

C-AD

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DB

Radiation

Safety

Minutes of Radiation Safety Committee of April 20, 2011

Committee

Subject: Review of Changes for the AGS ACS

Present: D. Beavis, R. Karol, A. Etkin, C. Theisen, J. Sandberg, P. Ingrassia, D. Hillis, and J.W. Glenn

This meeting continues the discussions¹ from the April 13, 2011 RSC meeting on the logic changes to the AGS Access Control System (ACS) for the PLC upgrade of the ACS. A preliminary agenda² was distributed before the meeting and used to guide the discussion.

Controlled Access

The committee discussed the remaining issues for Controlled Access. Human performance might suggest that the best approach would be to have the North gate consistent with the other personnel gates. The cost of a complete system for a gate is about \$15k. It is estimated that the North gate is used for Controlled access about once every two years. It was decided that the North Gate is not used enough to justify the cost of a remote key tree system. Cameras will be installed to enable MCR to monitor Controlled Accesses at the gate. The key will be obtained from the MCR key tree.

The MCR key tree will have an iris scanner for releasing the keys and registering the personnel.

The keys will be required to be returned to the same key tree after access is complete. Personnel should not exit different gates but this could be allowed if a means to keep the logs accurate is presented. There is typically little need for personnel to enter one gate and exit another.

The key trees will have bypass switches if a key is lost. The details of the functioning of the key trees will be provided to the RSC. The keys do not operate a key switch at the gate but are attached to a unique RFID that activates the gate release in conjunction with a simultaneous release from MCR. The details will be reviewed to ensure that there are no weaknesses introduced by lost keys that are eventually recovered.

The limit to the number of personnel into the ring can be administrative. The logic behind the existing limits may not be appropriate when multiple gates will be allowed for Controlled Access. Operations should review the desired limits on a gate by gate basis and have the access procedure modified and reviewed.

The changes for Controlled Access will be tracked. **(CK-FY2012-AGS-776)**

Linac to AGS

This area will be swept from the AGS side. The indicators at the gate must be able to tolerate the radiation levels that are present. Personnel from the Linac must be able to escape into the AGS. The mechanics of the gates must be designed for this mode of escape. **(CK-FY2012-AGS-777)**

J15 Shutter

The committee recommends that dual in/out position switches be placed on the J15 shutter. The shutter ensures that there is no beam remaining in the machine if a gate is opened. The South Wiring Tunnel and the FEB front-stub tunnel must be part of this system as well as all the access gates. The present logic should be closely copied. The shutter position switches should be placed in Div. A and Div. B. The diagnostic option that is in the present system should not be used in the new design. **(CK-FY2012-AGS-778)**

Dual Current Transformers

The dual current transformers are used to protect thinly-shielded areas downstream of the AGS (namely AtR and RHIC). It is recommended that the 8-degree and 20-degree bends be removed from the logic. In addition the valve between the high intensity source and the RFQ will be removed from the system. It is expected that little versatility will be lost but less testing will be required for the system. **(CK-FY2012-AGS-779)**

A .NE. B

The generation of Division A not equal to Division B indication was clarified. In some systems this signal is generated by the firewall PLC. For the new AGS system it will be generated at the HMI level. The PLCs do not shutoff the beam due to A not equal to B. However, there are times that a division will turn off a machine but the reason to turn the machine off is not communicated to the HMI level due to technical reasons (register sizes and communication limitations). The new design will be ensure that the reason a division turns a machine off is recorded into the logs. This issue does not arise very often but should be eliminated in the new design.

The new design has a permit passed between the two PLCs controlling the interlock logic. If one of the machines detects a state that it is not appropriate it will take action to make the area safe and tell the other system that the permission for beam has been

removed. The other PLC will then also render the area safe even if it did not detect a problem. (CK-FY2012-AGS-780)

When possible input signals should be “debounced” to prevent any transient changes of state. This can be accomplished in hardware or software. It was noted that the RHIC gate system may have a time of about 0.5 seconds due to the RC constants in the current loops for the gates. A detected state change must be acted on quickly enough such that no one can receive any appreciable exposure.

Miscellaneous

The alcoves around the ring will be examined and when appropriate chosen for check stations. Micro-switches typically sense if the gate is locked in the present interlock system. The design should incorporate this feature when appropriate. The gates will have new micro-switches added and in some cases new locking mechanisms. All personnel gates will have new displays to provide status information for personnel.

Questions or comments on the AGS design should be sent to C. Theisen, D. Beavis, and J. Reich.

References

- 1) RSC Meeting minutes of [April 13, 2011](#).
- 2) D. Beavis, [Agenda](#).

CC:

Present
RSC
RSC AGS File
RSC Minutes File
H. Huang
K. Brown
C. Gardner