Second Supply to the ACT Stage 2 - 7520825

Executive Summary

ActewAGL owns and operates electrical networks in the ACT. The effective and reliable operation of these networks relies on robust 132kV transmission network.
The ACT Government introduced Electricity Transmission Regulation 2006, which imposed on the NSW transmission network services provider TransGrid a requirement to provide additional supply capacity to the ACT. The Regulation requires TransGrid to establish a second supply point geographically separated to the current TransGrid supply point in West Belconnen. Utilisation of the second supply point capacity requires ActewAGL to establish and connect two new 132 kV circuits to the TransGrid's supply point.

As part of the Stage 1 project, on 04 November 2009 ActewAGL Board resolved to approve to proceed with the construction of the two new 132kV transmission lines from Theodore end and connect to the TransGrid Bulk Supply Point in Williamsdale at a total cost of $18.5 million. ActewAGL has engaged Jemena for the construction of the first stage and the work was completed and commissioned in February 2012

In order to comply with the requirement to provide additional supply capacity to the ACT the two Gilmore to Theodore 132kV single circuit transmission lines require upgrading to match the capacity of the Williamsdale to Theodore 132kV line presently under construction.

The options considered to upgrade the existing lines with high capacity conductors do not meet the Planning requirements. Therefore the most viable option is to built a new double circuit, single structure, bundle conductor line, similar to the current Williamsdale to Theodore line being built at an estimated total cost of $10.5 million.

Project Background

The ACT Government introduced Electricity Transmission Regulation in 2006, which imposed on the NSW transmission network services provider TransGrid a requirement to provide additional supply capacity to the ACT. The Regulation requires TransGrid to establish a second supply point geographically separated to the current TransGrid supply point in West Belconnen. Utilisation of the supply point capacity requires ActewAGL to establish and connect two new 132 kV circuits to the TransGrid's supply point.
Stage 1 of this project was to build a 15.3km double circuit single structure 132kV line from Williamsdale to Theodore. This work was completed and commissioned in March 2012. In order to comply with the requirement to provide additional supply to the ACT the existing two Gilmore to Theodore 132kV single circuit transmission lines require upgrading to match the capacity of the Williamsdale to Theodore 132kV lines already completed and commissioned.
Stage 2 is to upgrade the 132kV transmission line interface between the completed Stage 1 works and the existing ActewAGL Gilmore to Theodore (G2T) Transmission Line.
At the completion of stage 2, the combination of Stage 1 & 2 works will provide a uniform transmission line capacity from the 330/132kV Williamsdale Bulk Supply Substation to both the 132kV Theodore Z/S and 132kV Gilmore Z/S.

Project scope and exclusions

The Gilmore to Theodore lines were originally designed using All Aluminium Conductor (AAC). The existing concrete poles are also not rated for bundle conductor configuration and need to be replaced. As the new rating requirement is double the existing rating, innovative methods of achieving the rating requirement, such as high temperature conductors, need to be considered to avoid a complete rebuild of these assets.

The project scope is:

- Installation of 7.1km's of double circuit double Uranus conductor 132kV transmission line.
- Removal of 117 concrete poles.
- Installation of approx 55 new concrete or steel poles. Final number determined at detailed design stage.
- Upgrade the existing overgrown vehicular access track.
- The technical design requirements will be almost identical to Stage 1 as they are both Stage 1 & 2 of a very similar construction and dimension. Stage 1 final design will be used as a base for Stage 2 design in terms of transmission line fixings, conductors, insulators and pole configurations.

Constraints and assumptions

- Constraint:
    - Environmental constraints imposed by SEWPaC, ACTPLA and the EPA to protect the Pink Tailed Worm Lizards (PTWL), existing grasslands and yellow box gum trees.
- Assumption:
    - Minimum rain delays with a long term weather forecast of drier conditions than experienced in the last 3 years.
    - Sufficient erosion control measures employed to avoid additional remedial works.

