Sebastian Roberts
General Manager – Transmission & Gas Branch
Australian Energy Regulator
Sent by email: james.silcock@aer.gov.au

Re: Follow-up Information Request – Sydney CBD RIT-D Dispute

Dear Mr. Roberts,

I refer to your letter dated 31 August 2018, requesting additional information about Ausgrid's 'Ensuring reliability requirements in the Sydney CBD' Regulatory Investment Test for Distribution (RIT-D).

In relation to the specific requests made by WSP and the AER, I can advise as follows:

1. *Explanation on the build-up of costs for safety, environment and corrective maintenance, addressing how they were calculated and incorporated into the modelling for this project.*

An explanation of the build-up risks costs for safety, environment and corrective maintenance is provided in the spreadsheet named "*Ausgrid RIT-D Sydney CBD Safety_Environmental_Corrective Maintenance Risk Costs 10 September 2018.xlsx*" (attached).

2. *Explanation on the selection process for the assumptions and parameters used in the energy at risk calculations within Item 8 of the initial information request.*

   a) *Furthermore, referring to the table below from Ausgrid's response, clarification on what is meant by 'Repairable failure rate' and how it is applied.*

Transformer Type	Weibull parameters		Replace Time	Repairable failure rate	Repair Time
	η	*β*			
33/11kV transformer w/endboxes	3.77	113.9	35 days	0.0014	10 days

(source: Ausgrid, Response to AER information request - Sydney CBD RIT-D Dispute, page 17)

The explanation of the key assumptions and parameters used in the energy at risk calculations is presented in Appendix C of the Final Project Assessment Report, sections C.2 and C.3.

The repairable failure rate recognises that there are failures modes that do not result in an end-of-life condition, and therefore a repair is more cost-effective than the equipment replacement, taking into account the expected remaining life of the asset.

For a transformer, these may include failures such as leaking gaskets, defective motor boxes, worn tap changer contacts or corrosion/pitting of the transformer tank.

If the transformer can be put back into service after repair works or replacement of damaged parts, then these failures are assumed to be 'repairable'. These are characterised by relatively short duration repair times and are represented by constant failure rates for future years. Major failures are considered to be 'end-of-life' failures and non-repairable and it is assumed that the failure probability can be defined in terms of Weibull distribution.

The end-of-life unavailability (U_{EOL}) and repairable unavailability (U_{Repair}) are calculated by applying the equations reported in Appendix C of the Final Project Assessment Report, section C.3.2. That is:

$$U_{EOL} = \frac{P_f \times Replace\ Time}{365}$$

Where, P_f is the probability of failure calculated using Weibull parameters.

$$U_{Repair} = \frac{f \times Repair\ Time}{365}$$

Where, f is the constant failure rate which represents the repairable system.

The total transformer unavailability is calculated taking the union of UEOL and U$_{Repair}$ as shown in the equation below.

