30 July, 2015

Lord Dalgety
Electricity Commission
Tu’atākilangi
Nuku’alofa

Dear Lord Dalgety


In accordance with the reporting requirements of the Electricity Concession Contract and in response to your request for additional information as specified in the suggested MOU dated May, 2012, TPL submits the following reports for the month of May 2015.

1. System Loss Report
2. Fuel Efficiency Report
3. Reliability Measures Report (Tongatapu and Outer Islands)
4. Monthly Outage Events Report

The above report items are described in detail below.

1. System Loss Report

The following graphs illustrate the 12 months Moving Average (smoothed) Systems Losses for all four islands since July 2011. The 12 months moving average losses are used because of the variability of monthly Real Time Systems Losses due to the impact of the number of days and fall of the weekends in respect to meter reading cycle. In addition, system loss report is always one month late as last month consumption data (i.e. meter readings) will only be read this month and available to report next month. Hence May EC Report contains only April system loss data.
For the month of May, 2015, all island moving average system losses have slightly increased from 11.25% (April, 2015) to 11.61% (May, 2015) still achieve the regulatory target of 13%.

The individual island group’s system losses are shown below.
The graph above shows that Tongatapu systems losses have increased from 11.10% (April) to 11.52% (May).

Vava’u losses have been steady at 12.5% (see the graph below).
Ha’apai system losses have always been below target until January, 2014. Since January, system losses have increased possibly due to Cyclone Ian effect.

Eua systems losses have been steady around 13% during past several months.
2. Fuel Efficiency Report

It is important to note that fuel efficiencies calculated here include diesel generation only (i.e. renewable generation has been excluded) as stipulated by the Electricity Concession Contract.

Tongatapu fuel efficiency ratios have always been unachieved due to ageing generators and introduction of renewable generation plants that reduce diesel generators’ load factors. The fuel efficiency has improved in April, 2015 but decreased again in the last month.

Vava’u fuel efficiency ratios have been well above the target due to the two new 600KW generators commissioned in May, 2010. But it decreased in February and corrected again.
Mostly, fuel efficiency ratios have been under-achieved in Haapai but been steady in the last few months.

Mostly, fuel efficiency ratios have been under-achieved in Eua.
Overall, all island fuel efficiency ratios have been below the weighted average target of 4.17 KWh/L.

3. Reliability Measures (Tongatapu)

<table>
<thead>
<tr>
<th>Reliability Measures</th>
<th>SAI DI Monthly Performance (Minutes)</th>
<th>CAIDI Monthly Performance (Minutes)</th>
<th>SAIFI Monthly Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul</td>
<td>4.74</td>
<td>21.21</td>
<td>88.34</td>
</tr>
<tr>
<td>Aug</td>
<td>4.51</td>
<td>37.88</td>
<td>46.52</td>
</tr>
<tr>
<td>Sep</td>
<td>59.19</td>
<td>2.93</td>
<td>92.02</td>
</tr>
<tr>
<td>Oct</td>
<td>253.89</td>
<td>32.02</td>
<td>318.4</td>
</tr>
<tr>
<td>Nov</td>
<td>25.49</td>
<td>138.22</td>
<td>38.51</td>
</tr>
<tr>
<td>Dec</td>
<td>115.19</td>
<td>72.61</td>
<td>13.15</td>
</tr>
<tr>
<td>Jan</td>
<td>622.62</td>
<td>153.97</td>
<td>55.91</td>
</tr>
<tr>
<td>Feb</td>
<td>3010.76</td>
<td>189.06</td>
<td>77.52</td>
</tr>
<tr>
<td>Mar</td>
<td>23.32</td>
<td>146.48</td>
<td>118.91</td>
</tr>
<tr>
<td>Apr</td>
<td>336.9</td>
<td>236.17</td>
<td>94.02</td>
</tr>
<tr>
<td>May</td>
<td>294.55</td>
<td>100.64</td>
<td>37.85</td>
</tr>
<tr>
<td>Jun</td>
<td>14.72</td>
<td>7.26</td>
<td>87.19</td>
</tr>
</tbody>
</table>

