

Advanced Photon Source Upgrade Project



George Srajer
APS Upgrade Project Director
Deputy Associate Laboratory Director, Photon Sciences

Stakeholders Committee Meeting
3 December 2012

Charge to the Review Committee

1. Project Scope: Is the project's scope and specifications sufficiently defined to support the established cost and schedule performance baseline? Is the preliminary design sound and likely to meet the technical performance requirements in the Mission Need Statement?
2. Cost and Schedule: Are the cost and schedule estimates, including life cycle costs, credible for this stage of the project to establish the project performance baseline; and do they include adequate scope, cost and schedule contingency?
3. ES&H/QA: Are the Environment, Safety & Health, and Quality Assurance requirements being properly addressed given the project's current stage of development?
4. Management: Is the project being properly managed at this stage? Does the project organization possess the leadership and staff with sufficient technical expertise and experience to successfully execute the proposed baseline?
5. Prerequisites: Have all of the prerequisite activities and documents necessary to support CD-2 approval been completed? Is the project ready for CD-2?
6. Recommendations: Have the Recommendations from past reviews been appropriately addressed?

DOE CD-2 Review Agenda: Day 1

Tuesday, December 4, 2012 – APS 402 Lower Gallery

8:00 AM Executive Session Lutha	Daniel Lehman/Ron
8:45 AM ANL Welcome	Eric Isaacs
8:55 AM The Advanced Photon Source - Present and Future	G. Brian Stephenson
9:15 AM The APS Upgrade Project	George Srajer
10:00 AM ES&H	Tom Barkalow
10:15 AM Coffee Break	
10:30 AM APS Upgrade Project Management	Jim Kerby
11:10 AM APS Upgrade Integration	Tom Fornek
11:50 PM Committee Working Lunch	401 Upper Gallery
12:35 PM Tour	
1:50 PM Accelerator Systems	Marion White
2:30 PM Infrastructure and Enabling Technologies	Mohan Ramanathan
3:10 PM Experimental Facilities	Dean Haeffner
3:50 PM Summary	George Srajer
4:00 PM Coffee Break	
4:30 PM Subcommittees (Accelerators and Experimental Facilities)	Borland;Sajeev/Haeffner
5:30 PM Executive Session	Daniel Lehman
6:30 PM Reception Argonne Guest House and Dinner	Eric Isaacs



DOE CD-2 Review Agenda: Day 2

Subcommittee Breakout Sessions

Wednesday, December 5, 2012

SC #	BREAKOUT SESSIONS TOPICS	LOCATION
1	Front End, Insertion Devices, Long Straight Section and Diagnostics	401/B4100
2	Accelerator Physics, Short Pulse X-ray Systems	401/Lower Gallery
3	Ultrafast Beamlines (SPXSS, SPXIM, HFPP)	401/E1100
4	Diffraction and Imaging Beamlines (WFI, ISN, HEXD, XIS, S3DD)	401/A1100
5	Spectroscopy Beamlines (RIXS,MS-H, MS-S, ASL)	401/E1200
6	Management	401/A5000

DOE CD-2 Review Agenda: Final Day

Thursday, December 6, 2012 – APS 402 Lower Gallery

- | | |
|----------|----------------------------------|
| 8:00 AM | Follow up questions |
| 9:00 AM | Review Committee Writing/Dry Run |
| 12:00 PM | Committee Working Lunch |
| 1:00 PM | Closeout |



DOE CD-2 List of Reviewers

Department of Energy/Office of Science (CD-2) Review of the
Advanced Photon Source-Upgrade (APS-U) Project
December 4-6, 2012

Daniel R. Lehman, DOE/SC, Chairperson

SC1 Front Ends, Diagnostics, IDs, and Long Straight Sections

\$53M (WBS 1.05.02,1.03.02, 1.03.04)

* Kem Robinson, LBNL
Lonny Berman, BNL

SC2 Short Pulse X-Ray Systems and Accelerator Physics

\$51M (WBS 1.02.01, 1.03.03)

* Sam Krinsky, BNL
Mark Champion, ORNL
Sang-Ho Kim, ORNL

SC3 Ultrafast Beamlines

\$19M (WBS 1.04.02)

* Bill White, SLAC
Uwe Bergmann, SLAC

SC4 Diffractions and Imaging Beamlines

Dif, \$33M (WBS 1.04.02);

Imag, \$36M (WBS 1.04.02, 1.05.03)

* Tony Warwick, LBNL
Don Brown, LANL
Yong Chu, BNL
Eric Dooryhee, BNL
Rich Sheffield, LANL

SC5 Spectroscopy Beamlines

\$23M (WBS 1.04.02)

* Mike Toney, SLAC
Yong Cai, BNL

SC6 ES&H

* Steve Hoey, BNL
Jim Floyd, LBNL

SC7 Cost and Schedule

* Richard Boyce, SLAC
Rick Blaisdell, OAPM
Brian Huizenga, OAPM
Hannibal Joma, DOE/SSO
Ethan Merrill, DOE/SC
Ray Won, DOE/SC

SC8 Management

* John Galayda, SLAC
Kurt Fisher, DOE/SC
Steve Hulbert, BNL

Number of reviewers: 26

DOE CD-2 List of Observers

Harriet Kung, DOE/SC

Ron Lutha, DOE/ASO

Jim Murphy, DOE/SC

Frank Gines, DOE/ASO

Phil Kraushaar, DOE/SC

Jerry Kao, DOE/ASO

Peter Lee, DOE/SC

Ted Lavine, DOE/SC

Total count (reviewers + observers): 34



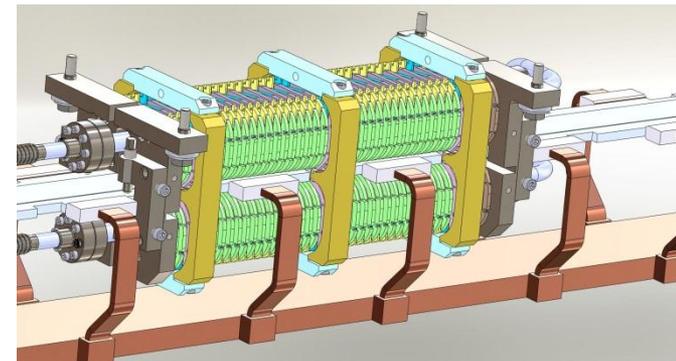
Outline

- Introduction: APS Upgrade Features
- Scope Overview
 - Roadmap and Beamlines
 - Work Breakdown Structure
 - R & D in Support of APS Upgrade
 - Cost Summary and Distributions
 - Key Performance Parameters
- Environment, Safety & Health
- Management
 - Organization Chart
 - Resources Allocation
- Prerequisites
- Prior Recommendations
- Long Lead Procurement Status
- Summary



