Grid Code Update

Wind Testing Workshop
28th May 2015
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Presentation Overview

- Grid Code Update
- ENTSOE Network Code Update
- System Analysis – Wind Farm FRT Behaviour

DS3 Grid Code Modifications

DS3 Major Modifications	• Frequency Response • Voltage Control • Wind Farm Fault Ride Through Behaviour • Harmonics
Clarification Modifications	• Six
Housekeeping Modifications	• Five
WFPS Guidance Note Document	• Explanatory document for Grid Code Modifications
Business As Usual	• Compliance and Testing Team

Outstanding

- Dynamic Model Modification
  - Revision of modelling requirements for Users
  - Models to better represent performance of installed plant
  - Validation of models against commissioning tests
- WFPS Grid Code Guidance Note
  - Revision based on industry dialogue
  - Aim to present to Grid Code Review Panel in September 2015

Overview of Network Codes

Connection Codes

- Requirements for Generators
- Demand Connection
- HVDC connection

Operations Codes

- Operational Security
- Operational Planning and Scheduling
- Load-Frequency Control & Reserves
- Emergency Procedures & Restoration

Market Codes

- Capacity Allocation and Congestion Management
- Forward Capacity Allocation
- Electricity Balancing

NC - Joint Grid Code Working Group

6 Codes Reviewed

Next 3 Codes by September 2015

Grid Code Modifications

Connection Codes
Significant Impact

Operations Codes
Potentially Large Impact

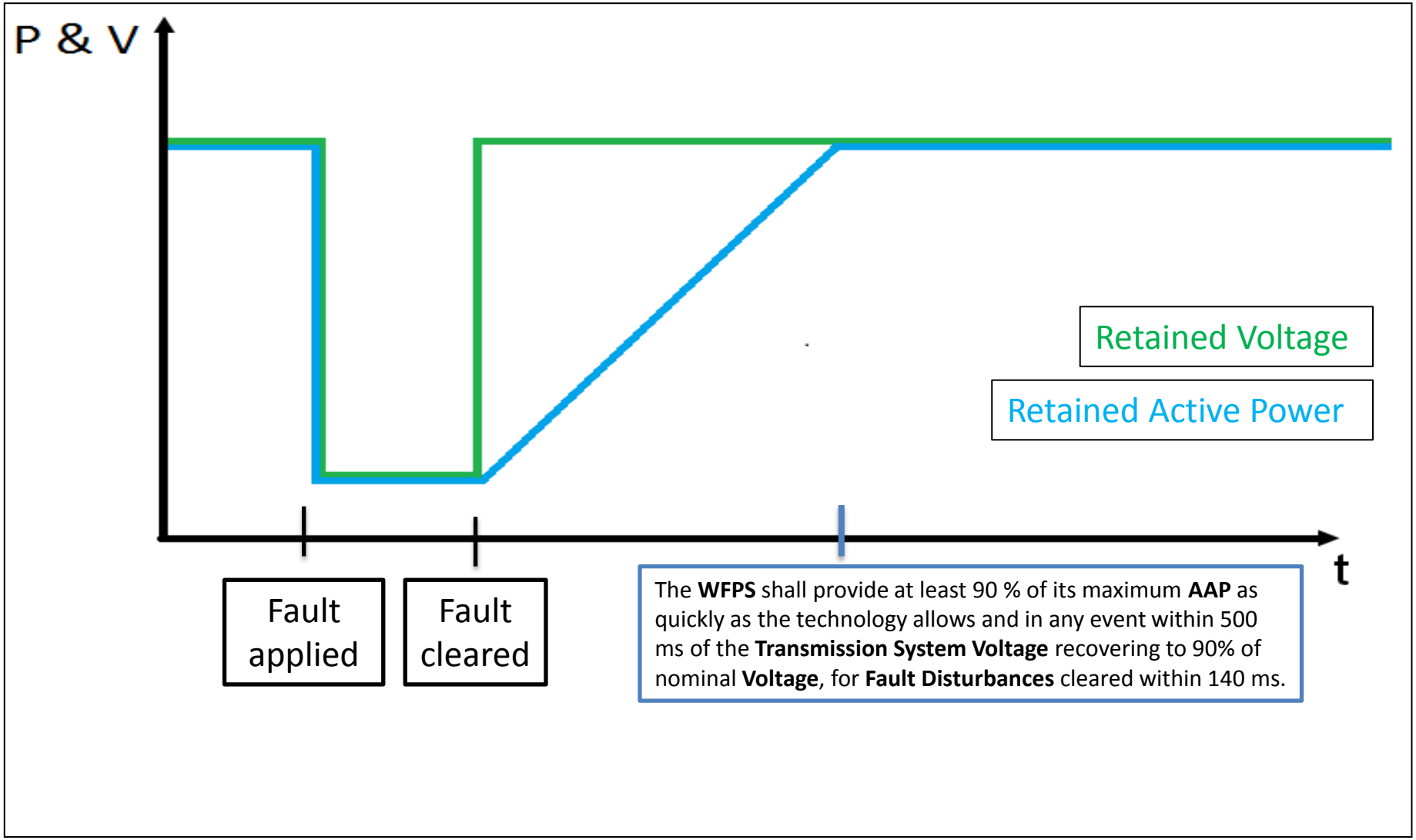
Market Codes
- Market Documentation
- GC Scheduling & Dispatch

