

Siemens Response to the

Issue 1 Materiality of the issue

- 1. Are changing power system conditions impacting on the ability of AEMO, and other parties, to accurately model the power system?**
 - The first and last Generating System Model Guidelines were issued in 2008, now over nine years since the initial guidelines were issued.
 - The ability for AEMO to accurately model the power system has only been impacted by AEMO's lack of response to changing technology. AEMO has not provided any sufficiently detailed technical arguments for requiring this level of detail.
 - Siemens Gamesa doesn't believe conducting more detailed studies is warranted unless there is a consistently detailed network model for the generator models to use. If only positive sequence network models are used the response of the detailed models will be exactly the same as the RMS model. There is no evidence that the development work to provide a more accurate and detailed network model is being done.

- 2. Given any such impacts, do existing NER requirements for the provision of model data remain sufficient for parties to undertake effective power system studies?**
 - Yes, responses from the RMS simulations are adequate to conduct sufficiently detailed analysis of the security and stability of the power system. Siemens doesn't believe the phenomena that can be studied over and above a RMS simulation using EMT simulation techniques will have any material impact on power system security over and above what can be achieved in RMS type studies.
 - AEMO hasn't specified the phenomena that AEMO are particularly looking at and have provided no acceptable or unacceptable criteria.
 - At the time of responding to this rule change AEMO does not have the corresponding network data that would allow them to study the phenomena that provide the answers to grid stability in the EMT/fast transient time frame.

- 3. Is it necessary to amend the NER to place more explicitly defined obligations on participants to provide specific modelling data to AEMO?**

Yes there are dramatically varying levels of detail that are required for different study time frames. For disturbances caused by lightning for instance no control system representation is required, because the time constants are so small there is not enough time control systems to react.

AEMO need to be more explicit about what they are studying and more adequately explain in what situations they require an EMT type model. No acceptance criteria for these studies has been defined. The reference to "AEMO's reasonable opinion" is unacceptable and should be removed, either AEMO know what they're asking for or they formally change the NER to meet their requirements.

In many instances construction contracts for power plant (for all technologies) there is a requirement to do everything to meet the obligations of the rules. In the instance where AEMO's reasonable opinion requires something out of the ordinary, Siemens Gamesa or any OEM may not be able to respond.

Issue 2 Information gathering

- 4. Does AEMO have scope to gather sufficient information under existing NEL/NER provisions?**

Yes AEMO has greater information gathering powers than almost any other ISO worldwide. Provision of any further information is unwarranted.

- 5. Is the solution proposed appropriate?**

No. There is insufficient detail in the AEMO proposal. Where EMT models have been requested by ISO's in other jurisdictions there are identifiable phenomena and clear pass and fail criteria applied for modelling results. EMT models also come in different guises and it is not clear what phenomena AEMO is interested in.

Issue 3 Costs of compliance

6. What are the likely costs for participants of providing a broader scope of modelling data, or more detailed EMT-type models, to AEMO?

Siemens Gamesa estimates that it costs in the vicinity of €12,000,000 to develop an EMT model. This cost can be broken down into the cost of a test turbine, the cost of testing campaigns and the cost of engineering and development. The time to develop an EMT model including testing is around three years.

7. Is there a difference in costs if an EMT-type model is requested before connection, or required retrospectively after the connection is completed?

Yes, it would cost significantly more to do it afterwards, and may not be possible at all due to the lack of test data.

8. What data provision requirements should apply to a generator that is halfway through the connection process, when new data provision requirements are introduced?

The requirements of the version of the NER at the time of the connection application.

9. Could the cost of any new data provision requirements form a barrier to entry for new participants?

Yes, this has been proven in other jurisdictions where EMT modelling is required. It effectively locks out manufacturers who don't have very active research and development facilities in the area of grid modelling and is compounded when very specific modelling software is required.

Issue 4 Possibility of compliance

10. Are there any restrictions associated with providing data of the type contemplated in the rule change request?

Yes. Especially with regard to IP.

Issue 5 Existing generators

11. Should AEMO be able to request additional modelling data from existing generators who are already registered and have executed connection agreements?

Siemens Gamesa has no comment. Except to say that if existing test data does not exist then developing an EMT model would be very costly and very complicated.

12. Does the rule change request and the proposed rule provide sufficient guidance or clarity regarding what circumstances AEMO may require additional model data from existing participants?

No. None. Specifically there is no information on what power system phenomena will be studied and no information on what level of detail is required. There is also no information on what criteria would be applied for pass or fail in EMT studies.

Issue 6 Data disclosure

13. Should third parties have access to EMT-type models?

Access would have to be decided on a case by case basis. In general if there was a risk of intellectual property being propagated to a competitor, Siemens Gamesa would not consider allowing that information to be released to a third party.

14. What information should be made available to third parties? Would encryption of this data provide sufficient protection to address issues related to commercial sensitivity of the data?

No. EMT models reveal sensitive information even when encrypted.

15. Should EMT-type model data be provided only to AEMO, or should NSPs also have access?

Only to AEMO, Siemens Gamesa's understanding is that the EMT type models would be used in certain grid conditions to examine the difference in performance between the RMS and EMT timeframes.

16. Should information provided by NSPs be made available to third parties?

Yes, as far as Siemens Gamesa understands there is little proprietary information in the network elements.