$$U_{Total} = U_{EOL}\ \cup\ U_{Repair}$$

For City East, the contribution from transformer unavailability due to the repairable failures is not material compared with overall unavailability due to transformer end of life failure as shown the graph below, taken from modelling data for City East.
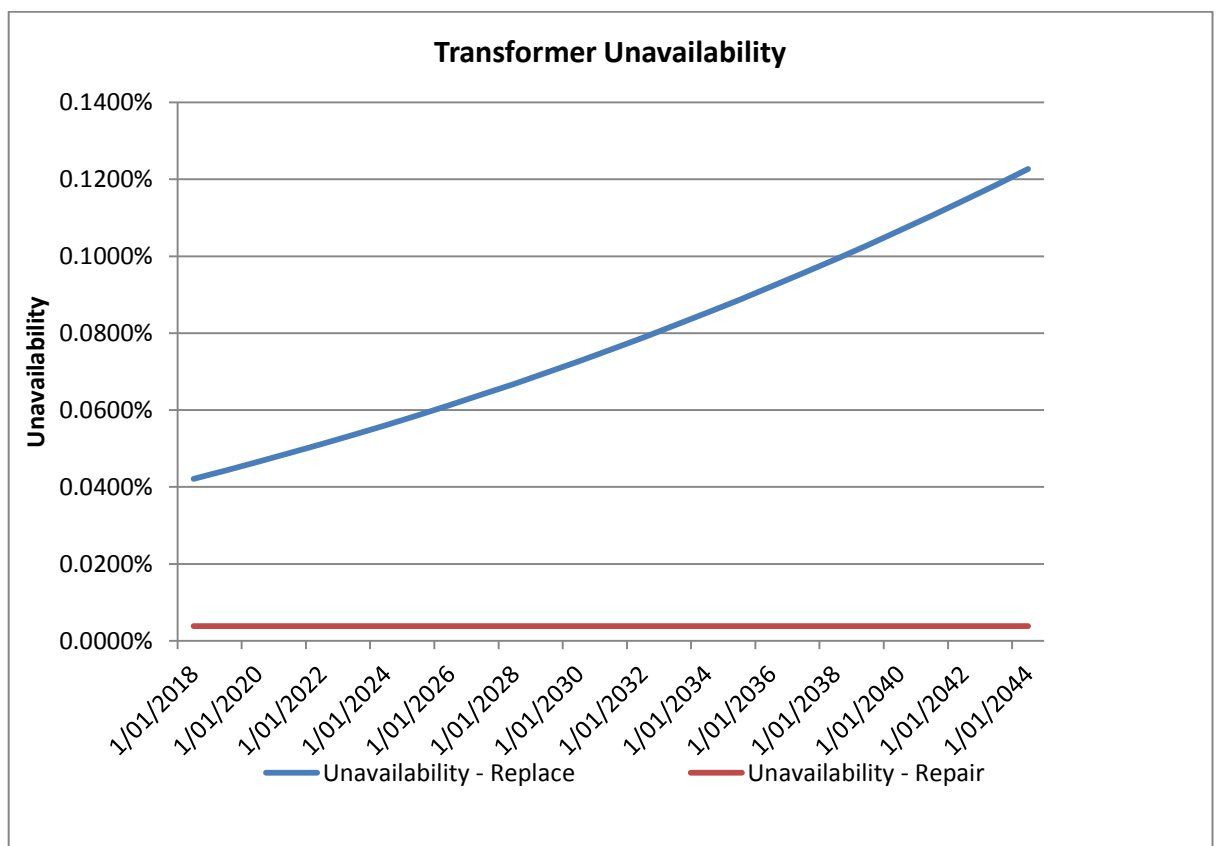
3. The model and associated methodology that have been used to determine the preferred timing of the project and the capital expenditure profile, in addition to what has been provided within Item 2 & Item 4 of Ausgrid's initial response to the information request.

- The preferred timing of the project is determined with the use of the spreadsheet named "*Ausgrid RIT-D Sydney CBD project timing 10 September 2018.xlsx*" (attached). The preferred timing is identified as the year in which the annualised cost of the proposed project falls below the

expected annual market benefits derived from completely removing the identified network risks. Note that while the project has two clear benefits and related dates, it is an integrated project so broadly addresses the later preferred date of 2025 in its timing.

- The capital expenditure profile of the project is reported in the spreadsheet "*Ausgrid RIT-D Sydney CBD model.xlsm*", under the "Calculation" Tab (blue cells in rows 230-231 and 284-285). This spreadsheet was already provided in the USB drive with our previous response on 8 August 2018.

- As noted in the meeting on 22 August, the purpose of the *'DM assessment'* spreadsheet is to complete a preliminary demand management screening test. This test uses the net NPV benefit for the preferred network solution to derive the available budget for an option where demand management forms part of an alternative option. The available budget is then assessed to determine whether it is possible to procure the required demand reductions with the available budget. In this instance, the available budget is not considered sufficient.

- The DM assessment applied a further simplification, which is consistent with the delivery approach of the proposed option, by combining the two projects to derive the estimated DM budget.

- While the document contained some information from preliminary assessments which did not form part of the decision, the values for unserved energy, safety risk, environment impact and major repairs used are as per the formal RIT-D model.

- The variation in the capital cost for the preferred network solution is due to the exclusion of some project costs from the RIT-D assessment used to determine the investment trigger year. The RIT-D assessment excluded expenditure already incurred in FY17 and much of FY18 ($1.9 million) and decommissioning costs ($3.4m); whereas the DM assessment included but did not defer sunk costs as well as including and deferring decommissioning costs.

Please feel free to contact me at your convenience on 02 9269 4222 or 0438433095 if further clarification or information is required.

Sincerely,

M. Webb

Matthew Webb
Head of Asset Investment