Eastern, WECC, ERCOT and Hydro Quebec

May, 2014 Frequency Events’ Data Summary and

Corresponding Frequency Plots

For: NERC Resources Subcommittee and Frequency Working Group

Prepare by: CERTS and Electric Power Group

Date: June 18, 2014
Frequency Response can be calculated from NERC SA Actual MW Loss divided by 10^B-A. The results will be in MW/0.1 HZ.
Frequency Response can be calculated from NERC SA Actual MW Loss divided by $10^B-A$. The results will be in MW/0.1 Hz.
# EASTERN INTERCONNECTION MAY, 2014 FREQUENCY EVENTS

<table>
<thead>
<tr>
<th>Event 1</th>
<th>Actual Loss [MW]</th>
<th>NaN</th>
<th>Estimated Loss [MW]</th>
<th>-801</th>
<th>Freq(B-A) [mHz]</th>
<th>42</th>
<th>Freq(A-C) [mHz]</th>
<th>-33</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event 2</td>
<td>Actual Loss [MW]</td>
<td>NaN</td>
<td>Estimated Loss [MW]</td>
<td>1221</td>
<td>Freq(B-A) [mHz]</td>
<td>-51</td>
<td>Freq(A-C) [mHz]</td>
<td>50</td>
</tr>
<tr>
<td>Event 3</td>
<td>Actual Loss [MW]</td>
<td>NaN</td>
<td>Estimated Loss [MW]</td>
<td>524</td>
<td>Freq(B-A) [mHz]</td>
<td>-16</td>
<td>Freq(A-C) [mHz]</td>
<td>34</td>
</tr>
</tbody>
</table>

![Graph 1](image1.png)

![Graph 2](image2.png)

![Graph 3](image3.png)

![Graph 4](image4.png)
2014/05/11 07:02:05 Sun Eastern Time

- Actual Loss [MW]: NaN
- Estimated Loss [MW]: -680
- Freq(B-A) [mHz]: 51
- Freq(A-C) [mHz]: -35

2014/05/11 19:19:14 Sun Eastern Time

- Actual Loss [MW]: 590
- Estimated Loss [MW]: NaN
- Freq(B-A) [mHz]: -32
- Freq(A-C) [mHz]: 27

2014/05/11 19:37:55 Sun Eastern Time

- Actual Loss [MW]: 887
- Estimated Loss [MW]: NaN
- Freq(B-A) [mHz]: -68
- Freq(A-C) [mHz]: 66

2014/05/13 06:18:35 Tue Eastern Time

- Actual Loss [MW]: NaN
- Estimated Loss [MW]: -1126
- Freq(B-A) [mHz]: 42
- Freq(A-C) [mHz]: -38
WESTERN INTERCONNECTION
MAY, 2014 FREQUENCY EVENTS
ERCOT INTERCONNECTION
MAY, 2014 FREQUENCY EVENTS

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Actual Loss [MW]</th>
<th>Estimated Loss [MW]</th>
<th>Freq(B-A) [mHz]</th>
<th>Freq(A-C) [mHz]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014/05/01</td>
<td>15:13:23</td>
<td>NaN</td>
<td>583</td>
<td>-98</td>
<td>161</td>
</tr>
<tr>
<td>2014/05/06</td>
<td>07:53:22</td>
<td>-306</td>
<td>NaN</td>
<td>12</td>
<td>-52</td>
</tr>
<tr>
<td>2014/05/12</td>
<td>00:04:33</td>
<td>NaN</td>
<td>50</td>
<td>19</td>
<td>12</td>
</tr>
</tbody>
</table>
2014/05/13 12:30:33 Tue Central Time

Actual Loss [MW] NaN
Estimated Loss [MW] -745
Freq(B-A) [mHz] 69
Freq(A-C) [mHz] -88

2014/05/13 21:23:35 Tue Central Time

Actual Loss [MW] NaN
Estimated Loss [MW] 1051
Freq(B-A) [mHz] -77
Freq(A-C) [mHz] 105

2014/05/15 04:19:58 Thu Central Time

Actual Loss [MW] 448
Estimated Loss [MW] 861
Freq(B-A) [mHz] -66
Freq(A-C) [mHz] 115

2014/05/17 00:46:58 Sat Central Time

Actual Loss [MW] 573
Estimated Loss [MW] 867
Freq(B-A) [mHz] -61
Freq(A-C) [mHz] 147
HQ INTERCONNECTION
MAY, 2014 FREQUENCY EVENTS

2014/05/13 07:11:57 Tue Eastern Time

Actual Loss [MW]  NaN
Estimated Loss [MW]  -704
Freq(B-A) [mHz]  41
Freq(A-C) [mHz]  -398

2014/05/17 17:41:40 Sat Eastern Time

Actual Loss [MW]  NaN
Estimated Loss [MW]  907
Freq(B-A) [mHz]  -121
Freq(A-C) [mHz]  466
2014/05/20 14:36:50 Tue Eastern Time

Actual Loss [MW] NaN
Estimated Loss [MW] 1313
Freq(B-A) [mHz] -115
Freq(A-C) [mHz] 378

2014/05/21 06:32:13 Wed Eastern Time

Actual Loss [MW] NaN
Estimated Loss [MW] -343
Freq(B-A) [mHz] 93
Freq(A-C) [mHz] -450

2014/05/21 12:57:31 Wed Eastern Time

Actual Loss [MW] NaN
Estimated Loss [MW] -559
Freq(B-A) [mHz] 72
Freq(A-C) [mHz] -439

2014/05/22 03:44:20 Thu Eastern Time

Actual Loss [MW] NaN
Estimated Loss [MW] -1357
Freq(B-A) [mHz] 121
Freq(A-C) [mHz] -521
2014/05/22 12:09:54 Thu Eastern Time

Actual Loss [MW] NaN
Estimated Loss [MW] -1842
Freq(B-A) [mHz] 116
Freq(A-C) [mHz] -532

2014/05/26 15:06:35 Mon Eastern Time

Actual Loss [MW] NaN
Estimated Loss [MW] -223
Freq(B-A) [mHz] 86
Freq(A-C) [mHz] -453

2014/05/27 18:55:31 Tue Eastern Time

Actual Loss [MW] NaN
Estimated Loss [MW] 351
Freq(B-A) [mHz] -74
Freq(A-C) [mHz] 370