Operational and ownership boundaries between Transend and Aurora, and efficiency and effectiveness of the Tasmanian electricity industry and customer service levels.

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TRANSEND

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1 Summary

This information for relevant stakeholders:

(a) explains the existing ownership and operational boundaries between Transend, the Tasmanian transmission network service provider (TNSP) and Aurora, the Tasmanian distribution network service provider (DNSP);

(b) summarises Transend's understanding of the boundary concerns raised in submissions (with a number of these submissions listed in Appendix 1);

(c) documents the rationale for and advantages of the current boundaries; and

(d) identifies the current processes, cooperation between Transend and Aurora and proposed work to continue to enhance outcomes for customers.

Transend considers that there are no material benefits to customers from a change in the asset ownership boundaries between Transend and Aurora. Transend and Aurora continue to work together to improve customer outcomes, including current work to efficiently transition towards new operational arrangements to further benefit customers.

2 Background

The current operational and ownership boundaries between Transend and Aurora have been in place since the disaggregation of the Hydro Electricity Corporation (HEC) and the consequent formation of Transend Networks and Aurora Energy on 1 July 1998.

The disaggregation of HEC required a range of pragmatic decisions to be made including establishment of practical ownership and operational boundaries between all new entities. This included the setting of boundaries between transmission and distribution. As with all such decisions there are consequent disadvantages and advantages and on balance the advantages of the boundaries set at disaggregation well outweigh the disadvantages.

For the purpose of this document, the term "operational" boundary is used narrowly to describe the boundary delineating the organisational authority to physically operate (including remotely operate) high voltage (HV) switching devices or enable/disable associated protection functions. It excludes management of the asset life cycle functions. There are currently no differences between the operational and ownership boundaries between Transend and Aurora.

Essentially, as indicated in simplistic form in a number of submissions on this matter, the current boundary between Transend assets and Aurora assets is at the point of connection of the distribution feeder cables to the HV (44 – 6.6 kV) switchboards. That is, the Transend owns, maintains and operates the switchgear (including circuit breakers and disconnectors) and Aurora owns and maintains the connecting high voltage cables (distribution feeders). The same principles generally apply in Transend's arrangements with direct connect customers.

3 Disadvantages of the current operational boundaries

A number of submissions, for example those submissions 1 – 5 referenced in Appendix 1, identify, at a high level, perceived disadvantages of the current ownership and operational boundaries, with recent focus on the operational boundaries, and the perceived advantages of amending the boundaries. In summary, concerns relate to potential delays in Aurora accessing its assets to maintain them or restore supply following faults within Aurora network which have tripped the feeder circuit breaker under Transend's control.

The submissions express a view that the lack of real time information about the status of the HV feeder circuit breaker and load data directly available to Aurora and the need for Aurora operators to liaise verbally with Transend control room operators is contributing to the delay in supply restoration.

The reference submissions 1-5 provide no quantitative details of the extent or duration of the perceived delays. Nor do the submissions explain in practical terms how Aurora would use the unsupplied real time data on the feeders to shorten the perceived delays.

Transend considers that the time to respond to faults largely reflects in-built procedural safety mechanisms and operational protocols rather than Transend's failure to respond in desirable timeframes. Implementation of appropriate protocols means that there may be minor delays in restoring supply to the customer as a result of the necessary interaction between operators.

Transend also rejects the inherent suggestion of the reference submissions 1 – 5 that Transend's focus on transmission network operations is at the expense of operations associated with restoration of supply to distribution feeders which results in poor service to Aurora's customers.

4 Advantages of current operational boundaries

The advantages of Transend having both asset management and operational control of the distribution feeder switchgear (including circuit breakers) are summarised below.

Transend, as the TNSP, was resourced at disaggregation to manage (as a minimum) the pure transmission assets (extra high voltage (EHV) transmission lines and substations) and consequently had the people with appropriate skills and experience to manage the transmission assets including the complex, highly integrated control and protection assets associated with EHV Substations and EHV/HV substations.

Traditionally the HEC had organisationally been arranged in the same transmission/distribution asset responsibility split as Transend and Aurora, from asset development through to asset management and operational control.

At the time of disaggregation of the HEC it was recognised that a significant amount of capital expenditure needed to be invested on Tasmania's transmission system to bring it up to contemporary safety, reliability and security of supply standards.[1] The required work included expenditure on EHV/HV supply substation assets including work on unreliable, unsafe outdoor types of HV switchboards.

For this reason, unlike Aurora, Transend was established with no debt and the well documented requirement to borrow capital for the purposes of bringing the transmission network up to contemporary standards.

[1] p36 of the draft TESI paper 'Financial Review of the State Owned Electricity Businesses" paper provides independent validation of this requirement.

Distribution feeder circuit breakers at EHV/HV supply substations are part of an integrated system (i.e. HV switchboards) which in most instances include, in addition to the distribution feeder switchgear: HV transformer circuit breakers and disconnectors, bus-coupler circuit breakers and disconnectors, busbars, cables and associated measuring equipment (instrument transformers) and protection and control circuitry. In contemporary arrangements, including those at Transend, all the HV switchboard equipment is enclosed in modular, interconnected metal panels making up a discrete asset. It is not practical to split ownership responsibilities (including asset management responsibilities) within the HV switchboard as proposed in the reference submissions 1 – 5. Applying an operational responsibility boundary within the switchboards has safety implications and potential inefficiencies with the need for complex procedures.

