NEXT Scope verification
Summary
Compiled 8 May 2017
J. Keister

The contents of this summary documentation package includes the following:

1. Executed memos from Steve Hulbert (NEXT Project Manager) to Paul Zschack (NSLS-II Photon Science Division Director) declaring completion of NEXT project scope;

2. Report of the Scope Verification Review for NEXT, held February 2017;

3. Project and scope verification overview materials provided at the time of the Scope Verification Review;

4. Scope completion declarations (closeout acknowledgement forms) for each NEXT control account, executed by each relevant control account manager

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Memo

Date: April 28, 2017

To: Paul Zschack, Photon Science Division Director

From: Steve Hulbert, NEXT Project Manager

Subject: Acceptance of ISS Beamline by NSLS-II Facility Operations

Construction of the ISS beamline at 8-ID, one of five insertion device beamlines delivered by the NEXT Project, is complete and light has been delivered to its endstation. The milestones achieved during the transition from construction to operation for this beamline are provided below. Successful achievement of these milestones is evidence that the ISS beamline is ready for operational status in the NSLS-II Facility:

- ISS Photon Delivery System complete and ISS IRR complete (24-Mar-2016)
- Authorization from the NSLS-II Director to Start ISS Commissioning (3-Apr-2016)
- ISS First Light (5-Apr-2016)
- ISS Flux verified (23-Jun-2016)
- ISS Endstation construction complete (28-Oct-2016)

The endstation for ISS features a sample chamber for in-situ, operando measurements and detectors for absorption (pin diodes, silicon drift diodes) and emission (von Hamos spectrometers) measurements.

ISS beamline scope was verified at the NEXT Scope Verification Review held 27-28 February 2017 and completion has been documented via WBS Closeout Acknowledgments.

The purpose of this memo is to report this status and request your acknowledgment that the NSLS-II Facility has accepted the ISS photon delivery system and endstation into its operating portfolio.

Steven L. Hulbert — 28 April 2017

Steve Hulbert, NEXT Project Manager — Date

Cc: E. Johnson, J. Hill

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Memo

Date: April 28, 2017

To: Paul Zschack, Photon Science Division Director

From: Steve Hulbert, NEXT Project Manager

Subject: Acceptance of ISR Beamline by NSLS-II Facility Operations

Construction of the ISR beamline at 4-ID, one of five insertion device beamlines delivered by the NEXT Project, is complete and light has been delivered to its endstations. The milestones achieved during the transition from construction to operation for this beamline are provided below. Successful achievement of these milestones is evidence that the ISR beamline is ready for operational status in the NSLS-II Facility:

- ISR Photon Delivery System complete and ISR IRR complete (29-Jun-2016)
- Authorization from the NSLS-II Director to Start ISR Commissioning (7-Jul-2016)
- ISR First Light (11-Jul-2016)
- ISR Flux verified (8-Aug-2016)
- ISR Endstation construction complete (24-Mar-2017)

The endstations for ISR include:

1. Base Diffractometer #1, featuring an instrumented six-circle diffractometer
2. Base Diffractometer #2, featuring a two-circle diffractometer and translation stages accommodating large high-field magnets
3. Base Diffractometer #3, featuring KB focusing mirrors and a gas handling system to support x-ray scattering measurements of in-situ modification and growth

ISR beamline scope was verified at the NEXT Scope Verification Review held 27-28 February 2017 and completion has been documented via WBS Closeout Acknowledgments.

The purpose of this memo is to report this status and request your acknowledgment that the NSLS-II Facility has accepted the ISR photon delivery system and endstations into its operating portfolio.

Steven L. Hulbert
Steve Hulbert, NEXT Project Manager

28 April 2017
Date

Cc: E. Johnson, J. Hill

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Memo

Date: April 28, 2017

To: Paul Zschack, Photon Science Division Director

From: Steve Hulbert, NEXT Project Manager

Subject: Acceptance of ESM Beamline by NSLS-II Facility Operations

Construction of the ESM beamline at 21-ID, one of five insertion device beamlines delivered by the NEXT Project, is complete and light has been delivered to its endstation. The milestones achieved during the transition from construction to operation for this beamline are provided below. Successful achievement of these milestones is evidence that the ESM beamline is ready for operational status in the NSLS-II Facility:

- ESM Photon Delivery System complete and ESM IRR complete (29-Jun-2016)
- Authorization from the NSLS-II Director to Start ESM Commissioning (22-Jul-2016)
- ESM First Light (25-Jul-2016)
- ESM Flux verified (15-Aug-2016)
- ESM Endstation construction complete (26-Apr-2017)

The angle-resolved photoemission spectroscopy (ARPES) endstation for ESM features a sample chamber with static and micro-scanning stage sample manipulation capabilities as well as heating/cooling and sample preparation and characterization tools. Electron detection is provided by a high resolution multi-channel (energy and angle) hemispherical electron energy analyzer.

ESM beamline scope was verified at the NEXT Scope Verification Review held 27-28 February 2017 and completion has been documented via WBS Closeout Acknowledgments.

The purpose of this memo is to report this status and request your acknowledgment that the NSLS-II Facility has accepted the ESM photon delivery system and endstation into its operating portfolio.

Steven L. Hulbert — 28 April 2017

Steve Hulbert, NEXT Project Manager — Date

Cc: E. Johnson, J. Hill

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Memo

Date: April 28, 2017

To: Paul Zschack, Photon Science Division Director

From: Steve Hulbert, NEXT Project Manager

Subject: Acceptance of SMI Beamline by NSLS-II Facility Operations

Construction of the SMI beamline at 12-ID, one of five insertion device beamlines delivered by the NEXT Project, is complete and light has been delivered to its endstation. The milestones achieved during the transition from construction to operation for this beamline are provided below. Successful achievement of these milestones is evidence that the SMI beamline is ready for operational status in the NSLS-II Facility:

- SMI Photon Delivery System complete and SMI IRR complete (3-Nov-2016)
- Authorization from the NSLS-II Director to Start SMI Commissioning (7-Nov-2016)
- SMI First Light (7-Nov-2016)
- SMI Flux verified (3-Dec-2016)
- SMI Endstation construction complete (21-Apr-2017)

The endstation for SMI features a sample chamber tailored to soft matter systems, with integrated goniometers and pixel array detectors (PADs) for wide-angle X-ray scattering (WAXS) and grazing incidence WAXS (GIWAXS), followed by an 8m-long chamber and PAD for small-angle X-ray scattering (SAXS) and grazing-incidence SAXS (GISAXS).

SMI beamline scope was verified at the NEXT Scope Verification Review held 27-28 February 2017 and completion has been documented via WBS Closeout Acknowledgments.

The purpose of this memo is to report this status and request your acknowledgment that the NSLS-II Facility has accepted the SMI photon delivery system and endstation into its operating portfolio.

Steven L. Hulbert — 28 April 2017

Steve Hulbert, NEXT Project Manager — Date

Cc: E. Johnson, J. Hill

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Memo

Date: May 4, 2017

To: Paul Zschack, Photon Science Division Director

From: Steve Hulbert, NEXT Project Manager

Subject: Acceptance of SIX Beamline by NSLS-II Facility Operations

Construction of the SIX beamline at 2-ID, one of five insertion device beamlines delivered by the NEXT Project, is complete and light has been delivered to its endstation. The milestones achieved during the transition from construction to operation for this beamline are provided below. Successful achievement of these milestones is evidence that the SIX beamline is ready for operational status in the NSLS-II Facility:

- SIX Photon Delivery System complete and SIX IRR complete (15-Feb-2017)
- Authorization from the NSLS-II Director to Start SIX Commissioning (17-Feb-2017)
- SIX First Light (21-Feb-2017)
- SIX Flux verified (26-Feb-2017)
- SIX Endstation construction complete (4-May-2017)

The endstation for SIX features a sample chamber with static and scanning sample capabilities as well as temperature control, sample preparation, and characterization tools. Detection of the inelastically scattered photons is provided by a custom high resolution spectrometer with soft X-ray CCD detector.

