APS Upgrade Project Status

Jim Kerby

APS Upgrade Forum
April 13, 2017

News

- Washington Update
- FY17 Budget
  - Continuing resolution through April 28th
- People
  - Searches underway for Installation Coordinator, and APS-U Director

Welcome!

Robert Winarski, Experimental Systems Design Team

Carrie Sauter, Project Controls Analyst

Henry Pallan, Project Controls Analyst

Jeffrey McGhee, Aps Upgrade Safety Coordinator

Corey DeLoye, Project Controls Analyst





DOE Mini-Review

- Tuesday March 14, 1-5pm “in” Germantown
- Four external reviewers:
  - Dave Robin, LBNL, accelerator physics
  - Dave Fritz, SLAC, experimental/beamlines
  - Frank Crescenzo, DOE, BHSO, management
  - Barbara Thibadeau, ORNL, cost/schedule
- Key Recommendations (DRAFT):
  1. ANL and U-Chicago leadership should act swiftly to appoint a new project director and complete an adequate transition period before CD-2 baseline.
  2. Develop conceptual design [30% drawings] for the long beamlines building and obtain an independent cost estimate prior to CD-2.
  3. For each of the 8 flagship beamline projects, complete the functional requirements documents, preliminary beamline design, and non-generalized cost & resource loaded schedules prior to CD-2.
  4. Develop a Transition to Operations (TTO) plan for “early” beamline scope prior to CD-2.