Main Features of the APS Upgrade

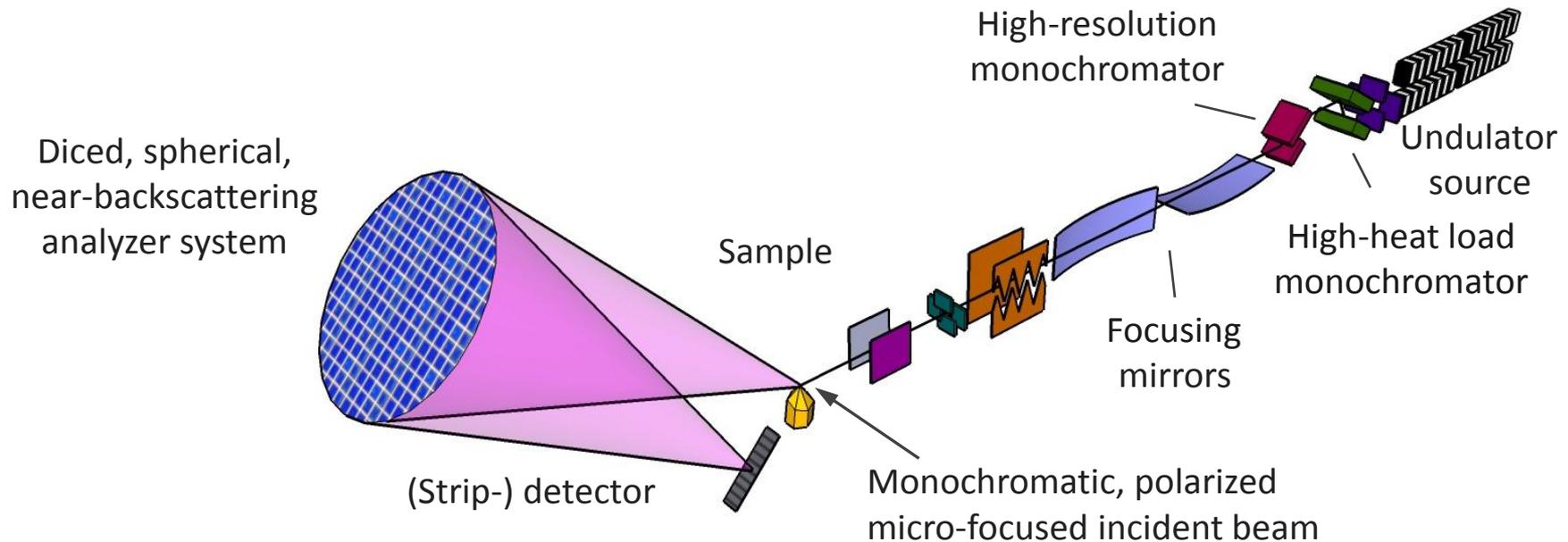
- The APS Upgrade will be transformational, providing a dozen new or upgraded beamlines with improvement in areas such as high-energy diffraction, *in-situ* studies of materials synthesis, wide-field imaging, ultrafast diffraction and spectroscopy
- Insertion devices optimized for brightness at high energies (e.g., superconducting or revolver), long straight sections, superconducting rf cavities to produce picosecond x-ray pulses, higher electron current, and beam stability
- Upgrade machine with minimal loss of operating hours to ongoing programs



Transformational RIXS Instrumentation Upgrade Objectives

Components of the RIXS Beamline/Instrument Upgrade:

- Doubling monochromator throughput
- Two orders of magnitude focusing improvement from $(50 \mu\text{m})^2$ to $(5 \mu\text{m})^2$
- Order of magnitude energy resolution improvement from $\sim 200 \text{ meV}$ to 20 meV
- Order of magnitude detection improvement from 1 to 8-10 analyzers
- New sample environments for high P, high and low T, electric and magnetic fields and laser excitations



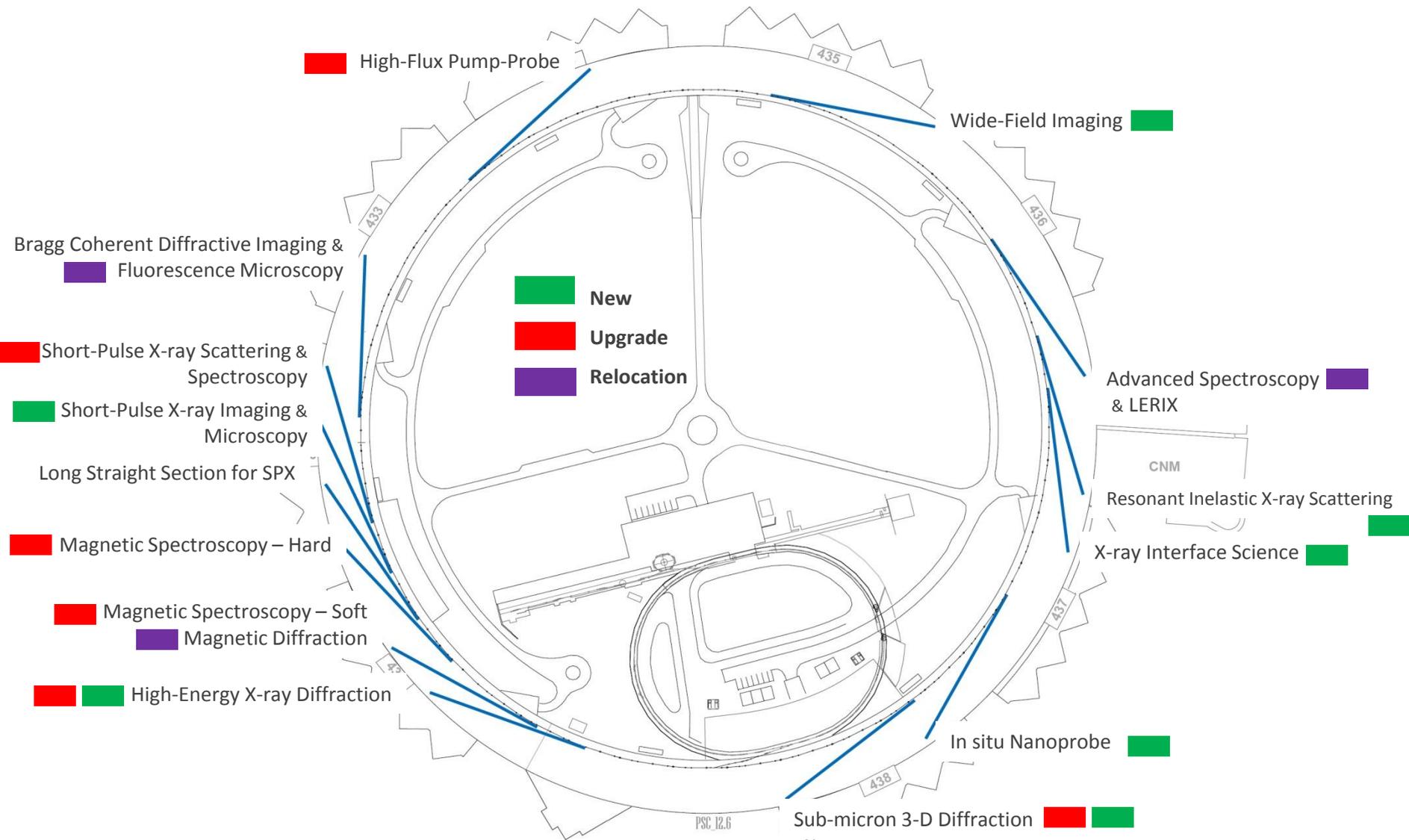
Development of "Roadmap" for Locations of Future APS Beamlines

