

**WIND STEERING GROUP
Meeting No 3
CR1**

**Friday 12th March 2004
14:30 - 18:00hrs**

CER/04/211

Attendees	Denis Cagney	CER	Chairperson
	Padraig Fleming	CER	
	David Naughton	CER	
	John McCann	SEI	
	Simon Grimes	ESB NG	
	Paul Smith	ESB NG	
	Tom Greene	ESB NG	
	Philip O'Donnell	ESB NG	
	Gay Kirwan	ESB Networks	
	Tony Walsh	ESB Networks	
	Paddy O'Kane	IWEA	
	Paddy Teahon	IWEA	
	Grattan Healy	MnG	
	Liam O'Donnell	CER Consultant	
Apologies	OFREG		

IWEA – Irish Wind Energy Association

MnG – Meitheal na Gaoithe

1. Agenda

MnG asked why the issue of constraining wind generation had been added to the agenda given that the Group had agreed that this issue was beyond the remit of this group in the second meeting.

CER stated that ESB NG had requested that this item be added to the agenda. CER pointed out that its letter of 23rd December asked that issues regarding constraining be examined during the extended moratorium. IWEA expressed concerns about the context in which constraining was to be raised.

The proposed agenda was agreed.

Minutes 2nd Meeting

MnG stated that it had numerous changes to the minutes of the second meeting which it would forward by email.

2 Survey of Existing Connection Offers – Initial Results

Liam O'Donnell presented on the findings of the survey carried out independently on behalf of the CER. Liam concluded that approximately 661MW of the 786MW was likely to connect to the system by mid 2006. CER stated that the report and a copy of the presentation would be made available to the Group.

A discussion followed. Among the points arising were the following:

- Liam said that the division between transmission and distribution was not referred to in the report on the grounds of protecting the confidential interests of developers.
- Liam stated that those developers without offtake contracts had committed substantial effort and funds to their projects and that in his judgement they were determined to see their projects come to fruition.
- Greater commitment than heretofore was now required by developers bidding for AER contracts, in particular since the AER 3 competition.
- In response to one query, Liam was somewhat surprised at how many developers look likely to proceed. Having said that, the commitment of developers to their projects was substantial.
- CER thanked Liam and said that it would build in the findings of his survey in whatever future decision it will take on the moratorium (as should ESBNG in any proposal to CER).
- CER reminded the Group of certain projects claiming they should have got offers before the moratorium started. There is around 100MW in this position. One project has been adjudicated on positively, but the others are less clear. There are TSO/DSO differences on this. Liam did not consider this aspect in his work.

3 Grid Code for Wind – Progress Update

ESBNG updated the Group on the developments of the grid code issues since the 2nd meeting of the Group.

The Wind Consultation Group had its 5th meeting on 3rd March at which it was planned that the outstanding frequency and voltage issues would be concluded and Signals/Communications/Control would be discussed.

ESB NG is slightly behind schedule due to the lengthy discussions which took place at the 5th meeting but has proposed a schedule which would allow the accelerated wind grid code programme to get back on track.

The wind consultation group is due to meet next on the 16th of March, with the final meeting scheduled to convene on 1st April. ESB NG is due to present its recommendations to the Grid Code Review Panel (GCRP) on 6th April. ESB NG said it was quietly confident that it would be in a position to present a new grid code for wind for the CER's approval on 9th April.

ESB NG stated that detailed discussion papers and summaries should be available for consultation by 22nd March. These papers would cover Fault Ride Through (FRT), Frequency and Voltage issues.

CER referred to the note on its website of 4th March allowing an extension to the time allowed to accept current live connection offers.

SEI addressed the issue of whether wind farms with connection offers would have to comply with the new grid code. It suggested that offers are issued on the basis that the developer must comply with the grid code or the modified code as the case may be. It indicated that in Northern Ireland the wind generator must comply with the code requirements specified at the time the offer is issued.

CER stated that this issue will be considered.

IWEA stated that it would be very difficult for wind generators to comply with all elements of the new grid code and we should certainly not underestimate the difficulties in this regard.

ESBNG pointed out that SONI is also working on adapting a Wind Code, and ESB NG and SONI are trying to align changes to the codes, for compatibility, and at least to avoid unnecessary differences.

4 Reconciliation of Connection Offer Processes – Progress Update

ESB Networks updated the Group on the progress of aligning the offer processes of the transmission and distribution systems. It indicated that general agreement had been reached on amending the processes such that there would be no material differences. It said that the TSO and DSO have devised a common queuing system on a First in -first out basis to apply after the end of the moratorium. ESB Networks should be in a position to forward its draft proposals to CER early next week.