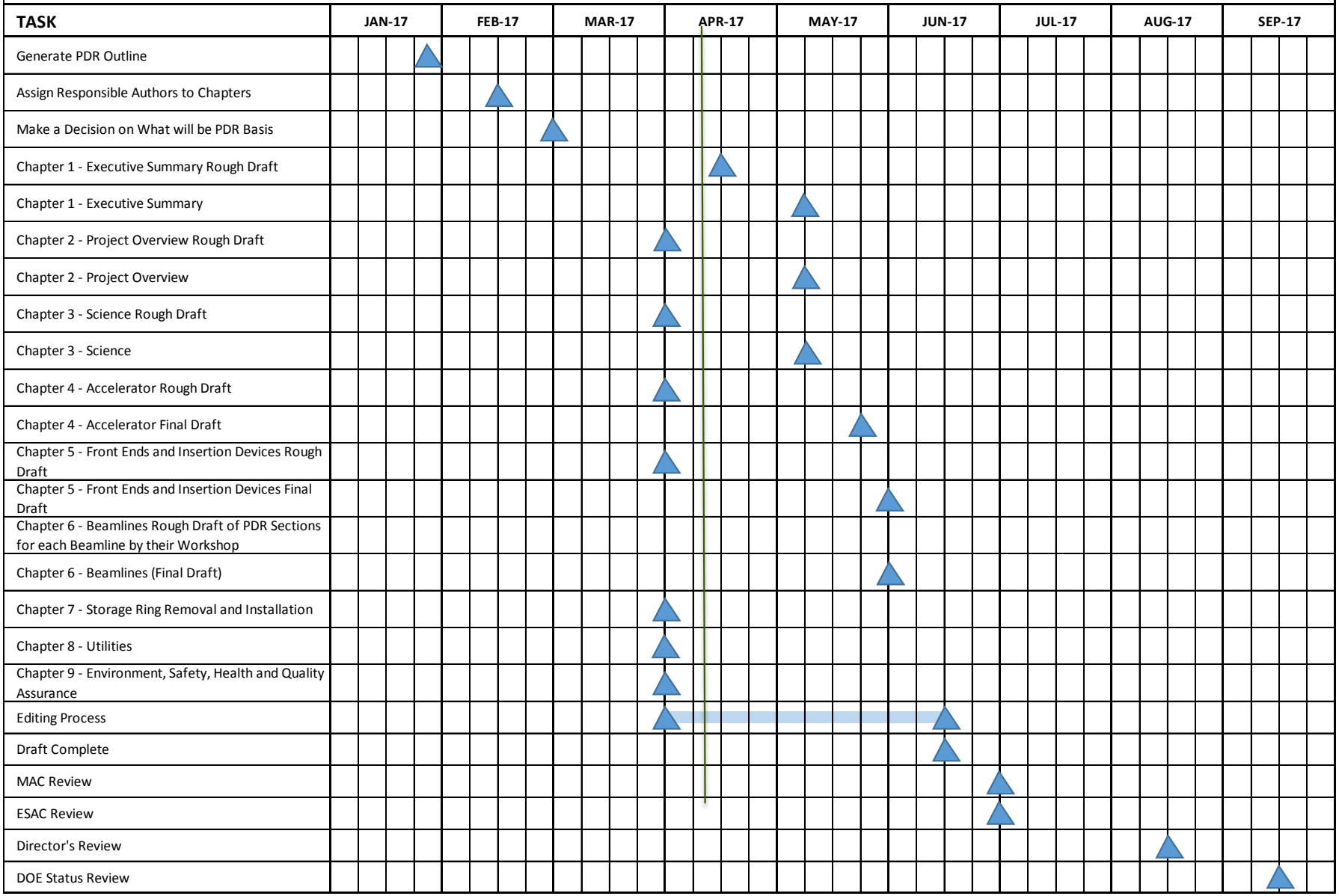
DOE Mini-Review Outcome

- Nothing unexpected
- We expect the final written report shortly with no major changes
- Next review ‘in the fall’—schedule becomes clearer as the budget does
- THANK YOU – we are doing the right things, no course trajectory changes -- let’s keep going!

Working Timeline

- November
  - ✓ Complete beamline roadmapping
  - ✓ SAC Meeting Nov. 9-10
  - ✓ Complete Lattice/RF analyses and selection
- December
  - ✓ ESAC Meeting Dec. 1-2
  - ✓ Mini-MAC Meeting Dec. 14-15
  - ✓ Issue Enhancements call for proposals
- January
  - ✓ Begin follow-up prelim design reviews (as needed)
- February
  - – Project Controls effort on LLP prep
- March
  - ✓ SAC Meeting
  - ✓ DOE “mini”-review
  - ☯ Complete ES&H/QA doc updates
  - ☯ Specification/interface docs
  - ✓ Enhancements Review
- April
  - ✓ Beamline Workshops
- May
  - – Complete PDR for review
  - – Work plan based on funding profile
- June
  - – MAC, ESAC
- July
- August
  - – Ops Triennial (Aug 15-17)
  - – *(Director’s Review)*
  - – Finalize documents for DOE Review
- September
  - – *DOE Review (tbc)*

Preliminary Design Report Timeline



September DOE Review Preparation

- Earned Value Management Training Part 2
  - Variance Analysis focus for doing VARs (variance analysis reports)
  - Thursday and Friday this week; CAMs choose a session and attend
- Project Manager Scope Status Meetings
  - Walk through each CAM's area checking
    - Scope – PDR to WBS
    - Current Technical Status
    - Risks
    - P6 Reporting
  - check consistency of scope and reporting; develop punchlist of next steps