- Roadmap development is part of the strategic plan for future APS
 - Incorporates beamlines within APS Upgrade (APS-U)
 - Includes beamlines being developed in parallel with APS-U (e.g. Dynamic Compression Sector)
 - Provides options for beamline developments beyond APS-U

Requirements and Goals:

- Must include all beamlines given top ranking (“Very Strongly Recommended”) by APS SAC
- Must include any displacements of existing programs
- Goal to include provisions for all beamlines approved by the APS SAC
- *Goal to minimize disruption or relocation of existing CAT or XSD beamlines*
- *Utilize the three unoccupied sectors (25, 27 and 28) to facilitate the process and deliver early science*

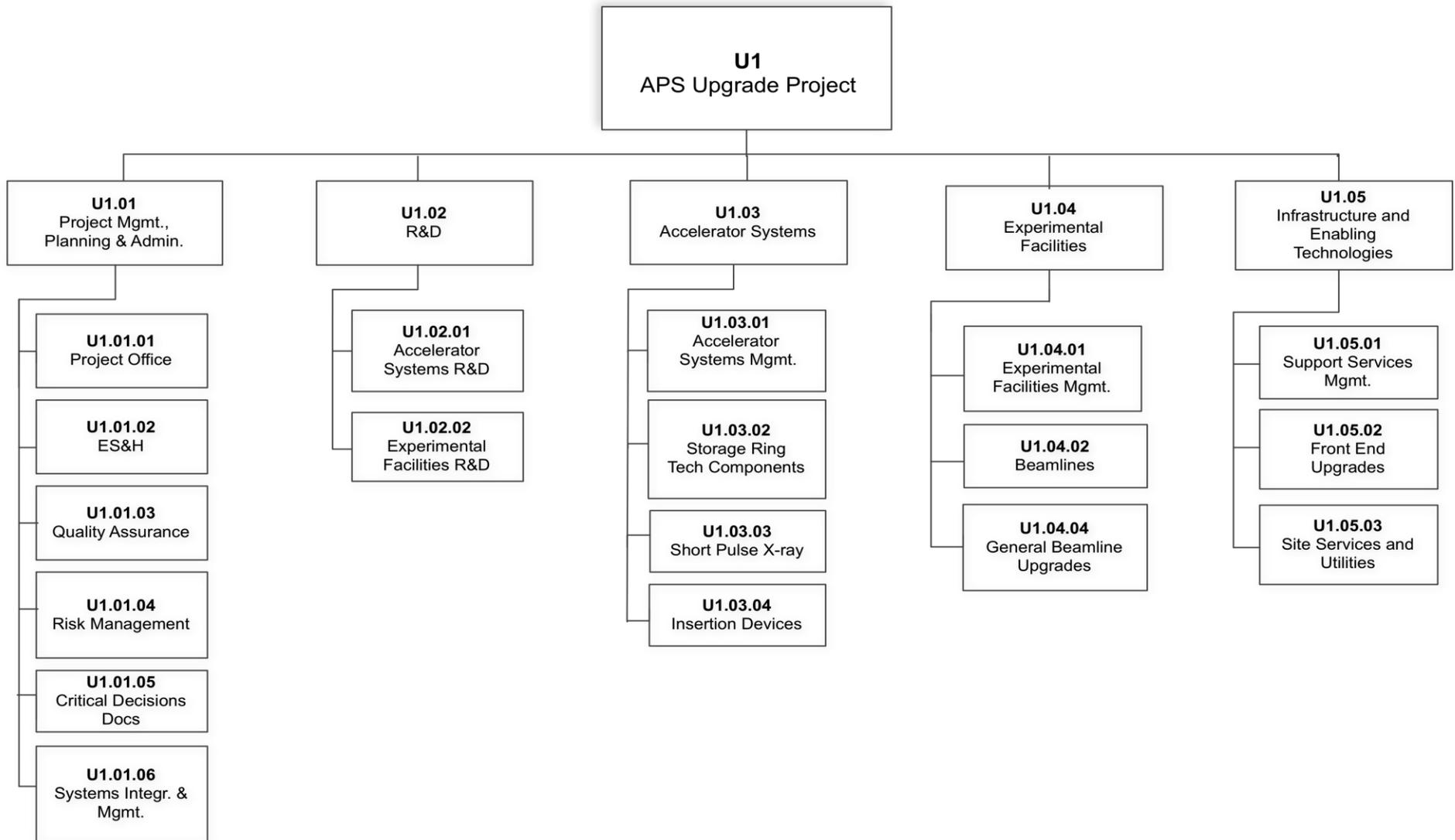
APS Upgrade Baseline Beamlines Scope



APS Upgrade Scope at a Glance

New	Upgrade	Relocation	WBS	Description	Sector	Front End	Planar ID	Revolver ID	Polarizing Devices	Superconducting Device	Canting Magnets	Long Straight Sections	ID Vacuum Chamber	SPX enabled
	1		U1.04.02.02	Short Pulse X-ray Scattering and Spectroscopy	7-ID	HHL		1				1	1	1
1			U1.04.02.03	Short Pulse X-ray Imaging and Microscopy	6-ID	SPXCU		1			1		1	1
	1		U1.04.02.04	High Flux Pump-Probe	14-ID	HHL								
1			U1.04.02.05	Wide Field Imaging	20-ID	CU			1		1		1	
1			U1.04.02.07	In-situ Nanoprobe	32-ID	CU		1			1		1	
1			U1.04.02.08	Resonant Inelastic X-ray Scattering	27-ID	HHL	2						1	
	1		U1.04.02.09	Magnetic Spectroscopy - Hard	4-ID	HHL			1				1	
1	1		U1.04.02.10	High Energy X-ray Diffraction	1-ID	LSSCU		1		1	1	1	1	
2			U1.04.02.11	X-ray Interface Science	28-ID	CU		1			1		1	
1	1		U1.04.02.12	Sub-micron 3D Diffraction	34-ID	-								
		2	U1.04.02.13	Advanced Spectroscopy and LERIX	25-ID	CU	1				1		1	
	1		U1.04.02.16	Magnetic Spectroscopy - Soft	2-ID	CU			1		1		1	
		1	U1.04.02.17	Magnetic Diffraction										
		1	U1.04.02.18	Fuel Spray Dynamics	BM									
		1	U1.04.02.19	Bragg Coherent Diffractive Imaging	9-ID	CU					1		1	
		1	U1.04.02.20	Fluorescence Microscopy										
			U1.03.02.01	Long Straight Section for SPX	5-ID							1	1	
			U1.03.04.03	Superconducting Device (1m device)						1				
			U1.05.02.02	High Heat Load FE for Existing Beamlines			3							
			U1.05.02.06	Retrofit FE v1.2 FE for Existing Beamlines			7							
8	6	6				22	3	5	3	2	8	3	12	2

