



PNG POWER Ltd

FOR TO UPGRADE CURRENT HARDWARE AND SOFTWARE OF PNG POWER Ltd GEOGRAPHICAL INFORMATION SYSTEM (GIS) TO MEET THE INCREASE TRANSMISSION AND DISTRIBUTION ASSETS DATA CAPTURE AND MAKE IT AVAILABLE THROUGH GIS SYSTEM TO THE END USERS.

PERFORMANCE ENGINEERING BUSINESS UNIT
TERMS OF REFERENCE (TOR)

UPGRADE OF THE CURRENT GIS SYSTEM AND INTERGRATING WITH OTHER
CORPORATE IT SYSTEMS TO ENABLE ACCESS FOR END USERS

1. Introduction

PNG Power Limited (PPL) requires the services of qualified and experienced professionals or companies to review current installed PPL Geographical Information System (GIS) and recommend solutions to fully implement and utilize the system. The key objectives of the Service Provider will be to re-establish systems originally installed and intended for the end-users, to provide recommendations for improvements, to provide procedures for the sustainability and maintainability of GIS systems and most importantly to provide training for the end-users and Performance Engineering GIS staff.

2. Background

PPL is a Government owned power utility responsible for the generation, transmission, distribution and retailing of electricity in Papua New Guinea. The company is regulated for price and service standards under a Regulatory Contract signed between PPL and the Independent Consumer and Competition Commission (ICCC).

PPL is a vertically integrated business employing approximately 1,750 people, both permanent and casual employees, and operating twenty power supply systems (generation, distribution and retailing) and six distribution and retailing centres. The major power supply systems are located in the National Capital District and Central Province (Pom system), the New Guinea mainland (Ramu system) and the East New Britain Province (Gazelle system). These systems combined account for 90% of total power generated and sold. Hydro, diesel fuel and bio-fuels are the sources of energy with hydro power generation contributing 62% of total electricity generation. PPL also purchase power from Independent Power Producers (IPPs) including Kanudi Hanjung Power Station, the PNG Forest Products and New Britain Palm Oil.

The reliability of power supply infrastructure has been affected by several factors; the most important being age and the sustainability of proactive maintenance culture which has often resulted in poor performance of power supply assets over time.

For these reasons; breakdown of the assets including those in the transmission and distribution systems are occurring causing unplanned and forced outages. Therefore to reduce and avoid these outages and failures and for faster response by field staff in their restoration efforts, the GIS system was developed and installed for providing planning and maintenance support. Since its installation and with planned and coordinated maintenance; Port Moresby Distribution network has seen a big improvement in the distribution asset reliability. As a result of this achievement; GIS system is planned for roll out in all PPL centres. Therefore this engagement is very crucial in achieving the objectives of this TOR.

3. Scope of Works

The Scope of Works is in four parts however the proposals do not necessarily need to be performed in the order stated. On request PPL will provide the relevant documentation and support to assist the Service Provider to prepare and provide their proposal. The proposed Scope of Works shall be but is not limited to the following tasks:

3.1 Full implementation of the GIS system for PPL network

Brief Background

The GIS system was developed in 2012 -2014 and implemented in 2016. In the development stages three sites were earmarked for the testing purposes. This was to test the system's installation, application, interface, feature and performance prior to acceptance. Following the successful installation and implementation; POM asset data captured was processed in MapInfo and uploaded onto the PPL GIS Server.

However in the last two years the asset data captured for other centers and processed in MapInfo have not been updated in the server to fully utilize the GIS system. The reasons are:

a) Issues with the Generic Asset Numbering:

The generic numbering system is an auto generated number starting from 1 onwards and added to an asset when captured. This was set up and configured in MapInfo which the GIS team is currently using however issues identified with asset numbering have stalled progress.

E.g. Pole Number PL1: PL is pole; 1 means single digit number from 1 onwards that distinguishes one item from another. If POM system has 14000 poles captured the pole numbers will start from PL1 to PL14000 and continues whenever a new pole is added and likewise for the other assets.

