



CER Rate of Change of Frequency (ROCOF)

Modification to the

Grid Code

Consultation Paper CER/13/143

RESPONSE on behalf of

AES Kilroot Power Ltd and AES Ballylumford Ltd

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1. Introduction

This consultation response paper is prepared on behalf of AES Ballylumford Limited and AES Kilroot Power Limited (collectively "AES") and documents AES' response to the CER proposed Rate of Change of Frequency Grid code modification consultation. AES welcomes the opportunity to submit comments in response to the above consultation document and would note that AES participated in the Eirgrid/SONI DS3 workgroup providing input into Joint Grid Code Working Group Position Paper on RoCoF issued in September 2012.

AES, through its involvement in various industry bodies and working groups, is fully aware of the objectives to increase the levels of system non synchronous penetration to allow the Governments' policy for renewable generation to be achieved and that this is dependent on conventional generator flexibility. Due to the consequent change in the behaviour of the power system more operational flexibility will be required from all generating technologies and AES understands the requirement for an enhanced or in the case of Northern Ireland (NI) the introduction of a RoCoF standard in the respective grid codes.

AES would note that it already has plant that is extremely flexible and provides significant ancillary service functions at present and is keen to see that flexibility valued and rewarded appropriately.

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

Although the ROI grid code has had a RoCoF requirement of 0.5 Hz/sec a move to 1 Hz/sec represents a significant change in the flexibility required from a conventional generator. Equally in NI, although the grid code is silent on a RoCoF requirement and the SONI minimum functional specification was developed after the design of the current generators operating in NI, there has always been an emphasis on the requirement for flexibility from generators in NI. AES does not foresee a high risk of catastrophic failure from an incident with a RoCoF of 1 Hz/sec. However, as highlighted by some other generators and as identified in the Consultants (KEMA) study commissioned by the TSO, should the RoCoF event occur when operating in leading power factor mode, AES is concerned that an increased number of high RoCoF incidents could have a significant cumulative effect on machine and plant life. Having stated that, AES does not have any objection to the increase and inclusion (NI) of a the RoCoF limit of 1 Hz/sec averaged over 500milliseconds in the grid codes provided the limit is not implemented until the required OEM plant assessments and any subsequent modifications to the plant has been completed.

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

AES agrees with the CER's proposed position that implementation of the modification will occur only following the completion of technical studies and any necessary implementation works that have been identified as being required by the OEMs to ensure that the machines, in so far as is reasonably practicable can sustainably comply with the new RoCoF limit. A difficulty most generators will have relates to engaging with the OEMs to ensure the completion of the required studies and works in the proposed time frame. AES would like to understand further how compliance with the standard would be determined by the TSO in light of the comments in the PPA report as to the feasibility of conducting suitable compliance testing.

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

AES understands its requirement to act as a prudent operator under the Grid Code and that the proposal to engage the OEM to carry out studies on the impact of high RoCoF events on the machine life, which is essential to the on-going prudent operation of the plant, has been acknowledged in the conclusions of the CER consultant's (PPA) report. AES agrees that these studies should also include a detailed investigation of the RoCoF levels expected in the 100ms time period of an event. AES can understand the view that Eirgrid/SONI, in its role as TSO, would be in the best position to determine when sufficient number of conventional and other generators plant is deemed to be compliant with the new required RoCoF limit to enable the SNSP level to be increased.

AES agrees with the point highlighted in the PPA report i.e. that each generator, for insurance and other reasons, will want to engage its own OEM to complete plant specific studies rather than rely on a more generic TSO run study. As such our OEMs will determine how long they will need to complete the study and provide conclusions. AES is concerned with the long term impacts on machine life and will engage it's OEMs to provide specific analysis and conclusions. Although the PPA report has suggested that in future years with higher levels of SNSP there is no evidence to suggest the number of high RoCoF incidents will be any greater than it is now, it is also fair to say that every event could have a higher RoCoF value than currently experienced. The ability to withstand one historic high RoCoF event cannot be taken as evidence of long term compliance capability as has been suggested as this approach will not address the requirement for repeated survival and the impact on longer term operation and maintenance regimes. For this assessment we required the expert opinion of the specific OEM.

