

## **GCC Tape Robot Room EPO Root Cause Analysis**

### **Event**

On the morning of April 21, 2011, FESS Fire Technicians were performing maintenance work on the fire suppression units within the SL8500 Robots in the Grid Computing Center Tape Robot Room. One of the technicians was new on the job and was working with a more experienced technician. The experienced technician asked the new technician to press the push button on the "Release Abort Station". He went to the building fire alarm pull station on the wall with the Emergency Power Off (EPO) button next to it and pushed the EPO, instead. This shut down the air conditioning and electric panel powered by the 40 KVA Uninterruptable Power Supply (UPS) in the room. After he realized what he had done, he quickly pulled the EPO button out of the depressed mode which brought the power to the air conditioning unit again. The 40 KVA UPS power remained off. However, it was found that the electric panel, powered by the 1000 KVA UPS remained live.

### **Background**

The Tape Robot Room in question is located in the north end of the GCC building. It was built in early 2006 and intended to house up to 4 tape robots along with associated computers (mover nodes). There was a requirement for emergency backup power in the event of a power outage. The project was able to fund a 40 KVA uninterruptible power supply (UPS) which would provide 20 minutes of hold-up time, but funds did not allow for a standby generator. Users of the tape robot system requested more than the 20 minute hold-up time. We therefore decided to add a second source of electric via a panel powered by the 1000 KVA UPS from computer room A. The yet to be delivered tape robots and associated computers were dual corded and could plug into both sources. In the event of a power outage, the hold-up time could be up to 6 hours depending upon how quickly the computers in computer room A would shut down. The 1000 KVA panel had an EPO shunt trip breaker installed with the intention of it being connected to the room's emergency power off (EPO) system just like the panel fed from the 40 KVA UPS. In fact it was not connected. To the best of everyone's recollection, this was probably due to the amount of activity we had on our plate at that time. This included the start of construction of LCC room 107, the finalization of construction documents for GCC computer room B, the installation of water zoning valves at FCC which required a cooling water outage for both FCC computer rooms, concern over mussel cleanout in the lab's ICW system and it's

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possible effect on FCC computer room cooling and an FCC water leak in a computer room. All of these and more were happening in the same timeframe in March and April of 2006.

### **Approach**

All Computer Room Planning meeting minutes from that timeframe were reviewed in order to determine the timing and details of the new panel installation and surrounding events. The original people associated with the installation of the panel contributed their recollections.

### **Direct and Root Causes**

The electric panel powered by the 1000 KVA UPS had not been connected to the EPO. If there had been a checklist or a punch list of the final phases of the project that included a test of the EPO system, this would likely not have been missed.

### **Contributing Causes**

The step to connect the 1000 KVA UPS to the EPO was omitted due to distraction. There were several other major projects and problems being tended to at this time that the facilities people were overseeing.

### **Corrective Actions (already complete)**

The division has been reorganized and staff has been added to Facility Operations to help with the increasing work load. Greater formality has been added to project management procedures and includes checklists.

### **Recommended Actions**

It is imperative that prior to commissioning a new electrical distribution service, that all functionality be tested for proper operation and recorded. This will be included in the checklist for commissioning.