Building 911
P.O. Box 5000
Upton, NY 11973-5000

BROOKHAVEN NATIONAL LABORATORY

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C-A Accelerator Systems Safety Review Committee

Memo

date: *April 22, 2008*

to: *ASSRC Members, RSC Members and Guests*

from: *J.W. Glenn, D. Beavis, R. Karol*

subject: ***Joint Meeting for ASSRC/RSC Review of Energy Recovery Linac (ERL) Safety Analysis Document and Accelerator Safety Envelope (ASE)***

ASSRC Members: J. W. Glenn*, J. Alessi*, P. Bergh*, P. Cirnigliaro*, A. Etkin*, P. K. Feng*, P. Ingrassia*, S. Jao, R. Karol*, E. Lessard*, J. Levesque, G. McIntyre*, D. Phillips*, F. Pilat*, D. Robbins, J. Sandberg*, J. Scott*, M. Sivertz*, J. Tuozzolo*, M. Van Essendelft, J. Wright, K.C. Wu
*present

RSC Members: D. Beavis*, L. Ahrens, P. Bergh*, I.H. Cheng, A. Etkin*, J. W. Glenn*, R. Karol*, E. Lessard*, W. Mackay*, J. Reich*, J. Sandberg*, K. Yip, J. Jamilkowski,*, T. Shrey
*present

Presenters: E. Lessard, R. Karol

Others Present: I. Ben-Zvi, A. Burrill, D. Kayran, J. Maraviglia, D. Pate, P. Sullivan (DOE), Y. Than

Ed Lessard began the meeting by noting that this was a joint meeting of the RSC and ASSRC to review the draft ERL SAD and ASE dated April 4, 2008. The PowerPoint presentation slides are included in the minutes for each committee files. All comments after the meeting are welcome and will be considered. The ERL is a stand alone electron accelerator which requires its own BNL approved SAD, an Accelerator Readiness Review (ARR) conducted by an independent committee appointed by the BNL Deputy Director for Operations, and a DOE BHO approved ASE. The reason for this is that it can produce radiological areas. The SAD and ASE are being presented to the committees at this meeting. Following incorporation of comments from the internal C-AD committee reviews, the draft SAD and ASE will be presented to the BNL ESH Committee (LESHC) for their review. Following incorporation of LESHC comments, these documents will be sent to the BNL Deputy Director for Operations for SAD approval and transmittal of the ASE to the DOE-BHO for approval.

The current schedule for SAD, ASE and Conduct of Operations reviews; and milestones for actual ERL pre-commissioning tests, commissioning and operations was reviewed. The projected lifetime of ERL is a few years.

ERL produces an electron beam at injection energy of 2 to 3 MeV to a transport line leading to a superconducting RF cavity which increases the electron energy to 20-25 MeV. The bunch is then circulated in the ERL ring, returns to the RF cavity where the voltage is 180 degrees out of phase to allow recovery of the bunch energy to the RF cavity. The used bunch energy is reduced to about 3 MeV and sent to the water cooled beam dump. This is a research and development facility which will prove the ability to install electron cooling at RHIC to keep the ion bunch density high resulting in higher luminosity at the current values of intensity. This will allow for faster data gathering, improved data statistics and result in the ability to look at rarer events.

Lessard reviewed the SAD and ASE content, Chapters 1 through 3 and 5 through 8. R. Karol reviewed the results of the Hazard/Safety Analyses in Chapter 4. Most hazards are conventional hazards and are treated the same as any industrial hazard. The hazards that were analyzed in detail were radiation and oxygen deficiency. There are no new hazards at ERL that are not currently present at other C-AD facilities.

It was noted that Appendix 5, Fault Study Results, will not be entered into the SAD until the machine is operational and the fault studies are completed. This practice is acceptable and allows for maintaining the fault study records in a known, easy to find location.

The following recommendations/questions were made by the Committees:

1. The ASSRC Chair requires that the potential for ozone formation in the ERL cave be evaluated and compared with the allowable concentrations.
2. The ASSRC Chair asked that more details on how electrical power consumption will be minimized be added to the SAD while operating ERL as part of the Environmental Management System description.
3. The RSC Chair stated that committee members should get any comments or questions on the text or calculations to Lessard or Karol within the next week.
4. J. Alessi and W. MacKay asked that an explanation be given as to why the calculated dose from the laser port penetration is relatively high compared to other ERL cave penetrations in Chapter 4. This may be in error.
5. J. Alessi questioned the slide that indicated the RF radiation is transported in vacuum pipe. It is transported in a waveguide not under vacuum, and in the evacuated portion of the fundamental power coupler. This description needs to be better stated in SAD Chapter 3.

Dist: ASSRC D. Passarello
Guests T. Roser D Lowenstein