

Project Justification – IT03 – GIS Gas Transmission Pipelines

Document Name	GIS Gas Transmission Pipelines Project Justification
Reference	IT03
Version	1.0
Issue Date	25/10/2016
Owner	Mark Beech
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Document Control

Change History

Version	Date Issued	Issued By	Comments
1.0	25 Oct 2016	Paul Le Feuvre	First issue

Note: Printed copies of this document are uncontrolled.

Document Review

This document has been reviewed by the following parties prior to approval:

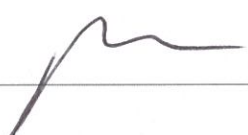
Reviewer Name	Role	Date
Mark Cooper	Gas Asset Manager	18 October 2016


Document Approval

Approval of the Project Justification for the IT03 – GIS Gas Transmission Pipelines project is provided by the signatories shown below.

Changes to this document will be coordinated and approved by the undersigned or their designated representatives via project change management.

The undersigned acknowledge they have reviewed and approved this document.

Approver Name	Approver Title / Role
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ITEF	IT Executive Forum
Approved by ITEF – Refer Correspondence	Date: October 2016

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1. Project Description

Multinet Gas (MG) manages approximately 175km of licenced transmission pipelines operating at a pressure in excess of 1050kPa. These pipelines are operated, constructed and maintained in accordance with AS/NZS 2885 Pipelines Gas and Liquid Petroleum with asset details captured spatially within MG's GE Smallworld (GIS) system.

This project allows MG to achieve compliance with a range of specific business and regulatory requirements (e.g. mandated Safety Management Study and Maximum Allowable Operating Pressure reviews).

This project provides MG with the capability to obtain and effectively manage requisite additional data required to support this class of transmission asset in-line with accepted industry practice.

2. Objectives / Purpose

At present high pressure transmission pipeline assets are typically treated in MG's GIS in the same way as all other distribution assets. The additional data (e.g. GPS locations, asset maintenance history), critical to maintaining the integrity and safety of this class of asset is not currently available and/or maintained within the GIS system.

The information requirements for management of transmission pressure assets include GPS locations, detailed asset detail, asset maintenance history and overlay aerial photography. This includes not only the pipeline but associated fittings, welds, bends, valves, service and regulators. This is critical to maintaining the integrity and safety of this class of asset and it is not currently available and/or maintained within the GIS system.

As a result every network project to upgrade, replace or maintain a licenced transmission pipeline must source and/or re-validate the additional data from scratch. In addition to additional cost and delays incurred for each new project, MG currently lacks both a body of accurate information and the capability for utilising it in real time.

Technology advances have also led (and will continue) to the increasing use, and availability, of digital data such as GPS locations from field devices, aerial and site photographs. MG needs improved capability to store, maintain and analyse this data for this asset class.

The objective of this project is to extend the functionality of the GIS system allowing the additional data (including new data types and sources) for this asset class to be sourced, stored, analysed and maintained such that it is readily available for maintenance, emergency and augmentation projects on the MG network.

3. Strategic Alignment

3.1. National Gas Rules Alignment

The project aligns to the following National Gas Rules (NER) capital expenditure criteria:

- Rule 79 (1) the capital expenditure is such that would be incurred by a prudent service operator acting efficiently in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services;
- Rule 79 (2) (c) (i) the capital expenditure is necessary to maintain and improve the safety of services; and
- Rule 79 (2) (c) (iii) the capital expenditure is necessary to comply with a regulatory obligation or requirement.

Implementation of the initiatives included in this project, support the safe operation and maintenance of the high pressure pipeline elements of the network and MG's ongoing ability to meet its regulatory obligation through compliance with AS/NZ 2885.

3.2. Multinet Gas Strategic Themes Alignment

This project supports the key MG business strategy to:

- Ensure ongoing performance, resilience and safety in the changing distribution network
- Ensure readiness to achieve regulatory requirements
- Improve asset planning and management through analytics and reporting

In supporting the above themes, the GIS Gas Transmission Pipelines project helps MG achieve its business objectives of delivering customers a safe, reliable and sustainable energy supply.

4. Options

4.1. Option 0 – Do Nothing

Under this option the current processes would remain unchanged. This impairs MG's ability to:

- Continue to meet regulatory obligations;
- Reduce capital cost of network projects through improved efficiencies; and
- Better generate significant business value in many areas of the plan, design, build, operate, assess and maintain lifecycle of its Gas transmission network.

There would be an increased capital cost associated with each Gas Transmission Pipeline maintenance project arising from the need for site visits to re-validate existing data and to collect additional data required.

