DS3 Programme Advisory Council Meeting Minutes

Date: 22/10/2012
Time: 10.00 – 14.00
Venue: EirGrid Offices, Dublin.

Chair: Michael Kelly

Attendees: Donal Smith, Peter Duffy, Ian Luney, Carsten Junge, Úna Dixon, Gerry Hodgkinson, Mervyn Adams, Jody O'Boyle, Colin Spain, Caitríona Diviney, Peter Thomas, Joe Duddy, Michael Conlon, Joe Durkan, Kevin O'Rourke, Pamela Walsh, Peter Harte, Mark O'Malley, Paul Hickey, Cathy Mannion, Stephen Walsh, Denis Cagney (part), Jonathan O'Sullivan, Dick Lewis, Yvonne Coughlan, Tom McCartan, Alan Rogers, Michael Preston, Simon Tweed, Martin McCarthy, Shane Rourke (part), David Cashman (part), Ciara Corby (part)

Apologies: Juan Ma Rodriguez, Gráinne O'Shea

Summary

- The focus of the DS3 Programme over the next 12 months will start to move more into the system policies and tools space.
- The third System Services consultation paper is a major focus at present. It contains proposals on the financial arrangements around the new products.
- The Grid Code wind farm modifications from a wind industry perspective appear reasonable and straightforward.
- The RoCoF workstream is at a critical juncture and it may be appropriate to set up a focus group.
- The All-Island Curtailment report attracted comments particularly around the depth of analysis and the information that it should contain.
- It was suggested that discussion topics should be decided with members before the Advisory Council meeting.

Review of Actions from last meeting

The actions from the last meeting were reviewed.

It was clarified that based on historical analysis up to 5 high RoCoF events (greater than 0.5 Hz/s) per annum could be expected in 2020. This is detailed in the RoCoF Modification Proposal – TSOs' Recommendations paper.

DS3 Programme Update

Summary of Presentation
Yvonne Coughlan provided a general update on the programme to date including work completed in the Grid Code, System Services, Renewable Data, Performance Monitoring & Testing and Grid Code workstreams in the first year of the programme. The different means in which the DS3 Programme has engaged with industry over the past year were touched upon, e.g. consultations, Advisory Council meetings, Joint Grid Code Working Group meetings, industry forums, bilateral meetings and the DS3 section of the EirGrid website.

Updated plans based on the outputs of the first year will be published early next year and there will be a change in focus from system performance standards and incentives to required tools and policies. The focus of the programme in 2013 was also outlined.

Over-Frequency Response (Negative Reserve) was briefly discussed. Further investigation will be performed by the TSOs in order to clarify both the need for and sources of Over-Frequency Response.

Discussion
It was queried whether the required changes to the Distribution Code will reflect the proposed Grid Code modifications. It was stated that the same standards have been agreed in principle but subject to DSOs approval as they have some genuine concerns. It was stated that universal standards are the best way to proceed and there should be no substantial differences. ESB Networks stated that it is their intention to bring the Distribution Code in line with Grid Code.

Comment
The programme is broadly progressing to schedule but many workstreams are at critical junctures, e.g. System Services, RoCoF and Grid Code.

It was commented that the DS3 Programme is more open and inclusive than other initiatives.

Action Item
1. Check work being done by National Grid UK on high wind speed shutdown **[TSOs]**

System Services Review Update

Summary of Presentation
Shane Rourke gave an update on the System Services Review. There have been two consultation phases to date, a round of bilateral meetings with interested parties, an industry workshop and an international review of System Services has been published. The second consultation focussed on the technical aspects and proposed six new services. An approach to remuneration and contractual arrangements was also proposed. A key aspect of the second consultation paper was an increased focus on the reliability of services.

