



Mr John Pierce
Australian Energy Market Commission
Level 6, 201 Elizabeth Street
Sydney NSW 2000
Lodged via www.aemc.gov.au

Tuesday, 15 August 2017

Dear Mr Pierce,

RE: Draft Determination – managing rate of change of frequency (ERC0214)

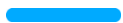
ENGIE appreciates the opportunity to comment on the Australian Energy Market Commissions (AEMC) draft determination on managing rate of change of frequency (draft determination).

The draft rule determination proposes a set of arrangements that would share responsibility for management of inertia services between transmission network service providers (TNSPs) and the Australian Energy Market Operator (AEMO). ENGIE understands that the key features of the draft rule determination would:

- require AEMO to determine sub-networks required to be able to operate independently as an island,
- require AEMO to develop and publish an inertia requirements procedure,
- require AEMO to assess whether an inertia shortfall exists, or is likely to exist, in any sub-network,
- require TNSPs to make minimum levels of inertia available to meet identified shortfalls,
- allow TNSPs to contract with third-party providers of frequency control services,
- require AEMO to approve TNSP proposals to contract for frequency control services, and
- allow AEMO to enable the inertia services provided by TNSPs.

ENGIE supports the aims of this draft rule determination which are to ensure that sufficient levels of inertia are maintained across the NEM to ensure that the power system is able to operate in a secure manner both for system normal conditions as well as following credible contingencies or protected events.

ENGIE also supports many elements of the proposed framework for the management and procurement of inertia services, with one notable exception. Similar to the separate rule change that is currently being considered in





relation to managing fault levels, ENGIE does not support the proposal that TNSPs would have responsibility for maintaining minimum levels of inertia.

ENGIE believes that a more preferable approach would be to assign responsibility for maintaining minimum levels of inertia to the independent power system and market operator – AEMO.

There are several reasons that ENGIE believes lead to the conclusion that AEMO is more suited to managing inertia than TNSPs. In summary these reasons can be classified as roles and responsibilities, competition versus regulation and practical considerations. These are discussed in turn below.

Roles and responsibilities

ENGIE believes that responsibility for maintaining inertia fits more appropriately with the roles and responsibilities of AEMO as defined in the National Electricity Law (NEL). ENGIE refers to the NEL clause 49 - AEMO's statutory functions and in particular, and notes clause 49(1)(e) in which AEMO is assigned the function to "maintain power system security". In contrast, the NEL defines TNSPs as having responsibility to "... own, control or operate a transmission or distribution system that form part of the interconnected national electricity system".

In restricting TNSPs' responsibilities to ownership, control and operation of the transmission system, the NEL has excluded TNSPs from responsibilities for management of power system security services such as system inertia. Furthermore, in specifically allocating the much broader power system security responsibility to AEMO, the NEL has ensured clear demarcation of responsibilities between TNSPs and AEMO.

In addition to the NEL, the national electricity rules (NER) in clause 4.3.1 sets out AEMO power system security responsibilities in additional detail, prescribing AEMO with responsibility to (in summary):

- maintain power system security,
- operate within the technical envelope,
- operate all plant within appropriate limits,
- assess impact of plant on the power system,
- determine and assess impact of constraints, and
- utilise ancillary services to maintain satisfactory power system operation.

ENGIE believes that by assigning responsibilities for system inertia procurement to TNSPs, the AEMC would be moving outside of the policy and regulatory framework established by the NEL and NER. If such a step is to be taken, then the fundamental principle of power system security management being assigned to one entity (AEMO) will be undermined. This is a step that should not be taken lightly, as it is vital that there remain an unambiguous allocation of responsibility for the critical function of maintaining power system security. This will be especially important as the power system transitions towards new technical and regulatory challenges where clear accountability will be of even greater importance.



Competition versus regulation

As well as the above policy and regulatory concerns, ENGIE also believes that by assigning responsibility for management on inertia to the TNSPs, the AEMC are in effect proposing that system inertia become part of the regulated framework of services provided by TNSPs. ENGIE believes that it is more desirable that the procurement of system inertia services be carried out within a competitive framework, as this is more likely to deliver efficient outcomes.

