

APS Upgrade Forum

Stuart Henderson

July 9, 2015

DOE CD-1 Review

DOE Office of Project Assessment (OPA) Review of APS-U is scheduled for

September 22-24, 2015

Working Timeline toward CD-1 Review

- April
 - ✓ Form Project Management Advisory Committee (PMAC) and Experimental Systems Advisory Committee (ESAC)
 - ✓ Set CD-1 review date
- May
 - ✓ Complete Basis of Estimate cost drill-downs
 - ✓ Begin Science planning workshops
- June
 - ✓ Hold PMAC meeting
 - ✓ Hold ESAC Meeting – next week
 - ✓ Complete Conceptual Design Report revisions
 - ✓ Hold SAC meeting
- July
 - ✓ APS-U Presentation to BESAC
 - Complete all documentation for Director's Review
 - Hold Director's Review July 15-17, 2015
 - Prepare draft Early Experiments document from Science planning workshops
- September
 - CD-1 Review Sept. 22-24, 2015



APS Upgrade Science Planning Workshops have been very successful

Workshop series on Early Experiments with the Upgraded APS 2015:

- May 18-19: Chemistry and Catalysis - A. Wilkinson (Ga. Tech), David Tiede (ANL), Karena Chapman (ANL)
- May 19-20: Soft Matter - Bob Leheny (Johns Hopkins), Alec Sandy (ANL)
- May 20-21: Condensed Matter Physics - Oleg Shpyrko (UCSD), John Freeland (ANL)
- May 21-22: Advanced Materials / Mesoscale Engineering - Bob Suter (CMU), Dillon Fong (ANL), Peter Chupas (ANL)
- June 1-2: Environmental Science and Geo Science - John Parise (SBU), A. Lanzirotti (UC)
- June 22-23: Biology and Life Sciences - Gayle Woloschak (NW), Bob Fischetti (ANL)



Recent Feedback

- ESAC
 - Suggest full beamline by beamline analysis of capabilities and needs for the upgrade
 - Suggest early beamline buildout both for R&D and starting APSU buildout before shutdown
 - Concern that the general optics and stability package might be light on funds. The beamline-by-beamline evaluation is central to answering this question.
- SAC
 - Endorsed proposed beamline selection process with a few suggestions
 - Noted excellent progress in formulating full project plan and constructive engagement with DOE
- BESAC
 - Very good response from the committee
 - Supportive comments on APSU plans

CD-1 Documentation Status

CD-1 Requirement	Status
Acquisition Strategy	Draft Submitted
Preliminary Project Execution Plan	Draft Submitted
FPD Appointment	Done
IPT Charter	Draft Submitted
Risk Management Plan	Done
Space Requirement	N/A
Conceptual Design Completion	
Review	Externally Reviewed Feb 2015
Report	Complete
Preliminary Hazard Analysis Report	Complete.
Integrated Safety Management Plan	Complete.
Preliminary Quality Assurance Plan	Complete.
Safeguards and Security Requirements	Complete.
Complete NEPA Strategy Determination	Complete. Letter from ASO rec'd.
Update Funding Documents	Ongoing and Current
Complete ICR	Concurrent with Sept OPA Review

- APS-U builds on previously existing and approved documents from CD-2 in Dec 2012
- CD-1 Documents in good shape

APS Upgrade Proposed Project Scope - Planning Basis

- Accelerator
 - New 6 GeV MBA high-brightness storage ring lattice in existing tunnel
 - Doubling of ring stored beam current to 200 mA
- New insertion devices for 35 sectors optimized for brightness and flux
 - Incorporates SCUs on selected beamlines
- New and upgraded front-ends of common design for maximum flexibility
- Beamlines
 - A suite of 6 flagship, world-leading beamlines and major upgrades to two beamlines
 - A package of optics, stability and detector upgrades to take full advantage of MBA source properties
- Improved electron/photon beam stability
- **Well-defined** installation and testing period is a **key deliverable**
 - **External review found the present ~12-month plan achievable**
 - Given the importance of minimizing APS unavailability, the APS Upgrade will require a very different strategic approach from typical installations

APS Upgrade design builds upon existing \$1.5 billion existing DOE and partner investments in infrastructure, APS injector, and beamlines