4.2. Option 1 – Build increased function into the existing GIS Data model

Implementing additional functionality into the existing MG GIS will enhance existing performance and system management capabilities ensuring that a wide range of regulatory, safety and integrity accountabilities are managed within the system rather than being reliant on largely manual processes.

Whilst this option leverages MG's existing investment in the current GIS platform, the significant additional implementation risk along with the more limited functionality that would be delivered make this solution less acceptable than Option 2.

4.3. Option 2 – Implement the pre-configured and pre-integrated Smallworld Global Transmission Office Suite (GTO) - Recommended

This option provides to the business a purpose build product solution for managing gas transmission pipeline assets that delivers, amongst other things, the following functionality:

- Loading and spatially aligning InLine Inspection (ILI), delivering improved data integrity
- Record and display spatially, Direct Current Voltage Gradient survey results
- Display of Geo tag highly detailed aerial photography of pipeline route
- Route Classification and High-consequence area assessment/analysis tools
- Additional characteristics (wall thickness, material type, coat specification, area classification, radiation zones etc.)
- Environmental Overlays for environmental planning and regulatory compliance
- Asset inspection - ensuring safe and effective inspection, maintenance and repair programs for very high pressure pipeline programs through the collection, management and retention of enhanced information
- Location analytics providing display of GPS location of pipes, including locations of past repairs maintenance and coating survey details on each section of pipe,

The standard GE Smallworld GTO module provides a high degree of functional fit to MG's transmission pipeline requirements and minimises the extent of customisation required to achieve the desired business outcome. This approach aligns with two core MG IT Architectural Principles:

- Apply Energy Industry Standards and Procedures
- Choose Best Fit Solution

The additional costs associated with this option are outweighed by the lower implementation risk and improved business outcome.

5. Economic Evaluation

The Economic Evaluation table below is the result from the “Business Case Output” from the “Financial Evaluation Spreadsheet”. This is MG's Capital Project Evaluation tool. The tool comes with standard parameters which are protected and cannot be altered.

The tool ranks the options based on Least Cost (Net Present Value). The least cost project will have a Project Ranking of 1.

The table assumes that there is no change in cost associated with the “Status Quo” solution and that costs for Options 1 and 2 take into account the relatively small ~(\$40k p.a.) Network project capital savings.

	"Status Quo" Reference Case	Option 1: Modify Existing Systems	Option 2: Implement New GTO Suite
Net Capex (\$)	\$135,000	\$1,883,000	\$2,078,198
Opex to 2022 (\$)	\$0	\$136,195	\$138,072
Least Net Cost (\$) (PV)	\$0	\$2,019,195	\$2,216,270
Project Ranking		1	2

Note: The Net Capex shown for the "Status Quo" option relates to the increase in capital costs that would be incurred by the Gas Transmission pipelines maintenance and capital program up to and including 2022.

5.1. Recommendation

It is recommended that Option 2 - implement the new pre-configured and pre-integrated Smallworld Global Transmission Office Suite (GTO) - be adopted as the option that best meets the requirements and delivers the most prudent and cost effective solution with an acceptable degree of implementation risk. The "Status Quo" option was not selected as it fails to address the current issues or ensure that MG can continue to meet compliance and regulatory requirements.

Whilst Option 1 - Build increased function into the existing GIS Data model - incurs a marginally lower capital cost to implement, this is outweighed by significantly higher implementation risk and a sub-optimal business outcome in its ability to fully support all business requirements.

5.2. Benefits Summary

The forecast for the business Gas Transmission pipelines maintenance and capital program for the 2018 – 2022 assumes the capability provided by this project.

The Project delivers the following benefits:

- Improves MG's ability to comply with Regulatory, AS2885 and licence requirements in relation to transmission pressure pipelines
- Supports mitigation of safety risks through improved management of assets operating at very high pressure
- Confidence in data and analysis through integrated processes, data currency, accuracy, traceability and quality
- Improves the scope, integrity and availability of information (e.g. Transmission Pressure information content)
- Effective and efficient utilisation of specialist resources (e.g. reduce time and money spent on retaining specialist resources, contributing to a minor reduction in capital costs for some Network projects)

6. Proposed Solution

6.1. Solution Overview

The current lack of effective storage, availability, utilisation and management of licenced transmission pipeline data requires current processes for managing these assets to be dependent on gathering information on an as needs basis. That is, as each new project to upgrade, replace or maintain a licenced transmission pipeline is identified, data must be sourced to both plan and execute the project.

The required data is frequently either unavailable in a central repository, or of an unknown quality such that resources have to be hired to source the data from the field.

