



Response to
CER Consultation on RoCoF Modification to the Grid Code
(CER-13-143)

13/08/2013

Executive Summary

The Issue in Question

In opening our response to the CER Consultation on RoCoF Modification to the Grid Code we first would like to draw attention back to what the underlying issue is. The issue in question is the challenge of moving SNSP from 50% to 60%, in a timely manner to facilitate the 40% RES-E targets in both Ireland and Northern Ireland. The proposed RoCoF standard of 1Hz/sec for generator units is simply an identified means to this end. However this proposal is only one means of addressing the fundamental challenge – providing for the TSO to operate the system with increased non-synchronous generation. Other solutions and approaches to meeting this challenge exist; those solutions and approaches also need to be comprehensively evaluated. Doing so will allow any final decision taken on this issue to be well-informed and based on solid evidence. At present that is not the case; that lack of a comprehensive review places the proposal to approve MPID 229 on very weak and unsubstantiated foundations.

Review of CER's Consultant's Advice

CER's decision to refer the TSO's proposals to the independent consultants PPA Energy is welcome; the resultant report has most definitely made an appreciable contribution to our analysis of the RoCoF issue. In their report the consultants outline a number of recommended processes to support a more comprehensive investigation of the RoCof issue. Some of these recommendations are summarised below:

1. requiring conventional generators to obtain detailed quotations and timescales for studies required to demonstrate ability to comply with the proposed 1.0 Hz/s over 500ms;
2. requiring the TSO to explore the level of ROCOF that arises over a 100ms period in a range of scenarios that show an average ROCOF of 1.0 Hz/s over 500ms, to enable further consideration of the short term impact of potentially higher rates of ROCOF;
3. requiring the TSO to provide further information about the alternatives to changing the ROCOF standard that exist, describing the potential impact of these on system operation and the electricity market, and detail the likely limitations of any alternatives on the level of SNSP that can be achieved in 2020; and
4. requiring the TSO to explain the process by which derogations from the proposed new ROCOF standard would be applied.

The consultants unequivocally advise CER **not** to approve MPID 229, until the recommended processes are completed and the results are evaluated. Such recommendation evidently implicates the current process as not sufficiently comprehensive and hence any decision at this stage would be premature.

Disregarding this advice, CER has proposed to approve MPID 229. While CER is well within its rights to reject the advice of its consultants, it is to be expected that such course of action would be based on robustly presented counter-arguments. At the very least, point-by-point, the consultants recommendations ought to have been addressed. There is no evidence of this in the consultation paper. Without that expected reply from CER it only begs the question as to what contribution the consultants work has had in the development of regulatory thinking on the RoCoF issue.

Risk-Reward Distribution is Distorted

The proposed singular action of introducing a RoCoF standard of 1Hz/sec into the Grid Code, with the associated features of non-cost recovery and imposition of GPs for non-compliance, implies a situation where one class of system users (conventional generators) are impelled to provide a system solution for which they enjoy no benefits, indeed they are disadvantaged by lower load shares, entirely at their own expense. In contrast some other system users are provided double benefits, first by avoiding any explicit payments and second by receiving lower SMPs in the case of consumers and lower curtailment in the case of wind generating units. This clearly represents discrimination between licence holders.

While there are concerns surrounding how capability to achieve the proposed RoCoF standard of 1Hz/sec by conventional generators can be demonstrated, nonetheless it provides a perverse incentive to require conventional generators to engage in that process under the threat of penalties and with all costs absorbed by them. For a very significant retrospective requirement, this is also the wrong signal to send to investors. Sizeable benefits are anticipated from the success of this process; for incentives to be properly aligned and in order to guide prudent, sustainable behaviour, it is essential that these improvements are funded centrally, perhaps through the SEM Imperfections mechanism.

