common positions for industry suppliers.

Areas of activity

The top leaders of the electricity operators who make up VLPGO meet once a year, in October. It is a solemn meeting, of the highest level, during which they establish the work guidelines for the following year and a new president is chosen.

The VLPGO presidency is yearly and is on a rotating basis. It begins with the meeting of that year, which is celebrated in the country which is going to hold the position. Luis Atienza, chairman of Red Eléctrica de España, will lead the association from October 2010 to October 2011, which is why this year's meeting has been held in Madrid.

For its part, the denominated Governing Board meets twice yearly. In these meetings, representatives of all VLPGO members review the work carried out by the different working groups in the previous six months and set out the direction to continue in.

The association has several working groups, joint projects and workstreams which work on strategic questions regarding the electricity systems. Each forum is led by one of the association members and representatives from the other operators take part in the forum.

The work of the groups is continual and is reviewed every six months. In addition, once a year, during the annual meeting, the VLPGO management decides on the creation of new projects, the termination of those which have fulfilled their objectives or the continuity of existing ones. In this final case their new objectives are also defined.

Working groups

- **Synchrophasors (smart meters).** This working group will analyse the technology used by smart meters and their possible applications in the operation of the electricity systems. Smart meters offer measurements of several electrical magnitudes in real time. These results can be used to control, to measure or to analyse the electricity system.
- **Enhanced security.** This group subdivides itself into three:
  - **Vulnerability.** To establish definitions on security, how it is monitored, how costs are budgeted and controlled with understanding the impact of regulators and governments.
  - **Restoration of the system.** The group reviews the best solutions for the restoration of the electricity supply and recovery of the service after blackouts.
  - **Equipment overstress.** The forum identifies the processes adopted by each of the companies to regularly check overstress on equipment and, once analysed, propose solutions.

- **Integration of renewable technologies.** The experts work on the exploration of the necessary tools and techniques to integrate renewable based power generation into the existing transmission system.

Joint projects

- **Asset Management.** Developing best practice tools for the management of assets –principally grids and substations– over their whole lifetime.
- **Transmission of electricity in HVDC (high-voltage direct current) in synchronous systems.** Studying the reinforcement needs of the grids, which will have to deal with the transmission of ever-increasing volumes of electricity in HVDC, destined to diverse aims.
- **Electric vehicle.** Promoting the advancement of the technology of the vehicles and the benefits they can bring.
- **Monitoring and control.** Integrating virtual technologies in the management of the security of supply and improving the monitoring conditions.

- **Visualization.** To facilitate the development of visualization technique, and provide means for power operators to share their research and application experiences.

Workstreams

- **Smart Grids.** Develop solutions to foster the deployment of smart grids.
- **Key Performance Indicators (KPI).** Analysing the different operational KPIs in use today by association members, decide if they are beneficial and develop a suite of best practice KPIs to optimize their use.

Future challenges

VLPGO tries to play a central role to guarantee that the operation of the electricity systems continue being reliable, safe and efficient. In addition, as the regulatory and economic initiatives evolve, the association will work to maximize the understanding and the exchange of experiences between members, with the aim of developing projects of common interest which guarantee the fulfillment of the results.

In the 2010 annual meeting, the thirteen members of VLPGO will approve the 2010 overview, the budget for 2011, a communication plan for the following year, the update of internal procedures and the proposals for the next year.

Members

Eskom. South Africa.
Installed Capacity: 43,5 GW.
Provides service to 49 million people.

Eskom is a state-owned company that generates transports and distributes 95% of the electricity that is consumed in South Africa and 45% of the demand of the entire continent. The company operates in an electricity market that includes the entire Southern Africa Development Community and it operates two service concessions in Mali and Uganda.

KPX. South Korea.
Installed capacity: 70 GW.
Provides service to 49 million people.

KPX operates the electricity system in all the regions of South Korea since 2001 and is the owner of 30,250 kilometres of high voltage lines in the country. It also acts as the Korean electricity market operator, managing the sale of an average 405,700 GWh of electricity per year.

MISO (Midwest ISO). United States.
Installed capacity: 159 GW.
Provides service to 40 million people.

MidWest ISO is a company founded in 1998 that began to operate as an independent system operator and manager of electricity markets in 2001. Currently it has more than 150,000 kilometres of electricity transmission lines throughout 13 states in Midwestern United States and one Canadian province.

