

PRIMARY SUPPORT

Power System Stabilization with Distributed Energy Resources

MATURATION

BENEFITS

- Cost reduction of electrical network operating margins
- Increase grid stability and security
- Best use of Distributed Resources.

KEY WORDS

- Electrical network
- Frequency Load Shedding
- Smart Grid

CONTEXT

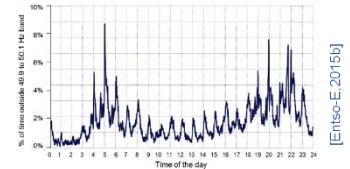
Due to Distributed Renewable Energy Sources (DRES), Power Flows are becoming bidirectional and lowering the inertia, increasing the frequency deviations and reducing the self healing reaction efficiency of our modern Power Systems. This high frequency deviation within power system gets a serious problem for today's network operation.

TECHNOLOGY

The purpose aims at stabilizing the frequency of the network by controlling the active power of distributed loads / sources with frequency deviation.

This is realized with 5 steps :

Daily occurrence of high frequency deviation in the Nordics (>100mHz)

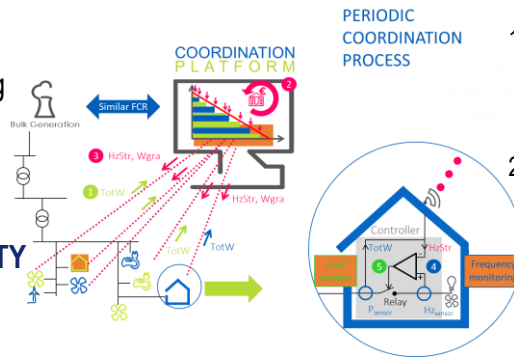


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INTELLECTUAL PROPERTY

- 1 patent delivered
- FR13/62664, PCT/US

LABORATORY



1. Periodically measure the value of the load shedding potential (small/diffuse load) or the production of renewable energy for a dispatch down (source)
2. Prioritize and sort within the frequency range for each site the estimated load shedding power in the next 15 minutes (taking into account the instantaneous load shedding power and the history of consumption of the site, or the production of renewable energy).
3. Send to each site it's own frequency threshold
4. For a load, if the grid frequency drops below the threshold, selected loads are disconnected. For a source, if the network frequency reaches the threshold, it reduces the injection on the network.

FUNCTIONS

- Automatic and secure selection of Frequency Containment Reserve (FCR).
- Automatic and secure selection of pre-Under Frequency Load Shedding (UFLS).
- Targeted DER and DRES: electric heating, hot water tank, electric vehicle, distributed storage and renewable sources.

APPLICATION

- FCR and possible pre Under-Frequency Load Shedding (UFLS)

MATURITE

The technology (hard and software) has been validated within the EU project DREAM. Successful testing was realised at the ICCS Lab in Athens, the airport in Milan and the showroom at Schneider Electric. Further tests in the lab on real network simulations have been carried out. Data was managed with a cloud based platform in Lille.



MATURITY

- TRL 6
- Démonstrateur
- Tested on network

CONTACT

Gisela SCHACH
Innovation project manager
gisela.schach@linksium.fr