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Via email: [expenditure@aer.gov.au](mailto:expenditure@aer.gov.au)

Dear Chris

### **Better Regulation Program – Replacement and Augmentation Expenditure Categories**

Thank you for the opportunity to provide a response to the AER's proposed categories for replacement and augmentation expenditure. Grid Australia has reviewed the categories and sub-categories proposed by the AER for Transmission Network Service Providers (TNSPs) in the *Repex and Augex Strawman Proposal* of 27 March 2013 and provides comments below.

Grid Australia is of the view that the repex and augex models demonstrated on 27 March 2013 are a long way off from providing meaningful results that could be applied with confidence to expenditure forecasting for transmission networks. The nature of transmission networks presents a number of difficulties for effective replacement and augmentation modelling because:

- The majority of replacement and augmentation expenditure for transmission networks is justified on the basis of individual asset condition, performance of a particular asset type or specific planning constraints. Very little transmission investment compared to distribution investment is modelled based on statistical projections. This is partly due to the fact that transmission networks have fewer assets with more extensive asset condition information available than distribution networks, as reasonably expected due to differences in the value of the individual assets and consequences of failure.
- With regard to augmentation expenditure, asset utilisation in transmission networks can differ from distribution networks, other transmission networks and other areas of the same transmission network. This is due to the complex considerations of system stability and security in transmission planning, and that in some cases the main limiting constraint of a flow path is not a thermal constraint. Further, in these situations the limit may not be ascribed to an individual asset, but to a collection of assets that describe the flow path that is the subject of the limitation.
- With regard to replacement expenditure, "unit costs" will reflect variations due to factors such as opportunities for co-ordination with other works and contractor pricing allocations. These factors will vary between TNSPs and for the same TNSP over time. The provision of

data at a highly granular level would involve disaggregation of some costs to smaller units than those at which TNSPs incur the costs, which may diminish the veracity of the data.

For these reasons, consistent with previous discussions with the AER, Grid Australia considers that replacement and augmentation expenditure models are best suited to being used as screening tools to identify areas for further detailed analysis using techniques such as engineering review.

Grid Australia also understands that the AER wishes to better specify information requirements to support regulatory decision making processes. TNSPs currently publish a range of information on asset age and condition in Network Management Plans (or similar) and information on network planning related to augmentations in Annual Planning Reports.

Grid Australia considers that this information may satisfy the AER's information requirements and provide a suitable understanding of TNSPs' key investment drivers. Grid Australia would be pleased to work with the AER to determine the extent to which this information would provide the information the AER requires, and refine the information where beneficial to better support regulatory decision making processes. Grid Australia also notes that consideration of expenditure categories can be made aside from replacement and augmentation expenditure models, and proposes that the AER establish a consistent framework for information reporting to be used across the various techniques that are proposed.

### **Replacement Expenditure Categories**

In its submission to the AER's *Issues Paper – Expenditure Forecast Assessment Guidelines* dated 18 March 2013, Grid Australia proposed replacement expenditure categories at a level of aggregation that would minimise "unit cost" variances to the extent possible. The AER's *Repex and Augex Strawman Proposal* proposes further disaggregation into sub-categories. A detailed response to these sub-categories is provided below.

#### Transmission (Overhead) Lines

The AER proposes sub-categories of steel towers, monopoles/pylons and conductors by voltage level and conductor type. Grid Australia advises that:

- The separation of conductors from towers/poles would generally be a lower level of disaggregation than in TNSPs' asset registers.
- Steel tower strengths can vary depending on factors such as span length and size of conductor. This means that designs of individual towers will vary depending on topographical situation. Grid Australia suggests that the consideration of sub-categories by capacity as proposed below would alleviate this to some degree.
- Pole structures can include structures comprising a single pole or multiple (up to three) poles, depending again on topographical situation.

Grid Australia proposes the following modified sub-categories for the Transmission (Overhead) Lines category:

- Steel towers – by voltage level and configuration (whether single or double circuit)
- Pole structures (regardless of the number of poles per structure) – by voltage level and configuration (whether single or double circuit)
- Conductors (km) – by voltage level and either conductor type (for example, whether single, twin or quad conductor) or capacity (which will dictate conductor type)

#### Transmission Cables

The AER proposes sub-categories by voltage and insulation type. Grid Australia considers these sub-categories reasonable, but notes that the population of cables at transmission voltages is small.