The third consultation paper is currently being drafted. It contains two distinct aspects:
1. Financial arrangements; valuing system services, financial modelling and analysis, and revenue allocation
2. Final position on remuneration approach, contractual arrangements and proposed final product designs based on responses to the second consultation paper

The TSOs have been working very closely with the RAs on the third paper. It has been an iterative process and while this has proved time consuming it is thought that it will help expedite the final approval process by ensuring that all of RAs queries have been addressed. It is expected to have the final draft for the RAs in advance of the SEM Committee meeting at the end of November. Assuming approval the consultation will be published as soon as possible. A four week consultation period (excluding Christmas) is proposed and offers of bilateral meetings will be extended to all interested parties during the consultation phase.

Finally, a recommendations paper taking account of feedback from all three consultation phases will be sent to the SEM Committee early in 2013.

Discussion

It was queried how the ramping product interacts with the energy market in terms of timeframes. It was stated that they are separate and that ramping is complementary to energy and is about rewarding for operating margin that is not utilised.

It was queried if the third paper could contain a section on how the testing for the new services would be carried out. It was stated that this level of detail would be determined at the implementation phase but high-level information had been provided in the second consultation paper. The TSOs are confident that all of the products can be reliably tested and more importantly performance monitored on an enduring basis.

The extent of the financial modelling performed was queried. It was stated that the financial modelling included a valuation of system services and identification of the costs to provide the services.

It was queried that if there was no wind on system how much of the services would be driven by other operational issues. It was stated that the vast majority is being driven by variable renewable generation but there would be some benefits in relation to more efficient operation of the system. The TSOs have witnessed reduced system service capability since the system since deregulation.

Comment
There was general agreement that bilateral meetings were a good idea. It was stated that the 4 week consultation period was too short given the analysis that needs to be performed by respondents. However, concern was raised about timing and getting the final approval. There was a belief that it was in everyone's best interest to get a speedy decision in order to provide certainty for the industry.

Action Item

2. Schedule bilateral meetings with interested parties while the consultation is open **[TSOs]**

Grid Code

Summary of Presentation
Alan Rogers gave an update on the Grid Code workstream and the proposed wind farm Grid Code modifications. The process was outlined which initially involved TSOs/DSOs discussions to outline the main requirements from the SOs perspective in terms of wind farm standards. There were six meetings of the Joint Grid Code Working Group to develop the modifications and subsequent bilateral discussions with wind turbine manufacturers. It was stated that there are no material differences between Ireland and Northern Ireland. The changes in Northern Ireland can be found in a supplementary document called the Wind Farm Power Station Settings Schedule. The three modification proposals for Ireland were outlined; Reactive Power, Fault Ride Through and Frequency Response and Ramp Rates. It was stated that the TSOs are not looking for best-in-class standards but instead are seeking reasonable standards that are achievable by all wind farms. System Services will be used as an incentive to achieve enhanced performance over and above the Grid Code standards.

The wind farm modifications were discussed at the Ireland GCRP meeting on 03/10/2012. The modifications were agreed in principle subject to minor edits and are scheduled to be sent to the CER for approval in late November. The Wind Farm Settings Schedule along with a report summarising the consultation responses will also be sent to NIAUR in late November.

One of the next steps is to bring the modifications to the Ireland Distribution Code Review Panel for approval.

Discussion
It was queried if there was any evidence on a macro scale of the effect of slow active power recovery of wind farms on the frequency of the system. It was answered that due to the relatively low level of wind on the system currently this has not yet been seen.

It was queried if any analysis was performed on the energy impact to wind farms due to the wind following ramp rate. It was stated that the wind following ramp rate was essential in order for TSOs to control frequency, e.g. if a storm front passes over the country. It was stated that the more wind farms on the system, the larger the ramp rate would be in aggregate.

It was queried how many of the existing wind farms were going to be able to achieve the standards in the proposed modifications. It is believed that wind farms designed and built in the last 5 - 7 years will broadly be able to comply with some firmware and software updates at relatively low cost. There are some that will not be able to comply and were not designed to do it. If the only option to comply with the proposed modifications is to install a STATCOM then the TSOs would consider supporting derogation in such a scenario. There will be a case-by-case examination under the existing derogation process of the Grid Code. Please see TSOs' paper on Retrospection here.