ESB NG has sent CER a letter outlining its proposals earlier this week.

CER will publish the proposed processes next week for consultation. [Since published on the CER website].

On the issue of the interaction between the transmission and distribution codes ESB NG said that there have been meetings between the operators and that the Wind Consultation Group would be studying the issue of Minimum size next Tuesday.

MnG enquired about ESB NG's initial thoughts on this issue, for example on the threshold for compliance with Fault Ride Through requirements. ESBNG said its proposal was that a threshold of 5MW would be adopted. Its proposal paper has been sent to the members of the Wind Consultation Group and MnG.

CER said that the Distribution Code Review Panel (DCRP) will meet on Monday and this issue will be discussed.

5 Programme of Modelling Wind Generation Plant – Progress Update

ESB NG stated that it had received a number of models with varying levels of status since the last meeting. ESB NG gave an overview of 6 manufactures it

was seeking models from. To date 5 of these manufacturers have provided one or more models with varying levels of accuracy, transparency and compliance. ESB NG said that it has entered into direct discussions with the manufacturers and that it was satisfied that they were working to the best of their abilities to provide the dynamic models to ESB NG. It indicated that the main difficulties of obtaining the models lay with the subcontractors.

ESBNG stated that the models tend to be rather opaque, to protect the manufacturer's technology, so that it cannot be sure that all elements of the technology are built in, including FRT. However, ESBNG said that it had meetings with manufacturers in Denmark, which have proven very helpful.

IWEA informed the Group that it had conducted its own research on the progress of providing and validating the dynamic models. It provided the Group with the findings of its research, a copy of which is in **Appendix 1** to the minutes. IWEA indicated that it felt the recent negative press in relation to the provision of the models was not a fair reflection of the efforts and progress been made to submit the models to ESB NG. IWEA had concerns that any lack of transparency in the process of obtaining the models has implications for ensuring a cooperative effort which participants wish to make to assist ESB NG.

IWEA drew particular attention to the website news release by ESB NG of 13th February and in its research it asked manufacturers if ESB NG has discussed model requirements or provided specifications.

ESB NG asserted that it had made contact with the manufacturers and indicated that some useful work had been done in the past two weeks. When asked by MnG if it was in a good position to model what's on the system now, ESB NG said it could make a reasonable approximation.

IWEA expressed concerns that the target associated with obtaining and validating the models was to lift the moratorium but that this process seemed unclear. The industry must understand ESB NG's modelling requirements so that a cooperative effort can be made.

MnG asked if ESB NG was in a position to request an extension to the moratorium on the basis of not having obtained validated dynamic models. ESB NG restated that accurate modelling is required to assist it in implementing complimentary measures when 700/800MW of wind is connected to the system.

SEI noted that a period of 6 months was discussed in the second meeting to validate the models and suggested that this may be an important period going forward.

MnG suggested that it may be useful for Liam O'Donnell to examine the likelihood of current applicants for offers bringing their projects to fruition and over what time period. This might give a better indication of the overall scale of the problem and whether a moratorium is needed. MnG suggested that this could well mean that there was no need for the moratorium, since applications currently waiting in the system are only likely to connect well after the stability analysis and system adaptations are made.

IWEA indicated that the modelling and Grid Code requirements may lead to further slippage of the 661MW identified by Liam O'Donnell as likely to proceed.

6 Constraining of Wind Generation

ESB NG gave a presentation on this issue which outlined the reasons why constraining is necessary from a technical and operational perspective. A copy of the presentation is in **Appendix 2**.

During the presentation, ESBNG stated that they did not have adequate real-time operational data. In reply to a question from MnG on this, ESBNG said they had SCADA from a few transmission connected projects, and basically made up the rest from forecasts. However as MnG and CER noted, provision of SCADA data is a requirement. DSO stated that it does not process this data real-time, and can't therefore supply it to the TSO in that way. MnG concluded this is more of an issue between the system operators.

MnG and IWEA argued that this issue was not directly associated with the moratorium and therefore this Group is not the appropriate forum for discussions on constraining. They stated that constraining was an issue which is possibly 2 years away and had nothing to do with the deadline of 31st March.

ESB NG stated that it was important to communicate the fact that wind generation will need to be controlled and that the issue and need for constraining will need to be addressed very soon, for instance in the Donegal area. ESB NG emphasised that the ability to constrain wind generation will be a requirement of the new grid code.