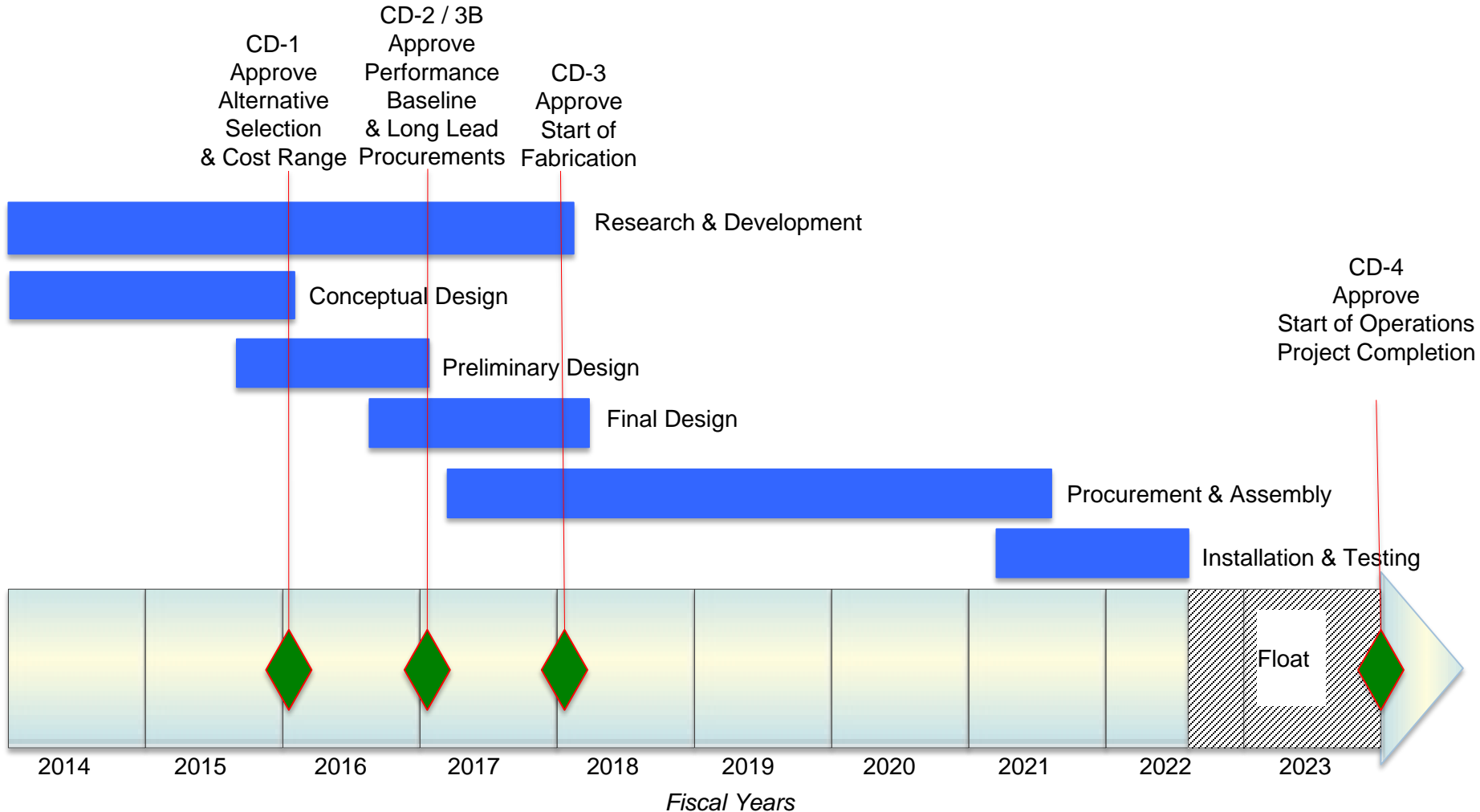
Proposed beamline scope delivers the best scientific return on investment

	Threshold Beamline Package	Science-Driven Beamline Package	Ultimate Beamline Package
	#	#	#
New Beamlines	3	6	8
Major Beamline Upgrades	4	2	7
World-Leading Beamlines	11	15	19
World-Class Beamlines (includes world-leading)	31	34	35
Meets Users' Science Needs		✓	✓
Internationally Competitive		✓	✓
Fully exploits APS-U investment			✓

When APS-U is commissioned, it will include a beamline suite that will deliver early-science wins commensurate with DOE/BES investment

Proposed next steps: CD-1 and beyond

We are ready to present APS-U at a CD-1 review in September



Proposed timeline for APS-U Project



Upcoming Events and Workshops

- Upcoming Events

- *Director's Review, July 15-17*
- *DOE OPA Review September 22-24*

- Upcoming Conferences and Workshops

- *SRI, New York NY, July 6-10*
- *Emerging Opportunities in High Energy X-ray Science: The Diffraction Limited Storage Ring Frontier, Argonne, July 13-14*
- *Denver X-ray conference, Aug. 3-7*