The multi-port fixed-angle vacuum connection between the sample chamber and spectrometer provides capability for commissioning of the combined beamline and spectrometer during the initial period of SIX operations. When ready, this vacuum connection will be replaced by the triple-rotating-flange version which provides continuous angle selection capability under ultra-high vacuum conditions.

SIX beamline scope was verified at the NEXT Scope Verification Review held 27-28 February 2017 and completion has been documented via WBS Closeout Acknowledgments.

The purpose of this memo is to report this status and request your acknowledgment that the NSLS-II Facility has accepted the SIX photon delivery system and endstation into its operating portfolio.

Steve Hulbert

Steve Hulbert, NEXT Project Manager

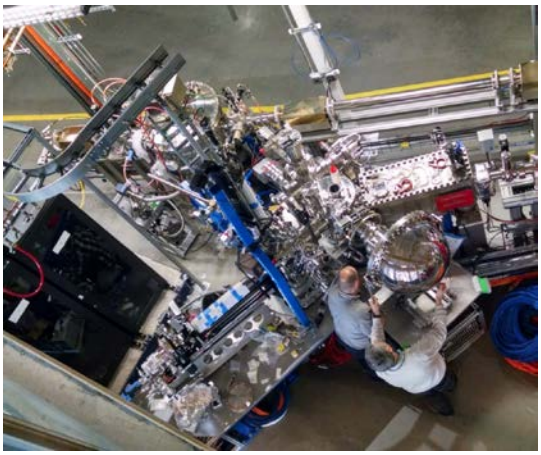
4-May-2017

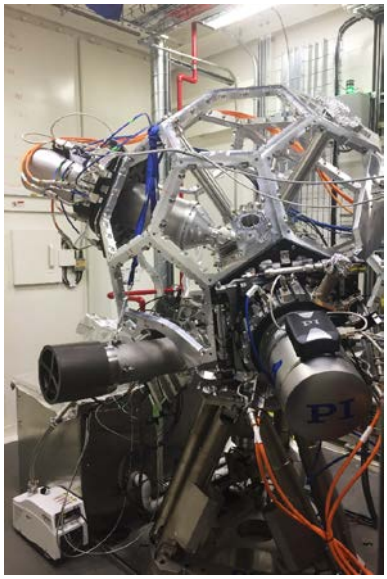
Date

Cc: E. Johnson, J. Hill

NEXT Project Scope Verification Review

February 27-28, 2017





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EXECUTIVE SUMMARY

Purpose of Review
An Independent Review Team was assembled to assess the completion of NEXT project scope, the quality and consistency of the completion documentation and assess the project's scope verification and closeout status.

Review Team
The Review Team was comprised of ANL and BNL technical and project management Subject Matter Experts as well as representatives from BHSO:

Michael Cowell, EPS DCOO	Committee Chair
Lonny Berman, NSLS-II	Beamlines
Robert Caradonna, BHSO	DOE/BHSO participant
Dean Haeffner, ANL/APS	Beamlines
Kerry Mirabella, C-AD	Project Management
Peter Wanderer, SMD	Accelerator
Khianne Williams, C-AD	Observer

Charge/Scope
The purpose of the NEXT Scope Verification Review is to help assure that the scope of the project has been delivered as represented in the Work Breakdown Structure Dictionary. The review committee had access to project documentation, interviewed Control Account Managers, and visited equipment in the field (with suitable escort) to aid in arriving at their assessment of the completeness of the project scope. The committee was expected to examine a representative sample of the documentation and actual project scope to arrive at their assessment. The specific elements of the charge were as follows:

1. Verification Documentation: Does the documentation cover the entire scope of the NEXT project? Has the completed and as yet to be completed scope been clearly identified?

2. Scope Verification: Through sampling of representative project scope, are the verification documentation, the WBS dictionary and the project scope itself consistent? Are there discrepancies that must be resolved to assure that the scope of the project has been fully completed?

Bases of Observations
The review was conducted over one and a half days, February 27-28, and included an In-brief presentation and an In-Tunnel Walk-down the prior week (February 14th). Given that the scope of the project encompassed a total of 35 control accounts, the review team was able to assess 100% of the project scope. Reviewed documentation included:

Project Documentation posted on web site
WBS Dictionary
Project Closeout Acknowledgment Forms
Documentation from previous reviews and presentations
Various Closeout evidence as requested by the Review Team

Reviewers generally assessed the WBS scope in their area of expertise. CAMs and Level II managers were assessed on the completion of control account scope they were responsible for.

TEAM I

Scope Assessed

Project Management (WBS 2.01.01)
Project Support (WBS 2.01.02)
Conceptual Design and Analysis of Photon Delivery Systems (WBS 2.02.02)
Utilities (WBS 2.03.01)
PPS (WBS 2.03.02)
EPS(WBS 2.03.03)
Control Station (WBS 2.03.04)
Common Beamline Systems Management (WBS 2.03.05)
Control System Management (WBS 2.04.01)
Control System Design & Implementation (WBS 2.04.02)
Control System Equipment (WBS 2.04.03)
ESM EPU Insertion Device (WBS 2.11.01)
SIX EPU Insertion Device (WBS 2.11.02)
Insertion Devices Management (WBS 2.11.03)
ID and FE Installation Management (WBS 2.12.01)
ID Installation & Testing (WBS 2.12.02)
FE Installation and Testing (WBS 2.12.03)

FINDINGS

The project uses a robust tracking and reporting system inherited from the NSLS-II project and a centralized document sharing system based on SharePoint. Valuable lessons were learned from NSLS- II in terms of technology, specifications, and inherited systems. As an example, one of the CAMs mentioned that WBS 2.03.01 – Utilities utilized lessons learned from performing the Utilities scope of NSLS-II's CSX beamline. Additionally, organizing installation of common utilities (including electric, gas, and fire protection) in one cost account ("horizontal integration") significantly increased the efficiency of this process relative to NSLS-II Project.

In WBS 2.03, work is ongoing (complete except for SIX beamline, utilities will be installed after spectrometer construction complete with completion planned for 3/31, and supporting Common Beamline Systems scope). In WBS 2.04, there is a clear distinction that the Project scope includes First Light for five of the six beamlines and then work after First Light is costed and tracked under Operations. This is clearly stated in the WBS dictionary.

The Deputy Project Manager (DPM) referenced a contract tracking spreadsheet showing that the team was aware of major procurement contracts that influenced account close-out and kept close tabs on this process. At the time of this review, 48 (76%) of the 63 significant procurement contracts closeouts were closed

The NEXT project employs a standard system (process and documentation developed by the Project Management Center) for the control account close-out process. The project team

mentioned during the interviews that the monthly status effort included awareness of when a control account was 100% complete and when the close-out process could start. At the time of the review, 15 (43%) of the 35 accounts were closed, with an additional 11 in process (total closed and in-process is 26, or 74%).

Completion documents reflected approved updates in scope or design. Systems reviewed (PPS, EPS, IDs, and EPUs) had to be completed in preparation for the IRR with documentation reflecting scope in the form of checklists/travelers. (The Committee was shown a 19-page traveler that controls the acceptance process.) This documentation which serves as proof of completion for both the scope and the IRR and/or system certification process exists in a centrally accessed SharePoint site hosted by NSLS-II. All CAMs interviewed could access this information.

In some cases, such as Controls (WBS 2.04), the documentation/specifications/parameters of the system were integrated into the software with built-in configuration and version control unlike travelers or certification documentation for hardware-based systems.

Interviews with (WBS 2.03.02 and 2.03.03) PPS and EPS CAMs found that close out documentation showing scope as outstanding, was in fact, recently completed. The project team was aware of the need to document the completed scope and post revised closeout acknowledgement forms. This interview also again raised the topic of lessons learned and valued experience from the NSLS-II project; this time in terms of leading to a more efficient process for determining the design and installation of the PPS for each of the NEXT beamlines.

Utilities (WBS 2.03.01) should have a WBS dictionary definition that includes installation activities. The current definition includes the words “Preliminary design, final design, project management, and purchase contract”, but makes no reference to installation activities by BNL labor. The BNL labor is detailed in the Control Account Plan and includes, for example, Building Trades and Electricians. Continued, though modest, support is required to support the SIX beamline through its endstation installation and the NEXT project through CD-4 requiring Common Beamline Systems Management (2.03.05) to remain open.

