C-AD

Radiation

Safety

Committee

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Minutes of Radiation Safety Committee of March 20, 2012

Subject: Initial Planning for Booster Access Control Upgrades

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The Booster Access Control System (ACS) will be upgraded from a relay based system to a PLC implemented system. Initial planning for the upgrade is beginning so that any opportunity to begin the upgrade early can be utilized. The AGS upgrade will be finished during the upcoming summer shutdown and the Linac upgrade will start. The booster upgrade will follow.

The new booster PLC based ACS will provide a near copy of the present relay ACS in terms of protection logic. The design will follow those being incorporated in the AGS PLC based ACS.

Some comments related to the upgrade follow:

Critical Devices→ The method of having PLC division A control critical device 1 and PLC division B control critical device 2 will be used in the Booster as it is being done in the new AGS PLC system. This keeps the dual chains as isolated as possible. Other methods of placing isolation switches were discussed but like the new AGS system the committee recommends keeping the system simple and avoid the complications of cross-linked interlocks.

Single Items→ Portions of the system that do not require redundancy will be confined to division A. This will include equipment protection, timed sequence stations, crash buttons, etc.

Reachback Devices→ The reachbacks will latch and follow the chain-to-device sequence as in the AGS system.

Crash Buttons→ The present crash buttons may be used rather than crash cords. There is concern the cord holders may protrude too far into the aisle. The booster tunnel is smaller than many of the others. The present buttons will be inspected for damage and a decision made later whether to use crash cords or buttons. If buttons are used they must be readily visible.

Sweep Gate→The booster has a sweep gate. The gate and its indicators should be examined to ensure that it is acceptable or needs to be upgraded. The AGS minutes[1] April 7, 2011 cover generic requirements for a sweep gate.

Warning system→ Sound and lights will warn personnel if the system is being reset for beam. The time delay will be at least 30 seconds and will be longer if needed to get to the crash buttons.

Sweep Zones→ A full sweep of the Booster takes about 20 minutes. Sweep zones were not considered necessary.

Plug Door→ The Booster has a large movable shielding door. The upgrade for the control of the AGS plug doors has been changed relative to the description of the RSC minutes. The changes to the control of the AGS plug doors came at the request of operations. It was requested that the same logic be applied to the Booster Plug door, which will include dual closed position switches. The ACG will provide the details of the new logic to the RSC for review. The gate outside the plug door will be examined for position switches. This gate does not need to be used under remote controlled access.

Controlled Access→ The man labyrinth will have a controlled access mode and remote controlled access will be allowed with key trees and video cameras. The increase in the key tree system at C-AD facilities may require operations to consider expanding the monitor systems for conducting remote controlled access. The new cameras will be digital and this may reduce the effort to expand the monitor system. A change in the limit of the number of gates open for remote controlled access may need to be considered in the future.

Lockout keys→ The beam stop lockout key will be located near the new MCR to make them more convenient for operations. The relocation becomes easier with a PLC system.

Electrical/equipment Protection→ The present Booster ACS has inputs related to protection of personnel from electrical hazards and equipment protection such as the beam scrapper at B6. The Chief Mechanical Engineer (CME) and the Chief Electrical Engineer (CEE) must provide a list of items that they want tied into the PLC based ACS. They need to also specify if they are to be put into the system in a single location or redundantly.

Booster-to-AGS Labyrinth→ The booster to AGS labyrinth will be a zone that is reset from the booster side. There will be no controlled access for this zone. The area will remain reset unless one of the gates is opened.

Chipmunks→ The chipmunks will be placed into Division A. There are two chipmunks in the fenced area over BTA. It needs to be determined if these need to be in redundant chains of the interlock system. The chipmunk at the EBIS penetration should be considered for elimination. The chipmunk high near the booster door should be examined if it is still necessary.

The access controls group felt the details discussed were sufficient for them to begin their planning process.

References

1) RSC Minutes, http://www.c-ad.bnl.gov/esfd/RSC/Minutes/04_07_11Minutes.pdf

CC:

Present
RSC
RSC Minutes e-File
H. Huang
Booster Liaison Engineer
RSC Info list