SAIDI minutes (measuring average total duration of interruption per connected customer) for the month of June, 2015 have decreased significantly from 51.1 (May, 2015) to 34.35 (June, 2015) minutes (see the table above). Some of the major HV faults contributed to the SAIDI minutes for the month of February are described below.
Report Date  | No of Customers Off | Fault Description | Repair Comment |
-------------|---------------------|-------------------|---------------|
02/06/2015   | 1,043               | Shut down         | Power shut down for an HV pole to be replaced due to an Accident |
13/06/2015   | 1,000               | Pole broken HV lines | Switch on nakolo to haveluliku 07:37, Tatakamotonga to Niutoua - on = 09:30, From Tatakamotonga to Niutoua then on at 11:30. |
10/06/2015   | 856                 | Coconut tree leaves on HV line partly off | Shut down from Vaini - Haateiho |
11/06/2015   | 400                 | Power partly off | Trip phase C from recloser so they fix it 00:11. Switch on power from Tokomololo Ki Ka'a'u at 12:11 Kala'a'u - Fo'ui switch on at 12:21 |
28/06/2015   | 150                 | Power partly off | Power partly off due to HV conductor broken so they Shut Down from Kapeta to Tofoa to reconnect power line. Materials: 1 x ins tape, 5m x gopher wire |
30/06/2015   | 50                  | Hihifo partly off | Partly off due to blown fuse inline 20 A blown so they replace it with 1 x 30 A DDO. |
30/06/2015   | 28                  | Partly off        | Material used: Amps 125 x 1, test after - 242 volts, |
11/06/2015   | 24                  | Power off         | Link 10A x 2 blown due to tree branch on HV line and replaced with: link 10A x 1, link 8A x 1 |
23/06/2015   | 22                  | Partly off        | Bloen fuse low on transformer so they fix it and then replace fuse low with complete pole fuse and 2 X IPC, 1 X 100 amps. TA- 239 V |

Cumulative SAIDI YTD is showing below. The annual target is 5% less than the last year’s value.

![Cumulative SAIDI 2012/13/14Vs. 2014/15](image)

The annual target of 1026 minutes were not met.
CAIDI minutes (measuring average total duration of interruption per interrupted customer) for the month of June 2015 have however, increased significantly from 34.75 minutes (May, 2015) to 169.56 minutes (June, 2015).

Cumulative CAIDI YTD is showing below. The annual target is 5% less than the last year’s value. However, the target was not met.

SAIFI (measuring average number of interruptions per customer) has decreased significantly from 1.47 (May, 2015) to 0.20 (June, 2015).

Cumulative SAIFI YTD is showing below. The annual target is 5% less than the last year’s value. However, the target was not achieved.
4. Reliability Measures (Outer Islands)

Since July 2014, TPL collects outage data to calculate the reliability measures for all three outer islands. The accumulated measures are shown below graphically.

The above graph shows the accumulated SAIDI for all three islands since July, 2014. The SAIDI figures include both planned and unplanned outages. Haapai has the highest SAIDI minutes since December, 2014 due to large planned outages during Cyclone Ian reconstruction project. Also, Haapai does not have N-1 security at the moment; in other words, there is no back-up generator to be used during planned generator overhauls or maintenance. Planned SAIDI figures were found very high compared with the unplanned SAIDI figures.

Again, accumulated CAIDI figures are highest for Ha’apai due to the same reasons. Again, planned CAIDI figures were found very high for all three islands compared with the unplanned CAIDI figures.
Cumulative SAIFI figures were found high for both Vavau and Haapai compared with Eua, implying that Haapai and Vavau have higher number of outages than in Eua.

5. Faults Events

There were total of 520 planned outages & unplanned fault events for the month of June, 2015 affecting 4,105 customers (it is possible that the same customer would have been affected by outages more than once). As per the table above, the number of fault events has decreased from 586 May, 2015 to 520 events in June, 2015. Compared with the last month, the number of faults in both customer premises and service lines has increased significantly. Street lights and LV lines faults have decreased slightly. Most of the customer services faults included fuses at the service line tap off point for a premise.

Should you have any queries with the information provided, please do not hesitate to contact me.

Yours Faithfully,
Ajith Fernando
Risk & Compliance Manager
Tonga Power Limited