CEO’s Message

I am happy to start the new year with some positive news.

EMC’s Server Replacement Project (SRP) is near completion after many months of rigorous testing. The project is part of our ongoing efforts to keep our operations and systems current, relevant and reliable. Find out more about the SRP on page 2.

In January, we successfully conducted our business continuity preparedness (BCP) exercise, known as ‘Exercise Thunderbolt’. This annual drill tests EMC’s response in the event that we are unable to continue working from our Novena Square office. The article below provides more details of Exercise Thunderbolt and EMC’s overall BCP work plan.

Looking at the National Electricity Market of Singapore (NEMS), the average monthly Uniform Singapore Energy Price (USEP) fell to $151/MWh in February. This is the lowest monthly level since September 2010. More details of the USEP’s movements in 2013 can be found on page 3.

We kick-started our community outreach activities for the year by celebrating Chinese New Year with clients of the Movement for the Intellectually Disabled of Singapore (MINDS) in Ang Mo Kio on 1 February. Read more about the fun celebration on page 2. EMC will continue with our support of renovation works and sponsorship of new equipment at the centre this year, to enhance the environment and facilitate the clients’ therapy and training.

Finally, the NEMS Market Report and Market Surveillance and Compliance Panel Annual Report 2012 are near completion. Printed copies of both reports will be ready in April.

Exercise Thunderbolt

On 29 January, EMC conducted our annual business continuity preparedness (BCP) exercise known as ‘Exercise Thunderbolt’. The purpose of this exercise is to evaluate EMC’s preparedness in the event that operations from the Novena Square office are rendered impossible.

The exercise involved staff evacuation from the office, as well as movement to and from a pre-identified holding area. EMC staff completed the exercise within the planned window period of three hours. There was no system-related disruption to the market during the exercise, except for a brief delay in our response to market participants while the key operational staff were participating.

With the successful completion of Exercise Thunderbolt, EMC has completed the BCP work plan for FY12/13 as detailed below:

<table>
<thead>
<tr>
<th>Type of BCP Test</th>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Disaster Recovery Test</td>
<td>Jun 2012</td>
<td>NEMS system switched over to Labrador site.</td>
</tr>
<tr>
<td></td>
<td>Mar 2013</td>
<td></td>
</tr>
<tr>
<td>Desktop Scenario Test</td>
<td>Jun 2012</td>
<td>Management team and identified personnel worked on injects to ensure familiarity with emergency crisis and business continuity procedures.</td>
</tr>
<tr>
<td>Home Quarantine Order</td>
<td>Jul 2012</td>
<td>Critical team carried out daily operations from home.</td>
</tr>
<tr>
<td>BCP Site Readiness Test</td>
<td>Aug 2012</td>
<td>Critical team moved to alternate office site.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IT LAN system switched over to NEMS Data Centre.</td>
</tr>
<tr>
<td>Exercise Epsilon</td>
<td>Sep 2012</td>
<td>All staff activated by phone. Management team and identified personnel reported back to office within pre-specified timeframe.</td>
</tr>
<tr>
<td>Exercise Thunderbolt</td>
<td>Jan 2013</td>
<td>All staff evacuated from office to simulate emergency situation.</td>
</tr>
</tbody>
</table>

Dave Carlson
Chief Executive Officer
Upcoming Information Technology Projects

As part of our continual efforts to improve our systems, EMC is rolling out two significant system upgrades.

**Server Replacement Project (SRP)**

The scope of the SRP includes:
- Replacing the ageing National Electricity Market of Singapore (NEMS) system hardware;
- Upgrading the NEMS databases;
- Upgrading the NEMS applications; and
- Maintaining these systems for the next five years.

The tender was awarded to HCL Technologies Singapore and the project started in December 2011.

After many months of rigorous and thorough testing, including six months of parallel system operations, EMC has scheduled for the migration of the existing NEMS trading systems to the new server on 21 March.

The key benefits of the SRP are as follows:
- Mitigates the risks of failures and disruptions due to an ageing system hardware;
- Keeps our system hardware up-to-date so that it can embrace new technologies to better meet our business objectives;
- Ensures that the critical NEMS systems (i.e., NEMS Trading System, Offer Management System, and Business Intelligence Management System) are running on supported databases and applications; and
- Achieves cost effectiveness in system maintenance via hardware renewal. With this project, we are able to achieve annual savings of almost 44 percent in hardware maintenance.

We would like to thank all our market participants (MPs) for assisting us with the testing of the new server in the past year.

**Network Upgrade Project (NUP)**

The scope of the NUP involves replacing the existing network infrastructure and maintaining the network for five years. The open tender was awarded to National Computer Systems (NCS) and the project commenced in February 2013.

The replacement of the network will be carried out in three phases for the three data centres. The target completion date is end March 2014.

The key benefits of the NUP are as follows:
- Mitigates the risks of failures and disruptions due to an ageing network hardware;
- Keeps the network infrastructure up-to-date so that it can embrace new technologies to better meet our business objectives and serve our customers. A good example is the upcoming implementation of the IPv6 (extended IP addressing capability) in anticipation that our MPs will eventually move to IPv6 in the coming years; and
- Achieves cost effectiveness in the total cost of ownership (TCO) for the network infrastructure. The TCO over the next five years for the new network infrastructure is potentially about 7.4 percent lower compared to the existing network despite significant upgrades to cater for future capacity needs.

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**Welcoming the Year of the Snake with MINDS Ang Mo Kio**

EMC volunteers welcomed the Year of the Snake in advance with clients from the Movement for the Intellectually Disabled of Singapore (MINDS) in Ang Mo Kio (AMK) on 1 February.

