
Review of the Frequency Containment Process (FCP) – FCR-D design

Executive summary

Nordic Analysis Group (NAG)

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1. Background

The Nordic Transmission System Operators (Energinet, Fingrid, Statnett and Svenska kraftnät) have through the Nordic Analysis Group (NAG) carried out parallel projects within the domain of automatic frequency control with improved frequency quality and stability as the main objectives.

The project portfolio has consisted of evaluating the performance of and requirements on

- i. Frequency containment process (FCP)
- ii. System inertia
- iii. Frequency quality
- iv. Under frequency load shedding (UFLS)

with the high level relationship between the projects according to Figure 1.

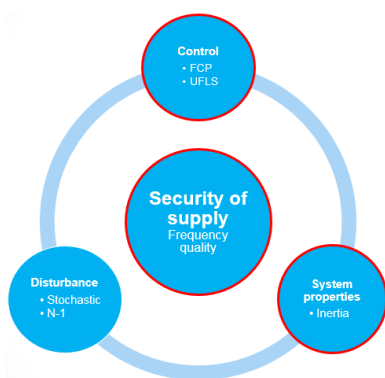


Figure 1: Relationship between the projects

Following the project "Review of the Frequency Containment Process (FCP)", a separate project "FCR-Design" has been run, with the goal to

- review and harmonize the technical requirements for FCR-D with the goal of relaxing the requirements in order to ease pre-qualification / pre-qualify more capacity/units,

based on the results from the FCP-project.

2. Results

The main delivery from the project is an FCR-D design based on a framework that was given to the project. The framework consisted of a set of constraints (reference incident, frequency quality,

transient / small signal stability, possible pre-qualified capacity per TSO) and a target to minimize the system inertia that is needed in order to fulfill the hard constraints. The project has also delivered a sensitivity analysis stating the impact of the various constraints on the final design.

For the defined framework, the resulting FCR-D design will require support from a new ancillary service, Fast Frequency Reserve (FFR), during all hours of the year in order to maintain transient frequency stability margins.

A second delivery from the project is the overall requirements on "switch over" between FCR-N and -D if these are to be provided by the same FCR providing unit.

3. Next steps

Due to the fact that the main framework resulted in a need for FFR during all hours of the year there is a need to complement these results with non-technical analysis such as a feasibility study and a multi-criteria assessment where the impact of FFR is also evaluated before concluding on the final technical requirements.

The feasibility study, planned start during the fall of 2019, shall also deliver a realistic plan for implementation of the new requirements for FCR, by involving stakeholders in national reference groups, identifying the main obstacles and how they can be overcome. The work with implementation / roll-out of the new requirements will take place after these studies have concluded.

4. Contact information

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