APS Upgrade Work Breakdown Structure



APS Upgrade Scope

WBS 1.02.01/1.03: Accelerator Systems and Associated R&D

- Short Pulse X-rays (SPX) by transverse rf deflection
- Increased beam stability and 150 mA operation
- 2 Superconducting undulators
- 5 Revolver undulators
- 3 Planar undulators
- 3 Polarizing undulators
- 3 Long straight sections (~7.7 m)

WBS 1.02.02/1.04: Experimental Facilities and Associated R&D

- 8 New beamlines; 6 Beamline upgrades; 6 Beamline relocations
- Nanofocusing optics development
- High speed detector development
- Resonant inelastic x-ray scattering optics
- High heat load upgrades to beamline optics and components

WBS 1.05: Infrastructure and Enabling Technologies

- 15 New front ends
- 7 Renovated front ends
- Physical infrastructure for Wide Field Imaging beamline
- Next generation beam position monitors



Research and Development Activities Toward APS Upgrade

- **Project R&D activities**
 - Superconducting rf cavities
- **Programmatic R&D**
 - Superconducting undulator – SCU0
 - Next generation beam position monitors

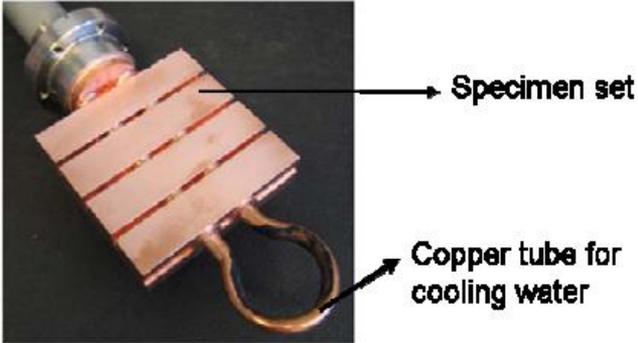
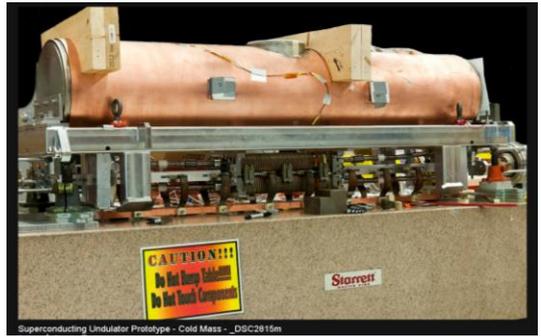
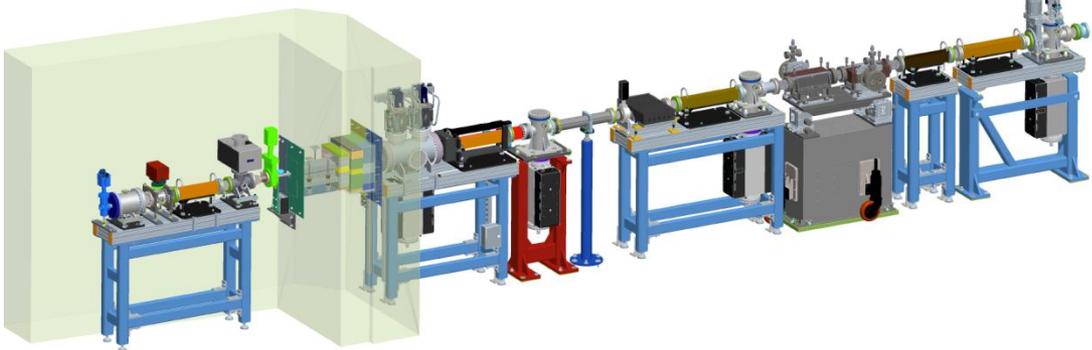


