Irish Next Generation Network

Welcome to the NGN's New Look Newsletter!

For 2020 CIGRE Ireland NGN is bringing you an updated newsletter to share information regarding recent industry news, upcoming CIGRE events and feature articles on the work of its members.

This is the 99th year of CIGRE and the NGN has big plans to build toward next year's centenary. Our strategic focus for this year is to continue to organise events that encourage Young Member's engagement within the industry, help support our two entrants to the Paris Young Member's Showcase, continue to promote young member participation in CIGRE Working Groups and build stronger links to NGNs from other countries.

The committee are always looking for new opportunities to engage with young members, so if you are interested in having your work featured in next quarter's newsletter or have an event idea then please contact bill.shannon@esb.ie

Industry News

It may be early in the year, but exciting things have already been happening:

EirGrid have reported that several wind records were set in February:

- Maximum wind output of 4,249 MW
- All Island wind generation was 1,827 GWh, over the month exceeding the previous record of 1,456 GWh
- SNSP was above 50 % for 72 % of the month, exceeding the previous record of 52 %

Find out more at:

- http://smartgriddashboard.eirgrid.com/#all/wind
- http://www.eirgridgroup.com/how-the-grid-works/renewables/

What to look forward to in 2020!

The Irish NGN has a great year of events planned, so stay tuned for further details throughout the year.

The NGN's core goal is to generate engagement with young members and create exciting opportunities to participate in CIGRE events. This year's proposed events are:

- Q1 Wind Energy Workshop and Site Visit (postponed but to be rescheduled)
- Q2 Industry Workshop
- Q3 CIGRE Session, Paris 2020. Two NGN members will represent the Irish NGN!
- Q4 CIGRE Ireland Young Member's Showcase
- Q4 Joint event with UK NGN in Belfast

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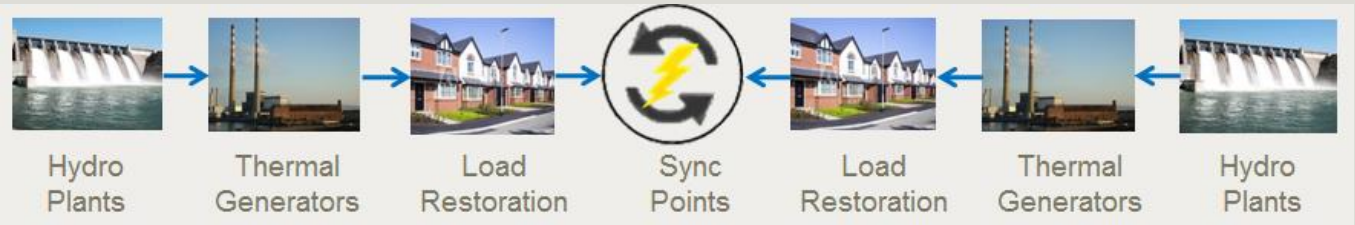
Q1 Newsletter 2020

Black Start: Restoring a Blacked Out Power System

Adrian Coughlan, EirGrid

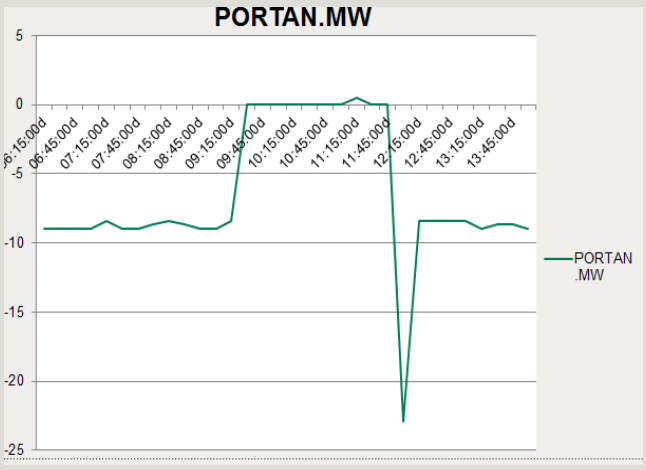
In accordance with the European Awareness System, the Irish power transmission system is at all times operating within five of the following states: Normal, Alert, Emergency, Blackout and Restoration. If a significant system event results in the system falling into a Blackout state, the transmission system operator (TSO) EirGrid will issue a Blue Alert. The following article will describe how Eirgrid plans for such an event.

Firstly, the system is split into four regions for restoration; North, South, East and West. Each region consists of both hydro and conventional generators as well as dedicated Bulk Supply Points to target for early demand restoration. The Irish approach to restoring system voltage in full blackout state is to start hydro plants using an on site diesel generator, using these to supply auxiliary loads of large generators and then restoring customers in this way. The four systems are then controlled synchronised together to form a stable resilient grid.



An alternative to the above approach is to use the East West Interconnector (EWIC). EWIC is a 260 km long VSC HVDC submarine cable from Ireland to Great Britain. It is contracted to provide top down black start capability. It can be use in place of the hydro plants as the initial source of voltage and power to supply the auxiliaries of the conventional generators.