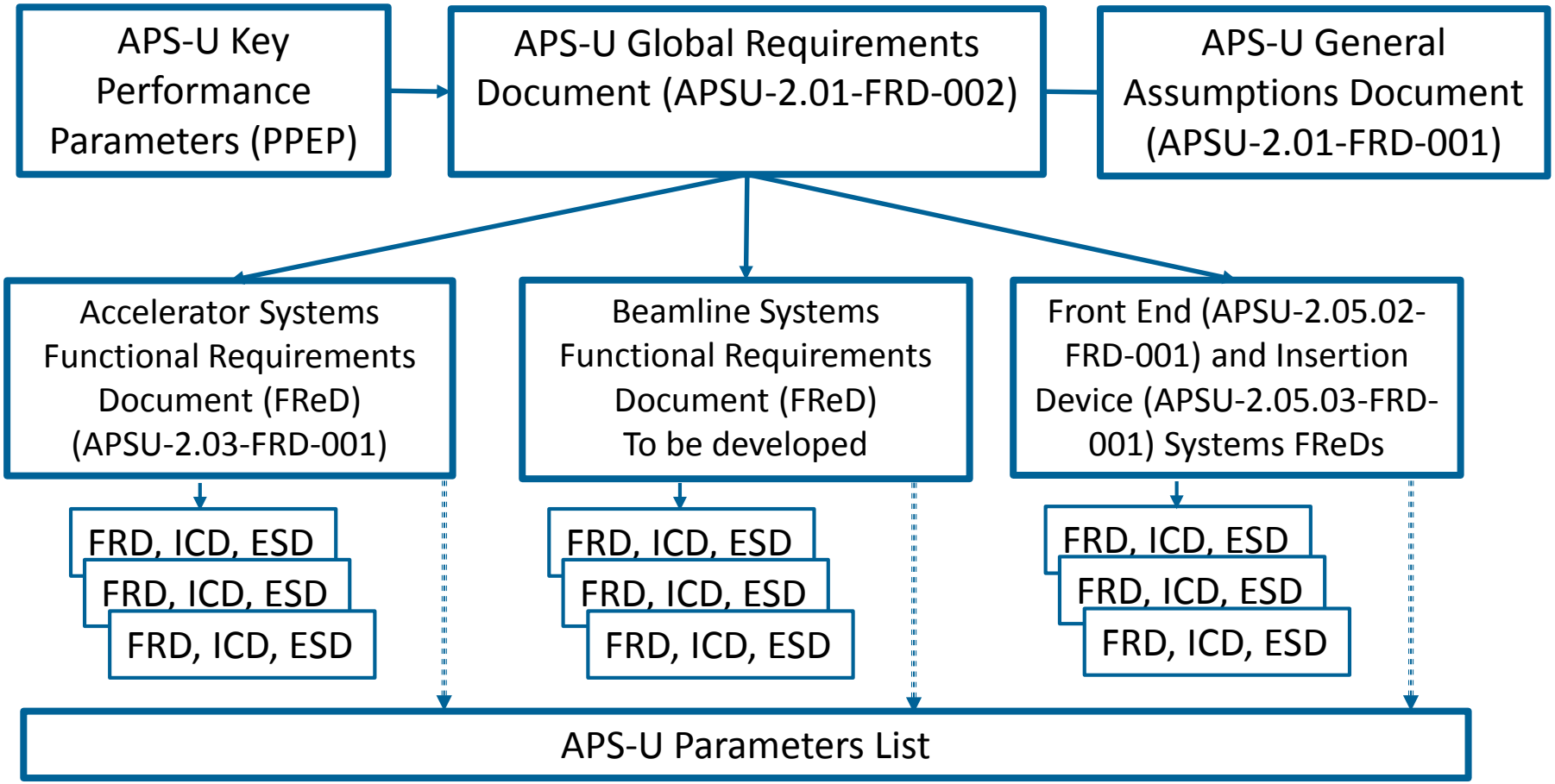
APS-U Specifications and Interface Control

Focused on producing an effective system that:

- Includes technical requirements development and control
  - Satisfies the customer's needs
  - Includes input from stakeholders
  - Considers schedule and cost criteria from Project Management
- Identifies and successfully manages interfaces
  - Ensures the project will function as an integrated whole
- Three basic types of documents
  - Functional Requirements Documents
  - Interface Control Documents
  - Engineering Specification Documents

From Tom Fornek last month

Requirements Hierarchy



From Tom Fornek

Typical Design Deliverables

Preliminary Design – CD2

- Functional Requirements Document – approved
- Interface Control Documents – approved
- Engineering Specification Document – draft
- Preliminary Design Calculations completed and reviewed
- Support and alignment design considered
- Assembly drawings and part drawings
  - Overall layout/assembly
  - Sufficient parts drawings to show viability of design
- Utility requirements
- Initial manufacturing plan
- Preliminary cost and schedule info

From Tom Fornek

Upcoming Meetings and Events

- Recent Events:
  - Facility Director's 5-way @BNL March 29

Presentations

Welcome and Goals for the Day	J. Hill (BNL)
Complex-wide beamline strategic plan Life Sciences Planning	D. Mills (ANL) B. Fischetti (ANL) / S. McSweeney (BNL)
Beamline Value Engineering Generic Beamline WBS Dictionary	E. Johnson (BNL)
Optics R&D Wavefront Sensors High-heat Load Optics Adaptive X-ray Optics Diffractive Optics	Rabedeau/Idir/Lahsen/Cocco/Goldberg
Open Discussions	J. Hill (BNL)
Tour of NSLS-II	J. Hill (BNL)
Wrap up	Hill/All

Strong ANL presence; opportunities for learning across the facilities are important for us to keep putting our best foot forward