Where pole data captured in other centers are processed in the MapInfo, the new pole number continues from the last pole number regardless of which center it was captured. E.g. If last pole number for POM was PL14000, the next pole number starts in Lae will be PL140001 and onwards and likewise for the other centers.

This scatters and differ the numbering sequence for the centers and furthermore no unique number to identify the centers these assets are numbered against. Therefore the data processing and uploading is temporarily been put on hold until a suitable unique asset numbering system is set and configured to distinguish assets in different center. Example of the current generic numbering for the centers is demonstrated below:

Center	First Pole Number	Last Pole Number
POM	PL1	PL14000
LAE	PL14001	PL14899
GOROKA	PL14900	PL15500
KAVIENG	PL15501	PL16001
POM	PL16002	PL16987
KIMBE	PL16988	PL17301

b) Incomplete network information for other centers:

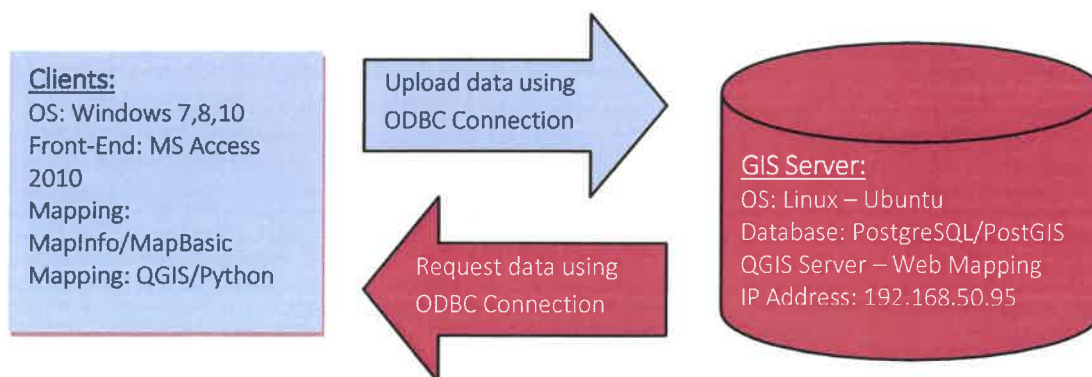
The GIS team has so far captured distribution assets and customer meter data for POM and other centers. A list of all of these updated feeders was sent to the GIS specialist to update feeder IDs for processing in the MapInfo. These data were returned with updated MapBasic file however they cannot be processed and uploaded onto the GIS server. Furthermore only POM system asset data is processed in MapInfo out of the 14 centers asset data captured and uploaded because of the asset numbering issue and also lack of knowledge on MapBasic program setting.

The Service Provider to review current asset numbering system and recommend and implement a suitable asset numbering system that must uniquely identify assets and also provide basic MapBasic training for the PPL GIS staff to be able to modify and add MapBasic program when and if required. Example of proposed asset numbering is demonstrated below:

Center	Center Code	Current Asset Number	Proposed Asset Number
POM	60	PL1	60PL1
LAE	40	PL1	40PL1
MADANG	13	PL1	13PL1

3.2 GIS Server/IT Systems/Applications

The current GIS system is shown as below:



The Service Provider to review the current system and improve and fine tune to deliver the following objectives:

- a) To change current OS Linux – Ubuntu to Windows OS and backend to MS SQL SVR from PostgreSQL/PostGIS;
- b) The system must be lightweight and consume limited resources within PNG Power LAN/WAN;
- c) The system must be made compatible with other systems or Applications to interface;
- d) The QGIS server response to zooming and navigation function must be quick and fast;
- e) Information tool to be added to identify details of individual assets if and when required;
- f) The system to be able to overlay PPL GIS data on open street goggle map background when and if required; and
- g) Current PPL MIS MS Access primary function is for job cards creation and viewing of assets. These functions are to be expanded further to link assets to key information on asset Standards and Specification, Feeder Maps, Project documents and Reports.

