



DS3: Grid Code Workstream (2013)

CONTEXT

The purpose of the Grid Codes in Ireland and Northern Ireland is to set the (minimum) standards relating to the operation and use of the Transmission System and define material technical aspects relating to the use of plant or apparatus connected to the Transmission or Distribution system. The Grid Codes are active documents that are continuously under scrutiny, review and modification. This reflects the dynamic nature of the power system where technology is continuously evolving and operating practices and procedures are updated in tandem. There is a process in place for modifying the Grid Codes via the Grid Code Review Panels. Common sections of the codes can be modified via the Joint Grid Code Review Panel. The Grid Codes have already undergone many changes to incorporate and reflect the particular technical characteristics of wind generation.

OBJECTIVES

In recent times, government policy has placed an emphasis on connecting renewable generation to the grid, particularly wind. Recent technical studies carried out by the TSOs and their consultants have shown that very high wind penetrations will necessitate further Grid Code changes to ensure system stability, and these changes should be harmonised as much as possible between Ireland and Northern Ireland to achieve an all-island effect. The required changes to both the Ireland and Northern Ireland Grid Codes will be discussed and managed through this workstream. This will include all relevant consultations, recommendations and Grid Code Working Group meetings and required implementation steps following regulatory approval.

In addition, this workstream will look at potential Grid Code modifications regarding new technologies, such as waste-to-energy generation, marine energy, electric vehicles, and smart grid devices. Any knock-on changes required to the Distribution Codes will be co-ordinated through this workstream.

Ireland and Northern Ireland form a single synchronous system, and it is therefore imperative that EirGrid and SONI ensure that a consistent approach is applied in both the Ireland, and Northern Ireland Grid Codes.

WORK COMPLETED IN 2012

Three Grid Code modifications have been agreed by the Ireland Grid Code Review Panel on wind farm standards (Frequency Response, Fault Ride Through, and Reactive Capability), and have been sent to the CER for approval. Similarly, the Wind Farm Power Station Settings Schedule in Northern Ireland has also been consulted upon, and has been sent to UReg for approval. On RoCoF, the TSOs are proposing a Grid Code Rate-of-Change-of-Frequency standard of 1 Hz/s, measured over a rolling 500 ms time window. The Regulatory Authorities will decide on whether, and/or how this standard should be implemented.

An internal paper on over-frequency reserve has been developed within EirGrid/SONI, and is currently being considered by management. A decision will be taken in 2013 whether Grid Code modifications are required to cover off this issue.

Following a review of the capabilities of an existing waste-to-energy unit on the Irish system, and reviewing the perspective from continental Europe, it was decided not to pursue a special exemption to the Grid Code Operating Reserve requirements for this type of plant.

An internal review of storage devices has been carried out by the TSOs. It is not proposed to develop any Grid Code modifications for energy storage devices at this point, though this will be kept under review. Similarly, an internal review of biomass generation has been carried out by the TSOs. It is not proposed to develop any Grid Code modifications for biomass generation at this point, though this will also be kept under review.

FOCUS IN 2013

The focus for the Grid Code Workstream in 2013 will be on Dynamic Model Requirements, DSU/AGU clarifications, European Network Codes and transposing the wind farm and RoCoF modifications into the Distribution Codes.

Dynamic Models

A Grid Code modification for dynamic model requirements has been drafted and was discussed at the December 2012 Ireland Grid Code Review Panel meeting, with a view to bringing a formal proposal to the Ireland Grid Code Review Panel early in 2013. In Northern Ireland, the Wind Farm Power Station Settings Schedule which was consulted on in 2012 contains the same dynamic model requirements. It is proposed to bring a similar dynamic model requirements modification to the Northern Ireland Grid Code Review Panel for all other plant in 2013.

Distribution Code Modifications

It will be necessary to consider the consequences of many elements of the Grid Code modifications for the two Distribution Codes. The wind farm standards that are agreed at the Grid Code Review Panels will need to be reflected in modifications to the ESB Distribution Code. However, they will not apply to all wind farm connection types at distribution level (there are different connection types depending on the voltage at which the wind farm is connected, and whether there is existing load at the connection point). The Distribution System Operators will determine the appropriate standards for each connection type in discussion with the TSOs. There will also be changes required to the RoCoF standards for generators in the Distribution Codes, although this is dependent on the outcome of the proposed Grid Code modifications.

