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Subject: Blue Alert: Electrical Maintenance Damages Computer Infrastructure

Title: Electrical Maintenance Damages Computer Infrastructure
Date: August 25, 1999 Identifier: 1999-RL-HNF-0031

Lessons Learned Statement: Power to computer circuits should not be interrupted without notifying computer support personnel to identify impacted computer systems and without determining if backup systems are required to maintain continued operations until normal power is restored. Facilities may have vital computers or computer support systems (e.g. network components) powered from their electrical circuits that may not be identified on facility drawings.

Discussion of Activities: Electrical maintenance activities have incapacitated or damaged sections of the site computer infrastructure on several occasions. Two of the most significant recent events were:

* In May 1999 the safety significant TWRS Wireless LAN Bridge which communicates tank monitoring data was inadvertently put out of service.
* The Enterprise Server and the Business Management System servers suffered $15,000 damage when one phase of 339A building power was shut down.

In each instance, there appears to have been no impact analysis or prior notification to LMSI of the scheduled maintenance. Although there has been considerable effort to improve communication between facilities and LMSI about these maintenance activities, similar events continue to occur about once a week.

Analysis: Possible causes of this problem include:

* The site computing infrastructure configuration may be inadequately documented in the facilities. Configuration management of the computing infrastructure is a LMSI responsibility and is generally maintained well within LMSI. Facility owners may not, however, have direct access to the information about the configuration of the computer infrastructure for planning electrical maintenance activities. Computers and network support equipment may be connected to general use circuits without those circuits being clearly labeled as supporting vital computer equipment.
* Changes to the electrical power grid may affect vital computer systems that are unknown to facility owners or Electrical Utilities. Planned outages are coordinated through facility management but if the facility does not know the configuration of its computer infrastructure the impact to computer systems is difficult to determine.
* Work package procedures may not require adequate analysis of impact of electrical outages on computer infrastructure. Electrical maintenance packages that could potentially affect major computer systems should contain a requirement to perform an impact analysis and/or notify LMSI for sign-off (similar to the U-DIG process) in the electrical work package.

Recommended Actions: Facilities should review their electrical configuration documentation with LMSI

Facilities personnel to ensure that all vital computer systems are identified and thus considered in electrical outages. Facility managers must thoroughly review all affected electrical loads, including computer systems, before beginning electrical maintenance activities. They should notify LMSI well in advance for jobs that could potentially affect significant computer systems and should consider including a notification signoff in the work packages for those jobs. They should shut down computer systems before deenergizing circuits and provide appropriate backup for lost capabilities.

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Functional Categories (Hanford specific): Electrical
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