In May 2018, the TSO successfully carried out a test with EWIC and the Distribution System Operator (ESB Networks). The objective of this test was to black start the interconnector locally, energise the transmission system up to the sync point and to synchronise EWIC with the main grid.
The adjoining trace shows the power flow as seen from Portan on the day of the test. Initially there was a 9 MW export as the station was running at a minimum load. The Blue Alert was issued and the station shut down. It then successfully black started at 10:12 and began to energise its path to the sync point. At 11:57, EWIC synchronised with the main system. The reason for the power swing was due EWIC synchronising at a slight high frequency (50.01 Hz) and it exported required amount to keep its frequency at 50 Hz



In summary, having black start capability in EWIC is critically important because it provides a quick, stable and safe source for black starting conventional generators. In addition, it is also provides a more reliable source when compared to older hydro generator stations.

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Q1 Newsletter 2020

Preparing Transmission Owners for Deployment of a Modular SSSC

Robert Fenlon, SmartWires

The SmartValve, is a modular static synchronous series compensator (SSSC) transitioning from pilot technology to a commercial solution for power flow control issues. As the SmartValve enters this phase, transmission owners need to be prepared with technical documentation, workshops and explanations that show how this device can be deployed, maintained and operated. SmartWires are now in the process of developing technical documents and processes such as the SmartValve Application Guide, Device Specification Sheets, Maintenance Strategy, Internal Device Protection and Sensors Documentation, and a Generic SSSC Technical Specification.

SmartWires are also delivering workshops and answering technical queries from transmission owners. The workshops and queries cover topics including the operation of this modular SSSC, device control modes, deployments, maintenance, interaction with protection, device applications and component characteristics. The aim of this work is to provide transmission owners with the information they need to procure, deploy, install and operate this modular SSSC over the entire lifetime of the device.

The impact and results of this work can be considered on three time scales: short term, medium term and long term. In the short term this work has led to system operators considering the SmartValve as a viable competitive solution for power flow control issues such as congestion and increasing transfer capacity. Many system operators have been assured by this work and are accepting the SmartValve as a viable alternative to traditional solutions. In the medium term this has led to the acceptance of the modular SSSC as the preferential solution for grid issues and has led to the order of at least 375 MVAr of SmartValve devices for installation in 2020. This is a significant progression in adoption of SSSC technology as there have previously been only 5 installations of standalone SSSC technology in the world. In the long term this work can lead to the wide scale adoption of the SmartValve and other modular FACTS devices. Adoption of modular devices overall can enable the energy transition, increase the integration of Smart Grid technology and improve the flexibility of grids across the world.

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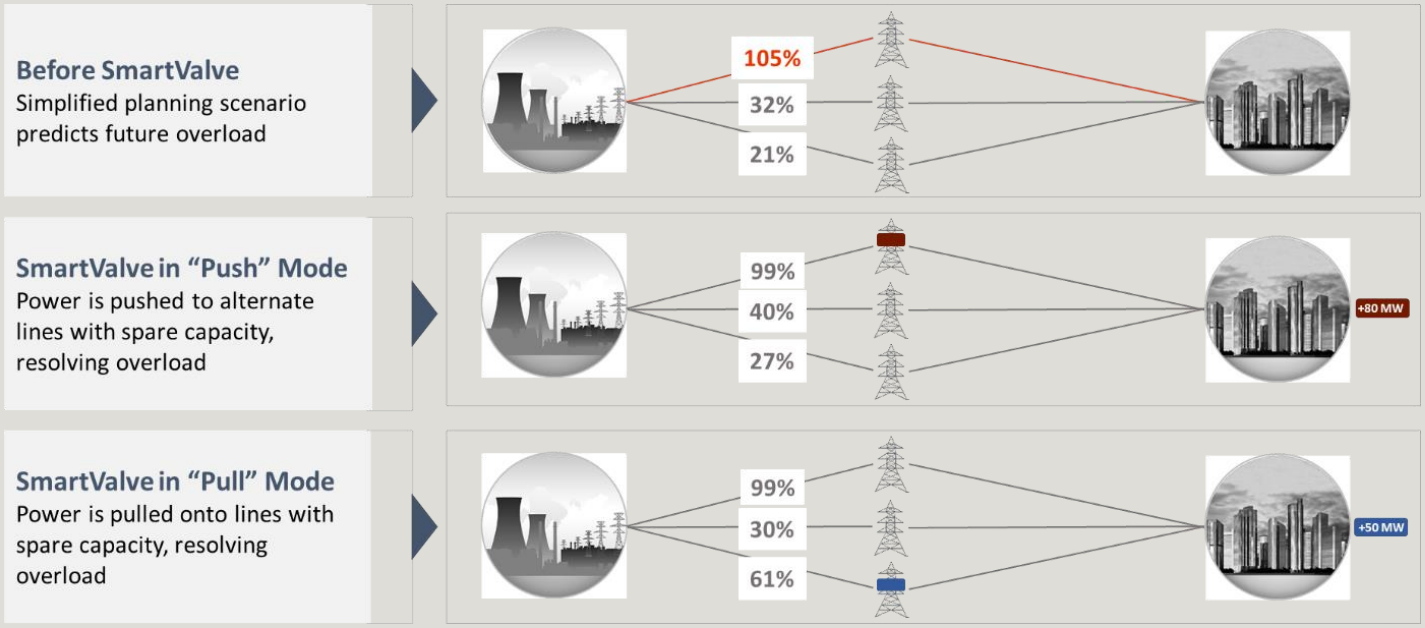

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For power system expertise