SSE Recommends

From the foregoing discussion we would urge the CER to move a step back from the proposal to approve the RoCoF Modification to the Grid Code at this time. There needs to be a broader recognition of the problem to be addressed as enabling NSNP increase from 50% to 60%. This will require identification of the various means that exist to solve the problem, as well as detailed comparative analysis of those various means, before moving to

the step of deciding on a solution. This course of action will indeed be in line with the CER's consultant's advice.

However, we believe that time is of the essence in this process. The implications of not raising SNSP as per the current DS3 schedule are potentially massive, not only for SSE's wind business in Ireland, but also for Ireland's renewable energy targets for 2020. Raising SNSP is a complex issue and while looking at numerous alternatives to achieving our goal we must do so in a timely and efficient manner. It is imperative that we maintain momentum in this process and define key deliverables over the coming months and years.

Bearing in mind the foregoing discussion, SSE makes the following 3 key recommendations, which are developed further in the main body of this response:

- 1. Suspend Approval of MPID 229, Expand Process to Conduct Studies** Suspend the current proposal to approve MPID 229 outright, together with the associated GPIs, but progress a comprehensive but time-limited programme of investigations and studies to determine a relevant subgroup of generator capabilities to achieve the 1Hz/sec RoCoF standard. In consonance with CER's view that not all generators need to carry out studies, and in line with the consultant's recommendation on derogations, clear criteria needs to be established to enable determination of subset of generators required to carry out the studies. One factor may be age of plant, which CER implies in the consultation. Yet another may be infrequency of plant running, which may indicate negligible risk of coincidence with high non-synchronous generation;
- 2. Redefine Issue, Identify Alternative Methods** Redefine the issue in question from one of requiring a RoCoF standard on conventional generators to one of identifying methods of managing RoCoF as a means of enabling higher SNSP. This will necessarily include the proposed RoCoF standard, but in addition will include other technically feasible means of addressing the issue as well;
- 3. Conduct Cost-Benefit Analyses, Proceed to Decision** Conduct thorough commercial, economic and technical analyses of all identified options as a means for determining which method, or combination of methods, best meets the primary objective of enabling increased SNSP. This must be done in parallel with the generator ROCOF studies and must be time-limited.

In addition to the recommendations above we also proffer the following:

- **Provide Worst-Case RoCoF Trace** Require the TSO to provide a worst-case RoCoF trace that generators can use to determine the limits of their capabilities;
- **Address Consultant’s Points** As pointed out earlier in this document, it is essential for CER to address in detail all points raised by their consultants, and specifically providing for the processes recommended;
- **Establish Working-Group** Given the significance of this issue, as well as the time imperative if the 2020 targets are not to be impacted, it is essential to convene an industry working group to provide impetus to the programme of investigating options for addressing the higher SNSP challenge. We propose that this group should convene from 01/10/2013 and meet every 2 months thereafter. It should have representation from generators, TSO and regulatory authorities.

Expanded Process

As stated above, there is a need to first expand the process by establishing a programme of works that include the processes recommended by the consultants. We outline below a high-level process timeline as a template for such an expanded programme.