Control Systems Management (WBS 2.04.01) had a close-out acknowledgement form stating that the management scope was complete. This should be amended as there are unfinished activities (pulling/terminating cables and systems testing) which require management oversight and documentation in Control System Design & Implementation (WBS 2.04.02); these activities are estimated to be completed in March 2017. The Committee viewed calibration/checkout file for Control System Equipment (2.04.03) for one of the five beamlines. This checkout is a requirement for the IRR. It was noted that the equipment axis alignment data is not configuration controlled since it is not safety related. The configuration can readily be changed in software, so backup is achieved via the computer archive process.

The Committee saw the Insertion devices and Front Ends within the scope of WBS 2.11 and 2.12 during the In-tunnel tour. NEXT project support of installation ended November 1, 2015 and work is being completed using operating funds. This is noted in the WBS dictionary. All but one of the NEXT-related IRRs have been completed (IRR for the installed second EPU device for ESM is expected to be performed by the operations team in April 2017).

The committee was shown documentation related to the magnets in the straight sections and insertion devices.

The committee was also shown documentation of the radiation shielding (polyethylene and lead) placed around the beam pipe) which included photographs documenting construction at each major stage (since the inner portions of the shield are not visible after the work is completed). The photographic documentation of the construction of the shielding was excellent.

COMMENTS

Per the Project Manager, the WBS 2.11 scope was part of an exchange for an equivalent-cost portion of hutch scope completed under NSLS-II and agreed to earlier in the project. The CAMs are very aware of the scope boundary in this WBS area but it may be helpful (for future reference) to clarify it in the WBS Dictionary (or elsewhere). All three (two for ESM, one for SIX) NEXT-procured IDs were observed during the "In-tunnel" ring tour. The Committee saw travelers for frontend / insertion device IRRs including the acceptance measurements.

The following control accounts have scope which is not complete. The project team has however, through both the review documentation provided and the CAM interviews, indicated that they are well aware of the affected activities and are closely monitoring them to ensure scope completion occurs as soon as possible:

Project Management (WBS 2.01.01)
Project Support (WBS 2.01.02)
Utilities (WBS 2.03.01)
Common Beamline Systems Management (WBS 2.03.05)
Control System Management (WBS 2.04.01)
Control System Design & Implementation (WBS 2.04.02)

The Project team seems to be very integrated at all levels. The enthusiasm of the CAMs and their commitment to understanding and completing their scope is very encouraging. The commitment to documenting the work is also to be commended and is very impressive. Checks and balances exist at multiple levels from weekly and monthly meetings to a centralized and open reporting system that everyone has access to. Systems have been put in place to support the project reporting and tracking processes and it is evident that the team has worked very hard to make this project successful and continues to do so.

Photographs that document important stages of construction and installation phases of the shielding should be considered a best practice.

RECOMMENDATIONS

Complete the minor edits to the WBS dictionary (WBS 2.03 and WBS 2.03.01) as noted in the Findings and Comments.

Revise the close-out acknowledgement forms to reflect that Control Systems Management (WBS 2.04.01) is not closed due to oversight needed for unfinished activities in Control System Design & Implementation (WBS 2.04.02).

Document completion of the outstanding work identified in the close-out acknowledgement forms as it is accomplished.

TEAM II

Scope Assessed:

ESM Advanced Conceptual Design WBS 2.02.04)	ESM Beamline (WBS 2.05.01, 2.05.02)
FXI Advanced Conceptual Design (WBS 2.02.05)	FXI Beamline (WBS 2.06.01, 2.06.02)
ISR Advanced Conceptual Design (WBS 2.02.06)	ISR Beamline (WBS 2.07.01, 2.07.02)
ISS Advanced Conceptual Design (WBS 2.02.07)	ISS Beamline (WBS 2.08.01, 2.08.02)
SIX Advanced Conceptual Design(WBS 2.02.08)	SIX Beamline (WBS 2.09.01, 2.09.02)
SMI Advanced Conceptual Design (WBS 2.02.09)	SMI Beamline (WBS 2.10.01, 2.10.02)

FINDINGS

The NEXT beamline CAMs are to be commended for their attention to their beamlines' scope, completion status, and work to go.

The NEXT Project scope work pertaining to the FXI (WBS 2.06), ISR (WBS 2.07), and ISS (WBS 2.08) beamlines is essentially complete (only two contract documents remain for ISR).

The remaining work for the ESM beamline (WBS 2.05) consists of the receipt and acceptance of the M4 mirror. This is forecasted to happen in March 2017.

The remaining work for the SIX beamline (WBS 2.09) consists of the receipt and acceptance of the M4 mirror (forecasted March 2017), completion of the wave-front analyzer stand and remaining sample holder parts (March 2017), remaining installation of the spectrometer optics (March 2017), receipt and acceptance of the manipulator for cryostat B (April 2017), and receipt and acceptance of the triple rotating flange (May 2017).

The remaining work for the SMI beamline (WBS 2.10) consists of the receipt and acceptance of the cable drag chain for the SAXS beam chamber (forecasted March 2017), followed by the remaining assembly of the SAXS beam chamber and mechanics (April 2017).

The hutches procurements for all of the beamlines except for FXI were sponsored by the NSLS-II Project. The procurement contracts included the manufacturing, delivery, and installation of the hutch enclosures including the associated doors and actuators, windows, labyrinths, stairs, bridges, rails, light fixtures, overhead cranes, and air handling systems.

COMMENTS

There exists a range of confidence levels regarding the likelihood of the indicated remaining work to be completed as currently forecasted.

Highest confidence exists for the remaining SIX beamline work related to the wave-front analyzer stand, remaining sample holder parts, remaining installation of the spectrometer optics, and the manipulator for cryostat B, as well as for the remaining SMI beamline work, to be completed as currently forecasted.

Modest confidence exists for the remaining M4 mirrors work for the ESM and SIX beamlines to be completed as currently forecasted.
Lower confidence exists for the remaining SIX beamline work related to the triple rotating flange to be completed as currently forecasted.

Concerning the M4 mirrors, their delivery by JTEC under subcontract to BESTEC is projected to happen by the end of March, at which time they will be subjected to measurements of their figures in the BNL Metrology Lab. The CAMs mentioned about the possibility of accepting the mirrors and dispositioning the contracts "use as is," if simulations were to show that both of these mirrors would be able to meet most beamline performance goals.

Concerning the triple rotating flange for SIX, this is a challenging component whose manufacture recently began, by an outfit working under subcontract to BESTEC. The outfit has experience in manufacture of such flanges, but the scale of the one for SIX poses a challenge.

The WBS dictionary definitions for the hutches for all beamlines except FXI are currently written in a way that implies that the full scope of the hutches was included under the NEXT Project scope.

RECOMMENDATIONS

Effort should be devoted toward successful completion of the remaining work at the beamlines.

It would be worthwhile to undertake simulations of the performances of the ESM and SIX beamlines under presumed M4 mirror figure conditions, to gain insights as to figure error thresholds that would be tolerable to result in acceptable beamline performance.
(Update note: It should be noted that shortly after the review but prior to finalization of this report, mirror performance simulations were conducted. The M4 mirror for the SIX beamline was delivered and the M4 mirror for the ESM beamline was expected by April 1st).

Close attention to the remaining manufacture and delivery of the triple rotating flange for SIX should be given. Regular teleconferences with the contractor and subcontractor should be considered.

The WBS dictionary definitions for the hutches for all beamlines except FXI should be revised to note that the scope of the hutches procurement contracts is excluded from the NEXT Project scope.