The regulated network framework was established at the commencement of the NEM when it was realised that the network was a natural monopoly and was therefore not suited to being exposed to competitive forces. System inertia services are able to be provided by a range of service providers and therefore cannot be regarded as monopoly services.

Another possible justification that might be applied for regulating the procurement of system inertia services could be that a competitive regime had been trialled, but there was evidence of market failure, necessitating the imposition of a regulated solution. Given that there has been no effort to implement a competitive solution however, this justification cannot be applied at this time.

Practical considerations

System inertia is dependent on, amongst other things, the number of synchronous generators that are online at any particular time. TNSPs have no direct involvement in the operation of the national electricity market which determines the commitment and dispatch of scheduled generators. AEMO on the other hand, as the independent market and power system operator, have a number of powers and mechanisms available which could be utilised in managing system inertia.

One of these existing mechanisms available to AEMO are constraint equations which AEMO utilises within the NEM dispatch engine to ensure that dispatch outcomes remain within the secure technical envelope. AEMO currently utilise a number of different constraint equations to manage rate of change of frequency for the loss of either the Heywood or Basslink interconnectors.

ENGIE is not suggesting that the management of inertia through these existing constraint equations represents an adequate or complete solution to the issue of management of rate of change of frequency. These constraints designed and implemented by AEMO do however, demonstrate that AEMO regard the management of inertia to be within their area of oversight, and have already taken steps to manage this issue.

As well as constraint equations, there are additional tools and mechanisms available to AEMO to respond to the need to manage system inertia. One of these is procurement of ancillary services. Under the national electricity rules, AEMO is able to procure network support and control ancillary services (NSCAS) under the provisions of NER clauses 3.11.3 and 3.11.5. Admittedly, the current arrangements in clause 3.11.3 does require that, having identified an NSCAS need, AEMO may (not must) request the relevant TNSPs to advise if and when it will be in a position to resolve the need. Clause 3.11.3 then requires AEMO to assess the adequacy of the network service provider's response, and if AEMO believes that there remains a risk to power system security and / or reliability, then AEMO must use reasonable endeavours to meet the NSCAS need.



These NSCAS arrangements make it clear that AEMO bears the ultimate responsibility for the adequate procurements of these services, and this can easily be applied to procurement of system inertia services.

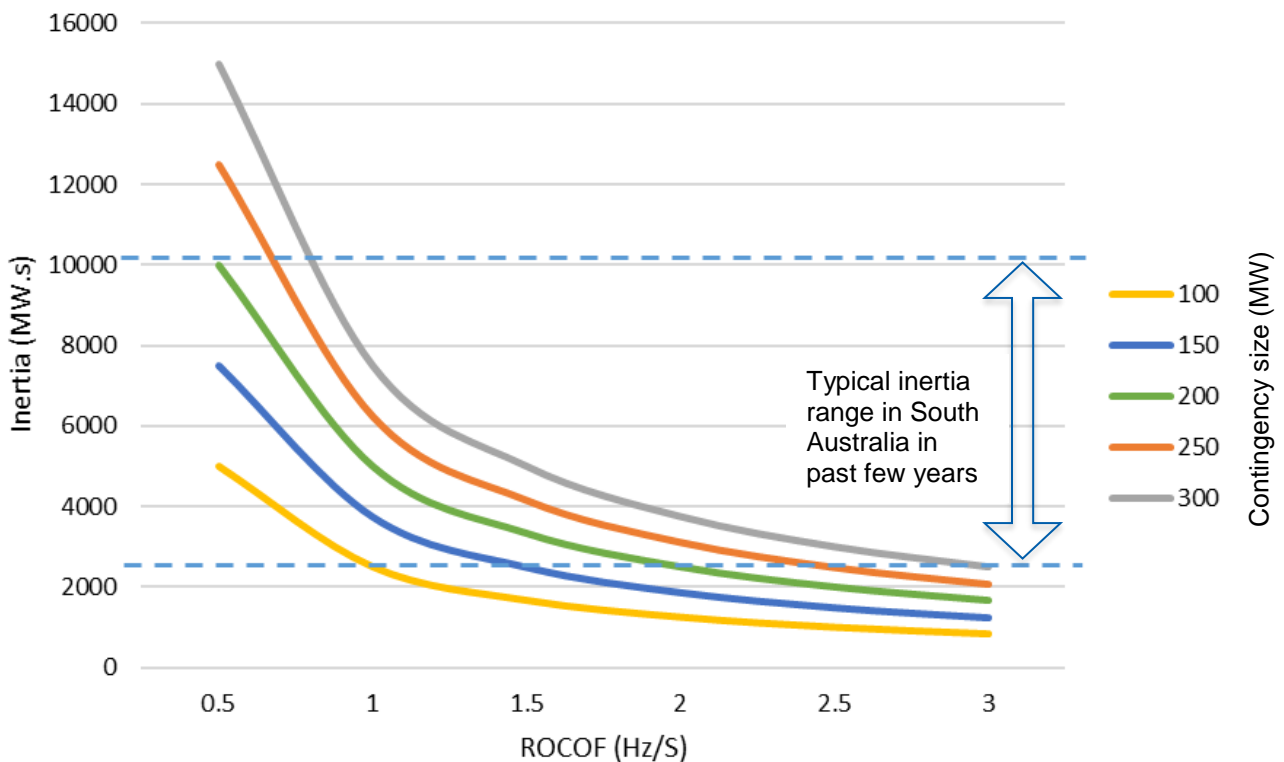
ENGIE believes that the existing mechanisms of constraint equations and ancillary service procurement could be developed and refined to allow AEMO to have greater control over the management of system inertia, leading to more effective and efficient overall outcomes.

