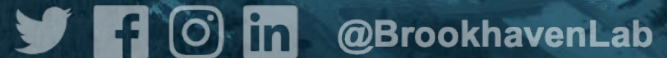




TAKE FIVE for Safety- Work Planning for RHIC Repair

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Job Scope (Initial Plan)

- Prior to Repair:
 - Arcs 12/1 and 2/3 warmed up to 45K and allowed to drift warmer
 - Arc 4/5 warmed to ambient temperature, with cryogen supply locked out
 - VODH system disabled in the 4/5 arc
 - Arcs 6/7, 8/9, and 10/11 remain cold at 4.5 K.
- Repair scope:
 - Open RHIC Cryostat(s), Splice Can(s) Identify and Repair Shorted Bus Conductors, close Splice Can(s) and Cryostat(s)

Identification of Potential Job Hazards (Initial Plan)

- ☐ Activation
- ☐ Cryogenic
- ☐ Electrical
- ☐ Ergonomics
- ☐ Fumes/Mist/Dust
- ☐ Material Handling
- ☐ Oxygen Deficiency
- ☐ Vacuum Systems
- ☐ Welding/Cutting/Grinding/Brazing

Primary Hazard Mitigations (Initial Plan)

- LOTO of Hazardous Energy (Cryogen, Electrical, Instrument)
- Permit and fire protection mitigations for Hot Work Activities
- Exhaust Ventilation (ODH System)
- Postings/Barricades
- PPE for cutting

Accelerator Safety- USI Evaluation (Initial Plan)

- ODH System, including oxygen monitors with control of alarms and fans will remain enabled for entire RHIC ring.
- VODH module for arc 4/5 will be bypassed; modules for other arcs will not be affected.
- Arc 4/5 will not need VODH controls

RHIC Tunnel Sextant ODH Controls (As related to Initial Plan)

Cryogenic System Condition	Relative ODH Risk	RHIC ASE Controls
Helium at 293K (Ambient Temp)	Low	None
40K<Helium< 80 K	Medium	<ul style="list-style-type: none"> • ODH Monitoring, Alarms, Ventilation, Automatic Isolation • 3 Exhaust Fans per sextant minimum
Helium < 40 K	High	<ul style="list-style-type: none"> • Helium<80K Controls; PLUS: • VODH Must be operable • VODH Sensors must trip ODH Mitigations at 0.5 atm (nominal)

Changing Conditions (This Week)

- Identification of need for
 - Adjustment to Cryogenic Isolation- Accelerator Safety “USI”
 - Scaffolding to access point of work
 - Material handling planning and evaluation

Conclusion

- Planning purpose to identify and mitigate issues related to worker safety and health, accident prevention, and compliance.
- Questions were raised early
- Reviews have been a team effort with input from several planners and Subject Matter Experts
- Frequent communication to address changing needs and conditions
- Work is affected by “Accelerator Hazards” and “Non-Accelerator Hazards”