National Electricity Rule Amendment - Technical Standards for Wind Generation and other generation Rule

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Key Concerns

- **Transitional arrangements**
  - cost impact
  - project delays
- **Materiality**
  - Is 5MW really equal to 750MW?
- **Normal vs nominal voltage**
  - IEC and Australian standards
  - Manufacturer guarantees, supply contracts
- **Dynamic Models**
  - Protection of IP
  - Threat to new technologies, impact on availability
- **Continuous Uninterrupted Operation**

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Transitional Arrangements

- Support the draft determination
- Transitional arrangements
  - Sovereign risk for projects under development
  - Cost impact of applying new standards to existing projects
  - Project delays – a reset may make a project unviable
- NEMMCO issue with Kogan Creek
  - Existing connection agreement, no technical standards
- Assumptions on project progression
  - Rule request assumes linear progression
  - Lack of understanding parallel paths
  - Details of plant required to negotiate Connection Agreement

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Materiality

- Same Rules apply to all generators regardless of size
  - Small generators can rarely meet automatic standard
  - Need for negotiated standard – with assessment by NEMMCO
  - Additional costs and time
- Connection to distribution network has different issues
  - Generators not used to control voltage
  - Fault clearing times and communication time can be very long
- All connections will impact the system
  - only those with large negative effects to the system performance should be a concern
- Rules assume that generators always will always be able to negotiate an acceptable negotiated standard
- Rules try to force automatic standard
  - no reference to cost or benefit

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Materiality - continued

- Question: What happens when there is 4000MW of distribution connected wind farms?
  - Each distribution feeder can only take a limited amount of generation.
  - Instability, or collapse of part of a distribution feeder (whether under load or generation) is isolated from the main system through its network protection and impedances.
  - Widespread loss of generation would have to stem from a large disturbance in the transmission system
  - 'Cascading failure' cannot spread out from a distribution system unless several layers of network protection failed simultaneously.
- Distribution issues are localised.
- Conclusion: widespread loss of generation 'cascading failure' can only stem from transmission backbone disturbances.

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Nominal / Normal Voltage

- Australian and International Standards define standard voltage standards for equipment and systems
  - The rating of equipment is taken to be the 'highest system voltage" , always a percentage above nominal voltage
  - Requiring equipment to meet a higher standard will require special equipment to be manufactured
  - Higher costs to the generator and ultimately the consumer
- Some NSPs are reluctant to provide the normal voltage
  - Confusion between a fixed “normal voltage” and variable “normal voltage range”
- S51a.4 is well above the current worst case

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Dynamic Models

- Support the concept of public/confidential models
- NEM is the only market requiring public dynamic models
- Model development is lagging wind turbine development
  - Risk of loss of IP will affect the availability of new technology in Australia
- Current ‘standard’ models are not performing adequately
  - Confidence in IP protection will encourage manufactures to improve model
- Control block diagram – independent of software
  - Object code is dependent on the software version,
- A full consultation process is required on the existing model guidelines of NEMMCO
  - Current guidelines require a level of accuracy beyond that of the system model. Yet model validation is dependent on the system model

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Continuous Uninterrupted Operation

- Support concept of wording proposed by AER
- Still an issue with materiality
  - Small generators embedded into the distribution network won't cause "cascading failures
  - Often required to drop off by DNSPs
  - Fault duration in distribution networks is nuch longer than in transmission.
  - Disproportionate reactive power requirement for distribution connection. – Unnecessary connection cost increase.
- Still considering implications for inverter connected generators

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