Summary of Discussion on 2-6-19

Chipmunk area radiation monitors discussed here are those that monitor area radiation levels in occupiable areas and they may either interlock the accelerator facility off and/or alarm locally and in MCR when radiation levels go above the preset local limit. They are used for personnel protection and are a QA Level A1 electronic device. They are active electronic devices that are part of the Access Control Systems at C-AD. They are fail-safe and Classified as “hard-wired” protection devices suitable for radiation safety by the RSC (see OPMs 9.1.11 and 9.1.11.a).

There are 107 of these hard-wired devices in service at C-AD accelerator facilities. They are 25 to 30 years old. They are all similar design. Mathew Paniccia was requested to examine mean-time between failure (MTBF) for Chipmunk parts. The objective was to identify replacement parts that would extend the life of these devices 20 years.¹ Mathew’s replacement conclusions covered:

- Electrometer Capacitor Replacement
- Low Voltage Regulator Update
- LED Replacement Bulbs
- High Voltage Power Supply Replacement Device
- Mean Time Between Failure Analysis

During Mathew’s presentation, the following actions items were recommended by the RSC members and guests:

1. Develop a documented procedure to test annealed capacitors to help ensure the temperature dependence has been effectively eliminated. (Action Item 1: M. Paniccia)
2. Determine if annealing impacts MTBF or the long-term stability of the capacitors. (Action Item 2: M. Paniccia)
3. Develop specification/procedure for soldering the capacitor replacement. (Action Item 3: M. Paniccia)

¹ Chipmunk Upgrade, February 2019, M. Paniccia
4. Consider running cable to a location where the upgrades can be tested side by side with an in-service Chipmunk. Identify these Chipmunks in the ACS as “Test Chipmunks.” (Action Item 4: J. Citro)

5. Consider several locations for reliability testing the changes to the Chipmunks that will test its response over a wide range of radiation levels, ambient temperatures, response to slow (few ms) pulsed radiation and fast (0.1 μs) pulsed radiation (Action Item 5: J. Citro)

6. Inform MCR OCs and operators that “Test Chipmunks” will be in the ACS during the next 2 years and develop a procedure for MCR response. (Action Item 6: P. Ingrassia)

7. Ensure Chipmunk drawings are updated in Windchill. (Action Item 7: C. Theisen)

8. Provide a written Chipmunk Testing Plan and schedule and submit to the RSC. (Action Item 8: M. Paniccia)

The RSC members decided the replacement parts were replacement in kind, except for the Low Voltage Regulator design. However, the new circuit design is not complex and does not create a previously un-analyzed postulated accident or condition that could result in a significant adverse consequence. The RSC determined there is no Unreviewed Safety Issue associated with these changes. This determination is based on changes being low risk or replacement in kind (see OPM 1.10.1 and USI Checklist attached) and on the reliability testing in the real field conditions during the next two years.

D. Passarello will post the Action Items in Family ATS. All Action Items should be closed by February 1, 2021.

Copy to:

J. Citro
A. Curcio
D. Gassner
C. Hoffman
P. Ingrassia
J. Jackson
M. Paniccia
D. Passarello
T. Roser
P. Sullivan (DOE)
S. Zia
Collider-Accelerator USI Checklist Evaluation

Collider-Accelerator ESSHQ

Job or Project Title: Potential Chipmunk Modifications
Point Of Contact: M. Minty
USI Determination:  1

Explanation of USI Determination 0: Negative. This project or job does not impact Credited Controls in the C-AD ASEs. Please ensure that you adequately address the hazards during work planning.

Explanation of USI Determination 1: Potentially Positive. Because of the work identified, this project or job has the potential to impact Credited Controls in the C-AD ASEs. Please contact Peter Cirnigliaro (x5636) or Ed Lessard (x4250) for further assessment.

You answered YES to the following, which C-AD considers a potentially positive USI Determination:

4. Will the job or project add, modify or otherwise affect an Access Control System?
4d. Is the software or firmware for an ACS device altered or updated?

You answered NO to the following, which C-AD considers a negative USI Determination:

1. Are any radiation barriers added, changed or modified by the job or project (for example concrete and steel blocks, earth shields, fencing)?
2. Will the project or job generate new sources of radiation or radioactive material?
3. Will the project or job alter or change an interlocked or locked accelerator enclosure?
4a. Are critical devices changed?
4b. Are gates or entrances changed or altered?
4c. Are ACS networked devices added or removed?
5. Are the large volume gas systems or their controls at AGS, RHIC, sPHENIX, STAR or ERL being worked on?
6. Does the project or job involve altering, enlarging or otherwise changing an ODH area?
7. Are ODH fans or smoke removal fans or intakes in the RHIC tunnel or support buildings being modified in any way?
8. Are the smoke removal fans or intakes in the AGS tunnel being modifed in any way?
9. Are environmental systems being worked on (stacks, filter banks or exhaust fans at BLIP, NSRL and Building 801)?
10. Are ventilation systems in Building 801, BLIP Building 931 or NSRL Building 956 being worked on?

Return to the USI Determination Questions

To print, press CTRL+p