Comment
It was stated that some parts of the Grid Code were quite confusing and illustrative examples would help understanding. The TSOs will issue guidelines document relating to the new Grid Code modifications once approved

It was stated that the modifications are reasonable from a wind turbine manufacturer perspective.

It was stated that there is a cost to making changes to wind farms to comply with the Grid Code modifications. It was also stated however, that the cost of not making the changes would be greater in terms of increased dispatch down into the future.

Action Items

3. Issue a guidelines document covering the new Grid Code modifications once approved **[TSOs]**
4. Circulate reviews on Biomass and Storage technologies **[TSOs]**

RoCoF

Summary of Presentation
Tom McCartan presented on the current status of the RoCoF workstream. Following completion of studies based on a fully integrated power system the TSOs have proposed an all-island RoCoF standard of 1 Hz/s averaged over 500 ms. However, until the second North-South line is operational the TSOs are proposing a Northern Ireland standard of 2 Hz/s, both averaged over 500 ms. This is due to the risk of system separation prior to the second tie-line being in operation.

The RoCoF Grid Code modification was discussed at the Ireland GCRP meeting on 03/10/2012. It will be formally proposed and voted on at the next meeting. SONI brought their modification to the Northern Ireland GCRP meeting on 03/10/2012 and it has been published for consultation. It is expected that the RoCoF modifications will be sent to the RAs for approval by the end of the year. The TSOs are awaiting reports from the DSOs regarding their investigation of the maximum RoCoF capability of the Distribution System and how to increase the standard. Following a decision by the RAs and delivery of reports from the DSOs, testing and analysis of the RoCoF capability of generators and distribution system will commence.

There will be no change to the current SNSP level without sufficient information from the conventional generators and the DSOs regarding compliance with the proposed RoCoF Grid Code modifications and appropriate testing by the TSOs.

Discussion
It was queried that if a standard of 2 Hz/s is being sought in Northern Ireland until the second North-South line is operational then why reduce the standard afterward. This is so that new generators becoming operational after the second North-South line is operational do not have to comply with the higher standard.

A background on the evolution of the proposed RoCoF standard from 4 Hz/s to 1 Hz/s in Ireland and Northern Ireland was given.

It was queried whether the current 50% SNSP limit was leading to the cancellation/deferring of wind farm build. It was stated that it is not currently impacting much on curtailment but into the future when more are built it will begin having an impact.

It was queried if the timeline of the end of 2013 for resolving the RoCoF issue will be met. It was stated that it depends on industry and it is certainly solvable in that timeframe.

It was queried if the RoCoF issue had been discussed with the RAs. It was stated that it has been discussed up to the highest level with the RAs and they have been kept briefed and informed at every stage of the process.

Action Items

5. Inform the TSOs if there is anything that they extra can be doing to expedite the process **[Advisory Council members]**

DSOs RoCoF Studies Updates

Summary of ESB Networks RoCoF Study Update Presentation
An update was given by ESB Networks on their RoCoF study.

There are new protection rules (EGIP) which apply to new connections from 01/09/2012 replacing "G10". It contains all required protection settings values except RoCoF which will be released in a month's time.

RoCoF relays have to be able to detect a genuine island and do not want to create a problem for the stability of the system. Data has been received from EirGrid on worse case system events. Also, an investigation of RoCoF in islands using models has been performed. A report is currently being compiled by consultants based on simulations and modelling and two different RoCoF setting values for different types of generator are being proposed:

- A low setting for synchronous machines
- A high setting for asynchronous machines

Testing of the RoCoF settings has been carried out on the 7RW600 protection class relay.

The two major risks regarding RoCoF relays are:

1. Missing a genuine island due to:
    a. Islanded load and generation being similar
    b. Generation having fast frequency and voltage control
2. Risk of spurious operation during:
    a. Low voltage faults
    b. Major system events

Settings are required that will correctly pick up genuine islands but not trip spuriously and they will be kept under review for at least a year.