EMC has been supporting MINDS AMK for the past nine years. In recent years, we have focused our support on enhancing the centre’s facilities to provide a more conducive day-care environment for the clients. For example, we have sponsored equipment for the therapy room and minor renovation works in the centre.

This year, we sponsored two closed-circuit televisions to facilitate the centre’s study of their clients’ behaviour, as well as musical instruments to provide MINDS’ clients with a wider range of activities. The centre’s bathrooms will also undergo minor renovation works to improve the training environment.

Clients from MINDS AMK kick-started the Chinese New Year celebrations with a string of song and dance performances. This was followed by the distribution of oranges and hand-made bouquets of flowers to guests and volunteers at the centre. The fun-filled day ended with lunch at McDonald’s with the clients.

The event provided an excellent opportunity for EMC volunteers to engage the clients of MINDS AMK. We look forward to many more enjoyable activities with them in the future.
Market Update

USEP traded at the largest discount from VCHP since early 2009

After falling below the Vesting Contract Hedge Price (VCHP) in December 2012, the Uniform Singapore Energy Price (USEP) continued to trade below the VCHP in 2013. Notably, February’s USEP at $151/MWh is the lowest monthly USEP since September 2010, and represents the largest discount from the VCHP since April 2009.

The VCHP fell from $205.52/MWh in the fourth quarter of 2012 to $194.44/MWh in the first quarter of 2013.

On 15 February, the half-hourly USEP reached an all-time low at -$10.08/MWh in Period 5. Apart from this, the USEP also traded at or below $0/MWh for a total of 15 periods on 14 and 15 February. A contributing factor for the low USEP in February was the decline in demand.

Half-hourly USEP reached a new low in 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of trading periods when USEP ≤ $0/MWh</th>
<th>Lowest half-hourly USEP ($/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>8</td>
<td>($5.22)</td>
</tr>
<tr>
<td>2004</td>
<td>19</td>
<td>($10.03)</td>
</tr>
<tr>
<td>2005</td>
<td>0</td>
<td>$0.02</td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
<td>$0.14</td>
</tr>
<tr>
<td>2007</td>
<td>2</td>
<td>$0.00</td>
</tr>
<tr>
<td>2008</td>
<td>7</td>
<td>($0.06)</td>
</tr>
<tr>
<td>2009</td>
<td>10</td>
<td>($5.03)</td>
</tr>
<tr>
<td>2010</td>
<td>0</td>
<td>$108.79</td>
</tr>
<tr>
<td>2011</td>
<td>0</td>
<td>$124.67</td>
</tr>
<tr>
<td>2012</td>
<td>0</td>
<td>$100.43</td>
</tr>
<tr>
<td>2013</td>
<td>15</td>
<td>($10.08)</td>
</tr>
</tbody>
</table>
User Forum

Market Information Sharing Forum (MISF)

Chen Jian Hong from the Market Operations team presented at the 67th session of MISF on 17 January. Aside from updates on the overall market performance of the National Electricity Market of Singapore (NEMS) and the progress of system enhancements for 2012, Mr Chen also provided an overview of the NEMS’ performance in the first ten years. The presentation ended with a summary of the potential rule changes and new generation capacity expected in the near future.

EMC also had the pleasure of having Singapore Exchange (SGX) representatives present at the MISF. SGX’s presentation on the potential development of Singapore’s electricity futures market attracted a record number of attendees from our market participants (MPs).

EMC would like to encourage MPs to present at future MISFs as the forum is a good platform for sharing market information within the industry.

We also held another MISF on 14 March. Ms Bai Jie from the Market Operations team covered the market performance of the NEMS in the first two months of 2013 and provided a progress update on the latest system enhancements. She also discussed in detail selected feature topics during this forum.

The next MISF is scheduled for 16 May. All MISF representatives are encouraged to register online.

Market Systems User Group (MSUG)

The bi-monthly MSUG forum was held on 21 February. EMC IT shared its findings and follow-up actions on two incidents involving an EMC website outage and failed real-time dispatch schedules.

In addition, EMC IT provided updates on the Server Replacement Project (SRP) migration plan, detailing the activities involved and its impact on MPs. As part of the migration plan for the SRP, the team also shared details of the Disaster Recovery Preparedness (DRP) exercise scheduled from 4 to 21 March.

The forum ended with an update on the status of several projects - including the additional web services for scheduled generation, security constraints applied, and Risk Adjustment Factor values display on trading reports - as well as the progress of other on-going projects for the NEMS systems. The next MSUG forum is tentatively scheduled for Thursday, 18 April.

EMC Training Programme – Next Course on 16 and 17 May 2013

EMC will be holding the next run of its two-day training course, Understanding Electricity Markets, on 16 and 17 May 2013. Our staff will be conducting six sessions covering the following topics:

- Understanding Electricity
- Overview of the Electricity Sector
- The National Electricity Market of Singapore and its Unique Features
- Pricing in Detail
- Settlement
- The Demand Side

The course dates for 2013 are as follows:
- 16 – 17 May 2013
- 15 – 16 August 2013
- 14 – 15 November 2013

We advise you to book early to secure your place in the course of your choice and benefit from our early-bird discount.

Further details on the programme and on how to register are on our website, www.emcsg.com. For enquiries, please e-mail trainingprogramme@emcsg.com or contact Jan Lee at +65 6779 3000.

Send us Comments, Feedback or Questions

The EMC Bulletin is written by EMC for you and we are always striving to improve our service. We are interested in any feedback you might have about specific articles and topics covered or comments and suggestions about other areas you would like to see included.

Please send your comments, feedback or any questions either via e-mail to info@emcsg.com or via fax to +65 6779 3030.

Thank you in advance for your time and effort.