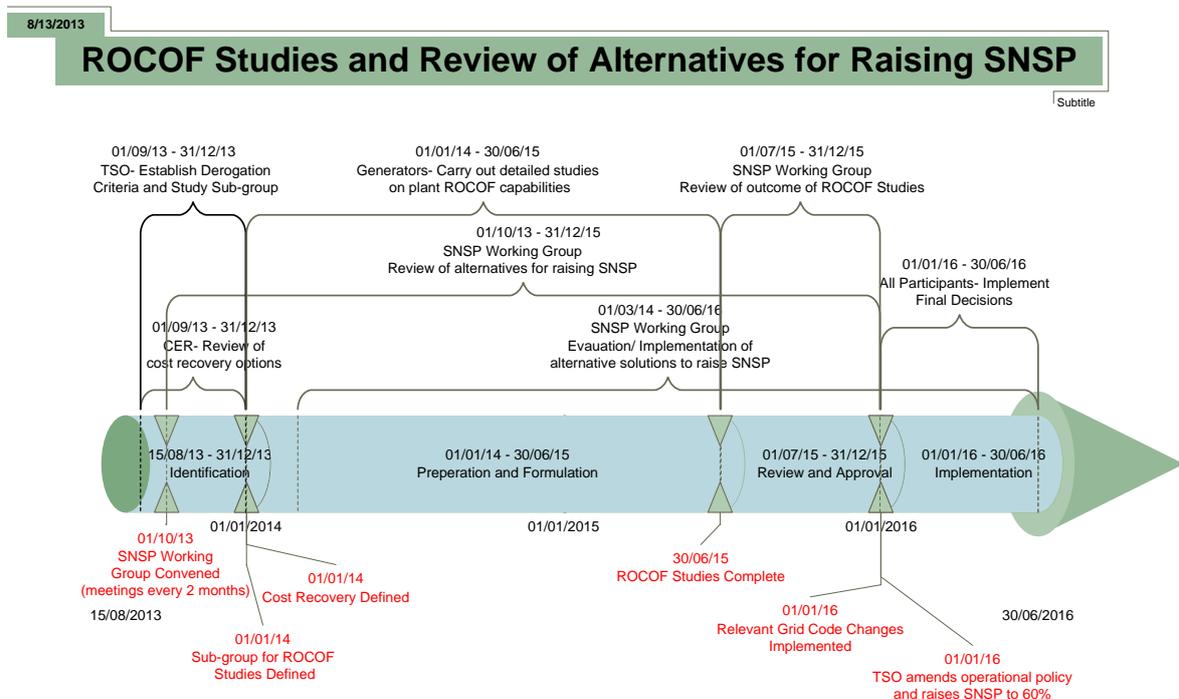


Figure 1: Programme Timeline for ROCOF Studies and Review of Alternatives for Raising SNSP

Key Points of Response

About SSE

SSE is the third largest generation capacity owner in Ireland with over 1,500MW in operation; this includes both wind and conventional generation. (Our conventional generation units currently in operation are Tarbert, Great Island, Tawnaghmore-HFO peaker and Rhode-HFO peaker). In addition we are currently constructing a 460MW CCGT at Great Island, Co. Wexford. Expected to be commissioned in 2014, this modern and efficient clean gas-fired power plant will replace the existing 216MW fuel oil unit at the site, resulting in further decarbonising of electricity generation in Ireland. With such a broad mix of generation technologies SSE is well placed to provide a balanced view on the issue under consultation.

Specifically in relation to wind, SSE operates 23 onshore wind farms in Ireland with a generation capacity of over 500MW – including Ireland's largest wind farm, the 84MW Meentycat Wind Farm in Co. Donegal. SSE Renewables is also Ireland's largest renewable energy developer, with almost 1400MW, across UK and Ireland in construction or with consent for development, and is actively progressing a significant pipeline of future projects.

With a stated objective to decarbonise its generation by 50% by 2020, SSE has responded strongly to government policy in Ireland and Northern Ireland which includes a target of 40% of electricity consumed on the island to be generated by renewable sources by 2020. To date, SSE Renewables has invested over €1 billion in renewable energy in Ireland.

SSE Position on the Proposed RoCoF Modification

With this level of current and planned investment into renewable energy in Ireland, it is firmly in SSE's interest that the Irish electricity system can be operated at higher SNSP levels to accommodate more wind-generated electricity and to reduce the level of curtailment on wind generation. Consequently SSE supports strongly the objective of successively raising the SNSP levels on the system in a timely manner, variously through the new system services proposed in the DS3 programme and through a means of managing RoCoF.

Recommendations

1. Suspend Approval of MPID 229, Expand Process to Conduct Studies

The proposal in the current consultation adopts a very narrow approach and has not fully considered all potential alternative means for addressing the issue. This, in our view, leads to the conclusion that the proposal to approve MPID 229 is premature. This view is fully supported by PPA Energy, the consultants engaged by CER to review the TSO's proposal.