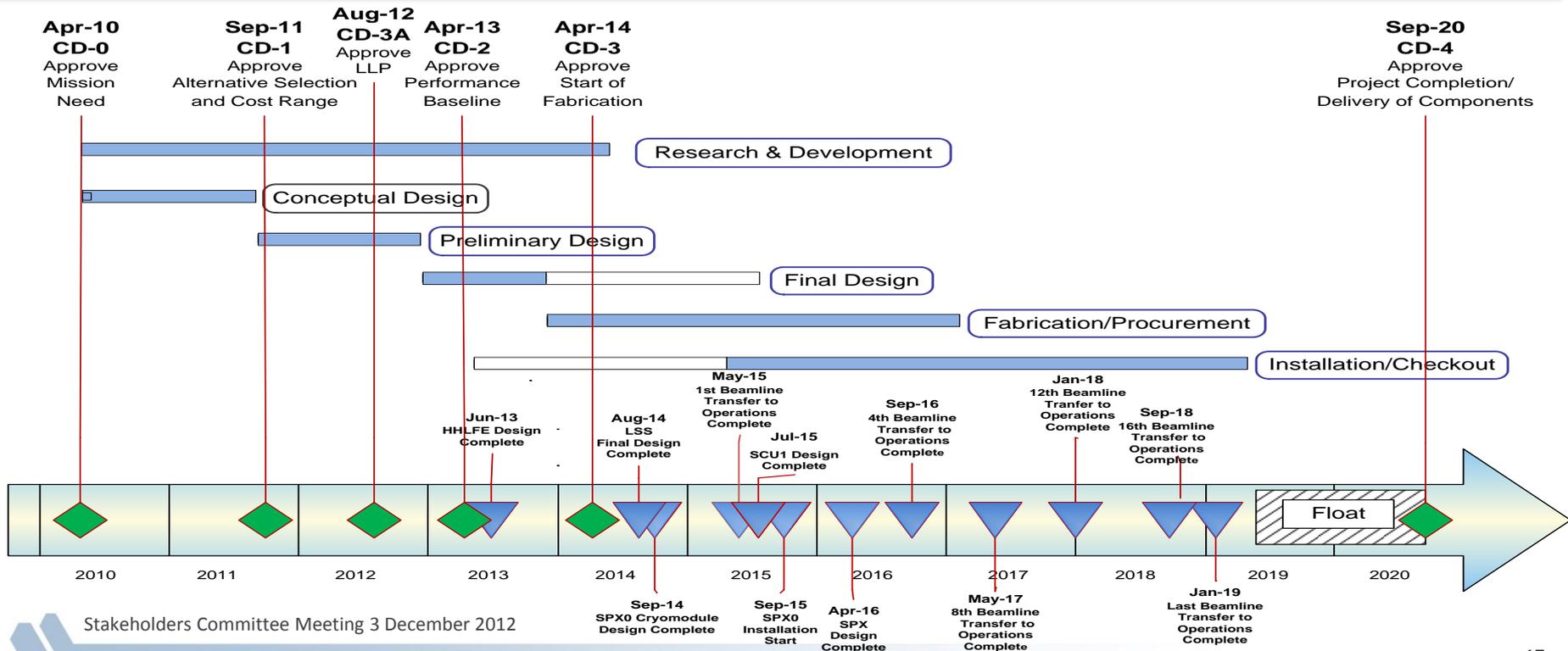
Figure 5: GlidCop Test Piece Assembly

- **Laboratory Directed Research and Development**
 - Revolver undulator
 - Electromagnetic variable polarization undulator
 - High heat load components
 - Fast X-ray detectors based on multichannel plates



Proposed Funding Profile and Schedule

	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	F19	FY20	Total
(OPC)	\$1M	\$7.5M										\$8.5M
(MIE)			\$20M	\$20M	\$38M	\$69.5M	\$103M	\$99M	\$33M			\$382.5M
Total Funding Profile	\$1M	\$7.5M	\$20M	\$20M	\$38M	\$69.5M	\$103M	\$99M	\$33M	\$0	\$0	\$391M



Stakeholders Committee Meeting 3 December 2012



High Level Project Cost Roll-Up

WBS		DIRECT (\$k)		ESCALATION (\$k)	DIV OH + ANL G&A (\$k)	TOTAL (\$k)
		Labor	Non-Labor			
U1	APSU PROJECT					
	01 - PROJECT MANAGEMENT PLANNING & ADMINISTRATION	14,018	16,241	2,833	2,444	35,536
	02 - RESEARCH & DEVELOPMENT (R&D)	7,438	7,909	397	2,043	17,786
	03 - ACCELERATOR SYSTEMS	22,644	38,684	7,679	7,339	76,347
	04 - EXPERIMENTAL FACILITIES	18,359	89,035	13,414	8,119	128,927
	05 - INFRASTRUCTURE & ENABLING TECHNOLOGIES	<u>6,756</u>	<u>19,335</u>	<u>3,134</u>	<u>2,412</u>	<u>31,636</u>
	Sub-total	69,215	171,205	27,457	22,357	290,233
	Available Contingency					100,767
	Total Project Cost					391,000

Contingency = 34.7%

Key Performance Parameters Table

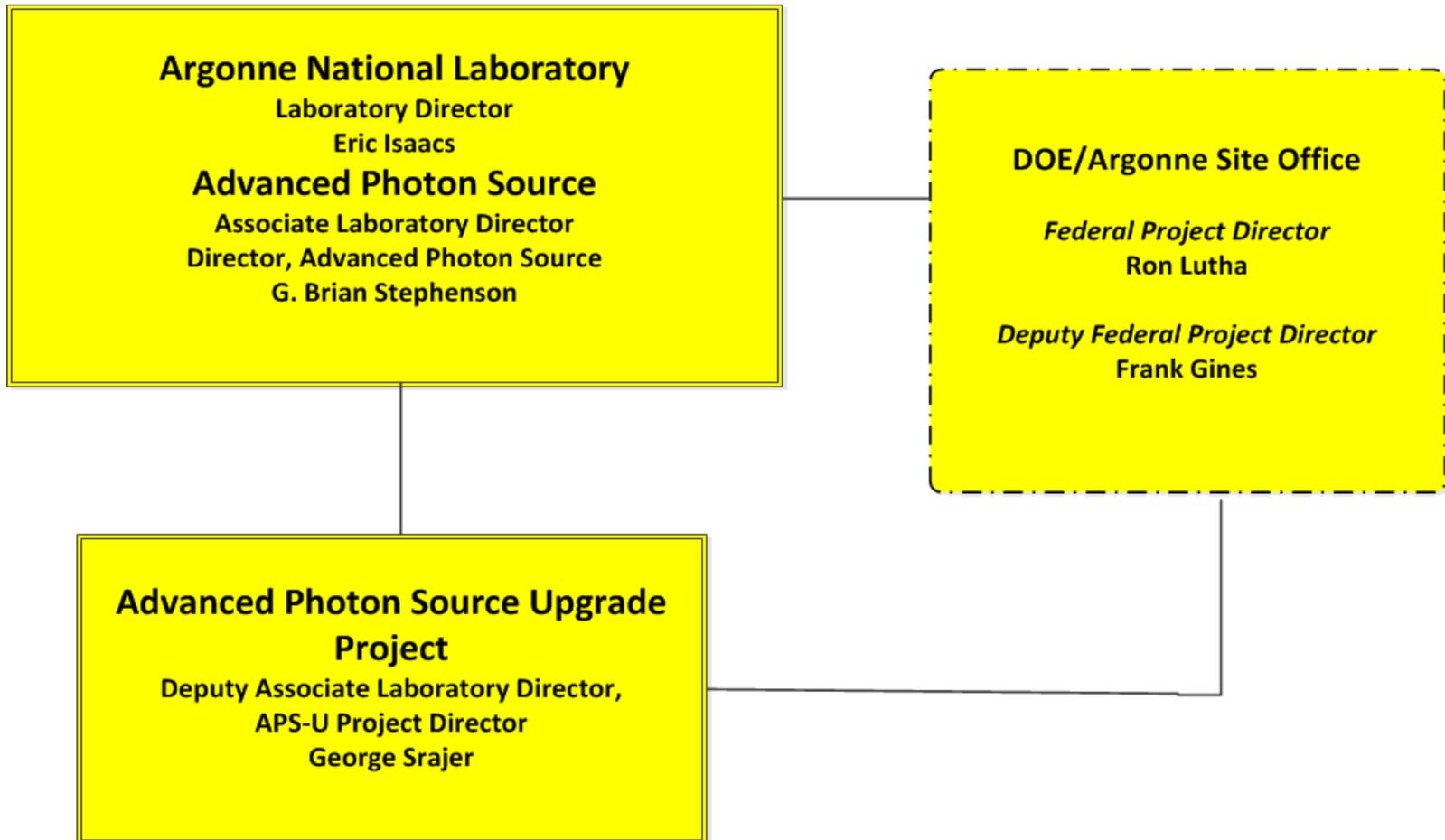
Key Performance Parameter	Thresholds (Performance Deliverable)	Objectives
Operating current capability for all front end components	150 mA	150 mA
Undulators installed	12	21
X-ray brightness* at 23.7 KeV or above for an installed insertion device	2×10^{20}	2×10^{20}
X-ray brightness* at 70 KeV or above for an installed insertion device	1×10^{19}	1.6×10^{19}
New beamlines installed and ready for commissioning with x-ray beam	6	9
Beamlines upgraded and ready for commissioning with x-ray beam	6	8
Resolution of a delivered x-ray focusing optic at 25KeV	20 nm	10 nm