Upcoming Meetings and Events

- Upcoming Workshops and Conferences
  - Beamline Preliminary Design Workshops
    - 3D Nano (Apr 14)
    - CHEX (Apr 24)
    - Polar (Apr 25)
    - InSitu/Ptycho (Apr 26,27)
    - HEXM (Apr 28)
    - ATOMIC (May 1)
    - XPCS (May 2)
    - CSSI (May 3)

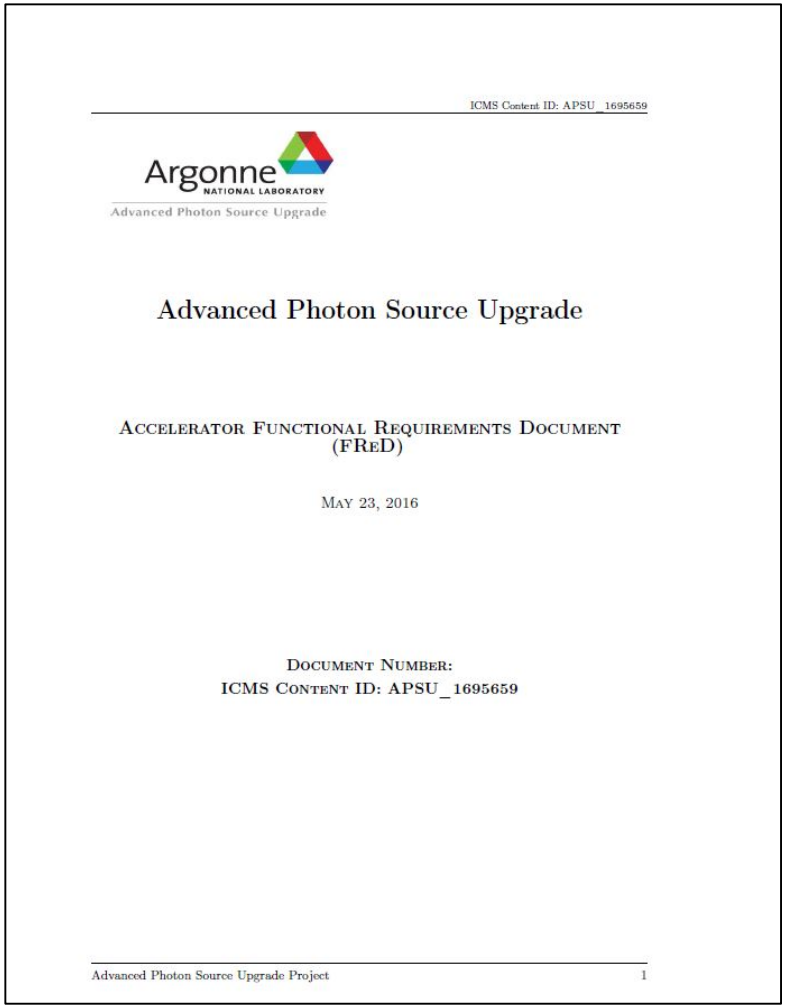
- HBSLS @BNL April 26-28
- IPAC'17, Copenhagen, May 14-19
- IMMW20, DIAMOND, June 4-9
- USPAS, Lisle, June 12-16

Thank You!

Functional Requirements

Derived from physics design

- Accelerator requirements documented in a Functional Requirements Document (FReD)
- System engineering specifications, interfaces are derived from FReD
  - Engineering specification documents (ESDs) will be produced during preliminary design.
  - Includes magnet properties, support alignment and stability physics requirements.



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ACCELERATOR FUNCTIONAL REQUIREMENTS DOCUMENT (FReD)