Rather than proceed straight to the approval process for MPID 229, SSE recommends that a comprehensive but time-limited programme of investigations and studies to determine capabilities of a relevant subgroup of generator to achieve the 1Hz/sec RoCoF standard. Therefore, SSE seriously urges the CER to reconsider its present intentions to approve MPID 229.

Derogation for Certain Plant

In consonance with CER's view that not all generators need to carry out studies, and in line with the consultant's recommendation on derogations, clear criteria needs to be established to enable determination of sub-set of generators required to carry out the studies. In our view, it will make little sense to require all plant on the system to meet the RoCoF standard. High RoCoF events in general will occur during periods of high SNSP levels. This will imply high winds and/or high imports across the interconnectors. As can be easily determined from SEM data, operation of certain plant coincide at vanishingly low rates with periods of high non-synchronous generation. Requiring such plant to meet the RoCoF standard in our view will be uneconomic and will reduce overall social welfare.

In furtherance to this view of derogating certain plant, we note that CER already supports that principle in their request to EirGrid to study system records and potentially exempting plants that have historically ridden through high RoCoF events from carrying out studies. Underlying this would be risk based assessment. We welcome that, but assert that the whole process should be subject to risk-based assessment. The carrying cost of requiring a significant proportion of the conventional generator population to carry out studies and subsequently potentially upgrade their plants, for very likely infrequent events is potentially uneconomic; it is necessary to carry out sufficient risk assessments on all likely scenarios. While we would appreciate when it comes to the Grid Code the TSO must apply fair treatment of all generators on the grid, this scenario is exactly what the derogation process is intended for. A cost-benefit analysis would most likely indicate that the change should not be applied to plant that is not run during high non-synchronous events.

2. Redefine Issue, Identify Alternative Methods

As TSO, one of EirGrid's primary contributions towards meeting the government's 40% RES-E target is ensuring safe and secure operation of the system at higher SNSP levels. SSE firmly supports that role. What we object to however is the fact of EirGrid identifying, studying, promoting and intending to impose, with regulatory consent, only one method of managing RoCoF, one of the factors impinging on the TSO's ability to run the system at higher SNSP levels. It is even more concerning that the CER proposes to go along with this, despite a recommendation of its consultants engaged to review the TSO's proposal¹ that "...the TSOs provide further information about the alternatives to changing the RoCoF standard that exist". Specifically mentioned by the consultants is the "maintaining of additional conventional generation on the system at lower levels of generation in order to maximise system inertia". Together with a range of other recommendations "the consultants recommend that CER does not approve MPID 229".

While the CER reserves the right to go against the advice of its consultants, proper practice at least requires that this be on the basis of superior evidence. SSE sees no indication of this. For avoidance of doubt CER proposes to approve MPID 229 even though other methods of achieving the objective of running the system at higher SNSP exist. Some of these alternative methods which could be adopted, singly or in combination, include:

1. **Network-based methods**, such as installing synchronous condensers to increase system wide inertia, hence reducing the level of RoCoF post fault;
2. **Operational-based methods**, such as improving control centre tools to identify the risk of potential high RoCoF event situations and taking precautionary measures such as in real-time temporarily lowering SNSP level or bringing on a subset of generators to provide more inertia;
3. **Market-design methods**, such as providing for co-optimised energy and reserves/services market design for the SEM Integration Project;
4. **Generator-incentive methods**, for certain capabilities such lower minimum generation running and low load operation modes (i.e. where a plant can go below its MIN GEN level for a restricted period);
5. **Generator-subset methods**, such as designating (perhaps by tender) certain generators to run during forecast infrequent high RoCoF events;
6. **Interconnector-flow methods**, restrict flows during potential high risk periods, thereby reducing the largest infeed and the risk of high RoCoF events.

¹ [cer13143](#) (a) PPA TNEI ROCOF Final Report.PDF

We would ask the CER to request the TSO to identify all technically feasible methods, or combination of methods, whether listed above or not, and to proceed to study them as viable means of managing the system with higher SNSP.