MnG mentioned that there had to be a proper agreed framework, involving compensation of producers, as is normal with other generators now. CER noted that the proposed MAE did not foresee any such compensation. MnG asked if, when wind generators did not deliver the bid quantity, they would be penalised? And if so, why would windfarms not be compensated for being backed off against our wishes?

IWEA said that the Renewables Directive provided a starting point for discussions on this issue. MnG stated that the policy framework was absent, and developers would not agree to imposition of constraining without an agreed framework. MnG said that discussion needs to be started now, either by CER, or within the Minister's proposed Renewables Group..

7 Other Business

IWEA asked ESB NG if it could provide any indication of what it will be proposing to the CER next Friday. ESB NG replied that it had not come to a decision yet. MnG noted that if ESB NG made no proposal, then the moratorium lapsed automatically.

It was discussed that ESB NG seemed to have three options:

1. End moratorium (ie no proposal);
2. Continue moratorium as is;
3. Some halfway house, possibly involving constraining off.

CER undertook to forward ESBNG's proposal to the members of the Group as soon as these become available.

8 Date of Next Meeting

It was agreed that the fourth meeting of the Group would take place on 22nd March at 14.30. [Note: This meeting was postponed until 26th March].

Appendix 1

Manufacturer	PSSE Models available?	Sent to ESBNG?	Models in development	Anticipated Release Date of Development Models	Validation Status	Contact
Bonus (not contacted officially yet)	1.3MW & 2.3MW	Yes Feb '04	(not contacted officially yet)	(not contacted officially yet)	(not contacted officially yet)	Jan Thisted
GE	GE1.5s and 3.6MW	On web site for the last 6 months	2.x (3 machines)	6 weeks (i.e. 1 st May)	In house validation based on fleet measurements	Carsten Junge
Nordex	N80/N90	Feb '04	S70/S77	<6 months	No info.	Ralf Duellmann
NEG Micon	1.65MW	No	2.75MW	Autumn '04	'Internally validated to some extent'	John Beck
Vestas	Non FRT versions of V52	Yes – Summer '03	V52 – 850kW V66 – 1.75MW V80 – 2.0MW V90 – 3.0MW	V80 1 st April; others shortly after. V90 is latest model and will follow in Autumn '04	Pre FRT models validated is by NESAs – Danish System Operator	Michael Rasmussen
Enercon	600kW 1MW 2MW	Yes 4 th March	4.5MW	Few months	'In house certification' plus FGH and Windtest (independent testing institutes) plus tests on 2MW machine in Hamburg	Stephen Wahctel
Gamesa	No	No	Yes 3 models	6 months	N/A	Lance Marram/Rick McGrath
Total	10		14			

Interviews conducted by Paddy O'Kane and Dave O'Connor

Appendix 2

Issues associated with Constraining Wind for technical reasons

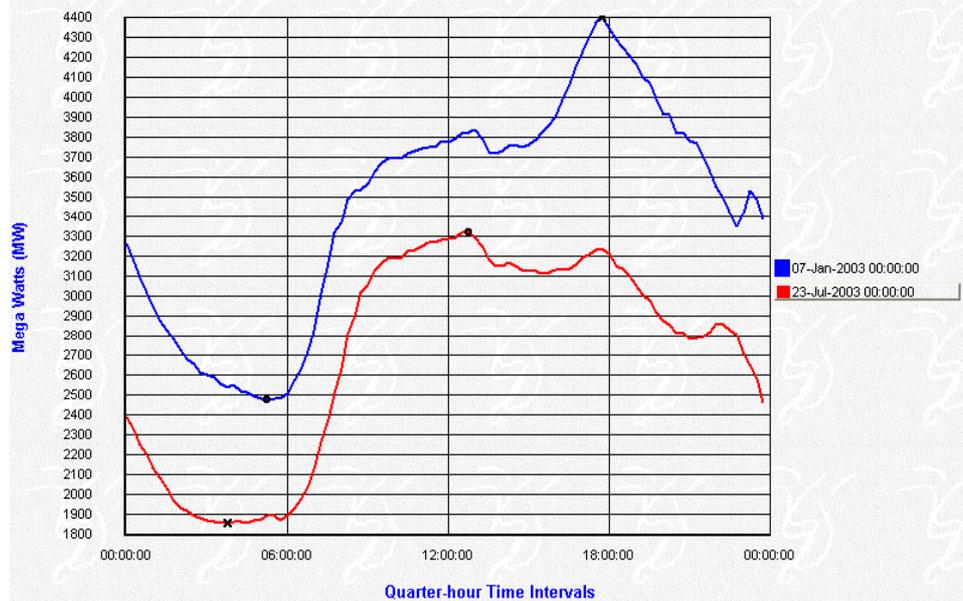
Power System Operation
ESB National Grid

12 March 2004



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Load Comparison



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Purpose of presentation

- Inform the Wind Steering Group on the issues associated with constraining wind generators.