EIRGRID semo SONI

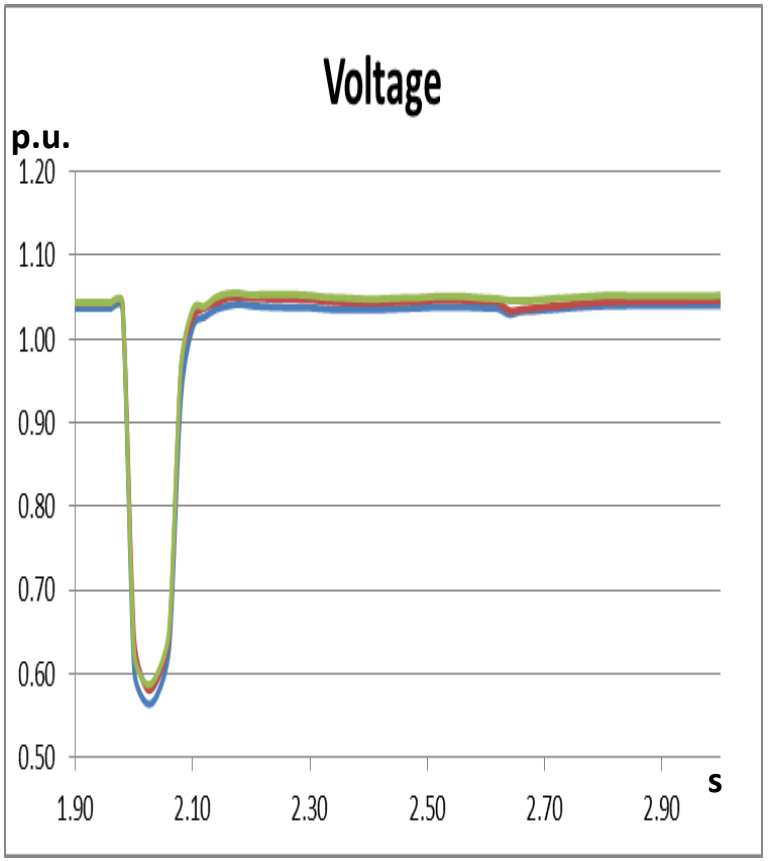
System Analysis

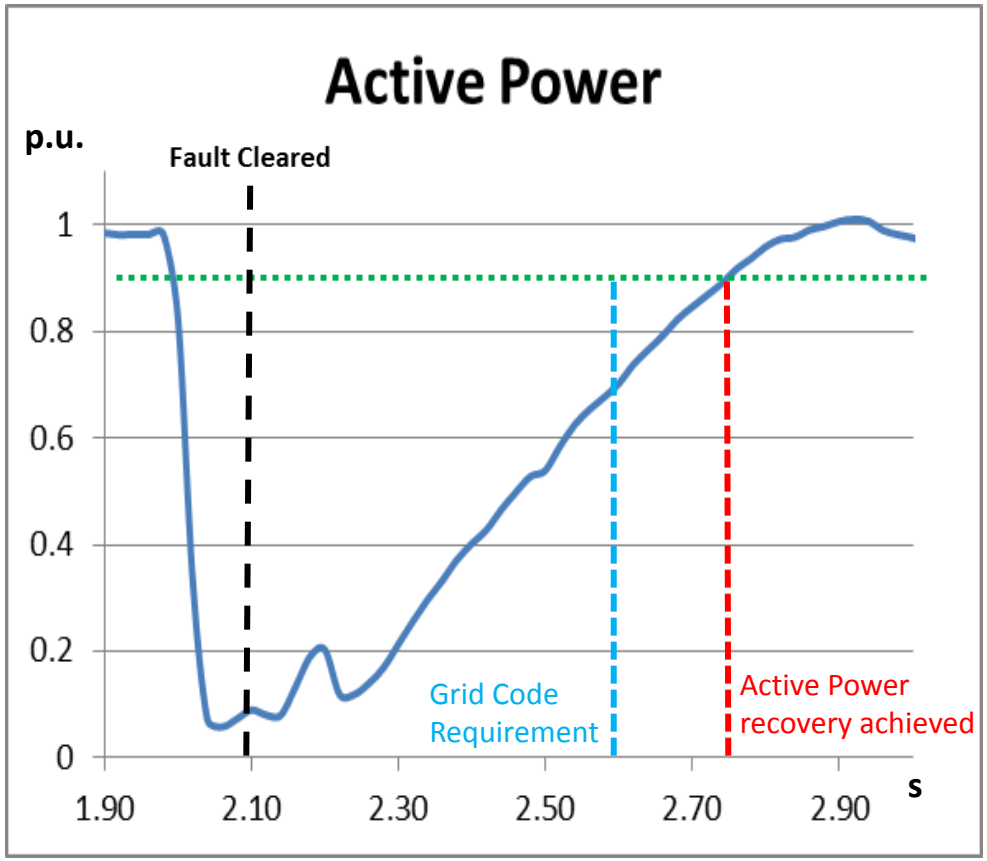
WFPS Fault Ride Through Behaviour

Grid Code Requirements for Wind Farm Fault Ride Through Behaviour



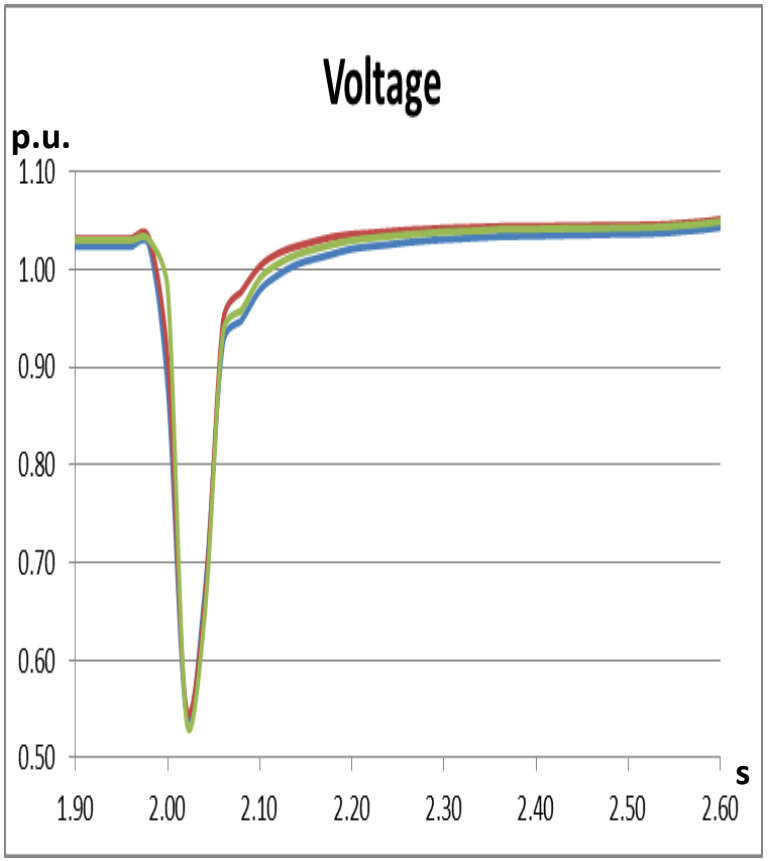
