**Controlled STAR Note #0221B**

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PROGRAM-PROJECT-JOB

**STAR Project**

TITLE

# Uninterruptible and Emergency Electrical Power Requirements

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| REV. A<br>12/18/96 | December 18, 1996--The magnet sub-system reduced its request for emergency power. The requirement that magnet water always be heated has been dropped. In the event of a power failure, only power to operate the water pump is needed. Change the location of the water pumps. |
| REV. B<br>9/14/98 | It was decided that Emergency Power was not needed by the magnet. Decided that uninterruptible power was to be provided by sub-systems. Updated TPC Gas System and DAQ File servers to more refined power numbers. Added requirements for Online, Slow Controls, and Trigger. Added requirement that UPS systems must be integrated with the STAR interlock system. |

Jay Marx 9/15/98

Jay Marx, Project Director

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# Uninterruptible and Emergency Electrical Power Requirements for STAR

Controlled STAR Note #221B

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September 14, 1998

Abstract: This document describes the amount of uninterruptible and emergency electrical power, which STAR needs. A brief justification for each system is given. In addition, the document describes the location that the power outlets should be installed.

Issued: October 24, 1995
Revision A: December 18, 1996—The magnet sub-system reduced its request for emergency power. The requirement that magnet water always be heated has been dropped. In the event of a power failure, only power to operate the water pump is needed. Change the location of the water pumps.
Revision B: September 14, 1998—It was decided that Emergency Power was not needed by the magnet. Decided that uninterruptible power was to be provided by sub-systems. Updated TPC Gas System and DAQ File servers to more refined power numbers. Added requirements for Online, Slow Controls, and Trigger. Added requirement that UPS systems must be integrated with the STAR interlock system.

Systems, which will need uninterruptible and emergency power from RHIC, have been identified. Uninterruptible power is defined as electrical power that is continuously supplied. If uninterruptible power is on a battery system, a backup generator is needed to maintain power beyond the capability of the battery. Emergency power is electrical power that can be restored within 30 minutes of a power failure.

The STAR interlock system relies upon shutting off the power to the equipment when there is a safety alarm. In order for any UPS (uninterruptible power supply) system to be installed, there must be an analysis on what happens to the UPS system when there is a fault condition.

I have been able to identify the following equipment that requires these special power systems:

**Uninterruptible Power:**

TPC Gas System—4.5 kVA. We want to maintain the TPC gas and safety systems when there is a power failure. This system will be located on the East End of the south wall of the Assembly Hall (next to the gas distribution room). The gas system requires three phases at 10 A. Power should be available for at least 20 minutes.

DAQ File Servers—1.4 kVA. If power is lost to the DAQ computers, we would lose a significant time to restore the computing systems. As a power failure has a high probability of

damaging computers, it is cost effective to assure that the power always remains supplied. Furthermore, a power failure could cause disk failure. The DAQ computers will be located in the north end of the DAQ building.

Online— 500 w (two places). The CISCO Ethernet switch, which is used as the base for the STAR network, must not be affected by short power outages. Having this device always powered makes recovery of the STAR computer much faster after power loss. The switch consumes 376 w. Some auxiliary equipment makes up the balance of the total requirement. The switch is located in the northwest corner of the DAQ room. Similarly, the network on the platform needs to be protected. This network device is located in the Slow Control Racks in rack row 2A.

Slow Controls—1.5 kVA. The slow controls workstation is required to power long enough for an orderly shutdown of the detector systems following a power interruption. This workstation will be situated in the control room. In addition, 0.5 kVA is need for the terminal server located on the platform in the slow controls rack (second floor, first row south platform). This is necessary for checking the status of and the booting of VME processors located on the platform following a partial power interruption.

Trigger—1.4 kVA. The Trigger workstation must orderly shutdown the trigger CPU's when there is a power interruption. Uninterruptible power is required to provide enough power for this to happen. The trigger workstation is located in the Control room.

**Emergency Power:**

There is no need for Emergency Power.