AES would agree to cooperate, (within reason) with the TSO to provide information on the progress of the OEM investigation, the conclusions and recommendations determined. As regards the facilitation of RoCoF assurance testing to determine compliance AES would like to understand further how this aspect would be addressed by the TSOs.

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

AES recognizes that there is a requirement for a sufficient level of plant to be deemed to be compliant before any change to the SNSP level can be progressed. Undoubtedly the TSOs are in the best position to co-ordinate the responses from generators and determine when that level of plant has been attained. It is important that the TSOs understand that the generators time scales will be driven by the availability of the OEM experts to complete the studies and that if there is disagreement between generator and TSO on any aspect of the process, that there is recourse to the appropriate regulator/authority for resolution.

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

AES understands the requirement for its plant to be grid code compliant and the stated industry practice that it is the responsibility of the generator to achieve or maintain compliance. However as rightly stated in the CER consultation document the introduction of a new (NI) requirement for RoCoF will primarily benefit wind generators only and therefore conventional generators are being asked to incur the costs for completion of studies and potential associated plant modification works which would likely require outages to complete, to ensure they are grid code compliant, without the associated benefit. That coupled with the uncertain method for determining compliance could mean excessive costs for conventional generators with the benefit going to wind generators. The Regulators require generators to undertake this work and if required, modify their plant if the required RoCoF levels are to be achieved. It is not clear if the value of the new ancillary services will provide a suitable incentive to make any investment feasible but the only other option suggested by CER would appear to be to exit the market. AES views this as discriminatory toward conventional generators as these additional costs are incurred as a result of the requirement to connect more renewable generation and should be treated as a cost of connection for the renewable plant.

On cost recovery, AES has reviewed the 3 options identified in the paper and would make the following comments.

- (i) No cost recovery: AES understand that this would have the least impact on consumers but would have a significant impact on generators. The current budget proposal from our OEM is @ €1m to complete the studies they require. AES believes it is unfair and discriminatory to expect the

- generators to bear the costs of the studies which will result in whole consumer benefit. AES does not support this option.
- (ii) Cost recovery from consumers: AES understands the CER position on this option however as the increase in SNSP will allow for higher levels of renewable generation resulting in lower SMP benefiting all consumers and ultimately help government policy. Consequently we believe that the costs for getting to this position should be borne by all consumers. AES would suggest that information on costs for studies could be provided and managed to ensure that costs are kept as low as possible. Although these costs are associated with Grid Code compliance they are also associated with providing the circumstances for increasing the levels of SNSP which will in turn reduce SMP levels to the benefit of all consumers. AES supports this option.
 - (iii) Postalised recovery from all generators: AES has engaged with and obtained a plan for the completion of studies envisaged by its OEM. This plan has been assessed and budget costs developed for the completion of the work. AES is not aware if other generators have developed proposals to the same extent with detailed costs structures. If each generator is to carry out independent analysis as was indicated in the PPA report then it is possible that AES could incur higher costs than that required to complete the studies on its own plant under the postalisation option. AES does not support this option.

A further option

- (iv) Individual Generator Reimbursement of Costs: as this is a government imposed policy and target led project, then the cost of implementation should be supported by government funding. Since the objective of the renewables policy is to deliver social benefit then customers should pay. A suggested method to control the costs is to provide open book cost reimbursement for each generator up to a pre investigation agreed quoted contribution amount (any surplus to be paid by the generator) to be reimbursed on completion of the studies from the savings in production cost realised by the TSO on implementation of a higher SNSP level.