Turbine 1: Fault Duration of 60ms

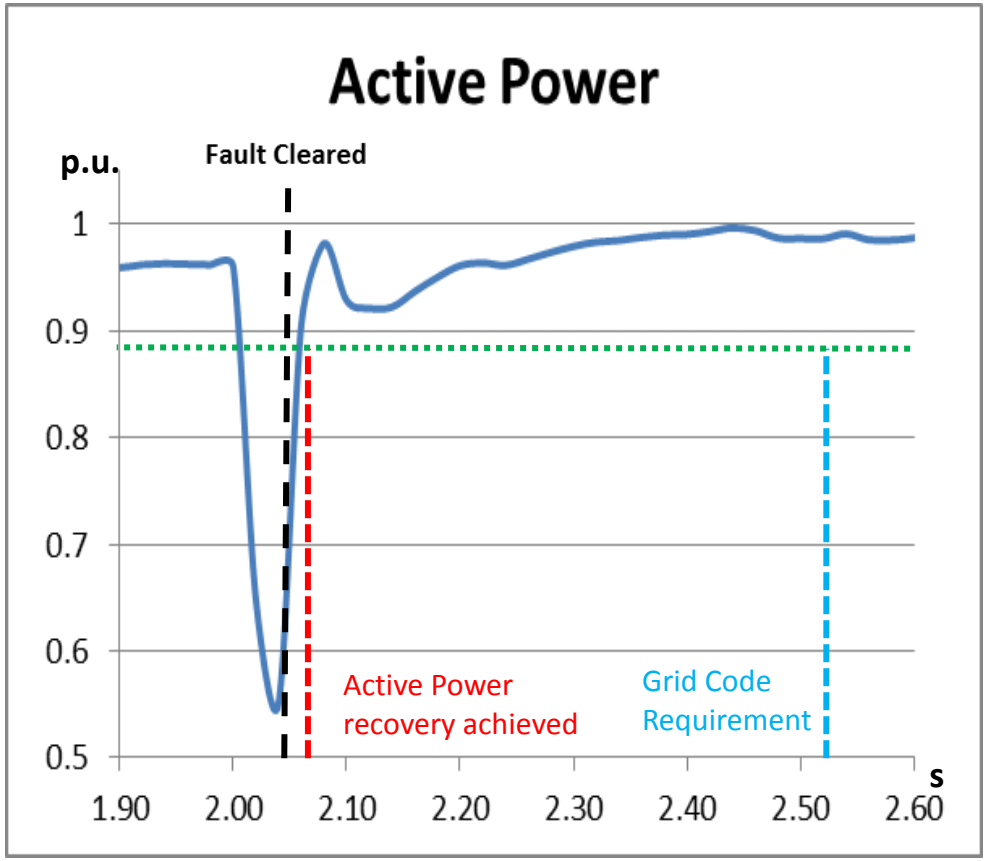




55.6% Retained V
5.9% Retained MW
680ms Recovery Time

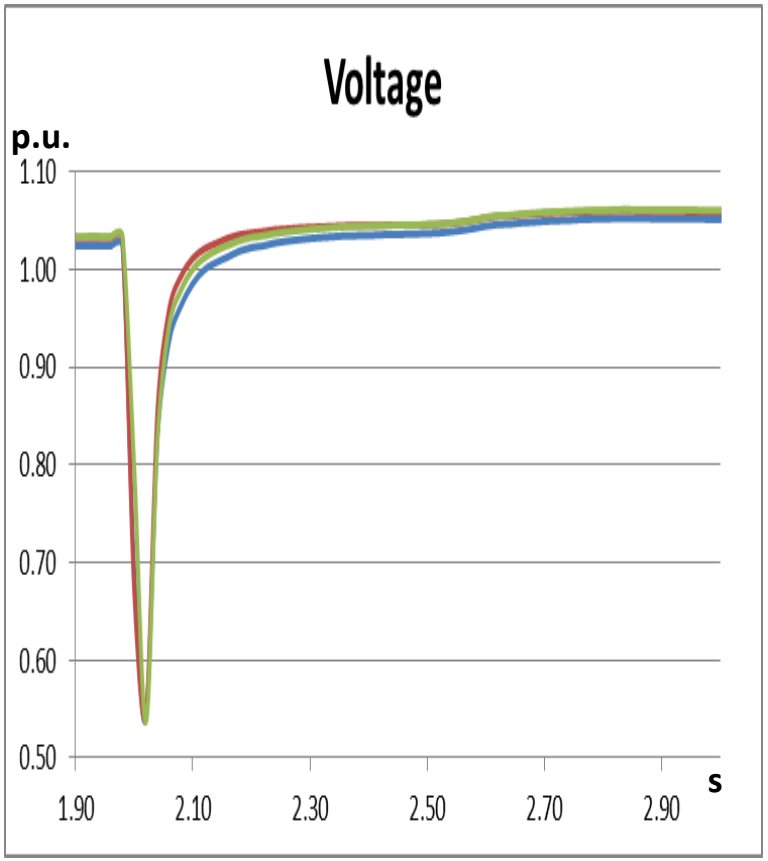
Turbine 2: Fault Duration of 67ms

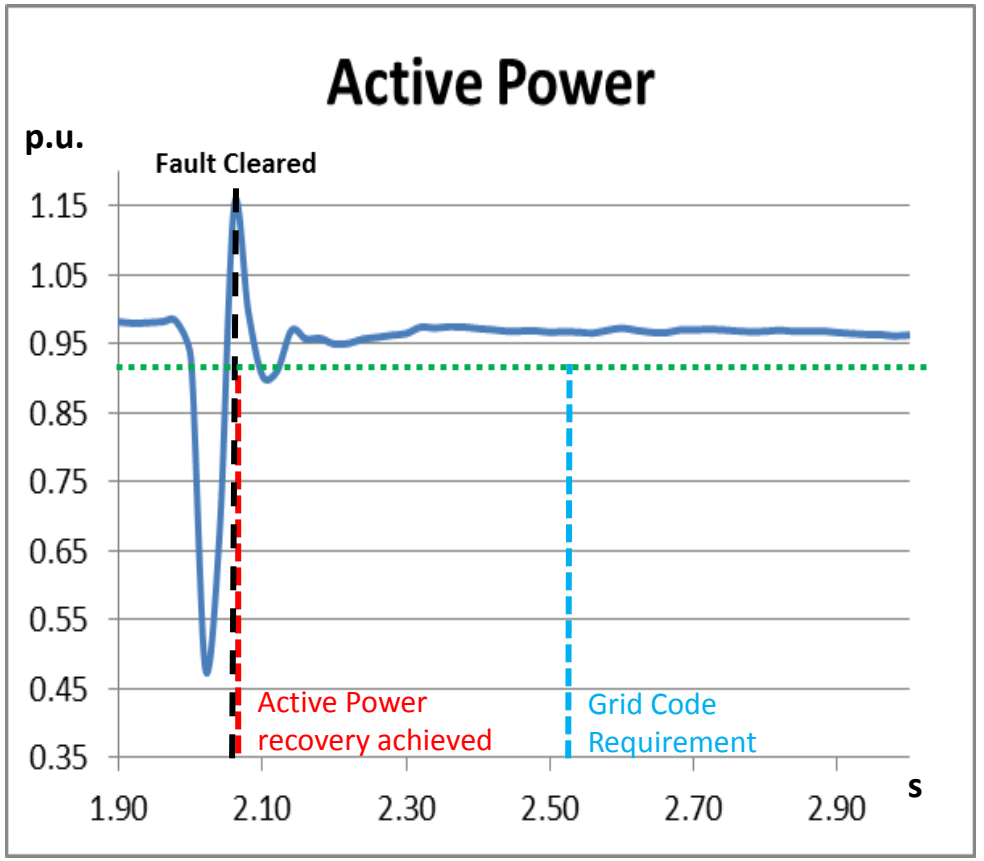