European Network Code

There is continuing development of a European Network Code that will be adopted by members of ENTSO-E. It is important that the current Grid Code and the new European Code are compatible, and so there is ongoing work in ensuring that the European Code is developing in line the

requirements of the Ireland and Northern Ireland synchronous power system. The European Network Code is expected to be transposed into national laws mid 2012, and will comprise a minimum set of standards that all plant must adhere to.

HIGH-LEVEL PLAN

TASK NO.	DELIVERABLES / TASKS	RESPONSIBILITY	ORIGINAL DUE DATE	DUE DATE
Wind farm Steady-state control modes				
GC.01.1	Follow up on Grid Code changes with performance monitoring and testing	TSOs	Q1 2012	Complete
GC.01.2	Discuss WFPS voltage control modes with DSOs	TSOs	Q2 2012	Q1 2013
GC.01.2.1	Develop modification to Ireland Distribution Code and bring to Distribution Code Review Panel	ESBN	New Task	Q2 2013
GC.01.2.2	Send modification to CER for approval	ESBN	New Task	Q2 2013
GC.01.2.3	RA decision on Distribution Code modification	CER	New Task	Q3 2013
GC.01.3	Bring any further changes to GCRPs / DCRPs and RAs as appropriate	TSOs	Q4 2012	No further changes to be brought
Dynamic Active and Reactive Power Response – Wind farms and Conventional Plant				
GC.02.01	Decision on WFPS Reactive Power Modes in Grid Code	CER	Complete	Complete
GC.02.02	Draft proposal on WFPS Dynamic Reactive Power	TSOs	Q1 2012	Complete
GC.02.03	Agree all island position on WFPS Reactive Power	TSOs	Q1 2012	Complete
GC.02.04	Draft proposal for Ireland and Northern Ireland GCRPs and present	TSOs	Q2 2012	Complete
GC.02.05	Engagement with stakeholders	TSOs	Q2 2012	Complete
GC.02.06	Final proposal for Ireland and Northern Ireland GCRPs / RAs for approval	TSOs	Q3 2012	Complete
GC.02.07	Decision on Grid Code proposals	RAs	Q4 2012	Q1 2013
GC.02.08	Discuss changes with DSOs & plan Distribution Code change	TSOs / DSOs	Q4 2012	Complete
GC.02.09.1	Develop modification to Ireland Distribution Code and bring to Distribution Code Review Panel	ESBN	Q1 2013	Q2 2013
GC.02.09.2	Send modification to CER for approval	ESBN	New Task	Q2 2013
GC.02.09.3	RA decision on Distribution Code modification	CER	New Task	Q3 2013
GC.02.10.1	NIE to carry out review of Distribution Code prior to bringing in new standards (non-DS3 related)	NIE	New Task	Q1 2013
GC.02.10.2	Develop modification to Northern Ireland Distribution Code and bring to Distribution Code Review Panel	NIE	New Task	Q2 2013

GC.02.10.3	Send modification to UReg for approval	NIE	New Task	Q2 2013
GC.02.10.4	RA decision on Distribution Code modification	UReg	New Task	Q3 2013
GC.02.11	Draft proposals on changes to conventional / embedded generation active and reactive power response http://www.eirgrid.com/media/DS3%20Discussion%20Document%20on%20Standards%20for%20Embedded%20Conventional%20Generators.pdf	TSOs	Q3 2013	Not to be pursued per Grid Code Review Panel decision
GC.02.12	Bring proposals to industry / GCRPs / RAs as appropriate	TSOs	2014	Not to be pursued
Rate of Change of Frequency Ride-Through Ability				
GC.03.1	Bring proposal on change to RoCoF to Ireland GCRP	TSOs	Complete	Complete
GC.03.2	SONI to investigate how RoCoF can be implemented in NI Grid Code	SONI	In progress	Complete
GC.03.3	Present proposal to DS3 advisory council	TSOs	Complete	Complete
GC.03.4	Establish Grid Code Working Group on RoCoF	TSOs / RAs / Industry	Q1 2012	Complete
GC.03.5	Discuss RoCoF with industry / stakeholders and agree a common position	JGCWG	Q2 2012	Agreement has not been reached. The modification will be sent to the RAs for decision
GC.03.6	Bring final proposal on RoCoF to GCRP / RAs for approval	TSOs	Q3 2012	Complete
GC.03.7.1	Decision on proposals	CER	Q4 2012	Q1 2013
GC.03.7.2	Decision on proposals	UReg	Q4 2012	Q1 2013
GC.03.8	Discuss changes with DSOs & plan Distribution Code changes for RoCoF relays	TSOs / DSOs	Q4 2012	Superseded
GC.03.8.1	Review RoCoF standard in Ireland Distribution Code	ESBN	New Task	Q1 2013
GC.03.8.2	Review RoCoF standard in Northern Ireland Distribution Code	NIE	New Task	Q1 2013
GC.03.8.3	Bring new RoCoF standard to Ireland Distribution Code if approved for Grid Codes	ESBN	New Task	Q2 2013
GC.03.8.4	Bring new RoCoF standard to Northern Ireland Distribution Code if approved for Grid Codes	NIE	New Task	Q2 2013
GC.03.8.5	Send modification to CER for approval	ESBN	New Task	Q2 2013
GC.03.8.6	Send modification to UReg for approval	NIE	New Task	Q2 2013
GC.03.8.7	RA decision on new Ireland Distribution Code RoCoF Standards	CER	New Task	Q3 2013
GC.03.8.8	RA decision on new Northern Ireland Distribution RoCoF Code Standards	UReg	New Task	Q3 2013
GC.03.9	Implementation of new standards	TSOs / DSOs / Industry	Q4 2013	Q4 2013

