



DS3: RoCoF Workstream Plan 2014 - 2017

CONTEXT

The “Facilitation of Renewables” report indicated that one of the key limits to increasing the real time penetrations of renewable plant power plants on the all island system was the rate of change of frequency (ROCOF). From operational experience and analysis, RoCoF in excess of 0.5 Hz/s are likely to be encountered when the system exceeds a 50% system non-synchronous penetration (SNSP) level or the synchronous inertia falls below 25,000 MWs. In recognition of this, the Ireland and Northern Ireland Grid Codes are being changed to a 1 Hz/s over 500 ms RoCoF standard.

Therefore without this higher RoCoF standard, the curtailment of wind will be higher (SNSP cannot exceed 50%, a threshold which is being hit with increasing regularity as more wind connects to the system) and the overall 40% target may not be achieved by 2020. Therefore the realisation of the objectives of DS3, of which RoCoF is an integral work stream, is important in terms of meeting the obligations under Directive 2009/28/EC to take appropriate measures to minimise curtailment.

WORK COMPLETED:

SONI and EirGrid have been engaged in discussions with the Distribution System Operators, Conventional Generation and Wind farm Generators in both Ireland and Northern Ireland on the subject of RoCoF on the island. A proposed grid code modification on RoCoF settings in both Grid Codes was brought forward to both Grid Code review panels and was recommended by the “Panel” by a majority vote on 4th December, 2012.

In February 2013, DNV KEMA presented on the findings of their Independent report on RoCoF at the Joint Grid Code Working Group meeting. This analysis looked at the ability of generators to ride through high RoCoF events. This document can be found [here](#).

In June 2013, the CER published its proposed decision; to go to consultation in relation to EirGrid's recommendation to modify the RoCoF standard in the Ireland Grid Code. UREGNI published their proposed decision on the Northern Ireland grid code modification for RoCoF in August 2013. The decision broadly aligns with the decision of the CER. Additionally, following feedback from Industry the TSOs published a Frequency Transient Analysis document in September 2013 which includes traces for all major frequency transients seen on the system from October 2010 to June 2013. This document can be found [here](#).

In April/ May 2014, CER and UREGNI published their respective RoCoF decisions which, while approving the TSOs’ proposed modification in principle, set out requirements for establishment of an industry implementation project that is anticipated will run until the end of 2017.

FOCUS AREAS 2014 – 2017:

While both Regulatory Authority decisions approve the TSOs' proposed RoCoF modification in principle, application of the new standard in the Grid Codes will only come into effect following confirmation from the TSOs that, from a system security perspective, it can be implemented. To determine this there will be an industry implementation project made up of three strands: TSO & DSO Implementation, Alternative solutions, and Generator Implementation.

The TSO-DSO Implementation project will oversee the DSOs' implementation of the new RoCoF standard on distribution Loss of Mains protection and application of the new RoCoF standard to a proportion of distribution connected generation, the quantum of which is to be established.

The Generator Implementation project will require generators conducting studies to determine their capability to comply with the new standard. These studies will be phased over a period of 18 to 36 months, with higher priority units being required to complete their studies first. Generators shall be required to make a declaration to the TSOs regarding their level of compliance within 18 to 36 months and will be assisted in doing so through a structured generator study programme overseen by SONI in Northern Ireland and a CER appointed 'Independent Expert' in Ireland.

The Alternatives project is a TSO led body of work to consider and develop alternative solutions to managing the RoCoF issue given the risk that implementation of a new RoCoF standard could take longer than the 18-36 month deadline set out by the Regulators' decision papers.

In addition to the three main strands of the implementation project there is also a requirement to develop appropriate financial incentive mechanisms to expedite the adoption of the new 1 Hz/s standard by generators.

NEXT STEPS:

The start date for the 18-36 month timeframe for the generator studies to be completed is yet to be notified by CER. The UR decision requires the first set of generator studies to be completed by 10th November 2015 with the remainder completed 18 months after this date.

The CER and UR will hold an industry forum and will engage with industry and EirGrid to establish the RoCoF Implementation Project. High level project plans for the three work streams (System Operator Implementation Project, Generator Implementation Project, and TSO Alternative Solutions Project) will be agreed and published in Q3 2014.