53% Retained V
56.4% Retained MW
10ms Recovery Time

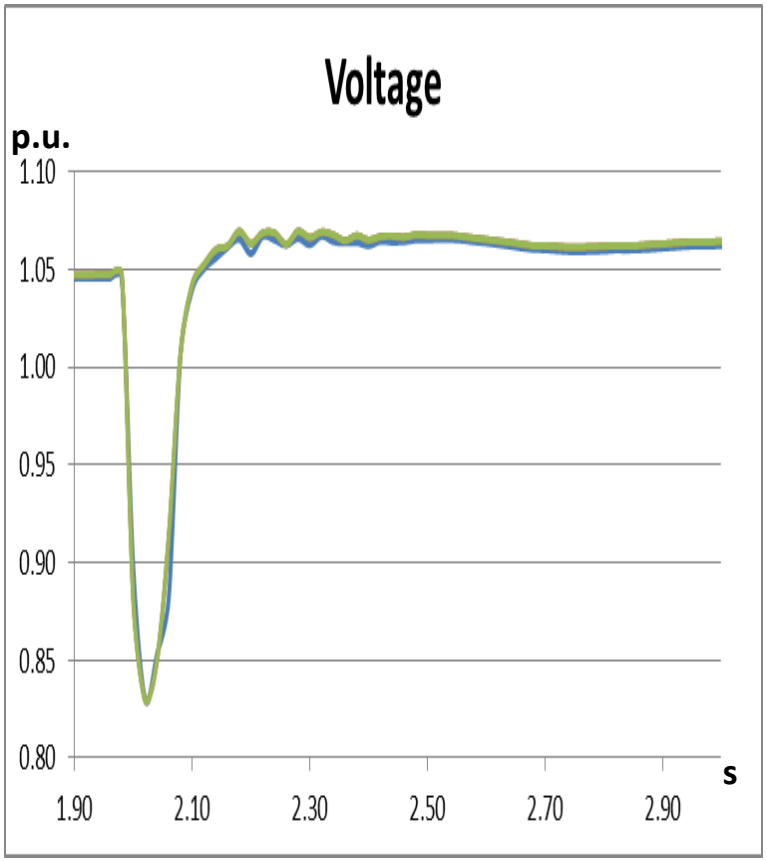
Turbine 3: Fault Duration of 67ms

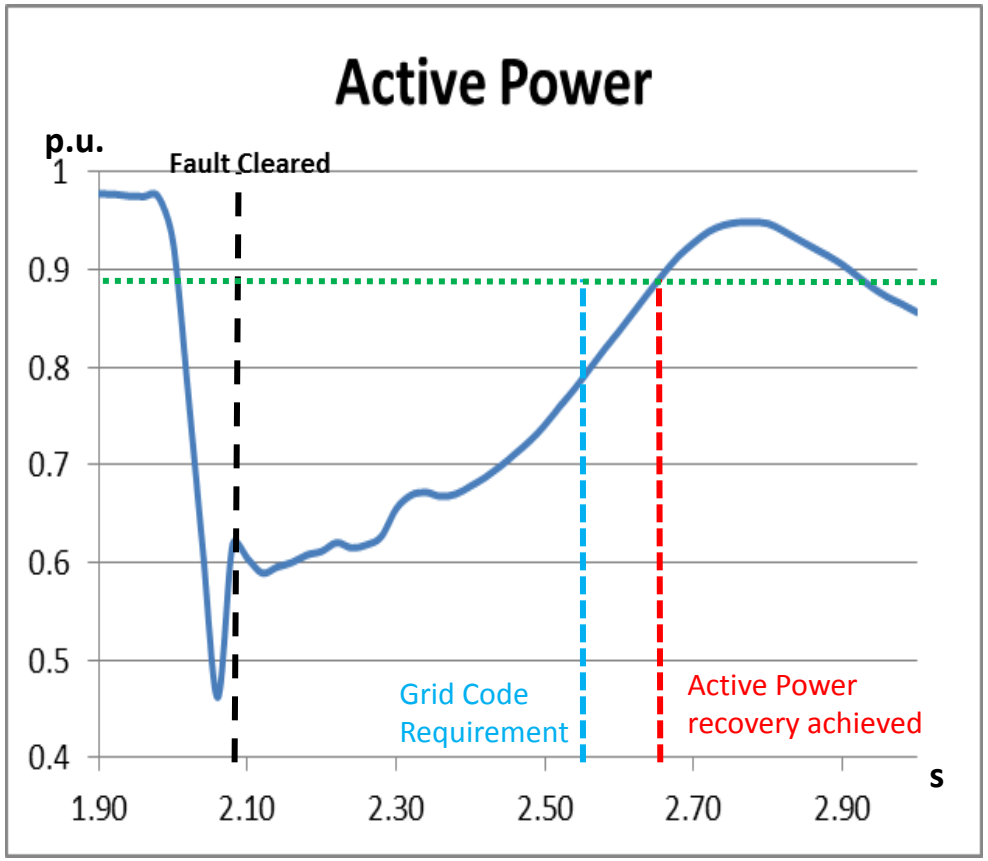




52.4% Retained V
48.3% Retained MW
10ms Recovery Time