ATTACHMENTS

1. Summary of Recommendations
2. Review Charge Letter
3. Agenda/ Interview Schedule
4. Control Account BAC by CAM
5. Bios of Review Team Members

SUMMARY OF RECOMMENDATIONS

1) Complete the minor edits to the WBS dictionary as noted in Findings and Comments (e.g. WBSs 2.03, 2.03.01).
2) Revise the close-out acknowledgement forms to reflect that Control Systems Management (WBS 2.04.01) is not closed due to oversight needed for unfinished activities in Control System Design & Implementation (WBS 2.04.02).
3) Document scope completion for outstanding items identified in close-out acknowledgement forms as it is completed.
4) Consider performing simulations of the performances of the ESM and SIX beamlines under presumed M4 mirror figure conditions, to gain insights as to figure error thresholds that would be tolerable to result in acceptable beamline performance.
5) Close attention to the remaining manufacture and delivery of the triple rotating flange for SIX should be given. Regular teleconferences with the contractor and subcontractor should be considered.
6) Revise the WBS dictionary definitions for the hutches for all beamlines except FXI to note that the scope of the hutches procurement contracts is excluded from the NEXT project scope.

COMMITTEE CHARGE LETTER

NSLS-II Experimental Tools (NEXT) Project Scope Verification Review

February 27 - 28, 2017

The NEXT project is over 97% complete against the EAC as of December 31, 2016 and is preparing for closeout leading to a CD-4 determination. Control Account Managers (CAMs) have reviewed their work packages, and either indicated that work is complete, or have identified work which remains open. The project has 12 CAMs and 35 Control Accounts representing the entire scope of the $90M TPC NEXT MIE project.

Charge to the Review Committee:
The purpose of the NEXT Scope Verification Review is to help assure that the scope of the project has been delivered as represented in the Work Breakdown Structure Dictionary. The review committee will have access to the scope completion and any other project documentation as well as the opportunity to interview Control Account Managers or visit equipment in the field (with suitable escort) to aid in arriving at their assessment of the completeness of the project scope. Given the scope of the project and the material available for review, the team will be comprised of BNL subject matter experts outside of the NEXT project as well as representatives from DOE/BHSO assigned to examine specific areas of the project. The committee is expected to examine a representative sample of the documentation and actual project scope to arrive at their assessment. The specific elements of the charge are as follows:

1. Verification Documentation: Does the documentation cover the entire scope of the NEXT project? Has the completed and as yet to be completed scope been clearly identified?

2. Scope Verification: Through sampling of representative project scope, are the verification documentation, the WBS dictionary and the project scope itself consistent? Are there discrepancies that must be resolved to assure that the scope of the project has been fully completed?

A closeout briefing is requested along with a review report to be sent to the NEXT Project Manager by March 17, 2017.

Review Committee membership :

Committee Member	Assignment
Michael Cowell –PES DCOO	Committee Chair
Lonny Berman – NSLS-II	Beamlines
Robert Caradonna – BHSO	DOE/BHSO observer
Dean Haeffner – ANL/APS	Beamlines
Cheuk Kwok – BHSO	DOE/BHSO observer
Kerry Mirabella – C-AD	Project Management
Peter Wanderer – SMD	Accelerator
Khianne Williams – C-AD	Observer

AGENDA/INTERVIEW SCHEDULE

NEXT Scope Verification Review
February 27-28, 2017
Agenda

Monday, February 27, 2017

Time	*Subject*	*Name*	*Location*
7:30-8:00	Arrival On-site Security/Badging	Review Team	Main Gate Badging Trailer
8:00 - 8:30	Executive Session	Review Team	CR 156 - LOB5
8:30 - 8:45	Welcoming Remarks	Erik Johnson	CR 156 - LOB5
8:45 - 9:30	NEXT Project and Review Overview	Steve Hulbert	CR 156 - LOB5
9:30 - 9:45	Break		
9:45 - 10:30	CAM Interviews - ESM Beamline - E. Vescovo	D. Haeffner / L. Berman	Experimental Floor / CR 156 - LOB5
9:45 - 10:30	CAM Interviews - Common Beamline Systems: Utilities, Control Stations and Management - C. Stebbins, M. Bromfield	P. Wanderer / M. Cowell / K. Mirabella	Experimental Floor / CR 165 - LOB5
10:30-11:15	CAM Interviews - ISS Beamline - K. Attenkofer	D. Haeffner / L. Berman	Experimental Floor / CR 156 - LOB5
10:30-11:15	CAM Interviews - Common Beamline Systems: PPS, EPS and Management - C. Stebbins, G. Fries	P. Wanderer / M. Cowell / K. Mirabella	Experimental Floor / CR 165 - LOB5
11:15 - 12:00	CAM Interviews - ISR Beamline - C. Nelson	D. Haeffner / L. Berman	Experimental Floor / CR 156 - LOB5
11:15 - 12:00	CAM Interviews - ID & FE Installation & Testing - G. Fries	P. Wanderer / M. Cowell / K. Mirabella	CR 165 - LOB5
12:00 - 1:00	**Working Lunch (no host)**		CR 156 - LOB5
1:00 - 2:00	Tour	Review Team	Experimental Floor
2:00 - 2:45	CAM Interviews - SIX Beamline - I. Jarrige	D. Haeffner / L. Berman	Experimental Floor / CR 156 - LOB5
2:00 - 2:45	CAM Interviews - Control System - Z. Yin	P. Wanderer / M. Cowell / K. Mirabella	Experimental Floor / CR 165 - LOB5
2:45 - 3:30	CAM Interviews - SMI Beamline - E. DiMasi	D. Haeffner / L. Berman	Experimental Floor / CR 156 - LOB5
2:45 - 3:30	CAM Interviews - EPUs - C. Kitegi, T. Tanabe	P. Wanderer / M. Cowell / K. Mirabella	CR 165 - LOB5
3:30-4:00	CAM Interviews - FXI Beamline - W. Lee	D. Haeffner / L. Berman	Experimental Floor / CR 156 - LOB5
3:30-4:00	CAM Interviews - Project Management and Support - S. Hulbert	P. Wanderer / M. Cowell / K. Mirabella	CR 165 - LOB5
4:00-5:00	Team Meeting	Review Team	CR 156 - LOB5
	Adjourn		

Tuesday, February 28, 2017

Time	*Subject*	*Name*	*Location*
8:00 - 8:30	Executive Session	Review Team	CR 156 - LOB5
8:30 - 9:30	Questions/ Follow-up	Review Team	CR 156 - LOB5
9:30 - 11:00	Executive Session - Prepare Outbrief	Review Team	CR 156 - LOB5
11:00 - 12:00	Out-Brief	Review Team	CR 156 - LOB5
12:00 - 1:00	**Lunch (no host)**		
1:00 - 3:00	Report Writing	Review Team	CR 156 - LOB5
3:00 - 5:00	Compile Finalize Report	Review Team	CR 156 - LOB5

Interviews: Summary View

Team:	D. Haeffner / L. Berman	P. Wanderer / M. Cowell / K. Mirabella
Room:	CR 156 - LOB5	CR 165 - LOB5

Time	CAM(s)	CAM(s)
9:45 - 10:30	Vescovo (2.05, 2.02.04)	Stebbins (2.03, 2.03.05), Bromfield (2.03.01, 2.03.04)
10:30 - 11:15	Attenkofer (2.08, 2.02.07)	Stebbins (2.03, 2.03.05), Fries (2.03.02, 2.03.03)
11:15 - 12:00	Nelson (2.07, 2.02.06)	Fries (2.12)
2:00 - 2:45	Jarrige (2.09, 2.02.08)	Yin (2.04)
2:45 - 3:30	Dimasi (2.10, 2.02.09)	Kitegi, Tanabe (2.11)
3:30 - 4:00	Lee (2.06, 2.02.05)	Hulbert (2.01, 2.02.02)

R. Caradonna, C. Kwok 'float'
M. Cowell, K. Mirabella, K. Williams 'float' as desired

"In-tunnel" walk-down planned at in-brief (2/14)