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

As mentioned earlier in this response the requirement for an increased or new RoCoF limit in the Grid Code(s) is driven by government policy developed after the design and commissioning of most of the conventional generating plant on the system. Given that the generators have not yet engaged the OEMs to conduct the studies required to determine what plant modifications may be required to enable compliance and therefore the level of costs due to plant modification and associated outages to implement are still unknown, generators (depending on the cost recovery option) could already be exposed to considerable costs for no benefit. In addition,

the proposal to introduce a significant financial penalty for non-compliance with the new RoCoF limit as an attempt to ensure compliance is unhelpful.

Both options for the structure of the GPI are extremely punitive given they are based on the requirement to demonstrate compliance with a RoCoF limit on which there is little information on how compliance can be tested. More information is required on how the GPI would be implemented. For example, if it is based on assessment after an event has taken place, i.e. a generator has failed to stay connected following a 1 Hz/sec event, there is already a GPI for a generator trip and short notice redeclaration in place to penalise this. Given it is unclear how generators will be expected to demonstrate compliance in advance of moving the SNSP limit and the level of penalty is €1.8m for a 400mw unit this arrangement is disproportionate and unfair given the uncertainties which still exist and the existing penalties.

AES objects to the inclusion of the RoCoF GPI and as an alternative would propose that those generators which cannot provide evidence of compliance are factored into the scheduling and dispatch processes at times of high SNSP and that the flexibility of plant is used more transparently in the unit commitment process.

AES would also like to express its concern at the uncertainty created for investors by the retrospectively imposed change of operational limits and compliance standards required by the Regulators and the considerable impact that the costs of compliance and the proposed non-compliance penalties would have on current and future projects.

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

Yes. The previous consultation papers on DS3 have indicated that even if all the required plant is compliant with the new RoCoF standard, additional flexibility will be required of plant to facilitate an increase in the SNSP level to that envisaged by the TSO. It is the intention to incentivise additional plant flexibility through the provision of new ancillary service products but it is unclear how many of the existing conventional generators can offer improved services under the new ancillary opportunities and therefore other technologies to provide flexibility should be explored.

As an example of one such option, AES has proposed the installation of Energy Storage technology at Kilroot Power Station and is currently conducting a feasibility study prior to a formal approach to SONI. The AES energy storage technology has been deployed in several markets in the world including the PJM market in the United States and the proposal could provide all of the proposed new and existing ancillary service products in addition to providing frequency regulation and overnight load to reduce wind curtailment. The TSO has expressed interest in the technology

and AES believes energy storage could provide an important component in a secure and sustainable system with increased SNSP. AES would encourage the TSO and Regulators to further explore the opportunities afforded by energy storage.

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

Project Time Scale

The TSO's recommendation paper sets out a time line for the completion of the project to complete the relevant studies and the subsequent implementation of the grid code modification. The plan estimates that the conventional generators will have engaged their OEMs, commenced their studies by Q3 2013 and will have completed them by end of Q1 2014. Based on the evidence provided from contact with our OEMs AES believes this time scale to be optimistic as one of our OEMs has indicated that it will take approximately 12 months to complete the required studies. The prospect of operating machines in a power system with the levels of SNSP being proposed is new territory for our OEMs and they will want to consider in detail the implications for their equipment as they have no previous similar operating history or experience.

Long term O & M costs

It is conceivable that as a result of the OEM studies conducted physical changes or changes to the operational and maintenance regimes may have to be made. This could have a considerable effect on the costs of operating and maintaining the plant. At this point the impact is not known but thought should be given to possibility that significant investment may be required to ensure compliance but also the higher O&M costs could impact negatively on the profitability of the plant.

Determination of Compliance with the new RoCoF Standard

As mentioned in the previous sections it is not clear from the documents provided how compliance with the new RoCoF standard would be assessed and determined by the TSO. It would be helpful if the TSO could provide more information on the assessment and compliance determination processes and the options and consequences of non-compliance with the RoCoF standard.