This results in longer project lead times and higher capital costs associated with the need to contract and retain specialist resources over long periods.

The augmented business capability provided by the recommended solution is the least cost option..

The recommended solution Option2 – Implement the GTO Suite - will deliver and/or support a range of previously unavailable features including:

- **Loading and spatial alignment of the Inline Inspection function**
Providing the ability to load and manage data relating to the maintenance (specifically pigging) of transmission pressure gas pipelines. Allowing the business to access relevant asset data including GPS, pipeline specification, location and condition data.
- **Recording and spatial display of Direct Current Voltage Gradient survey information**
Safe and effective management of the construction and maintenance of transmission pressure pipelines requires high quality information as to the type and condition of pipeline coatings and the location of such on a GPS basis. This capability is not currently available to the MG GIS.
- **Load and maintain high detail aerial photography of pipeline route**
This will be linked to other asset data in this list.
- **Route classification and high-consequence area assessment capability**
Providing an improved capability to analyse the available data, conduct the safety assessments associated with planning, construction and management of transmission pipelines and deliver more reliable outcomes.
- **Additional relevant pipeline characteristics**
Gather, store and maintain additional asset detail regarding wall thickness, material type, coat specification, area classification and radiation zones.
- **Environmental overlays**
Facilitation of the environmental planning required in the planning, construction, maintenance and repair of Transmission Pressure pipelines.
- **Asset Inspection**
Store and maintain detail in relation to programs of pipeline and associated assets inspections and amalgamate this within the overall functionality of MG GIS so as to facilitate the effective, safe and compliant maintenance of transmission pressure pipelines and associated regulator stations.
- **Location analytics**
Functionality allowing exact GPS location of pipes to be graphically shown, including locations of past repairs on each section of pipe, maintenance and coating survey results.

6.2. Assumptions

Initial analysis and investigation (including an initial assessment of software packages) has determined that the proposed functions and GIS customisations can be delivered within the cost estimates for Option 2. However, detailed requirements have not been developed at this stage.

The solution proposed assumes:

1. The pre-configured and pre-integrated Smallworld Global Transmission Office Suite (GTO) can be readily integrated with existing systems
2. It will deliver all functionality within the estimated cost, compromises may need to be made to the degree of automation and integration of these functionality and add-ons
3. The capital cost assumes that data will be sourced and collected from the field as needed rather than through a single initial data collection exercise.

6.3. Processes and Systems Impacted

The following systems and associated business processes will be impacted by this project:

- Smallworld GIS
- Gas Transmission Planning
- Gas Transmission Operations and Maintenance
- Gas Transmission Compliance
- SAP ERP / ISU

6.4. Risks

Risk	Cause	Impact
Failure to deliver required capability	<ul style="list-style-type: none"> • Non-compliance with Regulatory safety requirements • Requirements not well defined or understood • Project scope not well understood. • Poor project delivery methodology • Project team skills not appropriate to task • Poor project delivery 	<ul style="list-style-type: none"> • Safety compromised for consumers, public and employees • Benefits to consumers not realised. • Multinet's reputation diminished. • Additional cost
Existing GIS has technical and data deficiencies.	<ul style="list-style-type: none"> • Suitable data not available. • Application add-on's not suitable • Increased customisation required 	<ul style="list-style-type: none"> • Additional cost • Inadequate/inaccurate information and technical capability • MG's professional capabilities impaired

6.5. Constraints / Dependencies

7. Outputs

The project will deliver the following tangible outputs:

- Reduced Network project capital cost currently incurred in sourcing and analysing transmission pipeline data for planning and executing maintenance projects
- Improved data quality and increased detail on licenced Transmission pipeline assets.

8. Project Capital Costs

This section presents a summary view of the capital and operational costs and benefits of developing, implementing and operating the Proposed Solution.

Capex Category	Cost (\$'K)	CY' 2018	CY' 2019	CY' 2020	CY' 2021	CY' 2022	Source / Explanation
Labour IT	\$1,596.5			1,596.5			All IT and business labour costs associated with designing, developing and implementing the project solution.
Hardware (application specific)	\$79.8			79.8			Estimate of Hardware purchase costs based on supplier quotations / price lists
Software	\$250.0			250.0			Software licence purchase including first year support and maintenance
Security	\$16.0			16.0			~1% of Labour
PMO	\$136.0			136.0			Project Management Office including IT Capital Overheads
TOTAL	\$2,078			2,078			

9. Operating Cost Impact

The project, once completed, will not result in any significant increase in annual IT operating costs.

10. Timeframes

Q1 2020 to Q2 2020

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