CONTROL ACCOUNT EAC by CAM

Cost type	EAC

Sum of Cost	Org	CAM											
	Accelerator Division		Photon Science Division									Project Mana	Grand Total
WBS	Fries	Kitegi	Attenkofer	Bromfield	Dimasi	Jarrige	Lee	Nelson	Stebbins	Vescovo	Yin	Hulbert	
2.01.01 Project Management												4,237,558	4,237,558
2.01.02 Project Support												6,600,949	6,600,949
2.02.02 Conceptual Design and Analysis of Photon Delivery Systems												849,881	849,881
2.02.04 ESM Advanced Conceptual Design										101,376			101,376
2.02.05 FXI Advanced Conceptual Design							120,634						120,634
2.02.06 ISR Advanced Conceptual Design								210,700					210,700
2.02.07 ISS Advanced Conceptual Design			163,508										163,508
2.02.08 SIX Advanced Conceptual Design						179,533							179,533
2.02.09 SMI Advanced Conceptual Design					181,684								181,684
2.03.01 Utilities				4,389,631									4,389,631
2.03.02 Personnel Protection System (PPS)	2,356,497												2,356,497
2.03.03 Equipment Protection System (EPS)	949,559												949,559
2.03.04 Control Station				223,470									223,470
2.03.05 Common Beamline Systems Management									612,566				612,566
2.04.01 Control System Management											257,792		257,792
2.04.02 Control System Design & Implementation											3,364,195		3,364,195
2.04.03 Control System Equipment											1,350,562		1,350,562
2.05.01 ESM Management										474,027			474,027
2.05.02 ESM Beamline Systems										9,702,213			9,702,213
2.06.01 FXI Management							470,908						470,908
2.06.02 FXI Beamline Systems							1,322,516						1,322,516
2.07.01 ISR Management								1,034,389					1,034,389
2.07.02 ISR Beamline Systems								9,489,712					9,489,712
2.08.01 ISS Management			681,035										681,035
2.08.02 ISS Beamline Systems			10,555,409										10,555,409
2.09.01 SIX Management						772,555							772,555
2.09.02 SIX Beamline Systems						12,748,874							12,748,874
2.10.01 SMI Management					708,626								708,626
2.10.02 SMI Beamline Systems					8,820,014								8,820,014
2.11.01 ESM EPU Insertion Device		4,398,606											4,398,606
2.11.02 SIX EPU Insertion Device		70,375											70,375
2.11.03 Insertion Devices Management		96,272											96,272
2.12.01 ID & FE Installation & Testing Manage	20,739												20,739
2.12.02 ID Installation & Testing	584,560												584,560
2.12.03 FE Installation & Testing	847,660												847,660
Grand Total	4,759,015	4,565,253	11,399,952	4,613,101	9,710,324	13,700,962	1,914,058	10,734,801	612,566	10,277,616	4,972,549	11,688,388	88,948,585

BIOS OF REVIEW TEAM MEMBERS

Lonny Berman
Lonny Berman has worked at Brookhaven National Laboratory for 29 years. He joined the NSLS in 1987 and led the construction and operation of the X25 x-ray diffraction beamline. He became leader of the Beamline Development Group in 2007 and participated in a number of beamline construction and renovation activities at NSLS. More recently he has contributed to the designs of NSLS-II beamlines and, since 2013, has managed the ABBIX (Advanced Beamlines for Biological Investigations of X-rays) Project. He holds a BA (Physics), and MS and Ph.D. (Applied Physics) degrees from Cornell University.

Robert Caradonna
Robert has been a Federal Project Director with the DOE Brookhaven Site Office for eight years managing DOE-funded projects and has been in Federal service as a Project Manager for 24 years. Robert graduated from Clarkson University with a Civil & Environmental Engineering Degree and holds a NYS Registered Professional Engineer (PE) license and Project Management Professional (PMP) certification.

Michael Cowell
Michael Cowell has worked on Defense, FAA and DOE projects for over 30 years. While at Brookhaven National Laboratory, she has served in a variety of business, project management and operations positions supporting both scientific and environmental programs. She currently is the Directorate Chief Operating Officer for the Energy and Photon Sciences Directorate. Michael received her undergraduate degree in Biology from the University of Central Florida, an MBA from Dowling College and an MS from the New York Institute of Technology. She also holds a PMP from the Project Management Institute.

Dean Haeffner
Dean has worked at Argonne National Laboratory for 26 years. He was a principal scientist for the Advanced Photon Source (APS) High-Energy X-ray Scattering Program from 1992-2005, Lead Scientist for the APS 1-ID Beamline from 1993-2009, and Group Leader for the APS X-ray Physics Group from 1999-2005. Since 2009 he has been an Associate Project Manager for the APS-U Project in charge of Experimental Facilities (i.e., beamlines) for that project. He has a BS (Mechanical Engineering) from the University of Nebraska and a Ph.D. (Materials Science and Engineering) from Northwestern University.

Kerry Mirabella
Kerry has worked for a total of 37 years in DOD and DOE projects; 17 of those in the Collider-Accelerator Department (C-AD) at Brookhaven National Laboratory in Configuration Management and Project Controls. She is currently the Manager of Upgrade Support in the Accelerator Division, but also has roles with the Accelerator Test Facility upgrade (ATF-II) and eRHIC R&D. Kerry received her Bachelor of Business Administration degree from Dowling College, and her Master's in Business Administration at Adelphi University. She has also been an Adjunct Professor of Mathematics at Dowling, and holds a PMP from the Project Management Institute.

Peter Wanderer
Peter Wanderer is Head of the Superconducting Magnet Division at Brookhaven National Laboratory. He has been working on superconducting magnets for accelerators since 1980. Initially he worked on magnets for accelerators at Brookhaven, most recently the Relativistic Heavy Ion Collider. He has also worked on magnets for the Superconducting Super Collider in Texas and the Large Hadron Collider at CERN. During the SSC and RHIC projects, he was head of the Magnet Test Group. For the last twelve years, he has joined with colleagues at Fermilab, Berkeley, and SLAC in the development of Nb_3Sn-based magnets for an upgrade of the Large Hadron Collider.

He was awarded a Ph.D. in Elementary Particle Physics by Yale University in 1970. He joined the staff of Brookhaven National Laboratory in 1975, following postdoctoral positions at Cornell University and the University of Wisconsin.

He has served on review committees for Lawrence Berkeley National Laboratory, Fermi National Laboratory, Cornell University, and Texas A&M University. He has served on the Program Committees for the International Conference on Magnet Technology, for the Particle Accelerator Conference, and for the Applied Superconductivity Conference. He is a member of the American Physical Society and a Senior Member of the Institute of Electrical and Electronics Engineers.

Khianne Williams
Khianne has worked at BNL for two years in the Project Controls Group for the Collider-Accelerator Department. Prior to BNL, she had worked in construction and project administration for private industry for over eight years. She holds a Master's degree in Civil Engineering from New Jersey Institute of Technology and an undergraduate degree in Architecture and Environmental Design from Morgan State University. She also holds a CAPM from the Project Management Institute.

NEXT Project Overview

Steve Hulbert
NEXT Beamline Project Manager
NEXT Scope Verification review
February 27, 2017

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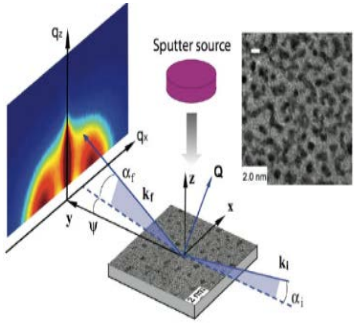
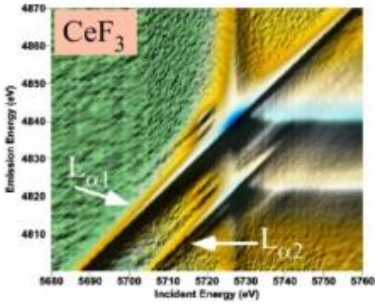
BROOKHAVEN SCIENCE ASSOCIATES

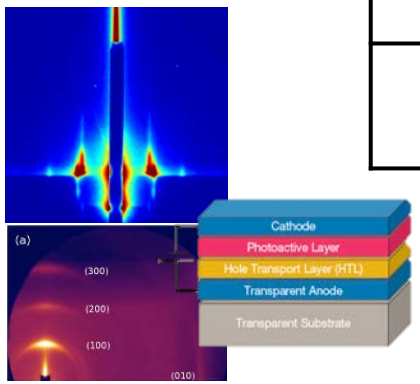
Outline

- NEXT Overview
- First Light, Flux KPPs
- Transition to Operations
- Key Performance Parameters
- Installations
  - Insertion Devices
  - Beamlines (Photon Delivery Systems, Endstations)
- Milestones to Completion

