Future System Operability Assessment





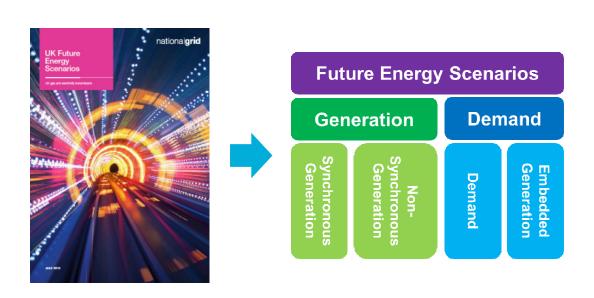


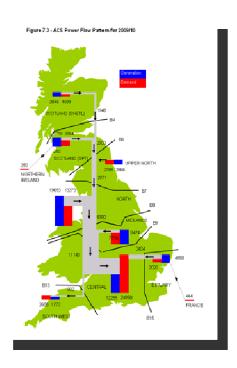
Liena Vilde – Power System Engineer

Vandad Hamidi - SMARTer System Performance Team Manager

Future Energy Scenarios

Impact of FES – power flows, transfer capacity and operability

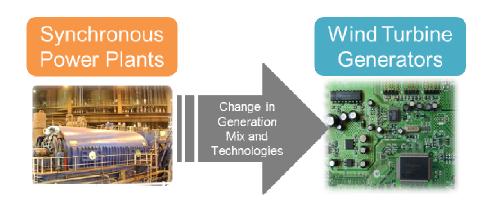


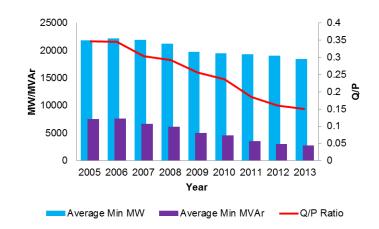


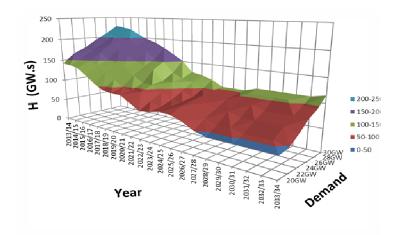
Change in Energy Landscape - Examples

Reduction in System Inertia → **Increase in RoCoF**

Reduction in Q/P \rightarrow High Voltage







System Operability Framework

Future Energy Scenarios

Performance Requirements

Operational Challenges

Operation Solutions & Opportunities

Electricity Ten Year Statement



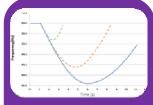
Change in Energy Landscape

Generation mixInterconnectionDemand sideservices



Economic, Efficient and Operable System

- •Large infeeds (>1800MW)
- •System stability
 Frequency
 - Voltage
 - Rotor angles
- •Constraint minimisation •Market facilitation



Reduction in System Strength

- System inertia
 - RoCoF
 - Primary response
 - System stability
- Short circuit level
 - Power quality
 - Protection
 - HVDC commutation
 - System stability



SMART Grid Development

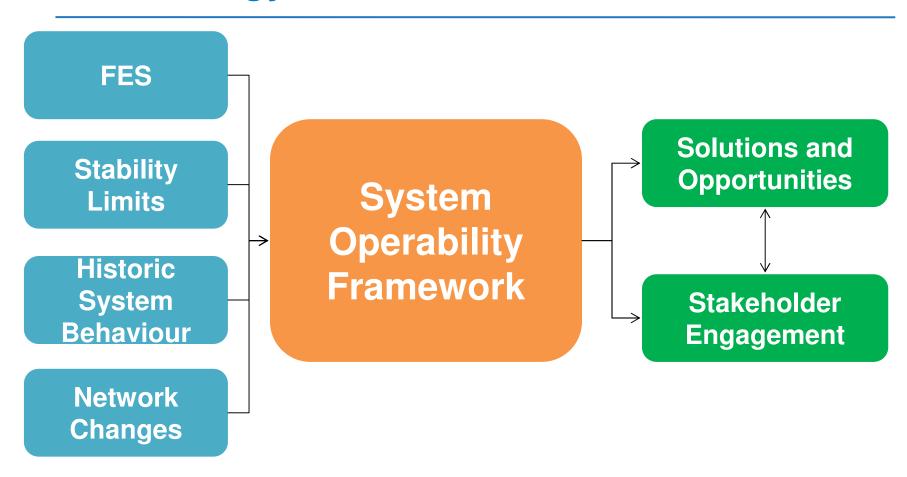
- •Rapid response
- •Demand side response
- Low load operation of thermal plants
- Dynamic thermal ratings
- •System wide controller
- Parallel HVDC links



