Katherine Moore
Head of Power Systems
Transpower New Zealand Ltd
Waikoukou, 22 Boulcott Street
Wellington, 6011
Lodged via system.operator@transpower.co.nz

Melbourne, 26. September 2025

Dear Ms. Moore,

Re: Consultation on Connected Asset Commissioning, Testing and Information Standard

Vestas appreciates the opportunity to provide feedback on Transpower's Consultation Document regarding the proposed Connected Asset Commissioning, Testing and Information Standard (CACTIS) released on 1 September 2025.

As a global leader in sustainable energy solutions, Vestas is committed to advancing technologies and practices that support the transition to a cleaner energy future.

Vestas would like to reinforce our submission to the New Zealand Electricity Authority Consultation Paper, lodged on 12 August 2025, regarding the Electricity Industry Participation Code 2010 amendment proposal on common quality-related information, where the first draft of the CACTIS was made available.

Vestas preferred approach to modelling is to use **"source code integrated" models**. In addition, Vestas also develops **simplified RMS models** in **PSS/E®** and **PowerFactory®**. A brief description of the two models are as follows:
- **Source code integrated models** (encrypted or unencrypted) contain proprietary Vestas Intellectual Property (IP). Encrypted models are shared exclusively with the System Operator under a non-disclosure agreement (NDA) and are not to be further distributed. Unencrypted models remain internal to Vestas and are not shared externally.
- **Simplified RMS models** in PSS/E and PowerFactory is a good representation of the product for the purpose of system studies. These models have gone through the model validation based on measured data in other jurisdictions in Australia and internationally.

These simplified models meet the needs for power system studies while safeguarding Vestas Intellectual Property rights.

Notably, **Vestas has recently entered into an non-disclosure agreement (NDA) with Transpower**, as the system operator, to share **encrypted** PSCAD™, PowerFactory® and Powertech's Transient Security Assessment Tool (TSAT) models.

Vestas recommends that Transpower consider adopting the principles and procedures outlined in Clause 3.13.3 of the National Electricity Rules (NER), as implemented by the Australian Energy Market Operator (AEMO) under the Power System Model Guidelines[1].

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[1] https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/participate-in-the-market/network-connections/modelling-requirements

Vestas – New Zealand Wind Technology Ltd

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In the Australian National Electricity Market (NEM) under the National Electricity Rules (NER), Vestas shares the following models for system studies:

- **Encrypted simplified PSS/E models** are shared with AEMO and integrated into their Operations and Planning Data Management System (OPDMS), which is used for the wide area network system studies and shared with the market participants.
- **Unencrypted simplified PSS/E models** and the **encrypted "source code integrated" PSCAD models** are shared with AEMO only.

A similar approach is followed in Western Australia (WA) under the Wholesale Electricity Market's (WEM) **Electricity System and Market Rules (ESM)** where:
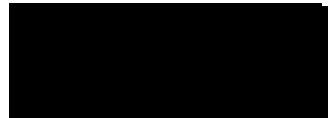
- Vestas shares the encrypted and unencrypted version of the simplified RMS model in PowerFactory with Western Power, the System Operator in WA.
- An encrypted "source code integrated" PSCAD model is also shared exclusively with Western Power for wide area assessments and is not distributed further.

In summary, Vestas has already shared full encrypted models with Transpower (as the system operator), and is open to share simplified PowerFactory encrypted models if Transpower is required to share with third parties (as part of the wide area network model) for system studies purposes. This approach aligns with established practices in Australia, both in the NEM and WEM.

Please refer to the appendix for our feedback on the draft of the proposed Connected Asset Commissioning, Testing and Information Standard (CACTIS). Should you wish to discuss any aspect of our comments, please contact Ram Raghuraman via ███████████████ or ████████████, or the undersigned.

Yours sincerely
Vestas – New Zealand Wind Technology Ltd.

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Dr Ragu Balanathan
Vice President, Power Plant Solutions
Vestas Asia Pacific

Appendix - Connected Asset Commissioning, Testing and Information Standard (CACTIS)

Chapter 4: Modelling Requirements

M1 AND M2 MODELS
Sections 4.3 and 4.4
The protection system (frequency and voltage protection functions) at the turbine level only.