MAY 23, 2016

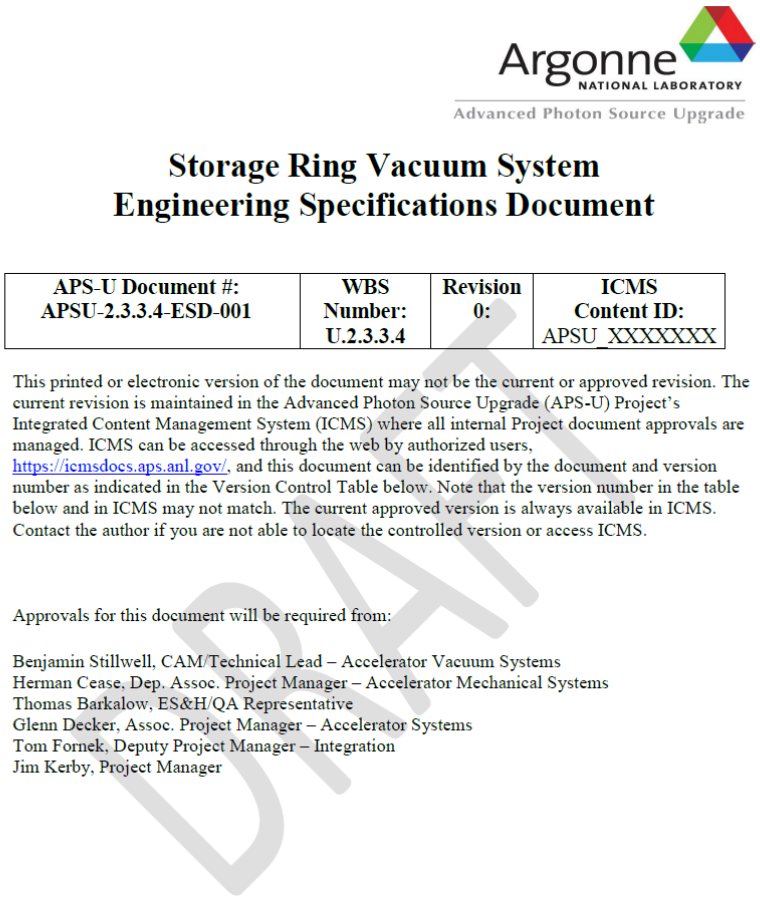
DOCUMENT NUMBER:
ICMS CONTENT ID: APSU_1695659

Advanced Photon Source Upgrade Project 1

From Tom Fornek

Engineering Specification Documents

- Engineering specification documents (ESDs) will be produced during preliminary design.
- Basic form of an ESD for a component is a Procurement Specification
- More complicated ESDs can be generated for entire systems.
  - Enough information is included to generate Procurement Specs for each system component.



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Storage Ring Vacuum System
Engineering Specifications Document

APS-U Document #: APSU-2.3.3.4-ESD-001	WBS Number: U.2.3.3.4	Revision 0:	ICMS Content ID: APSU_XXXXXXX

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Approvals for this document will be required from:

Benjamin Stillwell, CAM/Technical Lead – Accelerator Vacuum Systems
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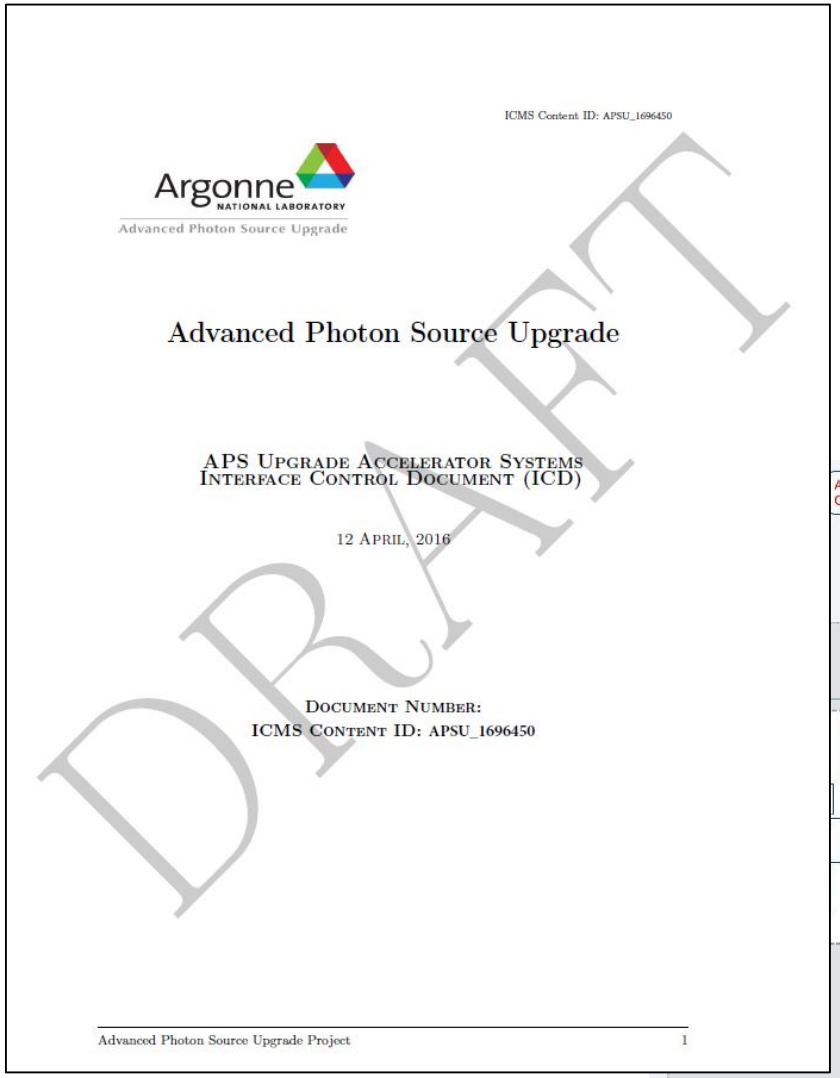
Thomas Barkalow, ES&H/QA Representative
Glenn Decker, Assoc. Project Manager – Accelerator Systems
Tom Fornek, Deputy Project Manager – Integration
Jim Kerby, Project Manager