Turbine 4: Fault Duration of 70ms



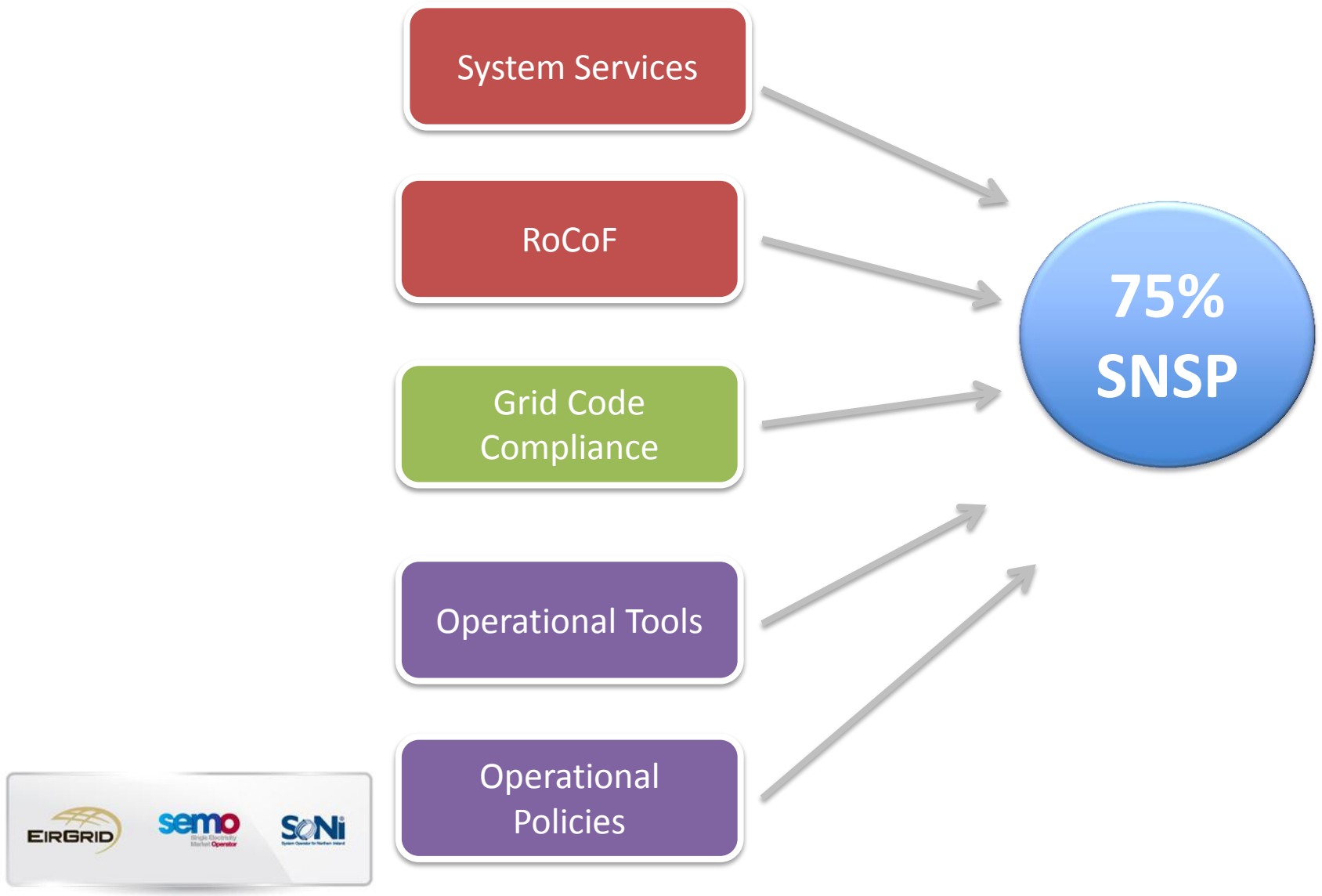


79% Retained V
46.4% Retained MW
590ms Recovery Time

Conclusions Review of FRT Behaviour

- Following up on behaviour with relevant wind farms
- May need further discussions with OEMs
- Number of derogations against this clause
  - 23 temporary derogations
  - 2 permanent & 1 temporary derogation applications with the CER
  - 2 permanent derogation applications with EirGrid.
- On-going operational studies highlight importance of fault ride through Grid Code compliance of WFs
- Updates to existing wind farm dynamic models possibly required

Complementary Progress Essential




EIRGRID
semo
Single Electricity
Market Operator
SONI
System Operator for Northern Ireland