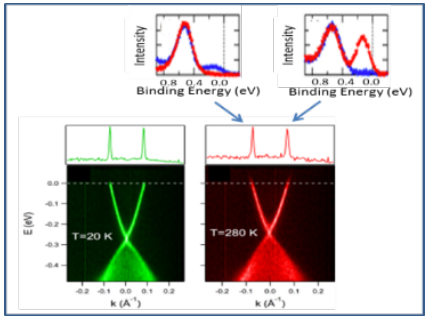
NSLS-II Experimental Tools (NEXT) Beamlines
DOE-BES funded $90M MIE project

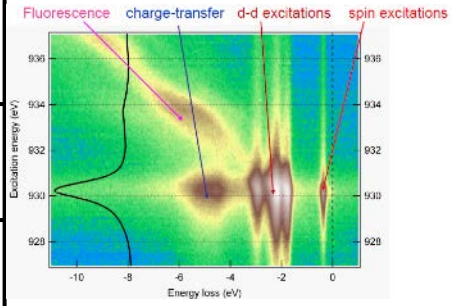


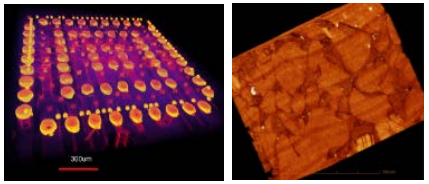




Beamline	Endstation	Energy Range (keV)	Location
ESM	μ-ARPES	0.015–1.5	21-ID
ISR	6-circle Diffractometer	2.4–23	4-ID
ISS	X-ray Emission, X-ray Absorption	4.9–36	8-ID
SIX	Inelastic Soft X-ray Scattering	0.165–2.3	2-ID
SMI	GISAXS	2.05–24 keV	12-ID
FXI *	TXM	5-11	18-ID







* FXI scope: Full Beamline Design and Construction of Shielded Enclosures (hutches)

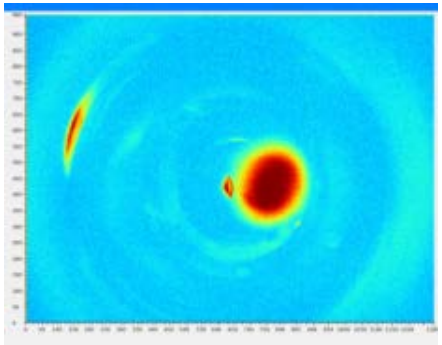
First Light, Flux KPPs

Beamline	Endstation	1st Light Date	Flux KPP Achieved
ESM	μ-ARPES	25-Jul-16	15-Aug-16
ISR	6-circle Diffractometer	11-Jul-16	8-Aug-16
ISS	X-ray Emission, X-ray Absorption	5-Apr-16	23-Jun-16
SIX	Inelastic Soft X-ray Scattering	21-Feb-17	25-Feb-17
SMI	GISAXS	7-Nov-16	3-Dec-16

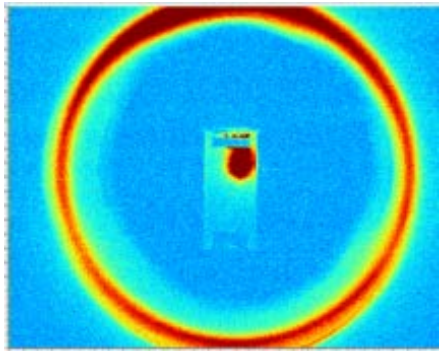
FXI *	TXM	BDN Portfolio

* FXI scope: Full Beamline Design; Construction of Shielded Enclosures (hutches)

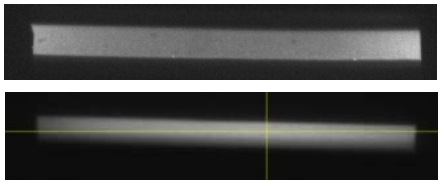
ESM



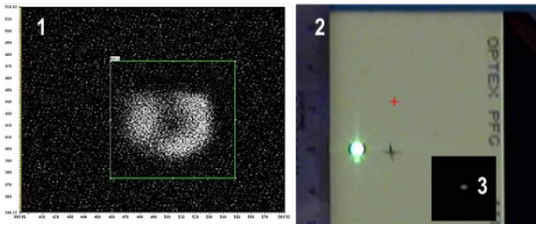
ISR



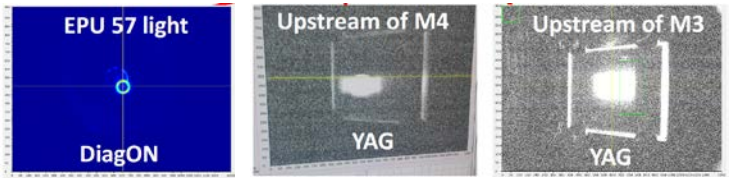
ISS



SMI



SIX



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NEXT Transition to Operations

	FE/ID IRR	Beamline IRR		Start of commissioning (first beam*)	Flux measurement KPP achieved	Endstation construction complete
ISS	Oct-15	Mar-16		Apr-16	Jun-16	Sep-16
ISR	Oct-15	Jun-16		Jul-16	Aug-16	Feb-17
ESM	Jun-16	Jun-16		Jul-16	Aug-16	Sep-16
SMI	Feb-16	Oct-16	Nov-16	Nov-16	Dec-16	Mar-17
SIX	Oct-16	Nov-16	Feb-17	Feb-17	Feb-17	May-17

* Verification of beamline flux KPPs starts; Labor charges to NSLS-II operations begin

- All 5 NEXT beamlines have started commissioning with beam
  - Objective KPP value measured at all 5 beamlines
- After 1st light:
  - Technical commissioning (ISR, ESM, SMI, SIX)
  - User operations (ISS)

NEXT Key Performance Parameters

Performance Measure	Threshold KPP	Objective KPP
Number of beamlines designed	6	6
Number of beamlines installed and ready for commissioning with x-ray beam	5	6
Number of photon delivery system branches installed* and accepted** by NSLS-II facility operations	5	6
Number of endstations installed* and accepted** by NSLS-II facility operations	5	7
Synchrotron flux value measured at an endstation position of ESM	10^{10} photons/s	10^{11} photons/s
Synchrotron flux value measured at an endstation position of ISR	2×10^{11} photons/s	2×10^{12} photons/s
Synchrotron flux value measured at an endstation position of ISS	2×10^{12} photons/s	2×10^{13} photons/s
Synchrotron flux value measured at an endstation position of SIX	1.5×10^{10} photons/s	1.5×10^{11} photons/s
Synchrotron flux value measured at an endstation position of SMI	10^{12} photons/s	10^{13} photons/s
On-axis spectral angular intensity capability at 1 keV for a delivered EPU insertion device (photons/sec/0.1% bw/mrad^2)	2×10^{17}	8×10^{17}

KPP achieved

* Status end of Feb-17

- 5 photon delivery systems installed and in service
- Endstations installed for 3 beamlines (ISS, ESM, ISR)

** Acceptance memos from Photon Science Division head to be received

EPU57 Insertion Devices (ESM, SIX)

ESM EPU57 installed at 21-ID in ring tunnel

SIX EPU57 and Front End installed at 2-ID in ring tunnel

EPU105 Insertion Device (ESM)

EPU105 (2.8m) ready for installation in 21-ID straight section (for ESM)