DRAFT

From Tom Fornek

Interface Identification and Control

High-level interfaces identified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APS Upgrade Accelerator Systems Interface Control Document (ICD)

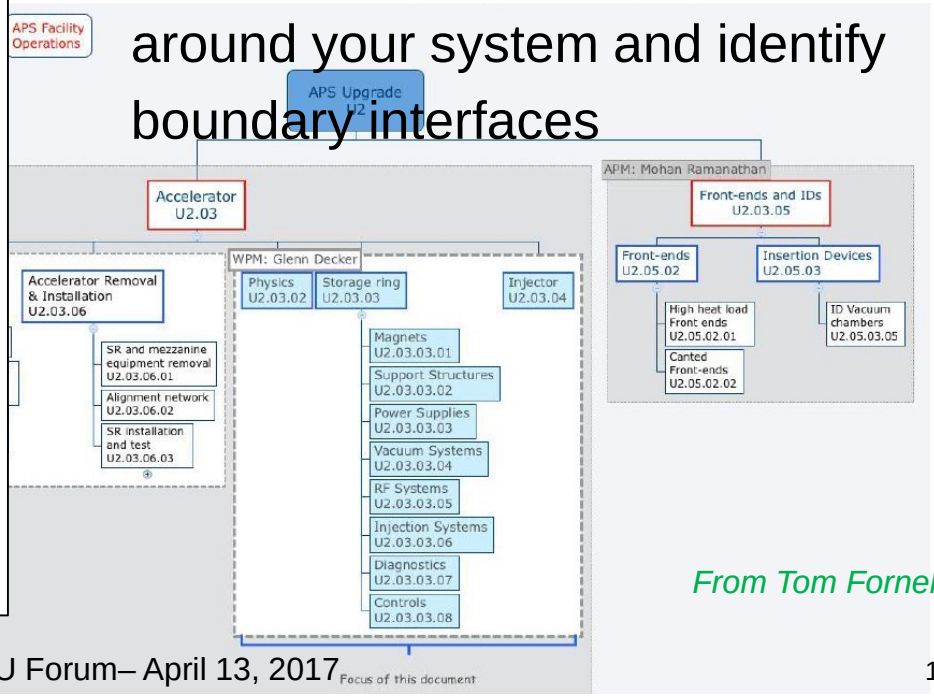
12 April, 2016

Document Number:
ICMS Content ID: APSU_1696450

DRAFT

Advanced Photon Source Upgrade Project 1

- System interface control documents (ICDs) approved prior to CD2.
- Mechanical Interfaces are identified on layout drawings
- Basic approach – Draw a box around your system and identify boundary interfaces



From Tom Fornek

Typical Design Deliverables

Final Design – CD3

- Functional Requirements Document – approved
  - Include: Vacuum, material reqs, dimensional reqs, surface finish and coating reqs, etc.
- Interface Control Documents – approved
- Engineering Specification Document – approved
- Final Design Calculations completed and reviewed
- Support and alignment design addressed
- Final Design Drawing Package
  - Approx. 70-90% drawings complete and reviewed
- Final utility requirements determined
- Manufacturing plan completed
- Cost and schedule info from vendors

From Tom Fornek