Hi Contingent Project,

Schweitzer Engineering Laboratories (SEL) appreciates the opportunity to comment on ElectraNet's Stage 1b early-works contingent project application, submitted on 21 January 2026, regarding the Northern Transmission Project (NTx).

SEL is a global leader in protection systems, power-system control, fault analysis, wide-area networking for critical infrastructure, and cybersecure operational technology (OT). SEL equipment protects and monitors transmission and distribution networks worldwide, including system-strength-limited regions similar to South Australia.

We recognise the importance of this actionable project, identified by AEMO in the 2024 ISP as part of the optimal development path to support new renewable generation, manage growing industrial loads in Adelaide, and relieve north–south transmission congestion.

SEL supports ElectraNet's approach and welcomes the opportunity to provide feedback focused on modelling, system security, cyber-resilient OT design, and early-works readiness.

The Stage 1b early-works application appropriately includes activities fundamental to enabling a major transmission augmentation, particularly:

- network planning and dynamic/static assessment,
- market modelling and technical scoping,
- environmental and approvals work,
- procurement readiness and governance, and
- stakeholder engagement.

SEL agrees that these early-stage activities are essential to progressing a complex ISP-aligned transmission project.

South Australia's power system is increasingly dominated by inverter-based resources (IBR). NTx is required to:

- maintain operational reliability,
- support AEMO's operational constraints, and
- improve renewable hosting capacity.

The inclusion of modelling and analysis in Stage 1b is therefore justified and necessary.

SEL supports ElectraNet's emphasis on network assessment and modelling and offers the following observations regarding good practice.

AEMO requires comprehensive RMS and EMT models, including R1/R2 validation, transient stability, harmonic analysis, and performance assessment for all NEM-connected plant. NTx modelling activities should align tightly with these guidelines to ensure compatibility with AEMO's assessment processes.

AEMO is transitioning to PSS®E v36 for connection-study modelling due to security and support considerations.

NTx early-works studies should assume v36 as the baseline to avoid rework.

AEMO's recent briefings on large-load modelling show that poor fault-ride-through characteristics and aggregated dynamic behaviour can significantly impact system security, particularly in Victoria and South Australia. This reinforces the need for EMT modelling in early-stage assessment of the NTx corridor.

We note the AER's recent approval of TasNetworks' PADR extension so that 2026 ISP data and models can be incorporated. The same principle applies to NTx: alignment with ISP models improves accuracy and reduces the risk of mid-process redesign.

As a global manufacturer of protection and control systems for high-voltage networks, SEL offers the following considerations for early-works planning.

Critical transmission projects should incorporate:

- software-defined networking (SDN) for east–west segmentation,
- secure relay-to-relay communications,
- authenticated control channels, and
- Principles for substation automation.

SEL's experience is that cyber design done early in the scoping phase leads to lower lifecycle cost and reduces integration risk.

Large transmission augmentations typically require:

- fault-level and protection coordination studies,
- short-circuit modelling,
- line-differential and distance protection design,
- transient recovery voltage (TRV) evaluation, and
- synchrophasor-based wide-area visibility for commissioning.

These elements align naturally with ElectraNet's modelling scope as described in the early-works application.

SEL provides the following recommendations for the AER and ElectraNet to consider:

Publishing a high-level description of modelling assumptions, ISP alignment, and sensitivity cases would support stakeholder engagement and reduce uncertainty during later RIT-T stages.

Given South Australia's unique IBR mix, early EMT-level studies should be prioritised to identify system-strength requirements, stability constraints, and performance risks before detailed design.

Consistency across ISP models, transmission planning studies, and real-world proponent models (wind, solar, BESS, and large loads) is essential to avoid duplicated study cycles or late-stage redesign.

SEL supports ElectraNet's Stage 1b early-works contingent project application and agrees that the proposed planning, modelling, and governance activities are necessary to progress this actionable ISP project.

We appreciate the opportunity to provide comment and are available to further support technical discussions regarding protection, modelling, OT cybersecurity, and system-strength readiness as the NTx project advances.

Warmest Regards,

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