SOFTWARE PACKAGES, FORMATS, AND CONFIDENTIALITY
Section 4.5
Could you please clarify whether the TSAT model is also required, given that the PSCAD and PowerFactoy models are included as part of the requirements?

Section 4.7
The supporting documentation scope should be limited to user guide. This requirement seems to be open ended.

GENERAL MODEL CONFIGURATION REQUIREMENTS
Section 4.10
(a) How is the adequacy and accuracy of models assessed?
(e) The Vestas models represent the actual product and may include control blocks or program code that are either unused, disabled, or intended for post-processing purposes. This requirement could involve significant modelling and development effort. Therefore, this requirement should be reconsidered and removed.
(f) The technical expectations of this requirement are unclear.
(g) Model development is a major task for OEMs. Compatibility with evolving software versions needs clearer guidance. Modelling guidelines should be well-defined, and software changes should allow enough time for OEMs to adapt.

PSCAD MODEL REQUIREMENTS
Section 4.12
(a) The term "adequate details" is vague and needs clarification.

MODEL VALIDATION
Section 4.13
What are the criteria for model validation?

MODEL DOCUMENTATION
Section 4.15
(i) Migrating to new software versions isn't always straightforward. Recompiling may not be enough—new models might be needed due to version incompatibility.

MODEL MAINTENANCE AND UPDATE
Section 4.16
(b) "Shortfall in the models" is not clearly defined.

Section 4.17
The one-month timeline should be reconsidered and removed. The development of updated models can vary significantly depending on the complexity of the required changes and may take longer.

Additionally, some updates are necessitated by platform limitations, which may require engagement with software tool providers—potentially extending the overall development time further.

Chapter 5: Connection Study Requirements

GENERAL CONNECTION STUDY REQUIREMENTS
Section 5.3
(b)(ii) Could you please clarify regarding the "tuning study" requirement?
(b)(ii) How do short circuit studies relate to frequency support obligations?
(c)(iii) How do short circuit studies relate to voltage support obligations?
(d)(i) How do short circuit studies relate to FRT obligations?

POWER-FLOW STUDY
Section 5.6
How should a minimum 3-year horizon be covered in studies?

REACTIVE POWER CAPABILITY STUDY
Section 5.7
The proposed reactive power capability study is incomplete. Other factors such as voltage level should also be taken into account.

SHORT CIRCUIT STUDY
Section 5.14
(a) How should a minimum 3-year horizon be covered in studies?
(b) The scope of full intact system and N-1-1 outage scenarios for short circuit studies needs better definition/clarification.

FAULT RIDE THROUGH STUDY
Section 5.20
(a) What is the distinction between Transient Stability and FRT studies? Both seem to involve fault scenarios—are they overlapping?
(b) Benchmarking scope should be clearly defined.

SHARING OF ENCRYPTED MODELS FROM OTHER ASSET OWNERS
Sections 5.22 & 5.23
Vestas has already shared full encrypted models with Transpower (as the system operator) and is open to share simplified PowerFactory encrypted models if Transpower is required to provide them to third parties for system studies purposes, which is the similar procedures applied in Australia.
Those simplified models meet the needs for power system studies and protect Vestas rights to the models.

General Question
What software versions are applicable (e.g., PSCAD v4 or v5)?

Chapter 6: Test Plan requirements

Section 6.4
(c) Test Plan only contains information associated with the steps to be taken during hold point testing. Potential risk and impact assessment are separately provided through pre-test simulations and load profiles. Hence it is not possible to incorporate them into test plan.
(d) In order to comply with system operator's planning, Test schedule with load profiles is submitted 5-7 days prior to testing looking at the wind forecast. This should not be part of test plan.

Chapter 7: Testing requirements

Section 7.3
(b) Please clarify if the m2 model validation timeframe of 3 months is from the practical completion and hold point release date by NSP? Wording is confusing with end of commissioning period in 1.15 (a) and 1.16.

ENGINEERING METHODOLOGY
Sections 7.7 and 7.8
The requirements are unclear. Please clarify the documentation that should be submitted.