In addition the report from CER's consultants, PPA Energy, clearly indicates that the RoCoF with increased renewable generation on the system can exceed 1Hz/sec and is likely that there will be incidences with a RoCoF between 2-6Hz/sec. There is no mention in the consultation paper of how EirGrid will seek to manage this in order to maintain a secure system. In our view these are serious failings of this proposal.

3. Conduct Cost-Benefit Analyses, Proceed to Decision

The purpose of enumerating the alternatives in the previous section is not to perfunctorily recommend any of them. It is simply to demonstrate some of the alternatives that exist. With the identification of all technically feasible options, the logical next step would be to carry out a comprehensive cost-benefit analysis on all the ones that pass initially muster. Until such an assessment is done and comprehensive comparisons, including commercials, made between them, the proposal to approve a change to the Grid Code will be premature.

Given the immediately preceding discussions SSE strongly urges the CER to suspend the proposed approval for MPID 229 and institute instead a comprehensive programme to evaluate all available options for managing RoCoF events. It may be the case that rather than a single 'silver-bullet' approach as represented by the MPID 229 proposal, a combination of the measures outlined could be employed to achieve the same objective. SSE would also note that the single "silver bullet" approach does nothing to address the issues arising when the RoCoF exceeds 1Hz/sec, which, according to the PPA report, is a likely event when SNSP exceeds 50%.

Comments on Associated Matters

Testing and Certification

There is general agreement that the capability of a generator to withstand a high RoCoF event cannot be fully tested in the real-world environment; to this much the CER attests. What is suggested then is that generators essentially self-certify. Again linking into our overarching view on the proposal, the uncertainty about establishing capability to ride-through high RoCoF puts to question the proposal to outright approve MPID 229 without a proper range of studies being carried out first.

Individual self-certification of generator sets is ill-advised for the following reasons.

Firstly, the lack of a unifying engineering standard or standard test will lead to generators reviewing high RoCoF event performance to different criteria. Secondly, reliance on desk-top studies without real-world live engineering tests limits the value of self-certification and the reliance that can be placed upon it.

Generators would only be in a position to certify the actual studies and tests carried out and would not be able to certify ride-through in a future high-RoCoF event.

As a result of this, to enable meaningful and comparable results, a precise range of tests or sets of studies will need to be specified in detail by a competent party, perhaps the TSO or an independent technical consultant, that generators will be required to step through. At the end of this process, generators will then be in position to certify completion of these tests and studies.

In addition SSE would raise the concern that the proposal, if applied retrospectively, will require generators to operate outside original design limitations. It is not clear whether current insurance policies would allow for this testing. This would result in generators being in breach of Section 23 of their respective Connection Agreements.

Cost Recovery

Furthermore if tests and/or studies are to be carried out by generators, with potential subsequent necessity for retrofits to upgrade capability, then provision for cost recovery ought to be made. It is unreasonable to require a class of system users to pay for a requirement that is of no benefit to them at all, but in fact disadvantages them. This is perverse and turns the 'polluter pays' principle on its head. To the extent that high RoCoF events can be attributed, the implicated contributors will be non-synchronous generation

units. It is one thing getting synchronous units to make adjustments for non-synchronous counterparts; it is quite another to make them bear the costs of such adjustments.

The assertion that because this change supports government/European policy of enabling renewables, hence customers should not pay is untenable. Customers already make direct payments to support various government policies, a principal example being payments into the PSO to support deployment of renewables and peat generation. The fact that this is not a direct payment to those classes of users does not erode the underlying fact which is that they would be the direct consequential beneficiaries of the upward change to SNSP.

Furthermore the strand of argument that cost recovery from consumers “would have a significant impact on consumers...while there would be little incentive for generators to keep the costs as low as possible” is unsubstantiated, particularly if partial cost recovery. But even if full cost recovery is implemented, a standard, tightly specified set of studies to be carried out by all generators should also keep the costs of the studies within a tight band.