*photon/second/0.1%bw/mm²/mrad²

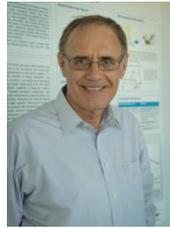
Key Performance Performance (KPP) parameters represent APS-U Project scope



APS Upgrade Organization at Argonne



APS Upgrade Organization Chart



Tom Burt

Thomas Barkalow
Richard Hislop (*)
Tona Kunz
Michael Oprondek
Gemma Cutinello

QA
ESH
Communication
Procurement
Human Resources

APS Upgrade Project Management

George Srajer
Jim Kerby
Edward Temple
Tom Burt
Thomas Fornek

Project Director
Project Manager
Project Advisor
Finance Analyst
Deputy Project Manager
and Integration Assoc. Project Manager



Jim Kerby



Tom Fornek



Tom Mann

Accelerator Systems
Marion White
Assoc. Project Manager

SPX
Tom Mann
Deputy Assoc.
Project Manager
Ali Nassiri
Technical Lead

Insertion Devices
John Grimmer
Technical Lead

Beam Stability
Robert Lill
Technical Lead

Long Straights
Leonard Morrison
Technical Lead

SCU
Yuri Ivanyushenkov
Technical Lead

(*) = Contract Personnel

Experimental Facilities
Dean Haeffner
Assoc. Project Manager

SPSXS
Dave Keavney
Technical Lead

HFPP
Eric Dufresne
Technical Lead

ASL
Steve Heald
Technical Lead

FSD
Alan Kastengren
Technical Lead

MD
Doug Robinson
Technical Lead

HEXT
Francesco DeCarlo
Technical Lead

BCDI
Ross Harder
Technical Lead

mFluor
Barry Lai
Technical Lead

General Beamline Upgrades
Gary Navrotski
Technical Lead

SPXSS/SPXIM
Eric Dufresne
Technical Lead

WFI
Kamel Fezzaa
Technical Lead

ISN
Jörg Maser
Technical Lead

RIXS
Thomas Gog
Technical Lead

MS/MS
Jonathan Lang
Technical Lead

HEXD
Sarvjit Shastri
Technical Lead

XIS
Hawoong Hong
Technical Lead

S3DD
Wenjun Liu
Technical Lead

Standard Components
Dean Haeffner
Technical Lead

Infrastructure & Enabling Technologies
Mohan Ramanathan
Assoc. Project Manager

Front Ends
Yifei Jaski
Technical Lead

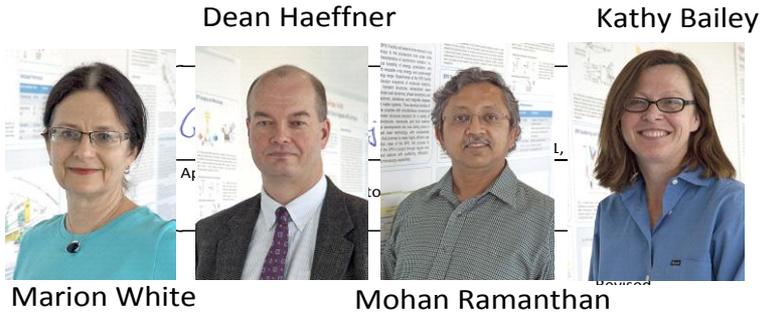
Infrastructure
John Sidarous
Technical Lead

Project Support
Kathleen Bailey
Assoc. Project Manager

Documentation
Elizabeth Freer (*)

Project Controls
Jeff Chan (*)

IT
Felix Lacap (*)



Marion White

Mohan Ramanathan

Matrixed Resources: APS Upgrade and Operations

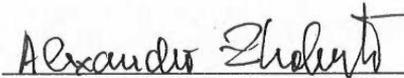
- The **Memorandum of Agreement (MOA)** between the APS-U and the APS divisions (AES, ASD, and XSD) provides a framework for allocations of APS staff effort for APS-U tasks
- The primary intent of the MOA is to ensure that the staffing needs of the APS-U are optimized and secured for successful completion of the project
- MOA was signed in March 2012

Signatures

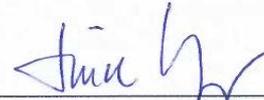
The undersigned concur with the terms of this Memorandum of Agreement:



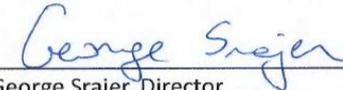
William Ruzicka, Director
APS Engineering Support Division



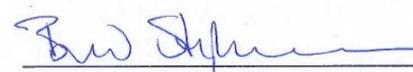
Alexander Zholents, Director
Accelerator Systems Division



Linda Young, Director
X-ray Science Division



George Srajer, Director
APS-U Project

 3/22/2012

G. Brian Stephenson, Director
Advanced Photon Source

Effort Request Agreement: APS Upgrade and Operations

- Assignments of Individuals to work on the APS-U is captured in the **Effort Request Agreements (ERA)** between the APS-U and each division
- In the ERAs, the amount of effort for an individual for a given year is estimated and agreed upon by divisional and APS-U management.
- In FY12 4Q: 65-70 FTEs on APS Upgrade
- **In FY13: 85 FTEs on APS Upgrade**

FY13 Effort Request Agreement: APS-U and XSD Division

- Signed in October 2012



XSD Group	Name	APS-U Role	FY 2013 Est. %
	Technical Lead SPXSS	Technical Lead	8%
	L4 WFI	L4	15%
	Deputy APM Exp		75%
IMG	De Carlo, Francesco	Technical Lead	18%
IMG	Wang, Yuxin		15%
IXN	Casa, Diego M.	Physics	10%
IXN	Gog, Thomas	Technical Lead	50%
IXN	Kuzmenko, Ivan	Physics	13%
IXN	Upton, Mary H.	Physics	10%
MIC	Cai, Zhonghou	Physics	10%
MIC	Fezzaa, Kamel	Technical Lead	50%
MIC	Harder, Ross J.	Physics	20%
MIC	Lai, Barry	Physics	50%
MIC	Maser, Jorg M.	Technical Lead	80%
MIC	Vogt, Stefan	Technical Lead	10%
MM	Haskel, Daniel	Physics	3%
MM	Keavney, David J.	Technical Lead/ Physics	15%
MM	Lang, Jonathan C.	Technical Lead	14%
MM	Robinson, Douglas S.	Technical Lead	14%

