

The Long Shut Down Re-Baseline Review Part Deux

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Comment #1 – Existing Building Systems

- The first goal is to verify that all of the equipment is in excellent condition and ready for a decade of use with routine monitoring. There is a concern that a combination of nearly two decades of radiation, together with a construction environment (dust etc.) may have resulted in damage to the devices that is not revealed by routine testing.

Manufacturer's recommendations for more thorough tests should be sought.

- Fire Protection
- Machine Protection
- Personnel Safety

- Requirements based on Fire Hazard Analysis
 - Performance verified through regular inspections and test, maintaining system integrity through LSD
 - FHAs to be revised
 - 3 year cycle, so will be timed with 12 GeV milestones
 - Greatest Unknown – Hall B
 - FHA scheduled for FY13Q2

- Other FY13 funded work
 - Replace 8" fire main entering Counting House
 - Upgrade VESDA installation in Hall C
 - Install flammable gas detection in Hall A/B/C/D
 - Gets attached to VESDA
 - Halls would still have local detection depending on planned experiment
 - Remove fire alarm interface modules in accelerator tunnel
- Work delayed to FY14
 - Replace Hall A & B fire suppression ring header
 - Accelerator and End Station fire protection loops
 - Hall D FHA - commissioning scheduled for FY14

Machine Protection/Personnel Safety System

- Safety Systems Group has been attempting to maintaining system integrity during LSD
 - This has been a challenge
 - Kelly Mahoney has been conducting educational awareness
 - Plan is to walk down infrastructure as much as possible
- Equipment Self-tests/inspections
 - Component failure – due to rad damage has been observed, replace all similar components in the area
 - PSS Certification required every 6 months, will occur before machine start-up to verify that all systems are functional

Machine Protection/Personnel Safety System

- Known Issues
 - Hall C PSS infrastructure affected by August flood. Trunk systems and distribution racks need to be gutted below 30 inches and re-done
 - Parts of PSS system are no longer in production– Halls A/B/C
 - MPS in Halls A&C have suffered radiation damage
 - There is a plan to address this
 - Hall Public Address systems are not always coherent

- Unknowns:
 - Integrity of PSS cabling
 - Plan is to walk down each Hall ~ 6 months before it comes on line
 - Status of Hall ODH systems will not be known until it is brought back on line
 - O₂ sensor electronics no longer made, need to find alternatives for a rad environment

Machine Protection/Personnel Safety System

- Priorities
 - Beam dump systems (MPS)
 - Upgrade PLCs (PSS)
 - Hall D and Accelerator have upgrades
 - Plan for phased replacement has been reviewed by external peer review and being worked
 - Standardize ion chambers (MPS)
 - Develop predictive modeling for targets to set the ion chamber threshold automatically

Comment #2 - Emergency Management

- A second goal would be to synchronize/reduce the differences in the procedures between the halls as much as is possible, so that what is routine process in the event of the various alarms is identical and a user in the hall doesn't need to ask "which hall am I in" before springing into action.
 - NE-2012-16 (most with August 2013 dates)
 - Review safety familiarization training for all the Halls to ensure harmonization
 - Assess adequacy of training for off-normal conditions and adjust as necessary
 - Hall B emergency access bypass switch decision and briefings for all if it is to remain
 - PLC weakness was fixed (regardless of decisions)
 - Guide for emergency response to specific events to address roles and responsibilities, authorities, formalized pass-down of information

Comment #3 - Readiness

- The LSD team and ESHQ should consider establishing a formal system to review and document the safety systems and procedures in the halls as part of the LSD process. If this does not get adopted by the LSD organization some other body needs to take responsibility.
 - ARR (next presentation)
 - PSS and Emergency Management aspects will be reviewed as part of the ARR
 - Review Fire Protection & Machine Protection Systems aspects prior to declaring readiness
 - Bring in outside reviewer
 - Validate as part of ARR

Accelerator Readiness Review (ARR) Planning

What is an ARR

- ARR (Accelerator Readiness Review)
 - *A structured method for verifying that hardware, personnel, and procedures associated with commissioning or routine operations are ready to permit the activity to be undertaken safely (420.2C)*
 - *An overview and sampling process, not an extensive wall-to-wall assessment*
 - *Leads to full operations*

Program Elements of the ARR *(as defined by 420.2C)*

1. Contractor Assurance System that maintains an internal assessment process ✓
2. Configuration Management program as it relates to accelerator safety is in place, including Unreviewed Safety Issue (USI) process ✓
 - USI process is in place and functioning as the configuration management process for the credited controls ✓
 - Implementation Plan in place (lab-wide program)
3. Credited control and administrative processes related to accelerator safety ✓
 - Current Safety Assessment Document (SAD) – which identifies our credited controls – this would include the PSS ✓
 - Approved Accelerator Safety Envelop (ASE) ✓
 - Clearly defined roles and responsibilities for accelerator activities (including training and procedures) – this would include emergency planning ✓
 - The Accelerator Operations Directives (AOD) Jan 2011 under revision to add Hall D references and ASE updates.
 - Commissioning Plan drafted, currently under revision
 - Director's Review in 2013

Program Elements of the ARR *(added by JLab)*

4. Experimental Readiness Review Process that incorporates standard and unique hazards, including hazardous waste products and mechanisms for disposal or return to host institution
 - ES&H Manual Chapter 3120, “CEBAF Experimental Review Process
 - Procedures for Nuclear Physics Experiments - under revision to clarify expectations
 - Operational Safety Procedure
 - Conduct of Operations Document
 - Radiation Safety Assessment Document
 - Experiment Safety Assessment Document

12 GeV ARR Approach

- Follow established JLab ARR procedure (QACI-041)
- Coordinated by ESH&Q (read Bob May)
- Modular/Phased Approach
 - (2) FY13
 - Accelerator & Hall A
 - (3) FY14/15
 - Hall B, C, & D
- Emphasis will be new safety systems and those safety systems that have changed from original CEBAF ARR
- Incorporating lessons learned from BNL



Planned 12 GeV ARR Topics

Health& Safety Hazards	ASE Credited Engineering Controls	ASE Credited Administrative Controls
Ionizing & Non-Ionizing Radiation	Permanent Shielding, Including Labyrinths	Locked Doors & Gates
Electrical Hazards	Movable Shielding	Experimental Review Process
Fire Hazards	Permanent Magnet to steer electrons to beam dump	CEBAF Operations Staffing – Sweep and Controlled Access
Pressures & Vacuum Hazards	Beam Dump Cooling Building Design	CEBAF Operations Staffing with Beam ON at ≤ 1 MeV
Cryogenics & Oxygen Deficiency Hazards	Nitrogen Gas Supply Orifices	CEBAF Operations Staffing with Beam ON at > 1 MeV
Magnetic Fields	Moller Polarimeter Gas Vent Line to Hall C	FEL Operations Staffing – Electron Beam ON
Other Mechanical, Chemical, & Gaseous Hazards	Personnel Safety System, including access control, ODH, and beam envelope controls	
Emergency Response		

Plus: [Roles/Responsibilities and Commissioning Plan](#)

Sequence of Events To The First ARR Phase

- Finalize Commissioning Plan
 - Action: 12 GeV Project
- Refine Scope of ARR
 - Action: ESH&Q Division/12 GeV Project/Director
- Establish ARR Team
 - Action: Associate Director, ESH&Q