Asset management of these assets is most efficiently performed by one party managing the assets as an integrated system.

Having one owner and operator of the HV switchboards has avoided the risks, and logistical and practical issues associated with multiple parties managing facets of the same assets (for example risk of slow and uncoordinated decision making and risks associated the number of people requiring access to the assets).

Since its establishment Transend, in consultation with Aurora as the affected customer[2], has replaced, upgraded or included in its new substations, HV switchboards at more than 14 EHV/HV supply substations, with modern indoor, enclosed switchboards with contemporary protection and control systems. Similar work is proceeding at further EHV/HV supply substations. In addition the protection and control systems in a further 9 substations have been upgraded. All HV protection and control systems upgraded in Transend supply substations since about 2003 have been implemented to provide the specific features requested by Aurora for distribution feeder protection. These features will improve security of supply by more reliably tripping the appropriate equipment (fault discrimination) and facilitate improved reliability of supply to Aurora's customers by enabling faster identification of the nature and location of faults leading to more rapid restoration of supply. These protection and control systems and associated communication systems enable the transmission network to be effectively monitored and operated from Transend's Network Operation and Control System (NOCS) and Control Room.

The new protection and control and communication systems in the 23 substations provide real time and diagnostic information to the NOCS control room operators and asset management personnel. At this time, information about the distribution feeders is made available to distribution network operators by the transmission network operators through voice communication.

Transend retains the capability to most efficiently manage the modification of protection settings to enable Aurora to perform its maintenance activities.

[2] The upgrade of HV protection and control systems at Transend HV substations has been done at the request of Aurora, and Aurora has been involved in the specification of equipment capabilities.

5 Current operational boundary interface processes

5.1 Restoration of supply where a fault on a distribution feeder has tripped the circuit breaker at Transend's substation:

When a distribution feeder circuit breaker trips the Transend NOCS system alerts the Transend Power System Coordinator (PSC) through programmed alarms. In accordance with the documented procedure, the PSC calls the Aurora Distribution Control Room and advises that the feeder circuit breaker has tripped and tags the feeder circuit breaker so that it cannot be remotely operated. The Aurora Control Room Operators will either arrange for field crews to investigate the fault or wait 15 minutes before requesting the Transend PSC to re-close the feeder circuit breaker. This procedure, with the in-built safety precautions, is generally consistent with the procedure of network service providers across Australia.

5.2 Modification of protection settings and operation of distribution feeder circuit breakers to enable distribution feeder maintenance activities:

Transend's Power System Coordinator will alter protection settings to enable live-line and/or vegetation work to be carried out on request from Aurora Distribution Operations.

For planned work Aurora Distribution Operations calls the Transend Control Room between 6:00 and 7:00 a.m. on a daily basis and work through a list of planned work. On completion of the work an Aurora Operator notifies the Power System Coordinator and feeder settings are restored as required. There should not be any delay in the work proceeding as scheduled or impact on Aurora customers.

Maintenance outages for planned work on Aurora distribution feeders are managed through an Aurora Switching Plan which is normally provided three to five days prior to the planned work.

In emergencies the Power System Coordinator will open off Aurora distribution feeders on request from the Aurora Distribution Operator.

6 Recent activities, resulting benefits and future opportunities

Transend is of the view that, the level of interaction and cooperation between the two companies in managing and operating "boundary assets" is high and continually improving.

Transend highlights two recent initiatives which address the concerns raised in the reference submissions 1 – 5.

(i) The relocation of Aurora's distribution operators within the same building as the Transend transmission system operators has enhanced operational communication and cooperation leading to improved services for Aurora's customers at the same time as leading to overall cost savings.

(ii) The provision of real time and diagnostic information about the distribution feeders by Transend to Aurora. The replacement of the protection, control and communication systems outlined earlier in this paper have meant that enhanced real time information has been gradually made available to Transend's operators. The subject information is available within Transend's NOCS, much of it on computer screens and discussions between Transend and Aurora about making this information available to Aurora's operating system are well advanced. Included in this provision of information is the "distance to fault" information which will assist in the more

rapid identification of fault locations on an increasing number of distribution feeders and hence more rapid restoration of supply to customers.

Provision of real time information by Transend to Aurora may be the first step in a strategy to transition Aurora's distribution operators to operational switching responsibility for the distribution feeder circuit breakers at Transend EHV/HV substations.

Transend continues to work with Aurora to continually identify opportunities for improve customer service.

7 Conclusions

Transend effectively manages the "boundary assets" between Transend and Aurora, including effective management by Transend and Aurora of switching activities at the boundaries.

Transend and Aurora continue to improve services to customers including initiatives to improve management of operational interfaces between the two companies.

Appendix : Related submission references

1. "Electricity Boundaries to suit the Customer" by David Asten synopsis of a paper presented to the Electricity Reliability Review Workshop, conducted by OTTER, 16 October 2009.
2. Response to "2010 Reliability Review Draft Report issued by OTTER" submitted by David Asten, 30 November 2010.
3. "Tasmanian Electricity Networks to suit the Customer" presented to the (Tasmanian) Electricity Industry Expert Panel by David Asten 18 April 2011.
4. Supplementary Submission to the Tasmanian Electricity Industry Expert Panel by David Asten 3 June 2011.
5. Submission to Australian Energy Regulator by David Asten 12 August 2011.