Main Grid System Strength Contingent Project

Response to AER information request dated 12 July 2019

19 July 2019

Security Classification: Confidential

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Item	AER Request	ElectraNet Response
Numbered Questions		
1	*Details and justification to demonstrate why an indoor synchronous condenser installation is the most efficient option compared with an outdoor installation.*	An indoor synchronous condenser installation is the most efficient option based on efficiency, operability and good engineering practice. All original equipment manufacturers (consistent with international practice) that ElectraNet has consulted with recommend installing the synchronous condensers inside a controlled internal environment. Some of the key considerations are as follows: • ability to control the indoor operating temperature through the use of a ventilation system to ensure optimal operating conditions and avoid the derating of the synchronous condensers during periods of high ambient temperatures (temperatures for outdoor installations are further increased by solar radiation). • provides a protected environment for regular maintenance operations to be performed. • provides a controlled environment for major maintenance activities and protects against contamination and damage to internal machinery. These works would include rotor extraction/stator checking and bearing, oil and vacuum skid and generator circuit breaker maintenance. • better atmospheric protection against pollution accelerating decay through moisture in the form of rain or dew (for both substations) and against the sea/saline environment (for Davenport substation). • better noise control capability and avoids the need for noise containment enclosures around the synchronous condensers, flywheels and pony motors. • reduced construction and commissioning delays due to weather once the building is erected.

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2	*A more detailed cost estimate for each of the line items in the 'Asset Allocation' worksheets of the costing spreadsheet provided. The information provided should enable the AER to understand the asset types, quantities, and unit rates that have been used to derive each of the line item estimates. If these cost estimates were derived using a method other than bottom up, then please provide details how each of the line item costs were derived, the assumptions involved in each line item estimate, and the calculations used to derive each line item estimate. This is to assist staff in assessing the reasonableness of the cost estimate and in relating the costing items to the scope of work.*	A more detailed cost estimate for the line items in the 'Asset Allocation' worksheets of the costing spreadsheet submitted with the contingent project application is provided in Attachment 1. [redacted]

3	*A definition of what costs are included in, or what cost variances are represented by, the 'project risk' costs included in the capital cost inputs spreadsheet (e.g. project risk allowances in cells D20 and D30 under 'Asset Allocation – Robertstown' and 'Asset Allocation – Davenport'). This should include a definition of the costs (i.e. risks) that are included in these risk allowances, and a spreadsheet setting out the details of how each of these risk allowances was calculated.*	The project risk cost estimates were calculated consistent with ElectraNet's project risk assessment methodology. The project risk costs reflect the relatively early stage of the project in the delivery cycle and complexity of the works involved. Separate risk assessments were performed for the Davenport and Robertstown substation sites. The steps taken in performing these risk assessments are outlined below: a) Project risks are identified through a process of expert internal review and assessment across the relevant project disciplines. A description of each risk specific to each site is captured and documented within a risk register. b) A risk assessment is then undertaken in order to quantify the cost of mitigating each risk, and then in turn to quantify the likely cost impact of the residual risk. This represents a refinement on the established project risk assessment methodology applied by ElectraNet that has previously been endorsed by the AER, and allows efficient mitigation costs and residual risks to be separately assessed: - For each risk identified in the risk assessment, a likelihood of occurrence and consequence level is estimated to determine an overall risk rating. The potential costs of mitigation are then estimated through a cost range. The likelihood of occurrence is then applied to these cost estimates in order to calculate the cost of mitigating that specific risk (mitigation cost). - Following mitigation, for each risk, a residual likelihood and consequence is estimated to determine a residual risk rating. The potential costs of consequence are then estimated through a cost range. The likelihood of occurrence is then applied to these cost estimates to calculate the residual risk cost after mitigation (contingency cost). c) The detailed inputs to this risk assessment were determined as follows: - Project risks were identified during project risk workshops held with the relevant subject matter experts; - Based on professional engineering assessment, the minimum, most likely and maximum cost impacts were estimated for all project risks, together with the likelihood of occurrence based on available information; and - The potential cost outcomes and likelihood of occurrence for each risk identified were further quantified by the relevant disciplines based on the area of activity or expertise in understanding the risk required.

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		d) Monte Carlo Analysis was performed to simulate both project risk mitigation costs and contingency cost outcomes on a probabilistic basis, based on the likelihood of occurrence and range of potential cost impacts across each of the identified risks. e) The outcomes of this risk assessment were then used to establish the risk allowance component of the capital cost estimate for each substation site, combining the estimated aggregate mitigation cost and contingency cost for each of the 2 sites. In accordance with the methodology above, a detailed spreadsheet setting out the details of each risk identified and the calculation of both mitigation costs of contingency costs for each separate site is provided in Attachment 2, together with the remaining inputs described above.
4	*The tender evaluation report (or equivalent procurement assessment documentation) that ElectraNet prepared in assessing the tender submissions it received for the synchronous condensers and flywheels. This will allow the AER to understand ElectraNet's reasoning for choosing the successful tender.*	[redacted]
5	*The technical specifications for the synchronous condensers and flywheels. This will assist the AER in assessing the proposed asset life and assessing the proposed project costs.*	The technical specifications for the synchronous condensers are set out in Attachment 4. It is noted that these specifications relate to the Robertstown site, but the requirements of the units at both sites are functionally equivalent.

Encl: Attachment 1 - Detailed Cost Estimate - CONFIDENTIAL
Attachment 2 - Project Risk Assessment - CONFIDENTIAL
Attachment 3 - Tender Evaluation Report - CONFIDENTIAL
Attachment 4 - Synchronous Condenser Technical Specification