The entire benefits of running the system at increased SNSP levels go to non-synchronous generators, in reduced curtailment, and to consumers, in lowered market prices. The economic outcome of having synchronous generators pay to generate those benefits would essentially be to give non-synchronous generators and consumers double benefits, first the avoided costs, and second the direct benefits. The CER is keen to avoid these economic double payments in other mechanisms of the market, such as in the BNE mechanism; surely it can see that the same applies in this case.

Consequently SSE recommends that generator investigations be conducted with full cost-recovery. In addition to the TUoS option mentioned in the consultation, we would also recommend the SEM Imperfections mechanism as another viable option. Irrespective, we recommend that CER identify and develop the most appropriate mechanism as a precursor to the studies commencing, or at the very least if that will lead to delays in the programme, approving cost-recovery in principle.

Generator Performance Incentive

Incentives normally presuppose that benefit exists in the first instance. This is definitely not the case for this proposal, which proposes penalties with no corresponding benefits to the concerned.

While not defined as an Ancillary Service, according to the definition of Ancillary Service in the Grid Code, the proposed RoCoF requirement is in effect an Ancillary Service since it is necessary for system support and not part of the central function of electricity generation. As such, provision of this service should be remunerated.

Furthermore, penalty amounts ought to be reflective of the costs imposed on the system as a direct result of non-provision of the relevant services. There is no evidence here relating the proposed penalty amounts to the costs imposed on the system. In final analysis it does seem that the penalty amounts proposed have simply been designed to be overly harsh and hence 'scare' conventional generators into compliance.

SSE is unclear as to what powers have been set out in legislation to allow for the penalties which are proposed. Penalties that 'claw-back' benefits previously given can be regarded as 'charge-backs'. But for penalties without corresponding payment streams (against which a charge-back is calculated), it is our view that the legislation does not include provisions to enable this.

Responses to Specific Consultation Questions

1. Do you agree with the CER's proposal to approve MPID 229 in principle?

No.

2. Do you agree with the conditions for giving MPID effect in the Grid Code?

Perhaps, but the conditions do not automatically lead to the MPID. Other alternatives exist that have not been fully explored and it is clear that this solution is insufficient in and of itself. The final solution needs to also incorporate the changes the TSO will undertake to ensure system security in events where the RoCoF event exceeds 1Hz/sec.

3. Do you agree with the proposal to establish an implementation project to co-ordinate the activities of generators and system operators?

Yes, but it should be paralleled with a higher level of exploring the alternatives to enabling higher levels of SNSP.

4. Do you agree with the proposed high level governance structure?

Only with the amendment that the project should be managed by a suitably qualified independent technical consultant. It should not be managed by the TSO. The TSO should play a role but it should be noted that the Generator itself must be fully satisfied itself that it can comply otherwise it wouldn't be prudent to sign up to the modification.

5. Do you consider that the costs for the technical studies should be recoverable?

Absolutely. Doing otherwise would be economically perverse.

6. Do you agree with the proposed introduction of a GPI for ROCOF?

No this is pre-emptive and too early to define. Until investigations are complete, it is not clear what the outcome will be. A decision would need to be determined on what the next steps are; it is not acceptable that a GPI is applied at that point.

7. Do you agree with the proposal to require EirGrid to explore and implement alternative solutions?

Absolutely. The currently process of procuring the approval of the MPID should be suspended until this is complete.

8. Are there any other issues you wish to raise?

As mentioned previously, the PPA report indicates that voltage dips with an SNSP between 50%-75% could lead to a RoCoF between 2 and 6 Hz/sec. The means by which the TSO will ensure system security during these events must also be investigated as part of the further study on alternative means to increase SNSP.

Furthermore the TSO needs to provide worst-case RoCoF trace, for generators to use in the determination of their plant capabilities.

All points highlighted by the CER consultants PPA, conclusions and recommendations should be addressed.

A working group should be established to track the recommended programme of works. Proper engagement of all parties is essential to enable the success of the programme. This programme of works must be tightly managed and time-limited to ensure Ireland is still in a position to meet 2020 targets for renewable energy.