There is over 1000 MW of generation connected to the distribution system with the old RoCoF protection setting of 0.5 Hz/s and action is required. If a generator can reasonably meet the new setting ESB Networks will require that they do. ESB Networks intends to talk and co-operate with industry to ascertain the relays and the capabilities of the turbines in use to find out how many can easily have their settings changed. They are looking to a low cost approach with only changes to settings on relays without the requirement for new equipment. ESB Networks believes that this is going to take time because there are a lot of different generators / wind farms with different contractors and maintenance routines. ESB Networks require the target level of compliance that is required to inform the levels of derogations to support.

Summary of NIE RoCoF Study Update Presentation
An update was given by NIE on their RoCoF study. The general approach in Northern Ireland up to now was to use Vector Shift (VS) instead RoCoF for Loss of Mains (LoM) protection.

Strathclyde University have been engaged by NIE to carry out laboratory-based verification of LoM protection. The studies have shown that for synchronous generators a 2 Hz/s RoCoF setting is not capable of detecting some genuine LoM events and that VS performs very poorly even at a 6° setting. For DFIG (asynchronous) machines a 2 Hz/s RoCoF setting detects all genuine LoM events however with a 500 ms delay some events were not detected. Voltage Shift protection worked well with DFIG generators. Fast frequency response on embedded generation could impact the ability of existing relaying to detect genuine LoM events.

NIE propose that at 11 kV and below there will be no change to the present LoM settings. There will be no change to the LoM protection on synchronous machines except to remove VS as an option. All other 33 kV generation without fast frequency response will have a RoCoF setting of 2 Hz/s delayed by 500 ms or a VS setting as advised by the TSOs. Other LoM protection settings may be required for generation capable of fast frequency response. This approach requires internal NIE approval.

Discussion
A question was asked regarding NIE not changing protection settings for synchronous generation or generation connected at 11 kV and below. It was stated that there is about 100 MW of small scale wind and diesel generation in Northern Ireland. The diesel generation is used infrequently so NIE do not see it as a problem. Large scale wind generation is seen as the biggest priority and from analysis carried out it appears that an increased RoCoF setting can be facilitated. NIE would like to ascertain the VS equivalent setting that makes RoCoFs of up to 2 Hz/s immune to tripping.

It was queried how NIE are going to communicate the volume of synchronous generation or generation connected at 11 kV to the TSOs.

It was queried that if 2 Hz/s is not seen as a reliable RoCoF setting for synchronous machines, where does the limit lie. The current setting is 0.4 Hz/s and NIE are not intending to change it as they see it as a big risk if LoM protection is compromised. It was stated that there is a big difference between 0.4 Hz/s and 2 Hz/s.

It was stated that if X MW of generation with a lower RoCoF setting remains the system will have to be dispatched to take account of the Loss of Largest In-feed + the X MW.

It was queried how the issue of different types of relay operating differently is going to be addressed if generators are free to use their own relays. It was stated that a study took place in 2005 in GB where signals from simulated/real events were injected into a large range of commercially available relays. The variation in results and performance of the relays was very wide. There was a big correlation between the cost of the relay and correct operation. It was stated that this can done by a standardised commissioning and testing programme where frequencies are injected into the relays to ensure correct operation.

The DSOs were asked about planned courses of action and timescales to implement the changes. NIE stated that internal approval is required in the first instance and they would need to agree VS protection settings with TSOs. ESN Networks stated that the new settings will be applied for new generation connecting from next month on but settings changes to existing generation will take longer.

Action Items
5. Organise meeting with DSOs and interested Advisory Council members to discuss how to move the RoCoF issue forward **[TSOs]**
6. Revert to NIE on appropriate VS settings equivalent to a RoCoF setting of 2 Hz/s **[TSOs]**
7. Circulate 2005 GB RoCoF relay study **[TSOs]**

Renewable Data

All Island Renewable Connection Report – 36 month Forecast

Summary of Presentation
Jon O'Sullivan gave a brief overview of the All Island Renewable Connection Report – 36 month Forecast. The document outlines the TSOs view of the range in MW of new renewable generation that is likely to connect every quarter over the next three years. An increased rate of connection is required in Ireland and Northern Ireland if the renewable targets are going to be met in 2020.