Waste-to-Energy				
GC.04.1	Draft internal discussion document on different approaches	TSOs	Complete	Complete
GC.04.2	Bring proposal to Ireland GCRP (Grid Code modification or derogation option)	TSOs	Complete	Complete
GC.04.3	Decision on proposals	CER	Q1 2012	N/A
Dynamic Model Requirements				
GC.05.1	Look at international requirements (UK/US/Australia/Europe etc.) on dynamic models	TSOs	Q1 2012	Complete
GC.05.2	Review current requirements and collate ideas	TSOs	Q2 2012	Complete
GC.05.3	Draft Grid Code modification / discuss with relevant parties	TSOs	Q4 2012	Complete
GC.05.4	Bring proposal to Ireland GCRP	TSOs	Q1 2013	Q1 2013
GC.05.4	Send modification to CER for approval	TSOs	New Task	Q1 2013
GC.05.5	RA decision on proposal	CER	New Task	Q2 2013
Demand-Side Management				
GC.06.1	Bring modifications on Demand-side unit MEC to GCRP	TSOs	Q4 2011	Complete
GC.06.2	Review of Grid Code standards for DSU and AGU	TSOs	Q4 2012	Complete
GC.06.3	Develop modification to Ireland Grid Code and bring to Grid Code Review Panel	TSOs	New Task	Q1 2013
GC.06.4	Develop modification to Northern Ireland Grid Code and bring to Grid Code Review Panel	TSOs	New Task	Q1 2013
GC.06.5	Consult on modification to Northern Ireland Grid Code	TSOs	New Task	Q2 2013
GC.06.6	Send modification to CER for approval	TSOs	New Task	Q2 2013
GC.06.7	Send modification to UReg for approval	TSOs	New Task	Q2 2013
GC.06.8	RA decision on proposal	CER	New Task	Q3 2013
GC.06.9	RA decision on proposal	UReg	New Task	Q3 2013
Grid Code Development and New Technologies				
GC.07.1	Monitor output from DS3 Workstreams to identify further Grid Code Changes	TSOs	Quarterly Review	Quarterly Review
GC.07.2	Watching brief on new technologies: Marine Energy / Off-shore Wind / Smart Devices	TSOs	2012 / 2013 / 2014	Quarterly Review
GC.07.3	Tentative proposals for integrating new technologies into the grid	TSOs	2013	Quarterly Review
Over-Frequency Reserve (formerly Negative Reserve)				
GC.08.1	Carry out a review of international best practice on over-frequency reserve	TSOs	Q2 2012	Complete
GC.08.2	Review if a Grid Code modification is required and if so develop an appropriate	TSOs	Q4 2012	Q2 2013

	modification to the Grid Code(s) to cover off this area			
GC.08.3	Decision on proposals	RAs	Q2 2013	Contingent
Storage Devices				
GC.09	Review of storage technologies	TSOs	Q4 2012	Complete
Biomass				
GC.10.1	Review of biomass technologies and characteristics	TSOs / Industry	Q3 2012	Complete
GC.10.2	Develop appropriate modifications to the Grid Codes to cover off this area	TSOs	Q4 2012	Not to be pursued
GC.10.3	Decision on proposals	RAs	Q2 2013	N/A
European Network Code				
GC.11.1	Develop plan on how to incorporate future network code requirements into Grid Codes	TSOs	New Task	Q2 2013
GC.11.2	Consult on plan with relevant stakeholders / RAs	TSOs / Industry	New Task	Q3 2013