HIGH-LEVEL PLAN

NOTE – COMMENCEMENT DATE FOR THE CER DECISION HAS NOT YET BEEN NOTIFIED

TASK NO.	TASK	RESPONSIBLE	ORIGINAL DUE DATE	DUE DATE
Project Overview				
RCF 1.01	RA (Ireland) decision on RoCoF	CER	New Task	Q2 2014
RCF 1.02	RA (Northern Ireland) decision on RoCoF	UR	New Task	Q2 2014
RCF 1.03	High level project plans agreed and published (Ireland)	CER / TSO	New Task	July 2014
RCF 1.04	High level project plans agreed and published (Northern Ireland)	UR / TSO	New Task	July 2014
RCF 1.05	TSOs' recommendation to RAs on implementation of new standard (18mths+3mths)	TSOs	New Task	Q1 2016
RCF 1.06	RA (Ireland) decision on RoCoF implementation	CER	New Task	Q4 2017
RCF 1.07	RA (Northern Ireland) decision on RoCoF implementation	UR	New Task	Q4 2017
RCF 1.08	RoCoF moves to 1Hz/s operational standard.	TSOs	Q2 2014	Q4 2017
Incentive Mechanisms				
RCF 2.01	SEM Committee direction on incentive mechanisms	CER/UR	New Task	Q3 2014
RCF 2.02	Design of new RoCoF incentive mechanisms	TSOs	New Task	Q4 2014
RCF 2.03	Consultation on new RoCoF incentive mechanisms	TSOs	New Task	Q2 2015
RCF 2.04	Decision from RAs on new RoCoF incentive mechanisms	CER/UR	New Task	Q3 2015
RCF 2.05	Implementation of new RoCoF incentive mechanisms	TSOs	New Task	Q3 2015
Generator Implementation Project				
RCF 3.01	Categorise each generation unit into different priority classification, engage with industry and submit to RAs for approval	TSOs	New Task	Q3 2014
RCF 3.02	Appointment of independent expert	CER	New Task	Q3 2014
RCF 3.03	Confirmation of ROCOF frequency traces to be used in analysis	TSOs	New Task	Q3 2014
RCF 3.04	Initial meeting between TSOs, generators and appointed 3 rd parties on ROCOF analysis	Generators	Q3 2013	Q3 2014
RCF 3.05	Industry workshop on ROCOF generation analysis	TSOs	New Task	Q3 2014
RCF 3.06	RA approval of generator unit priority classification	CER and UR	New Task	Q3 2014
RCF 3.07	Interim milestone meeting with TSOs and generators on the progress of ROCOF analysis	TSOs / Generators	New Task	Q2 2015
RCF 3.08	Generator testing of RoCoF standard (18 months)	TSOs / Generators	New Task	Q3 2015
RCF 3.09	Final meeting at the end of every generator study (18 months)	TSOs / Generators / Independent Expert	New Task	Q4 2015
RCF 3.10	Generator testing of RoCoF standard (24 months)	TSOs / Generators	New Task	Q1 2016
RCF 3.11	Final meeting at the end of every generator study (24 months)	TSOs / Generators / Independent Expert	New Task	Q2 2016
RCF 3.12	Generator testing of RoCoF standard (36 months)	TSOs / Generators	New Task	Q1 2017
RCF 3.13	Final meeting at the end of every generator study (36 months)	TSOs / Generators / Independent Expert	New Task	Q2 2017
ESBN and NIE Implementation Project				

Development of Standards				
TDL1.1	Development and submission Distribution Code RoCoF modification	NIE	New Task	Complete
TDL1.2	Development and submission of Distribution Code RoCoF modification	ESBN	New Task	Complete
TDL1.3	Regulatory decision on Distribution Code RoCoF modification	UR	New Task	Q2 2014
TDL1.4	Regulatory decision on Distribution Code RoCoF modification	CER	New Task	Complete
Data Gathering and Application of New Standards				
TDL2.1	Survey and compile database of existing RoCoF and frequency settings	NIE	New Task	Q2 2014
TDL2.2	Compile database of existing RoCoF and frequency settings	ESBN	New Task	Q3 2014
TDL2.3	Compile list of sites at which new standards would not apply	NIE	New Task	Complete
TDL2.4	Compile list of sites at which new standards would not apply	ESBN	New Task	Q3 2014
TDL2.5	Determine implications / approach to dealing with sites at which new RoCoF settings would not apply.	NIE / TSO	New Task	Q4 2014
TDL2.6	Determine implications / approach to dealing with sites at which new RoCoF settings would not apply.	ESBN / TSO	New Task	Q4 2014
TDL2.7	Provide agreed RoCoF sample frequency events for testing/modelling purposes.	TSOs	New Task	Complete
TDL2.8	Procure representative sample of existing G10 relays and perform injection tests	ESBN	New Task	Q3 2014
TDL2.9	Complete implementation of new RoCoF settings	NIE	New Task	Q2 2015
TDL2.10	Complete implementation of new RoCoF settings	ESBN	New Task	Q2 2015
Enduring Arrangements				
TDL3.1	Agree enduring process for administration of Loss of Mains settings	NIE / TSO	New Task	Q4 2014
TDL3.2	Agree enduring process for administration of Loss of Mains settings	ESBN / TSO	New Task	Q4 2014
Demand Monitoring				
TDL 4.1	DSO and TSO to monitor the impact of the new RoCoF standard on demand customers and the quality of supply as part of the TSO-DSO Implementation Project	ESBN	New Task	Q1 2018
TDL 4.2	DSO and TSO to monitor the impact of the new RoCoF standard on demand customers and the quality of supply as part of the TSO-DSO Implementation Project	NIE	New Task	Q1 2018
TSO Alternative Solutions Project				
RCF 4.01	Develop scope for alternative solutions	TSOs	New Task	Q3 2014
RCF 4.02	Industry engagement on alternatives project	TSOs / Industry	New Task	Q4 2014
RCF 4.03	Technical analysis of alternatives	TSOs	New Task	Q1 2015
RCF 4.04	Costing of alternatives and implementation timelines	TSOs	New Task	Q2 2015
RCF 4.05	Final report on alternative solutions provided	TSOs	New Task	Q3 2015