#### Substation Switchbays

The AER proposes sub-categories of circuit breakers by voltage level and type, isolators and surge diverters.

Grid Australia suggests that the switchbays category should not be disaggregated into equipment types, because lower level allocations are likely to be affected by “unit cost” variances discussed above and the data is likely to be non-comparable between TNSPs and over time. Grid Australia proposes that instead the substation switchbays category remain at the aggregate level. Substation switchbays should include current transformers and voltage transformers, which the AER’s straw man has under secondary systems.

#### Substation Power Transformers

The AER proposes sub-categories by nominal voltage level, capacity and cooling type. Grid Australia considers these sub-categories reasonable.

#### Substation Reactive Plant

The AER proposes sub-categories of SVCs, capacitors, synchronous condensers and reactors by voltage level. Grid Australia considers these sub-categories reasonable, but notes that:

- The function and capacity of SVCs differs on an individual basis, which makes comparison non-sensible.
- Only one TNSP in the NEM has synchronous condensers, and if replaced these may be replaced with different technology. There is therefore little value in this sub-category for other TNSPs.
- The reactors sub-category should refer only to oil-filled reactors, and not to smaller air-cored reactors which are used occasionally and not comparable.

#### Secondary Systems

The AER proposes sub-categories of current transformers, voltage transformers, protection relays and other. Grid Australia suggests that:

- Current transformers and voltage transformers are better considered part of switchbays than sub-categories of secondary systems, as noted above.
- With current and forthcoming developments in microprocessor based devices, historical distinctions between devices such as protection relays and other equipment are likely to be superseded by integration of secondary system functions.

Therefore, Grid Australia suggests it is non-sensible to disaggregate the secondary systems category, given that secondary systems technology integrates a number of functions. There is also no need to differentiate this category by voltage level.

### Communications

The AER proposes sub-categories of SCADA, optical fibre and other communications. Grid Australia suggests that units are difficult to quantify for these sub-categories, because:

- Optical fibre installations are partly managed under transmission line asset management, to the extent that the bearers are a component of transmission lines
- The sub-category “other communications” is too broad and diverse to sensibly quantify on a common basis.

Grid Australia suggests that the communications category should not be disaggregated into sub-categories.

### Other Assets

Grid Australia suggests that units are difficult to quantify for this category, and asks the AER to clarify the purpose of this category in terms of what it is intended to measure.

### IT

Grid Australia considers that IT should remain a separate category for capital reporting purposes, and therefore proposed it in the response to the issues paper. Grid Australia did not envisage the category would be relevant for replacement or augmentation expenditure modelling, due largely to the short asset lives of IT equipment. In terms of sub-categories, Grid Australia considers it necessary to distinguish only between:

- Business IT – comprising corporate systems such as office software, hardware, servers and networks
- Operational IT – comprising SCADA and systems used for the purposes of operating the network

### **Augmentation Expenditure Categories**

Grid Australia notes that the AER’s proposed categories cover assets serving particular geographical areas, but omit augmentations to the shared network. Grid Australia proposes categories that better reflect the segments of transmission networks:

- Transmission lines – main grid/backbone shared network
- Transmission lines – regional/subsystem shared network
- Transmission lines – radial load
- Transmission lines – radial generation
  
- Underground cables – main grid/backbone shared network
- Underground cables – regional/subsystem shared network
- Underground cables – radial load
- Underground cables – radial generation
  
- Substations – main grid/backbone shared network
- Substations – regional/subsystem shared network
- Substations – radial load
- Substations – generation connection

Grid Australia supports differentiation by voltage level.

Grid Australia notes that the scope of these categories includes prescribed services only.

Grid Australia notes that the proposed categories for distribution replacement and augmentation include descriptors such as CBD, urban or rural, to indicate line lengths. For transmission, given the smaller number of assets involved, and the wide range of distances that any given voltage level may traverse, there appears to be a need to explicitly include the length of line in any measurement of unit costs. This could perhaps be done by either expressing the costs as \$/km or expressing the capacity measure as MVA.km. Grid Australia would be pleased to work further with the AER and its consultants to develop suitable metrics.

Should you have any clarifications or questions on Grid Australia's response please feel free to contact Andrew Kingsmill on 0419 617 340 or by e-mail at [Andrew.Kingsmill@transgrid.com.au](mailto:Andrew.Kingsmill@transgrid.com.au).

Yours sincerely



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