

Summary of Meeting and Actions

Meeting Name	Frequency Response Technical Sub Group
Meeting No.	4
Date of Meeting	Monday, 28 th March 2011
Time	10:00am – 13:30 pm
Venue	National Grid House, Warwick

This note outlines the key action points from the fourth meeting of the Frequency Response Technical Sub Group.

1) Introductions, Minutes and Apologies

The Chair introduced the meeting and reiterated apologies from Damien McCool, Peter Thomas, Martyn Cunningham, Jytte Kaad Jenson, Ken Lennon, Bjorn Andresen, Simon Lord, and Alan Mason.

Sohnke Schierloh and Alistair Frew had not been able to attend in person and therefore joined by teleconference call.

2) Previous meeting's minutes and actions

The previous meeting's minutes had not been circulated prior to the meeting and therefore it was agreed that an electronic copy would be circulated after the meeting and members would have 5 working days to comment. The final version could then be accepted by email and posted on the website. The actions from the draft version were used for the meeting.

Action: TI

KL commented that it would be possible to collect more operational data and agreed to discuss requirements with National Grid – ongoing

Action: KL

It was agreed that the Working Group report should start to be drafted – ongoing.

Action: TI

Except the actions specified above all previous actions had been completed.

3) Modelling update

SW presented a slide pack which summarised National Grid's latest modelling and the assumptions what underlies it.

The first assumption to be discussed was the assumed ramp rates for generation. MC stated that he thought that the 8MW/s quote for synchronous plant was a bit fast and asked whether National Grid could compare this to actual operational matrices. GS confirmed that these had been compared to actual units and that some were faster and some were slower. National Grid said they would further confirm the ramp rate assumptions.

GS confirmed that all numbers were for 2020 scenarios and that 2025 scenarios were not considered. It was also confirmed that primary response was being considered only in the modelling.

As an alternative to rate of change of frequency triggers, National Grid has started to look at whether asynchronous plant with enhanced response ramp rates could fulfil the frequency containment criteria.

Low Demand, Low Wind scenario: Under this scenario it was confirmed that 1400MW of primary response had been selected in order to ensure that the frequency did not dip below 49.2Hz. A ramp rate for asynchronous plant of 1% of capacity/second was confirmed as well as a largest secured loss of 1800MW.

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Low Demand, High Wind: Under this scenario it was not possible to contain system frequency over 49.2Hz even with the scheduling of all available plant with a frequency response capability. This is partly because most of the plant running are wind turbines. It was confirmed that under this scenario a significant amount of generation was the existing nuclear (and therefore non-responsive) plant and that the new nuclear generation was the relevant infeed risk.

Low Demand, High Wind, df/dt triggered control: In order to meet the frequency containment criteria, a df/dt triggered synthetic inertia equivalent to 7% of available wind generation was incorporated into the model. The group highlighted that this raised the question of whether it was possible to deliver df/dt triggered synthetic inertia and primary response services simultaneously. It was also highlighted that the df/dt trigger could be implemented on other plant types such as interconnectors and give the same benefits.

Under this scenario it was assumed that the wind turbines would require a 0.5s delay time and 0.5s for filtering. MC stated that he thought such timescales would make accurate triggering difficult. SW agreed and explained that this was an accepted feature of this option and why other approaches, such as delta f, were also being considered.

Low Demand, High Wind with fast acting governors: Slide 6. Under this scenario it has been assumed that 1200MW of fast acting response can be produced in 4 seconds, or that the asynchronous machines can increase output by 2.5 – 3.0% / second. This analysis suggests that frequency containment can be achieved if the asynchronous machines which are providing primary response (and are hence already curtailed) can provide it quicker. Therefore it is feasible to define a synthetic inertia requirement that could be satisfied by means of a fast acting proportional governor (sometimes referred to as delta f control).

JD proposed that specific technology or solutions shouldn't be codified into an obligation but the required outcomes should be described so as to give the manufacturer room to be inventive. PC responded that whilst this is normally the case in this instance a bit of specification was required given that delays and ramp rates in frequency response were so critical to how the system performed after a large infeed loss.

The TSG also discussed whether a requirement expressed as a volume of energy would be a better approach or whether the requirement could be better described more generically as a droop characteristic.

A general summary from the slide pack was that if that when system demand is less than 35GW there appeared to be a requirement for Synthetic Inertia in some form (under the Gone Green Scenario).

TI suggested that the underlying assumptions behind all the modelling will need to be clearly documented in the Working Group Report and it may be wise to start doing that shortly. It had been assumed that for example that an 85% loading point was used across a fleet of wind turbines but market prices may dictate a narrower selection is made and this will affect ramp rates.

2025 Scenario

Under the expected 2025 generation background, there will be substantially increased volumes of wind and there are general plant scheduling issues associated with high wind periods. The TSG concluded that recommendations must be developed for a 2020 scenario first and if further evolution is required for 2025 that needs to be developed later, on a secondary basis.

4) Remaining steps and scheduling of final meetings

The TSG suggested that representatives from Ireland could be invited to a future meeting to discuss their finding to date on response issues on their network.

Action: TI

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The group discussed the deliverables and concluded that the Sub Group Report must contain:

- The complete model
- Assumptions behind the model
- Recommendations

It was proposed that the next meeting could be held during the w/c 2nd May and that the last meeting will be the w/c 23rd May. National Grid agreed to endeavour to circulate material two weeks prior to the meeting to allow it to be considered over the Easter period.

Action: National Grid (TI)

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Appendix 1 – Working Group Attendance

Members Present:

Tom Ireland	TI	Working Group Chair
Graham Stein	GS	National Grid
Joe Duddy	JD	Renewable Energy Systems
Stewart Whyte	SW	National Grid
Tony Lakin	TL	Turbopowersystems
Francois Luciani	FL	EDF Energy
Chris Hastings	CH	SSE
Mick Chowns	MCh	RWE Innogy
Peter Wibæk Christensen	PWC	Vestas

Members joining by teleconference call:

Alastair Frew	AF	Scottish Power
Sohnke Schierloh	SS	Enercon

Apologies:

Damien McCool	DM	EDP Renewables
Martyn Cunningham	MCu	Scottish Power
Jytte Kaad Jenson	JKD	Vestas
Ken Lennon	KL	SP Power Systems
Bjorn Andresen	BA	Siemens Wind Power
Simon Lord	SL	First Hydro
Steve Curtis	SC	National Grid
Peter Thomas	PT	Nordex
Alan Mason	AM	REpower