Discussion
The number of MW of new renewable connections this year was queried. It was stated that it is very low and likely to be less than 100 MW. Next year, optimistically 300 MW could be expected to connect but it is likely to around the low 200s of MW

It was stated that from a wind industry perspective the top items that are slowing build out of wind farms are:

1. Policy uncertainty
2. Support schemes
3. Planning (improved of late)
4. Grid build

High Wind Analysis of the All-Island System

Summary of Presentation
David Cashman gave a short overview of the analysis that the TSOs perform to evaluate system security at times of high wind. Snapshots of the system are taken at times with high wind penetration and are analysed for frequency, voltage and transient stability issues. The analysis to date has shown that at current levels of wind penetration there are no voltage and transient stability issues. However, the current Grid Code RoCoF standard of 0.5 Hz/s when measured over 100 ms is being approached regularly. The development of an all-island model is nearing completion which should further improve the accuracy of results.

All Island Curtailment Report

Summary of Presentation
Jon O'Sullivan gave an overview of the All-Island Curtailment Report 2011. The level of dispatch down of wind broken out by month, time of day and region was presented. It was stated that the report will be published pending RAs approval.

Discussion
It was queried if the report could separate out dispatch down of wind into curtailment and constraint. It was stated that it is impossible to distinguish 100% between constraint and curtailment. It is estimated that there is approximately an 80:20 split in between curtailment and constraint.

Industry has the opinion that a more detailed report would be of benefit including why dispatch down is happening in order to help mitigate against it. It is very difficult for the TSOs to identify the exact reason for dispatch down as the reasons are interacting. It was stated that the mitigation strategy for reducing curtailment is the DS3 programme.

It was stated that the report is not a report for an individual wind farm to understand why it was dispatched down but an overall system wide report required for the RAs under EU law (RES Directive).
It was suggested that adding an international context on the levels of dispatched down of variable renewable generation and an informed commentary would be helpful in terms of understanding the report.

Action Items

8. Send comments to the TSOs on ways to improve the report and information on curtailment reports published by other countries and regions **[Advisory Council members]**
9. Discuss making improvements to curtailment report based on comments received from industry and internationally published reports **[TSOs]**

Role of DS3 Advisory Council

Summary of Presentation

Yvonne Coughlan gave a short presentation on the role of the Advisory Council and asked for feedback on its format, membership, frequency of meetings and in general any suggestions that people may have to improve its efficacy.

Comment

Focus groups were suggested but it was stated that it should be kept in mind that there are formal processes in place for many DS3-related tasks e.g. Grid Code modifications are progressed through the Grid Code Review panel.

It was stated that Joint Grid Code Working Group was very effective and worked well.

Action Items

10. Provide feedback on the ways to improve the efficacy of the Advisory Council **[Advisory Council members]**
11. Send links to all relevant EirGrid documentation even outside of DS3 to Advisory Council members **[TSOs]**

Smart Grid

Summary of Presentation

Ciara Corby gave a brief overview of two strands of EirGrid's Smart Grid Programme; Demonstration Projects and the Smart Grid Innovation Hub.

Following an open invitation by the TSOs last April to take part in demonstration projects to develop, trial and prove new transmission system concepts and technologies, two projects have initially been chosen:

1. Glen Dimplex Quantum – Greenway Project
   This project will demonstrate how the Glen Dimplex Quantum space and water heating system may be deployed as an aggregated Demand Side Management tool or system service provider.
2. SSE Renewables / GE Fast Frequency Response Project
   This project will demonstrate fast frequency response from a Wind Farm using GE's WindINERTIA™ control

There is a healthy pipeline of additional projects that EirGrid will choose from on an ongoing basis.

The Smart Grid Innovation Hub is a collaborative initiative between EirGrid & SONI and the National Digital Research Centre (NDRC) to promote the development of innovative Smart Grid solutions with entrepreneurs and companies across the island.

Action Item

12. Follow up with Mark O'Malley regarding US Department of Energy DSM project **[TSOs]**