XSD Group	Name	APS-U Role	FY 2013 Est. %
MPE	Almer, Jonathan D.	Physics	10%
MPE	Haeffner, Dean R.	L2	100%
MPE	Kenesei, Peter	Physics	10%
MPE	Mashayekhi, Ali	Physics	10%
MPE	Okasinski, John S.	Physics	10%
MPE	Shastri, Sarvjit D.	Technical Lead	85%
SPC	Brewe, Dale L.	Physics	10%
SPC	Heald, Steve M.	Technical Lead	50%
SSM	Hong, Hawoong	Technical Lead	75%
SSM	Liu, Wenjun	Technical Lead	26%
SSM	Tischler, Jonathan Z.	Physics	28%
TRR	Dufresne, Eric	Technical Lead	36%
TRR	Kastengren, Alan	Physics	15%
TRR	Li, Yuelin	Physics	10%
TRR	Strzalka, Joseph	Physics	14%
TRR	Wang, Jin	Technical Lead	20%
XSD	Reininger, Ruben	Physics	50%
TOTAL Estimated FTE's			10.36



FY13 Effort Request Agreement: APS-U and AES Division

AES Group	Name	APS-U Role	FY 2013 Est. %
TSS	Cross, Julie O.	Support	20%
TSS	Fernandez, Patricia	Support	40%
TSS	Prokuski, Charles	Support	100%
TSS	Ramanathan, Mohan	APM	90%
TSS	Engineering Coordinator	Support	50%
TSS	Integration Engineer	Engineering	75%
TSS	Arnold, Ned D.	Engineering	100%
CTL	DiMonte, Nicholas	Engineering	30%
CTL	Diviero, Richard A.	Engineering	13%
CTL	Farrell, Sharon J.	Engineering	12%
CTL	Gilmore, Reginald L.	Engineering	20%
CTL	Laird, Robert J.	Engineering	35%
CTL	Lenkszus, Frank R.	Engineering	75%
CTL	Scaminaci, Anthony J.	Engineering	40%
CTL	Shoaf, Steven E.	Engineering	20%
CTL	Smith, Martin	Engineering	20%
CTL	Stevens, James	Engineering	25%
CTL	Xu, Joseph Z.	Engineering	3%
CTL	Xu, Shifu	Engineering	2%
DD	1000-DR APS-U Drafter	Drafting	100%
DD	1001 APS-U Design/Draft#1	Drafting	100%
DD	1001 M. Givens replacement	Drafting	90%
DD	Designing Drafting	Drafting	100%
DD	Designing/ Drafting (5.3 FTE)	Drafting	530%
DD	Downey, Joshua S.	Drafting	100%
DD	Fallin, David L.	Drafting	100%
DD	Kalt, Robert R.	Drafting	50%
DD	State, William C.	Drafting	100%
DD	Walker, Karen J.	Drafting	16%

TSS	Kelly Jaje	Support	50%
MED	1000-ME1 – Mechanical Eng.	Engineering	75%
MED	Benda, Erika	Engineering	30%
MED	Brajuskovic, Branislav	Engineering	100%
MED	Carter, Jason A.	Engineering	100%
MED	Engineer, Junior (JD?)	Engineering	100%
MED	Hanuska, Steven	Engineering	50%
MED	Jaski, Yifei	Level 3	100%
MED	Lee, Soon-hong	Engineering	75%
MED	Liu, Jie	Engineering	100%
MED	Liu, Zunping	Engineering	100%
MED	Morrison, Leonard H.	Engineering	50%
MED	Navrotski, Gary	Engineering	100%
MED	Nudell, Jeremy J.	Engineering	100%
MED	Schmidt, Oliver A.	Engineering	91%
MED	Stillwell, Benjamin K.	Engineering	100%
MED	Volin, Kenneth J.	Engineering	70%
MED	Westferro, Frank J.	Engineering	93%
MED	Wiemerslag, Greg E.	Engineering	94%
MOM	Hoyt, John	Engineering	25%
MOM	Kruy, Try Leng	Engineering	40%
MOM	Michalek, Wayne	Engineering	7%
MOM	Swetin, Eugene	Engineering	6%
MOM	Technician (vacuum)	Engineering	25%
SA	Technician (SA/QA)	Engineering	20%
SI	Belcher, Kenneth	Engineering	5%
SI	Binetti, Marianne C.	Engineering	3%
SI	Forrestal, John R.	Engineering	5%
SI	Markovich, Gregory M.	Engineering	3%
SI	McNamara, Phillip E.	Engineering	13%
SI	Sawatski, Christopher J.	Engineering	15%
SO	Doktorczyk, George J.	Support	5%
SO	Sidarous, John F.	Level 3	10%
SSG	Veseli, Sinsa	Software	100%
	TOTAL Estimated FTE's		39.16

FY13 Effort Request Agreement: APS-U and ASD Division

ASD Group	Name	APS-U Role	FY 2013 Est. %
ADM	Carwardine, John	Engineer I L4	40%
AOP	Mann, Thomas	Project Mgr	100%
AOP	White, Marion M.	L2	100%
DIA	Sereno, Nicholas S.	Physicist	25%
DIA	Berg, William J.	Engineer	10%
DIA	Bui, Hanh D.	Engineer	60%
DIA	Decker, Glenn	Physicist I L4	30%
DIA	Gerches, Maria R.	Admin	20%
DIA	Keane, Robert T.	Engineer	10%
DIA	Lill, Robert M.	Engineer I L4	55%
DIA	Yang, Bingxin	Physicist	50%
MD	Abliz, Melike	Physicist	50%
MD	Bettenhausen, Susan	Tech	20%
MD	Dejus, Roger	Physicist	35%
MD	Doose, Charles L.	Engineer	25%
MD	Grimmer, John	Engineer	70%
MD	Hasse, Quentin B.	Engineer	25%
MD	Jaski, Mark S.	Engineer	10%
MD	Kasa, Matthew T.	Engineer	30%
MD	Ivanyushenkov, Yury	L3	40%
MD	Merritt, Michael T.	Engineer	15%
MD	Moog, Elizabeth R.	L3	90%
MD	Shiroyanagi, Yuko	Cryo Eng.	40%
MD	TerHaar, John	Tech	30%
MD	Vasserman, Isaac	Physicist	10%