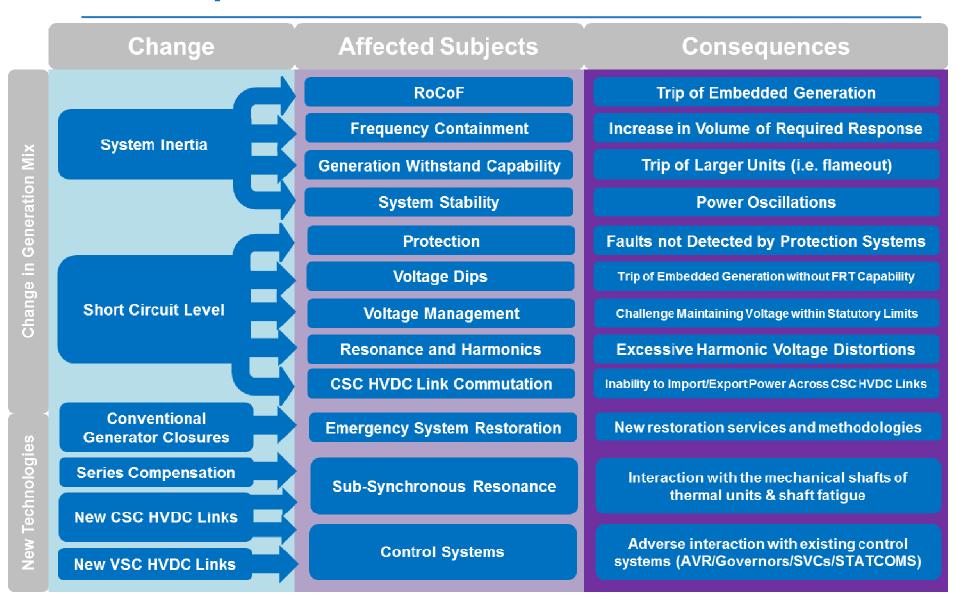
System Operation Chapter of ETYS

- Variations in each topic
- •Opportunities for stakeholders to provide new services
- •Stakeholder feedback

Methodology



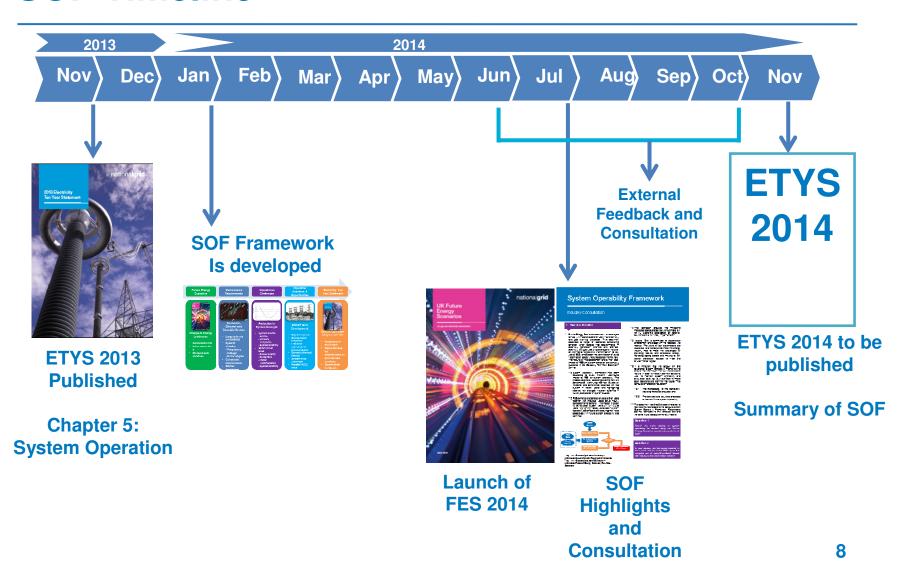
SOF Topics



Examples of Potential Solutions

- From a technical point of view, the following services could help manage operability:
 - Rapid Frequency Response
 - Synchronous Compensation
 - Demand side response
 - Improved services from HVDC Sources
- One solution may mitigate a number of issues CBA
- Further work is required to review technical and commercial codes

SOF Timeline





Any Questions

Contact

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