Specific comments

As well as the above general comments on the draft determination, ENGIE has a few specific comments to make, and these are included below.

ENGIE notes the proposal to introduce a minimum level of inertia that TNSPs would be required to maintain to operate each sub-network in either a satisfactory or secure state when an islanded. The draft rule requires AEMO to take into account certain matters when determining the inertia requirements for an inertia sub-network.

ENGIE anticipates difficulties for AEMO when it seeks to establish a minimum level of inertia. As shown in the following diagram, the amount of inertia needed is a function of the contingency size and the level of rate of change



of frequency (ROCOF) that is acceptable. For example, for a contingency size of 250 MW, over 12,000 MW.s of inertia is required if ROCOF is to be maintained to less than 0.5 Hz/s. However if we allow ROCOF to be relaxed to 2 Hz/s, then the amount of inertia needed is only about 3,000 MW.s.



Because the amount of inertia needed varies to such an extent depending on what ROCOF and contingency size are being catered for, it would seem to be very difficult to establish a true minimum level of inertia without being very conservative, in which case, there is less value in establishing a minimum value.

Rather than attempt to identify a minimum level of inertia, ENGIE suggests that AEMO seek to procure sufficient inertia service to cater for the largest credible contingency in each region, at an agreed maximum ROCOF. Although the details of how inertia contracts are valued will need further consideration, one approach could be that scheduled generators that choose to self-commit in the energy market would not be entitled to a payment for their inertia contribution, but where AEMO required additional inertia, it could instruct a generator to synchronise and operate at a minimum generation output, which would then trigger inertia service payments to that generator. The amount of inertia service payment could be a fixed value, or perhaps a difference payment based on the energy price.

In any case, it is clear that AEMO are far better placed than the TNSP's to decide how much inertia service is needed both in real time, and into the future. It follows that giving AEMO the responsibility for procurement and dispatch of inertia services will lead to more effective management of inertia, as well as more efficient outcomes.

In summary, ENGIE supports an immediate approach that seeks to ensure that sufficient inertia is in place for the upcoming summer period, and recognises that interim measures may be needed to achieve this timetable. ENGIE believes that AEMO are the most suitable agency to determine the required amount of inertia service needed, and to then seek to procure this service through a tender and contract process.

The tender process conducted by AEMO could be open to participation by existing synchronous generators and to TNSPs. Presumably, TNSPs could offer the provision of inertia by installing synchronous condensers. Unless other participants were able to offer sufficient levels of inertia at a total cost below that offered by the TNSP, then AEMO would then offer the contracts to the TNSP. This in effect would provide a safety net, to ensure that the overall cost of inertia was economic.

ENGIE trusts that the comments provided in this response are of assistance to the AEMC in its deliberations. Should you wish to discuss any aspects of this submission, please do not hesitate to contact me on, telephone, 03 9617 8331.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Chris Deague".

Chris Deague
Wholesale Regulations Manager