ASD Group	Name	APS-U Role	FY 2013 Est. %
RF	Agner, Roy F.	Technician	60%
RF	Fuerst, Joel E.	Cryo Eng.	100%
RF	Berenc, Tim G.	Engineer	40%
RF	Bromberek, David J.	Engineer	40%
RF	Holzbauer, Jeremiah P.	Postdoctoral	100%
RF	Horan, Douglas	Engineer	50%
RF	Jonassen, Timothy	Technician	25%
RF	Ma, Hengjie	Engineer	100%
RF	Middendorf, Mark E.	Engineer	100%
RF	Montiel, Charles	Technician	100%
RF	Nassiri, Alireza	L3	30%
RF	Waldschmidt, Geoff	Engineer	100%
RF	Wu, Genfa	L4	100%
RF	Yoder, William	Technician	100%
RF	Douell, Michael	Technician	25%
RF	Smith, Terry	Engineer	25%
RF	Grelick, Arthur	Engineer	20%
	1000-PH = Physicist	Physicist	75%
	SPX Technical Lead	Engineer	60%
	1001-LLRF Engineer	Engineer	50%
	Interlock Engineer	Engineer	50%
	TOTAL Estimated FTE's		23.40

Stakeholder Committee Meeting 3 December 2012



Sum of Effort Request Agreements for FY13

Division	FTE
XSD	10.36
AES	39.16
ASD	23.40
TOTAL	72.92

- Project Management and Support: 8 people
- Additional critical, full-time hires: 5 positions
- **Grand total for FY13: 85* FTEs**

*Not included: Contractors (6) and staff from other ANL Divisions (2 FMS+1 Procurement)

Director's CD-2 Review of APS Upgrade Management

Recommendation:

- The number of individuals who are full-time on the APS-U Project remains too small. Continue to increase the number of core full time APS-U people.

Response:

- *35 APS staff currently assigned $\geq 90\%$ on the APS-U Project; 5 new full-time*

Recommendation:

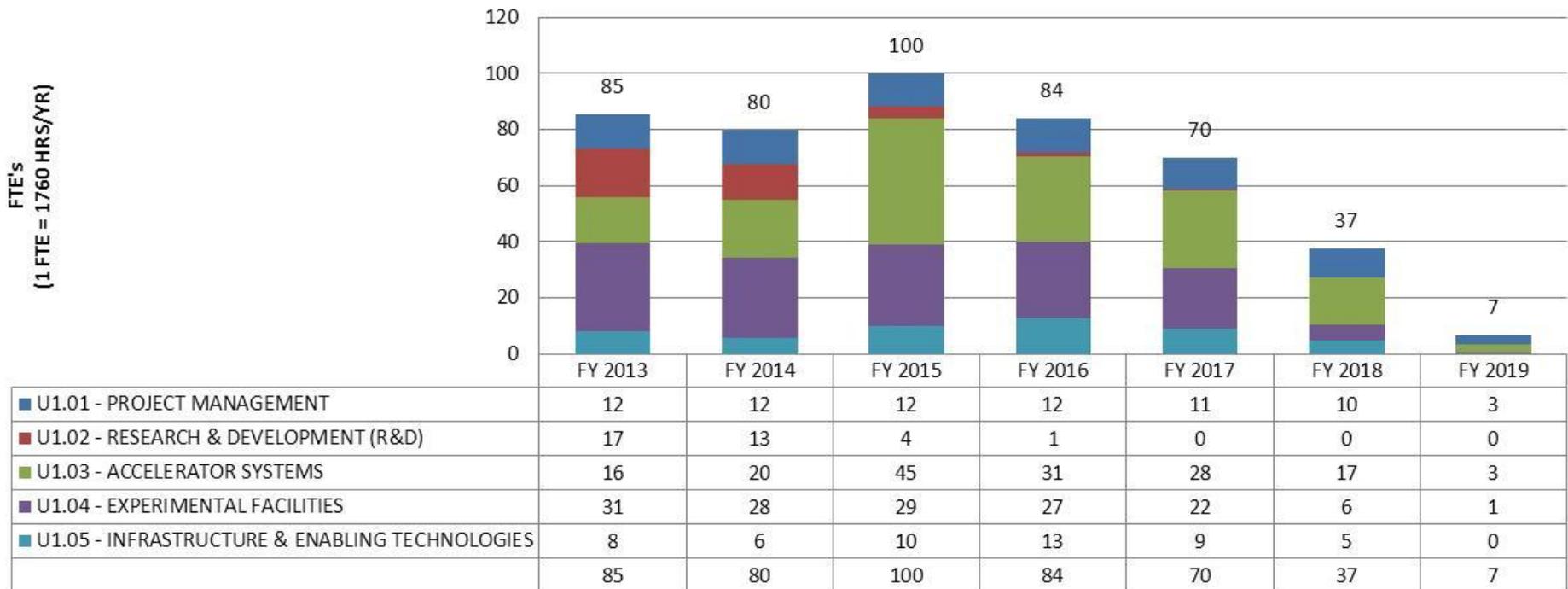
- Others from PSC who work on APS-U should have a significant ($>50\%$) fraction of their effort dedicated to the Project.

Response: In FY13 ERAs, percentage of effort from staff with $\geq 50\%$ effort assigned:

Division	FTE From $> 50\%$	FTE Total	Fraction
XSD	6.65	10.36	64%
AES	33.28	39.16	85%
ASD	17.20	23.40	74%
Total	57.13	72.92	78%

APS Upgrade Staffing Profile by Level 2

APS-U LABOR FTE's by WBS



- Ability to move 5 FTEs (largely driven by moving RIXS beamline forward) in a short time is an advantage of a matrixed system
- Labor is matrixed from the 550 personnel in Photon Sciences, and augmented by contractors, agreements with other ANL Directorates, and MOUs with other National Laboratories

Update on Long Lead Procurement

- Enclosures for RIXS (\$854.4K) and *option for ASL (\$404k)*
 - Pre-contract meeting held on November 8
 - Five contractors invited
 - Proposals received November 26
 - Contract to be awarded by December 17
 - Construction will begin in May and September 2013 (during shutdown)
- Monochromator for RIXS (\$562K)
 - In procurement
- Front End Components and Grid XBPM (\$200K)
 - Procurement package in approval process

Summary

- Scope of APS Upgrade sufficiently defined to support cost and schedule
- Scope of APS Upgrade fits in the funding profile with current 34.7% contingency and is supported by risk analysis
- Cost estimate is credible
- ES&H, Quality Assurance and Risk Registry are appropriate at this stage of the Project
- R&D activities to mitigate risks are proceeding well
- **With the strong management Team in place, continued strong support from the Laboratory and DOE, with scope and cost matching the funding profile and adequate contingency, requisite processes completed, APS Upgrade is ready for CD-2.**