Project objectives

- Time: The project will take 3 years and be completed by June 2015.
- Cost: The cost of works is estimated as $10.5 million
- Quality: All relevant Australian Standards and Health, Safety and Environmental Regulations will be adhered to. Where appropriate, internal ActewAGL standards and work practices will be incorporated into the project.
- Scope: Replace the two existing Gilmore to Theodore 132kV lines with a single pole transmission line having two circuits for a distance of 7.1 km's. This will require the replacement of 117 existing poles with 55 new stronger poles to carry the extra overhead cabling.
- Risk & Benefit :
    - Benefit resulting from the G2T transmission line upgrade:

        - Ensure a robust and reliable transmission line connection between the Williamsdale Bulk Supply Substation with the full capacity to pick up the entire Electricity network in case of any failure of the current TransGrid supply point west of Belconnen.
        - Meet the ACT Government introduced Electricity Transmission Regulation 2006
    - Risk resulting from the G2T transmission line upgrade:
        - Adverse weather conditions leading to project delays.
        - Development of a full EIS which would delay the project further.

Project Approach

- Environmental and Development Application approvals. ActewAGL to enage consultant to proceed with the Environmental and DA approvals. This may also incorporate an EIS but is considered a low possibility.
- Contract Delivery Method: Lump Sum through an open market "Request for Tender" process which will require evaluation and ActewAGL Board recommendations to appoint the successful tenderer.
- Concept Design & Functional Specification. The basis of the concept design & functional specification will be obtained from Stage 1. The Contractor will be required to do PLS-CADD design using the existing pole placements.
- Detailed Design will follow approval of the concept design.
- Construction includes the upgrading of access tracks and the removal and installation of concrete or steel poles. Construction will take a staged approach where the line is broken into 3 portions: 1, 2 & 3. This allows for easier Operational Interface and allows the existing transmission lines to provide power to the ACT.
- Transmission line commissioning after construction completed.
- Environmental Line restoration works after construction is completed.
- Contractor to handover Asset to ActewAGL including Work As Executed drawings and Operational and Maintenance Manuals.

OPTION STUDY

As the new rating requirement is double the existing rating, innovative methods of achieving the rating requirement, such as bundle or high temperature conductors, need to be considered to avoid a complete rebuild of these assets.

ActewAGL has engaged Jemena to undertake a feasibility assessment taking into account all possible options to meet the line capacity of the Williamsdale to Theodore line recently commissioned and provide a cost analysis to demonstrate any savings over total asset rebuild.

The existing concrete poles are also not rated for bundle conductor configuration and need to be replaced. As this is the most expensive option it was not considered for the study.

Three high temperature conductor types were considered for the study. However the design modelling work carried out confirmed that these conductors are either too heavy for the existing structures and exceeds the rated pole strength or does not meet the required emergency rating. Therefore these options were not considered further.

The double circuit line built with twin Uranus conductor from Williamsdale to Theodore was considered as the most technically feasible option to construct a new line from Gilmore to Theodore that meets the emergency rating requirements. This option was considered for implementation. Total length of this line is estimated as 7.2Km.

RISKS / BENEFITS:

The proposed construction of a new double circuit line will:

- Ensure there is a robust and reliable transmission line connection from Williamsdale Bulk Supply substation with the full line capacity to pick up the entire Electricity Network in case of any failure at the current TransGrid supply point in West Belconnen

- Meet the ACT Government introduced Electricity Transmission Regulation 2006, which imposed on the NSW transmission network services provider TransGrid a requirement to provide additional supply capacity to the ACT.

The proposed Stage 2 project faces a number of risks, being

- Adverse weather conditions could impede the project program, leading to cost increase. This risk can be managed through appropriate contract cost risk allocation mechanism and plan the work during drier periods of the year.

- Commencement of the line upgrade work will depend on the completion of the TransGrid 132kV tower line upgrade to 330kV between Williamsdale and Canberra Zones. This work is expected to complete by late spring 2012. (This allows the Gilmore to Theodore line to be then taken out of service for upgrade)

- Risks in development approval and requirements for a full EIS. This could delay the project and incur additional cost. We are seeking clarification from ACTPLA of the level of approval required. We are also seeking similar clarification from National Capital Authority (NCA).

- ActewAGL will submit the EPBS referral for the proposed action to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC). If this referral is assessed as a controlled action the recommendations will go through a public notification process. Then the department will submit the final recommendations to the Federal Minister for approval.

Financial Analysis:

The estimated cost of the project is $10.5 million spanning over three financial years. The work will be managed in multiple phases through competitive sourcing of design and construction resources.

The Regulatory decision in 08/09 was to complete the Stage 2 project in the period 2011/2012 and 2012/2013 at a total cost of $8.1m in 08/09 dollars. In 2011/2012 dollars this amounts to $9.1m. The estimated budget cost for the project is $10.15m.

