

# ELECTRIC POWER CORPORATION

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## THE REFURBISHMENT OF THE LALOMAUGA CONTROL SYSTEM AND HEADPOND FACILITIES Bid No. SAM EPC LALOM 01 / 2018

### PREBID Meeting on the 5<sup>TH</sup> March 2018 MINUTES

#### Attendees

- |                       |                                  |
|-----------------------|----------------------------------|
| 1. Krishant Kumar     | Pacific Engineering Projects Ltd |
| 2. Masoe Leslie Mua   | Transworks Ltd                   |
| 3. Etuale Ioane       | Transworks Ltd                   |
| 4. Mike Liu           | HNAC Technologies                |
| 5. Jevon Pristley     | Vortex                           |
| 6. Nick Saint M       | Vortex                           |
| 7. Toni Atilua        | EPC                              |
| 8. Jovesa Ah Kuoi     | EPC                              |
| 9. Leicester Cook     | EPC                              |
| 10. E O Fauolo        | EPC                              |
| 11. Sofeni Tafili     | EPC                              |
| 12. Brendan G William | EPC                              |
| 13. Jonathan Yoshida  | EPC                              |
| 14. Siu Fanolua       | EPC                              |

**MINUTES**

<b>Meeting ITEM</b>	<b>DISCUSSION</b>	<b>EPC Response where applicable</b>
<b>1. Welcome Comments</b>	By Jovesa Ah Kuoi as Chairman	
<b>2. Project Outline</b>	By Toni Atilua – Comments	
<b>3. Project in Brief</b>	<p>By Toni Atilua</p> <p>Lalomauga was built in the mid 1980s.</p> <p>The power plant has two Francis turbine driven generators each rated at 2250kVA, the total rated output is 3750kW but each machine on its own has been known to generate close to 2000kW at rated operating maximum head pond level of 120m.</p> <p>The project has 2 bid lots and 3 parts.            Lot 1 – is for Part 1 and Part 2. Part 1 covers refurbishment of governor control systems for both generators and integration to EPC SCADA system and Part 2 covers refurbishment of mechanical equipment; turbines, and bearings, and replacing of cooling systems and local supply transformer and refurbish of local supply electrical panel; other works include upgrade of parking area in front of the power plant, replacing of fence around transformers, replace of roof cuttering and downpipe and installation of a water tank to collect roof rainwater and connecting water tank to bathroom facilities and repainting of inside of powerhouse.</p> <p>Lot 2 – covers all work included in Part 3 which include head pond resurfacing replacing the plastic membrane and covering with concrete, building of a screen over outlet pipe of head pond, refurbish of intakes and replace screens.</p>	

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	<p>The Head Pond works include a new headrace intake screen and screens cleaning mechanism, and dig out silt built up inside screens. Also to be added is a screen monitoring sensor system to notify the operators of the condition of the screen.</p> <p>The PIV (already purchased by EPC) is to be installed at the exit point of the tunnel at the Lalomauga side of the tunnel. The PIV can be inspected at the Lalomauga Plant and bidder to allow for supply of any other parts and materials missing to complete installation.</p> <p>Local Services transformer. This is currently a pole mounted transformer connected to Sauniatu Feeder. Replace this transformer with a dry type indoor mounted transformer. Existing in the switchgear arrangement is a transformer riser cubicle. The transformer shall come with HV fuses.</p> <p>Generators are manually operated, with original bypass valve electrically operated by DC power. The valve failed when the valve pit is flooded. The bid requires the refurbishment of the start sequence to automate valves opening; to equalize water pressure on both sides of MIV before opening. The bypass valve shall be part of the automated process.</p> <p>Requirement of bid is that new governor control system is fully automated and be remotely controlled from the Fuluasou National Control and Dispatch Center (NCDC). Micro Grid Controller is installed to automatically controlled all generators and the two battery systems. Lalomauga hydro generators will also be integrated to Micro Grid Controller after replacing of governor control systems.</p>	

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	<p>Aim is for the NCDC to issue start signal to generators and provide a pre-select load for the machines. The turbine and generator control system shall then start the machine, synchronize to 22kV bus/grid and ramp load to the preselected load with an operator intervention. Generators will also be remotely taken off line and shut it down. The bid document has details of what is expected for the system, but two modes of operation is preferred:</p> <ol style="list-style-type: none"> <li>1. Load Control which will limit machine output to a predetermined load for the unit to operate at within the operating rating of the unit..</li> <li>2. Pond Level control which means the machine output will be such that the pond selected level will be maintained.</li> </ol> <p>Current Condition of the Plant and generators.</p> <ol style="list-style-type: none"> <li>1. Both machines are operating with an external heat exchanger operated off the penstock water to provide extra cooling of the bearing lubrication oil.</li> <li>2. The speed control system operates around the Woodward UG 08 governor with the necessary hydraulic power pack providing the servo motor link to the guide vanes assembly.</li> <li>3. Turbine guide vanes are leaking on a good number of the vanes.</li> <li>4. The Excitation system is manually operated using a variac.</li> <li>5. The synchronizing system is manually operated with no synch check equipment used.</li> </ol>	

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	<p>6. The bypass valve is a manually operated valve.</p> <p>7. The machines are manually started by:</p> <ul style="list-style-type: none"> <li>a. running the: <ul style="list-style-type: none"> <li>i. cooling oil pump</li> <li>ii. governor power pack pump</li> </ul> </li> <li>b. open bypass valve manually</li> <li>c. then open MIV by operating the MIV HPU unit</li> <li>d. operator checks the UG8 speed and load limit settings are in order before</li> <li>e. MIV is opened the governor shutdown solenoid reset knob is depressed to release the governor.</li> <li>f. The machine starts to rotate providing power to the PMG which provides power to the excitation system and the pendulum motor for speed feedback to the governor.</li> <li>g. When unit reached 95% rated speed, the excitation contactor kicks in and the machine is excited. Volts builds up to 6.6kV the machine transformers steps voltage to 22kV. The operator then brings the machine into synchronizing levels and the machine is put online.</li> <li>h. Load and Vars are controlled by either raising or lowering vanes opening for load with excitation to control VARs.</li> </ul>	
<p><b>4. Questions from Bidders.</b></p>	<ul style="list-style-type: none"> <li>1. Can an extension for the bid closing be granted?</li> <li>2. Can bidders bid for any LOT?</li> <li>3.</li> </ul>	<ul style="list-style-type: none"> <li>1. An addendum will be issued in response to the question/request.</li> <li>2. YES, bidders can bid for one or two lots.</li> </ul>

Meeting ITEM	DISCUSSION	EPC Response where applicable
5. Site Visit	<p>The four following project sites were then visited by bidders attending the pre-bid meeting:</p> <ol style="list-style-type: none"> <li>1. Headpond</li> <li>2. Falefa East Intake</li> <li>3. Falefa West Intake</li> <li>4. Lalomauga Hydro Station</li> </ol>	