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Strategy for Path to an APS Upgrade

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APS Monthly Operations Meeting

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What has to be done prior to CD-0 (Official Start of Project)?

- Build out of remaining beamlines
- Address accelerator R&D Issues
- Address beamline R&D Issues
- Continue to develop scientific case
- Expand the dialog with the user community
- Consider Environmental Issues

Accelerator R&D Issues

- Some of the R&D can proceed using tools and people available
- Additional R&D will involve prototyping and testing
 - Electron sources
 - SCRF
 -
- We sought LDRD in FY07 to begin this work, but it was not funded
- We will submit LDRD proposals in FY08

Need for facilities in which to pursue accelerator ERL R&D

- We intend to collaborate with other research groups (Cornell, TJNAF, BNL, etc)
- ERL R&D facility needs are most pressing in areas related to electron sources and SCRF
- We have surveyed the research work at US and international laboratories and have identified areas of strengths (i.e., opportunities for collaboration) and opportunities for contribution through facility development
 - Areas for contribution include:
 - *Electron source (laser lab, including R&D in spatial and temporal shaping, cathode fabrication and testing, SCRF gun for light source, emittance preservation)*
 - *SCRF – Unique needs of ERLs, explore frequencies other than 1.3 GHz*

Accelerator R&D Issues

- In October, 2006 we met to discuss facility needs to address the above
 - ASD, HEP, ONR, NIU
- A plan was developed; a white paper **for an accelerator R&D facility** was written and submitted to BES.
- We are now preparing an additional white paper for BES that outlines the needed Accelerator R&D. This will be submitted in February.
- We are planning for workshop in the fall of 2007 to get community input on R&D directions
- Begin R&D facility construction in FY08, some components of facility operational in FY08
- In the meantime, actively participate/collaborate in ongoing activities at other laboratories and universities
- SCRF issues need to be addressed by construction start of Upgrade project
- Electron Gun R&D will continue with all realizable improvements applicable to operational ERLs including the APS Upgrade

Beamline R&D Issues

- The white paper R&D Plan Includes Optics, Detectors and ps pulses
- Specialized APS workshops in Spring
 - Workshop on APS Upgrade/ERL Optics (April 23)

Scientific Case, User Community

- CMMP Facilities workshop on January 28th
 - Under the auspices of the National Research Council of the National Academies, a comprehensive assessment of the current status and future prospects of the field of Condensed Matter and Materials Physics (CMMP 2010) has commenced. For this study, the committee has been charged to “identify, discuss, and suggest priorities for construction, purchase, and operation of tools and facilities ranging from instrumentation for the individual investigator to the national user facilities.”
 - *Underscored need for machine and detector R&D*
- APS User Meeting – major focus of workshops will be upgrade science

Project nomenclature

- CD-0: states mission need, and a very rough description of project, it authorizes the project to write a Conceptual Design Report (NSLS-II: Aug 2005)
- CD-1: addresses how the need will be met, and at this time a cost range and rough schedule must be produced. After CD-1 the project can receive Preliminary Engineering and Design Money to begin detailed designs (NSLS-II: Review in December, 2006)
- CD-2: At this point the project is baselined. Scope cost and schedule are set. The request can be made for project funding
- CD-3: Construction start, Approval of CD-3 authorizes the project to commit all the resources necessary, within the funds provided, to execute the project.
- CD-4: Formal end of project, and start of operations