In the 2013 – 2014 financial year $0.5m will be included to complete a detailed design for the line.

Based on the estimated project timing $9.65m will be expended largely against this project in 2014 – 2018 Regulatory Period to fund the for following:

- Due to the design and scope change necessary to build the line to match the already commissioned Stage 1 Project.
- The original estimate has not made allowance for the removal and transportation of the existing 61poles from the site.
- The original estimate has very low allowance for creating all weather access tracks for construction and rehabilitation works.
- Estimated labour rate was very low in the original estimate and no allowance for living away from home cost.

Project Timing

Phase	Task	Timeframe
Phase 1	Obtain Development Approval, Detail design and BOQ & engage a contractor	2013/14
Phase 2	Construction of the Line between Theodore and Gilmore Zone Substation	2016/17
Phase 3	Completion of line construction, Commissioning and Remove the redundant lines between Theodore and Gilmore	2017/18

Project Cost

	Project expenditure and Forecast ($m)		
	2013/14	2016/17	2017/18
Second Supply to the ACT Stage 2 Project	0.5m	6.35m	3.30m

Project Dependencies

Development approval and requirements for a full EIS may be required. This could delay the project and incur additional cost. ActewAGL will seek clarification from ACTPLA of the level of approval required. We are also seeking similar clarification from National Capital Authority (NCA).

LEGAL AND GOVERNANCE IMPLICATIONS

There are no legal or governance implications resulting from this paper.

PARENT COMPANY IMPLICATIONS

There will be no specific implications for the parent companies apart from the effect via the joint venture.

Project Plan

ActewAGL will prepare a D&C tender to follow through a public tender process to select a suitable contractor for the work.

ActewAGL will prepare a Capital Works Approval to engage the successful contractor (The Contractor) to complete the detailed design including the line route and Geotech survey, technical drawings and BOQ.

Estimated total project cost is $10.5Million. Separate Board Paper will be submitted for the construction of Stage 2 once the Final Cost Estimate is established to engage the successful contractor.

The project is planned to implement as a D&C contract with the successful contractor. ActewAGL will be working with the Contractor on project plans, design and implementation program of the work.

Health, Safety & Environmental Implications:

This project is to replace existing two transmission lines with a single structure double circuit line within the existing line corridor. Therefore the work activities have minimal impact on the land within the line corridor. Environment investigations where necessary will be conducted in consultation with ACTPLA and other Government Agencies.

As per the current ACTPLA advice to ActewAGL a Section 211 exemption may not be granted and a full EIS may be required.

There will be no additional impact after completion of installation work. Environment consultant will be engaged to provide environment management plans and monitor the work from the initial stage of the project to completion.

Key Materials Required for the Project

Material	Quantity
New 132kV Transmission poles	55
Uranus conductor	90 km
Polymeric Insulators	375

Consultation and Development Approval:

The following major stakeholders will be consulted during the course of the project:

ACT government (especially ACT Planning Authority - ACTPLA)

National Capital Authority

Department of Sustainability, Environment, Water, Population and Communities

Land Owners

ActewAGL CEO and Board

ActewAGL Asset Management Division

ActewAGL Network Services Division

ActewAGL Asset Strategy and Planning branch

ActewAGL Major Projects branch

ActewAGL Service Delivery branch

ActewAGL Network Operations and Call Centre branch

ActewAGL Customer Solutions Branch

Others as necessary

Management Structure

The management structure for a Lump Sum contract is relatively simple compared to an Alliance Contract. The ActewAGL Senior Project Manager (SPM) becomes solely responsible for the interfacing between ActewAGL and the Constructor. Variations are approved by SPM within the financial boundaries set by the project budget.

Project Controls

The following project-level controls will be implemented to manage the project:

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- A Kick-off meeting to be held initially
- Design Meeting to be held fortnightly (or as required) by Project Manager
- Project Meetings to be held weekly (or as required) by Project Manager
- Monthly Project Reports prepared by Project Manager and distributed to Project Board.
- Highlight Reports are to be prepared by the Project Manager and distributed to the Project Board when controlling a Stage.
- **The Project Board will hold a Stage Gate Assessment meeting at the end of**

each stage to assess progress to date review the updated PID and approve moving forward to the next Stage.

- An End Project Report and Post Project Review Plan will be produced by the Project Manager for circulation to Project Board members at the end of the project. This will be accompanied by follow-on action recommendations and a Lessons Learned Report.