National Grid UK. United Kingdom.
Installed capacity: 68 GW.
Provides service to 65 million people.

National Grid UK operates the electricity system of the United Kingdom since 1990 and it is the owner of the high voltage grids in England and Wales, representing a total of 7,913 km. Currently the company is building an interconnection with the Danish electricity system. National Grid UK also has businesses in the United States and Australia.

Operador Nacional
do Sistema Elétrico

ONS. Brazil.
Installed capacity: 100 GW.
Provides service to 170 million people.

ONS is responsible, since 1998, for coordinating and controlling the operation of the power generation facilities and the Brazilian electricity transmission system, which supplies 98% of the population. The Brazilian generation system is characterized by the predominance of multi-property hydroelectric generation stations.

PJM Interconnection. United States.
Installed capacity: 165 GW.
Provides service to 51 million people.

PJM Interconnection began to operate as an independent system operator in 1997, although it had already acted as control centre for several electricity companies who decided to interconnect their networks in the 1920's. Currently, its area of operation covers fourteen states in north-eastern United States.

POWER GRID CORPORATION OF INDIA LIMITED

Power Grid of India. India.
Installed capacity: 43,5 GW.
Provides service to 1.200 million people.

Power Grid Corporation of India is a public company responsible for planning, coordinating, supervising and controlling all the transmission grids in India. In addition, it operates and maintains more than 71,600 kilometres of high voltage lines, by means of which it supplies 45% of the electricity demand in the country.

RED ELÉCTRICA DE ESPAÑA

REE (Red Eléctrica de España). Spain.
Installed capacity: 93 GW.
Provides service to 47 million people.

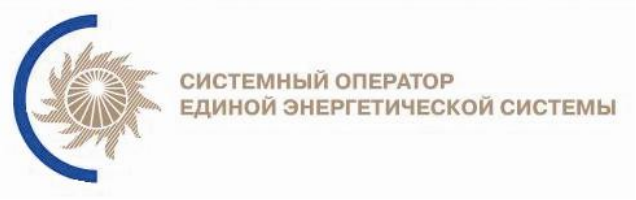
Red Eléctrica, established in 1985, was the first company in the world dedicated exclusively to electricity transmission and operation of electricity systems. REE is responsible for operating the Spanish electricity system and is the sole transmissioner, managing more than 35,000 kilometres of high voltage lines in Spain.

RTE (Réseau de Transport d'Électricité). France.
Installed capacity: 93 GW.
Provides service to 65 million people.

RTE, a subsidiary of EDF, is a public company responsible for operating, maintaining and developing under secure conditions the French high voltage transmission grid. RTE is the owner of more than 100,000 kilometres of high voltage lines in France and counts on 45 international interconnections.

SGCC (State Grid Corporation of China). China.
Installed capacity: 900 GW.
Provides service to 1 billion people.

SGCC is a state-owned enterprise founded in 2002 with the objective of operating the country's power grids and providing reliable power supply. Currently its assets, among which there are over 200,000 kilometres of lines, providing service to an area covering 26 provinces, autonomous regions and municipalities, which represents 88% of the national territory.



SO UPS. Russia.
Installed capacity: 146 GW.
Provides service to 144 million people.

SO UPS is a public company responsible since 2002 for the operation of the entire Russian electricity system. Starting in 2008, it is also responsible for the supervision of new infrastructure projects in the energy sector and fulfils the mission of verifying the transparency of the electricity market, both wholesale and retail.

Tepco (Tokio Electric Power Company). Japan.
Installed capacity: 64 GW.
Provides service to 45 million people.

Tepco was established in 1951 to supply the metropolitan area of Tokyo. Ever since, it has built several power generation stations to attend to an increasing demand and has managed Japan's transmission grid. Currently it also has a line of business in consulting which provides advisory services to several countries in the development of their electricity systems.

Terna

Terna (Terna Rete Elettrica Nazionale). Italy.
Installed capacity: 57 GW.
Provides service to 60 million people.

Terna is the Italian electricity grid operator and owner of the majority of the country's high voltage grids, with over 62,000 kilometres. The company was established in 1999 with the mission to become the manager of Italy's electricity transmission grid, although it did not become totally operative and independent until 2005.

RED ELÉCTRICA
DE ESPAÑA

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