NSLS-II Insertion Device Group in Magnetic Measurements Laboratory

EPU105 installed in 21-ID straight section, downstream of existing EPU57

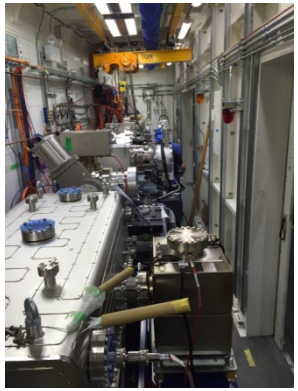
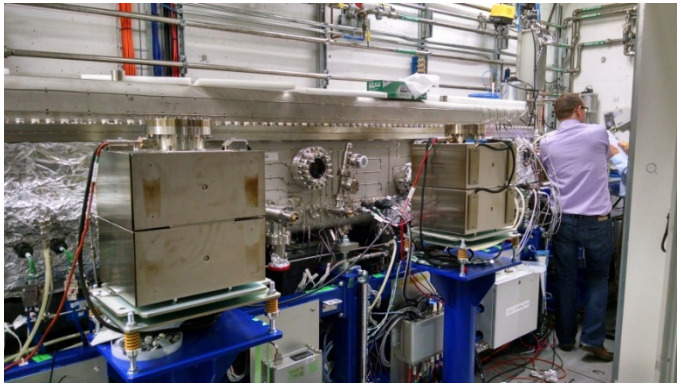
- 15-Dec-16: ESM EPU105 ready for installation (NEXT scope complete)
- 21-Dec-16: ESM EPU105 installed in 21-ID straight section
- All ID & FE scope for NEXT is complete

FXI Hutches

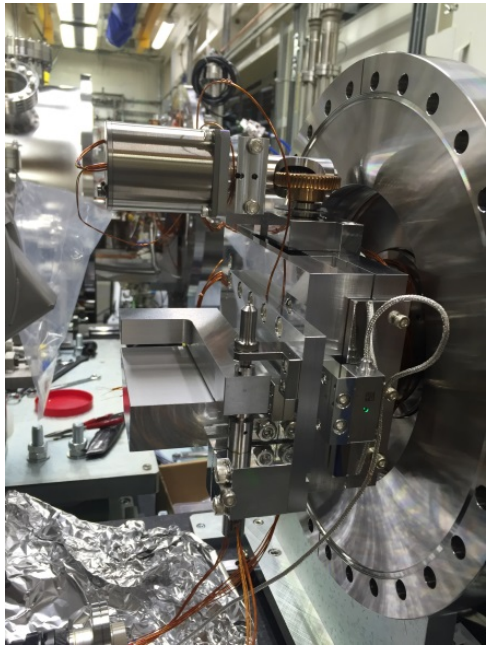
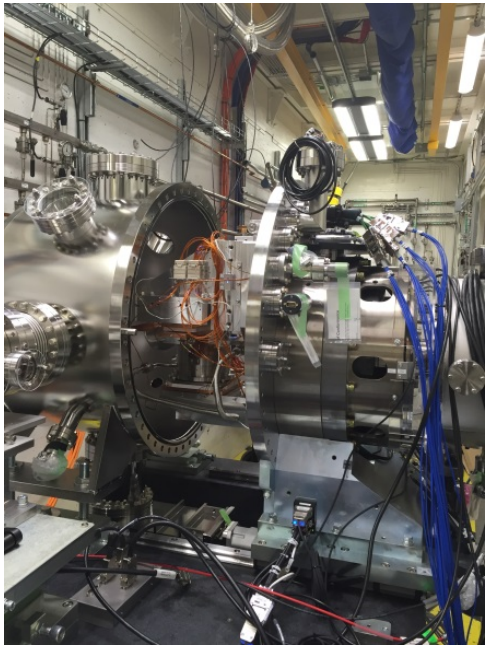
FXI FOE (hutch 18-ID-A)

FXI endstation hutch (18-ID-B)

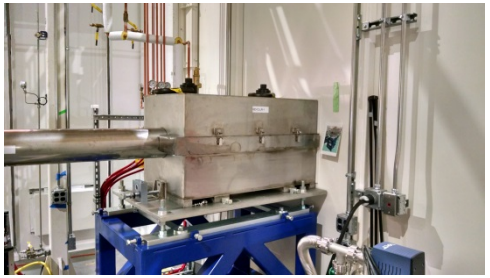
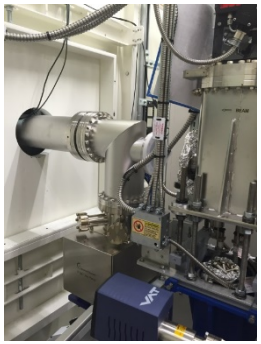
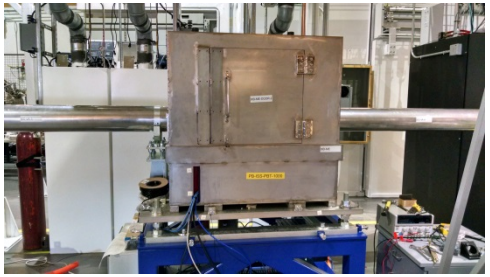
ISS Photon Delivery System

