

# Incident Report

## Redbus-hex.core.enta.net

Report Date: 7<sup>th</sup> July 2011  
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### Introduction:

The below report is a breakdown of the incident experienced at Telecity Harbour Exchange 6/7 on the 06/07/11 between the approximate times of 10:50 and 15:55.

### Breakdown of the events:

On the morning of the 06/07/11 at approximately 10:50 our monitoring indicated that the equipment we co-locate at Telecity was running on or had switched to UPS power. We were at this point hearing reports of widespread power problems within the building itself. Telecity were already aware of the issue and were investigating.

At approximately 11:30 we received confirmation from Telecity that they were experiencing power problems to the whole of the 7<sup>th</sup> floor. Under normal circumstances power would have been transferred across to Telecity UPS's and generator systems, however due to a fault this did not happen and an explanation of the fault would later be provided. Telecity continued to work on the issue in an attempt to restore power as soon as possible.

At 11:40 the Entanet UPS batteries became exhausted and so connectivity to the location was lost. Traffic was re-routed around the issue, however customers directly connected at this location would have been affected. Leased line customers at this point would have failed over onto backup solutions, if provided.

At approximately 11:54 we were informed by Telecity that power would start to be reinstated in stages, although all power should be restored within 20 minutes.

At 12:28 Telecity advised that power had been restored to the 7<sup>th</sup> floor, however our equipment was still unresponsive. We asked remote hands to specifically check our rack to ensure power had been restored.

At 14:05 remote hands had confirmed power had been restored to the rack. As the core router was still not responding and remote hands seemed to be overloaded the decision was made to dispatch our own engineer to site. The ETA for the engineer was 15:00.

At approximately 15:14 an engineer had arrived on site and checked over the core router. Diagnostics suggested that the flash card with the IOS image appeared to have failed. Another flash card was being sourced from an adjacent site and the ETR for this was put at 15:45.

At approximately 15:54 the engineer had arrived back on site, had replaced the flash card and therefore restored service. Entanet monitoring services were checked over to ensure no customers were still affected.

To avoid a service outage to any Entanet core router via a flash card failure in the future, measures have been taken to install additional flash cards from which the router can boot, should one fail. We are also in the process of rolling this out to other Entanet Core routers.

Since the incident we have received an official reason for outage and action plan to ensure there is no repeat of the outage. The Telecity report can be found below.

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## **Telecity Event Overview:**

### **Monthly mains failure test May 20<sup>th</sup>**

During a planned monthly mains failure test in 6&7 Harbour Exchange on May 20<sup>th</sup> it was discovered that the Generator Breaker on Switchboard SB UPS 02 failed to operate as designed. This Switchboard feeds the UPS systems that feed the customer load on the 7<sup>th</sup> floor of 6&7 Harbour Exchange. Investigations were carried out and the root cause of this fault was identified to be an overheated spring charging mechanism and its supply cables within the Generator Breaker. Temporary repairs were carried out to ensure the installation was safe and could operate normally, albeit on a temporary basis, until new parts could be installed.

### **Remedial works July 06<sup>th</sup> & incident**

On July 6<sup>th</sup> the works to replace these components were commenced. The Generator Breaker which feeds switchboard SB UPS 02 was isolated and the associated Mains Incomer Breaker was checked and found to be healthy. Then the spring charging mechanism was replaced.

The fixed portion of the wiring connection which is found in the Generator Breaker was also to be replaced as part of this maintenance procedure. It was during this part of the works that, due to a non-standard wiring configuration, a signal was removed to the under voltage coil on the Mains Incomer Breaker. This caused the Mains Incomer Breaker to open which in turn caused the loss of supply to the UPS input that feeds the 7<sup>th</sup> floor. At this stage, neither the engineer carrying out the works, nor the supervisor assigned to these works re-checked the status of the Mains Incomer and as a consequence the opening of Mains Incomer Breaker was initially left undetected. The BMS (Building Management System) outstation received the system alarms but was unable to communicate with the BMS head end. As a consequence no alarms were received within the TelecityGroup NOC or in our resident maintenance contractor's NOC.

Our teams became aware of the issue at 10.27 when alerts were received from other outstations notifying them that the batteries had gone into discharge state, dropping the load and causing a loss of customer supply.

### **Reinstatement**

At 10.34 TelecityGroup's specialist contractors proceeded to close the Mains Incomer Breaker. They then inspected the UPS at 10.36 to find the batteries' charge level too low to reinstate at this time. The system could not automatically restart because the DC voltage to the inverter was too low.

Reinstatement procedure commenced at 10.55 which involved placing the UPS into static bypass until the UPS DC system was reset. The customer load was then transferred back to inverter.

To ensure controlled reinstatement, the PDUs were isolated and the UPS system brought back online at 11.20. By 11.40 power was restored to the 07<sup>th</sup> floor and our Customer Service Engineers proceeded to restore power to individual circuits and customer equipment.

At 12.11 Customer Service Engineers confirmed that the power to customer equipment was back online and a resolution communication was sent to customers at 12.13.

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**Current situation**

The installation has not been altered since before the incident with the exception of the works carried out on the generator breaker. The system is therefore stable. A mains failure test will have to be carried out in order to prove the correct functioning of the electrical infrastructure following the works on the generator breaker. Until we've proven the infrastructure, dedicated engineering staff will be stationed in the switch room 24x7 to monitor the situation and perform immediate manual power restoration should the need arise.

**Actions to prevent reoccurrence**

We are now reviewing our operational procedures to ensure resilience is not compromised and this type of isolated incident does not reoccur - Time frame: 1 month

Introduce additional resilience in the BMS configuration which will improve the reliability of the alarm function of the BMS outstations - Time frame: 3 months

Install visual and audio beacons which will be automatically activated in the event of critical equipment failure by the equipment's internal alarm output to supplement the existing BMS - Time frame: 3 months

Carry out a controlled mains failure test in order to prove the electrical infrastructure - Time frame: 9/10<sup>th</sup> July. A customer notification will be issued today.

TelecityGroup apologise for any inconvenience that may have been caused by this incident.