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Generation System

- Centrally dispatched generation 5337MW (gross)
- External purchased 167MW (net)
- Wind generation 210MW
- System peak 4415MW (generated)



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Profile of conventional plant

- Largest unit size = 421MW (gas-fired single shaft combined cycle)
- 3 large combined cycle plant – 470MW, 421MW and 350MW
- 3 x 305MW coal/HFO fired units
- 4 x 250-270MW units (1 x gas, 2 x HFO, 1 x Gas/HFO)
- 2 smaller gas/distillate fired combined cycle plants – 160 and 115MW
- 3 x 120MW and 4 x 60MW steam units (5 x HFO, 2 x Gas/HFO)
- 1 x 128MW peat fired (two more are due within year - 150MW, 90MW)
- 480MW open cycle gas turbine (4 x Gas/distillate, 2 x distillate)
- 220 MW hydro
- 292 pumped storage (4 x 73 MW)



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Background - Wind Moratorium

In November 2003 ESBNG raised serious concerns at the scale of proposed new wind generation and the implications this had for the stability of the transmission system. ESBNG proposed that it would not enter into connection agreements with intending wind generators until certain technical issues had been resolved. In early December the CER agreed to this moratorium on further connection offers until the end of 2003. The moratorium was later extended until 31st of March 2004.

- The technical issues which were raised by ESBNG included the following,
 - Non compliance by wind generators with the Grid Code
 - Unavailability of validated models of wind generators
 - Lack of operation data from wind generators



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TSO responsibilities

- The TSO is legally obliged to operate a safe and secure power system.
- In order to discharge this obligation, the TSO must :
 - Model the current and future behaviour of the power system,
 - Monitor and control the operation of power system.



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Present Position (conventional generation)

- The output of conventional generators is dispatched by the TSO in accordance with :
 - their nominations,
 - Meet system demand,
 - meet the requirements of power system security.
- The kind of system security issues that cause generators to be constrained are :
 - operating reserve,
 - managing unexpected changes in demand,
 - providing voltage support
 - dealing with local transmission constraints ,
- The TSO directly dispatches or instructs the output of centrally dispatched generators on a real time basis.



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Present Position (wind generation)

- The TSO manages the existing wind generation by forecasting their output, as best we can, and adjusting centrally dispatched generators accordingly.
- This is acceptable for low levels of wind capacity.
- As the wind capacity increases, it reaches the ability of the power system to securely accept all wind generation output at all times.
- Therefore, the TSO must have the ability to limit or restrict the output of wind generators at times.
- We assume that wind generators get priority dispatch i.e. their output would only be restricted for security reasons.



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Wind Generator Performance

- As more wind generation connects to the system, it supplants conventional generation.
- Therefore, we will see, at times, wind generation forming a substantial source of generation.
- In this context, wind generation must provide similar services to those that are required from conventional generators.
 - controllability,
 - frequency response,
 - voltage control,
 - ability to withstand disturbances.



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Reasons for constraining wind

- Control system frequency.
- Ensure availability of operating reserve from conventional generators.
- Ensure the availability of adequate voltage support
- Maintain power quality
- Dispatch the system to meet the demand taking into account forecast uncertainty and plant restrictions.
- Manage transmission system bottlenecks and faults.
- Ensure the safety and integrity of the power system.



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What do we need to constrain Wind

- On- line SCADA monitoring and control facilities
 - TSO systems
 - DSO systems
 - Wind farm capabilities
 - Costs of retro-fitting if necessary
- Rules for paying the costs of constraining wind in an equitable manner.
 - CER to specify.
- Ensure the Grid Code and other Codes/agreements provide adequate powers for TSO to discharge its obligations to ensure safety and security.



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Wind Moratorium

- Constraining wind generation is part of the new Wind Grid Code.
 - SCADA monitoring and control
 - Frequency response
 - Voltage response
 - Fault ride-through
- Other Wind Moratorium issues are :
 - Verified models are required to determine system security limits.
 - Rules for constraining wind generation



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Summary

- In order to discharge its obligations to ensure safety and security of the power system, the TSO must have the capability and the powers to constrain (wind) generation if necessary.



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END



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