3.3 Support and Maintenance of GIS system

The Service Provider to re-align the maintenance support for the GIS system with PPL ICT team for first level issues. Complex issues will be subject to ICT recommendation to engage Service Provider if and where required.

3.4 Training Program

The Service Provider is required to provide training for the following:

- a) Quantum GIS (QGIS) software: Train GIS personnel to attain competency levels to manage GIS systems and confidently use QGIS. The training must be developed with SOPs and user manuals;
- b) GIS Server: To train ICT officer to maintain and sustain it;
- c) Develop relevant Training and User Manuals for the GIS staff and GIS system endline users; and
- d) This program shall be made visible and must be made a part of PPL's overall Training and Development program for its staff and users. Where classroom facilities are required, the Service Provider through the GIS Coordinator can liaise with PPL's Manager Organizational Development to use the PPL Training College facilities.

4. Training / Knowledge Transfer

Embedded in the Scope of Works outlined above are references to the participation of PPL staff in aspects of this assignment. While this is expected to provide value added input to the deliverables, it is also considered very important that the knowledge and skills level of

assigned staff are enhanced to the extent that future similar projects will have more direct responsibility assigned internally. The proposal should specifically address this aspect and provide a training program for the duration of the assignment.

5. Expected Outcome

On completion of this engagement all stakeholders are able to use the GIS system to improve the availability and reliability of power supply through accurate decimation of information between all stakeholders with regards to faults and also help management make good business decisions and this would involve having the following in place:

- Policies/SOPs relating to the use of the GIS are developed for acceptance and approval.
- The GIS System is user friendly and is fully utilized for its purpose by all stakeholders.
- ICT is upgraded to fully support the GIS System.
- The GIS staffs are trained and acquire the required knowledge and skills to perform their expected duties.

6. Project Duration

It is envisaged that all works stipulated in TOR Items 3.1 – 3.4 will be completed during this engagement.

7. Agreement and Accessibility

PPL Standard Consultancy Services Agreement and the approved consultancy proposal shall be used for this project.

8. Project Proposal Content

The proposal should elaborate on the proposed methodology, identify the personnel and proposed input and allocate/ estimate the corresponding man-hour requirements. The consultant shall breakdown the scope of works into different phases with applicable rates for offshore and onshore portions of works performed.

Commercial Proposals should be provided distinctly for each phase. An onshore daily rate should be provided by the Consultant along with a daily fixed per diem to cover all costs for works to be carried out onshore. Fixed hourly rates including reimbursable, per diems for all offshore works should be estimated and identified in the proposal. Note: Approval should be sought and given prior to any works undertaken offshore.

The proposal should include a spread sheet for each phase which links the charge out rates for the proposed personnel with their estimated time input, hence demonstrating the estimated fee portion of the proposal.

A monthly report shall be provided by the Service Provider with necessary invoices for all works performed within each month to PPL for verification and payments.

9. Method of Payment

The Service Provider shall state his preferred method of payment relating to the deliverables in the scope of work. Ten percent (10%) will be retained and paid after completion of all the work.

10. Contact Persons

Requests for clarifications and additional information should be directed to:

Mr. Dominic Afuyave on Email: dafuyave@pngpower.com.pg

Mr. Augustine Efi on Tel: [\(675\) 324 3465](tel:6753243465) or Email: aefi@pngpower.com.pg

11. Proposal

The bidders to submit their proposals to:

Tenders Committee

PNG Power Ltd

P.O. Box 1105 Boroko, NCD, Papua New Guinea

Email: supplyhelpdesk@pngpower.com.pg

The period for submission of proposals shall be Four (4) weeks from first date advertised in the local daily newspapers. Unless time extensions are approved for the submission of proposals, all proposals received after the closing date will not be considered.

Sighted: 
Henao Korema
A/Manager ICT

Date: 26/09/18

Signed: 
Alex Oa
General Manager Performance Engineering

Date: 28/09/2018