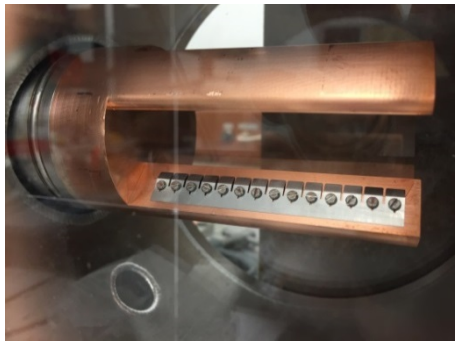
High Heatload & Collimation Mirrors

High Heatload Monochromator

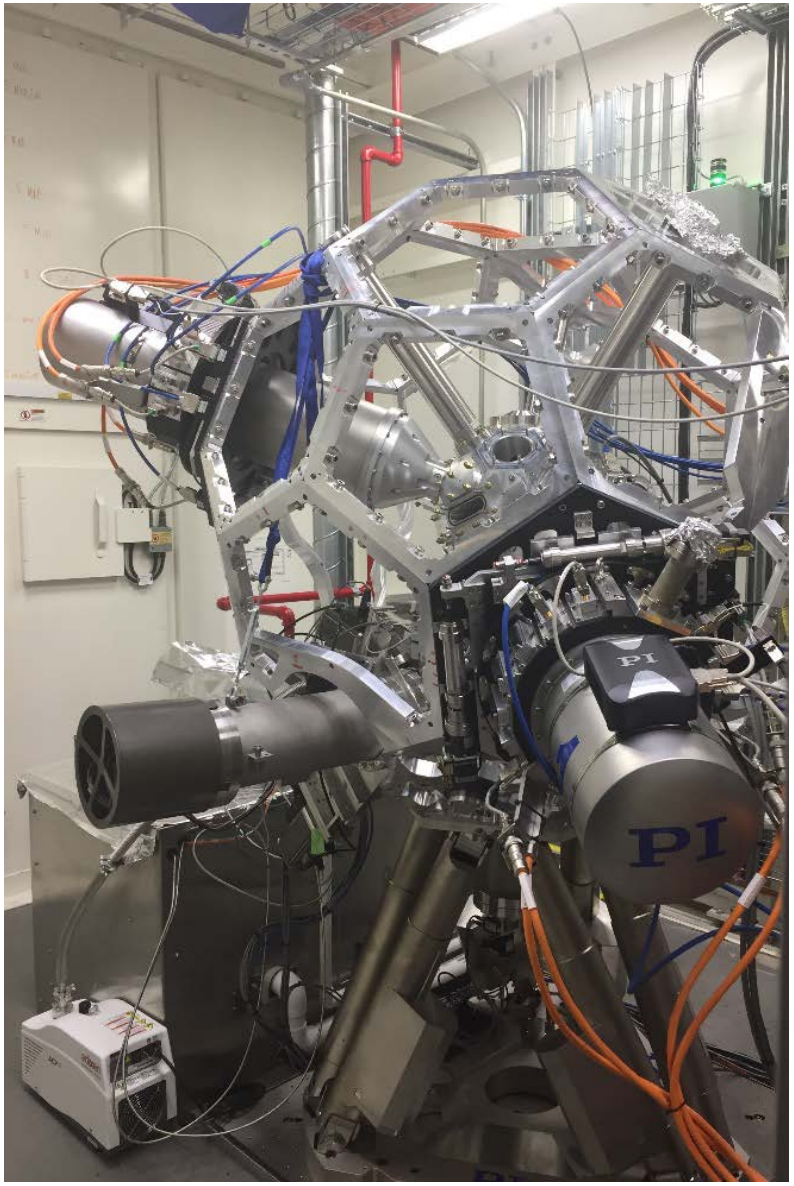




Shielded beam transport



Diamond BPM screen

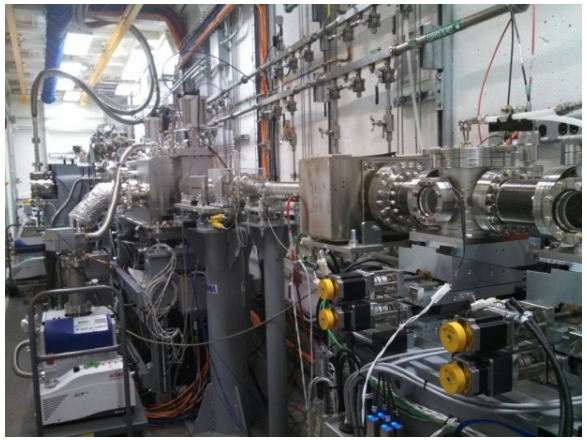
ISS Endstation



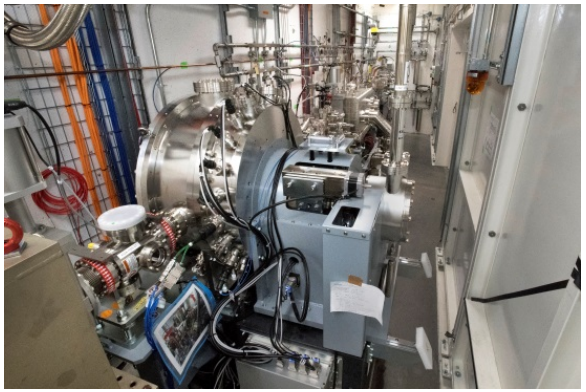
Gas Handling System

ISS endstation with two Von Hamos XES spectrometers (PI) installed. The remaining 16 ports will be outfitted with spectroscopy detectors (integrating PIN diodes and silicon drift diodes) or other (future) types of spectrometers such as the spherical backscattering analyzer type.

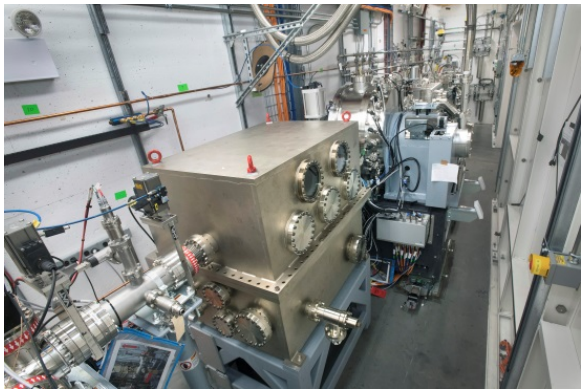
ISR Photon Delivery System



White Beam Components (FOE)



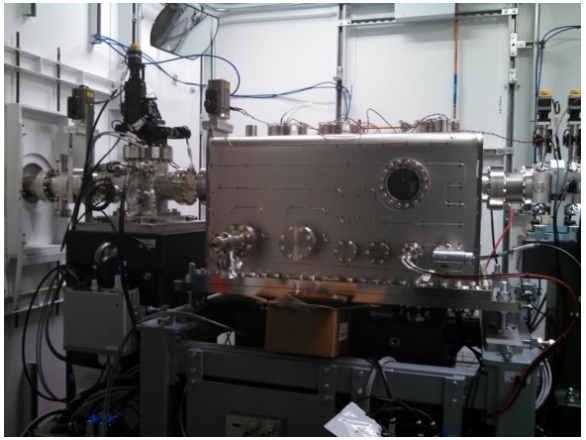
Double Crystal Monochromator



Dual Phase Plate Assembly

VFM, visual beam diagnostic, bremsstrahlung stop, and photon shutter (FOE)

DCM Cryocooler and phase separator (on mezzanine)



Diamond beam position monitor, DHRM, and secondary source aperture (SOE)

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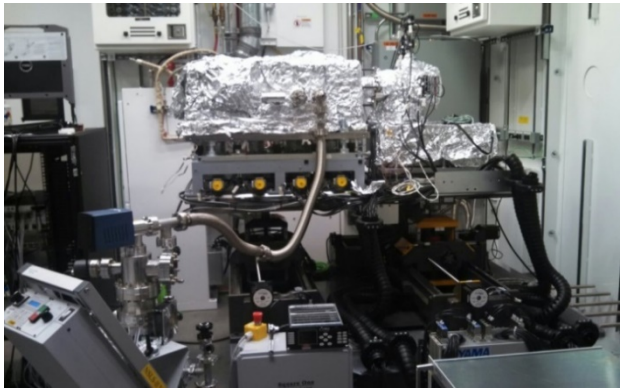
ISR Endstations

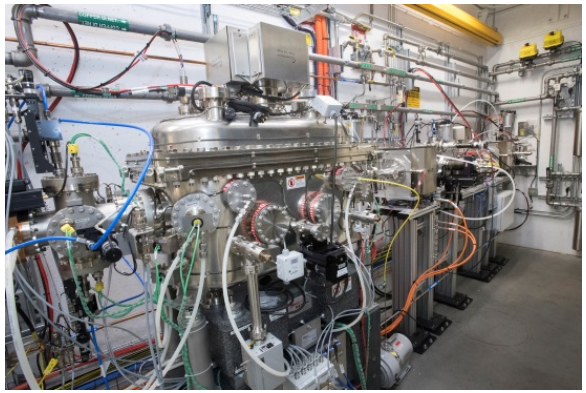
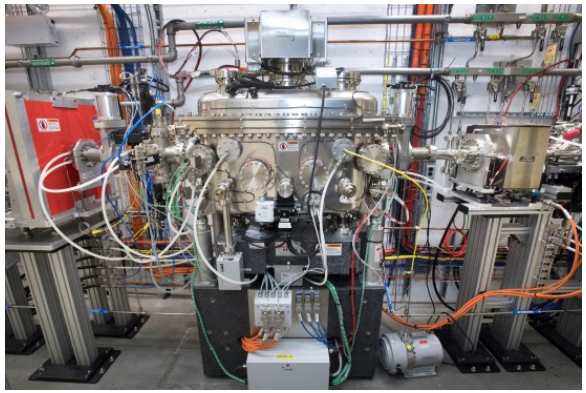
ISR Instrumented 6-Circle Diffractometer (4-ID-C)



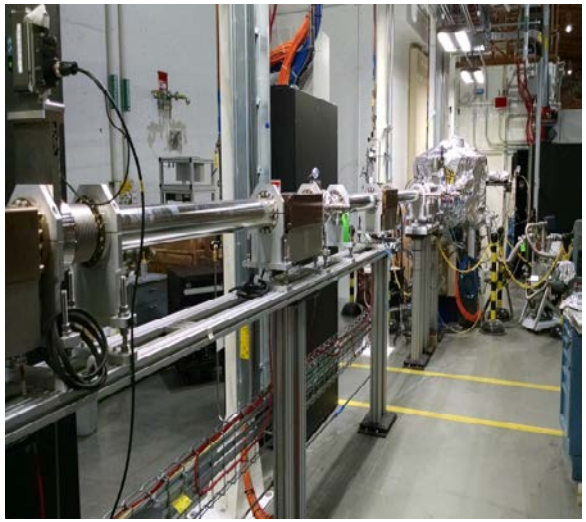
KB focusing mirror chamber (4-ID-D)

Gas Handling System (4-ID-D)

ESM Photon Delivery System

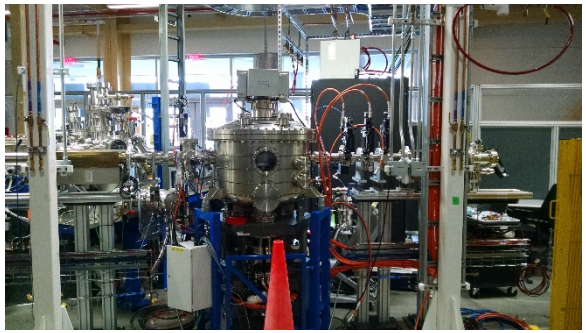



White beam components, M1 mirror, shielding (FOE)



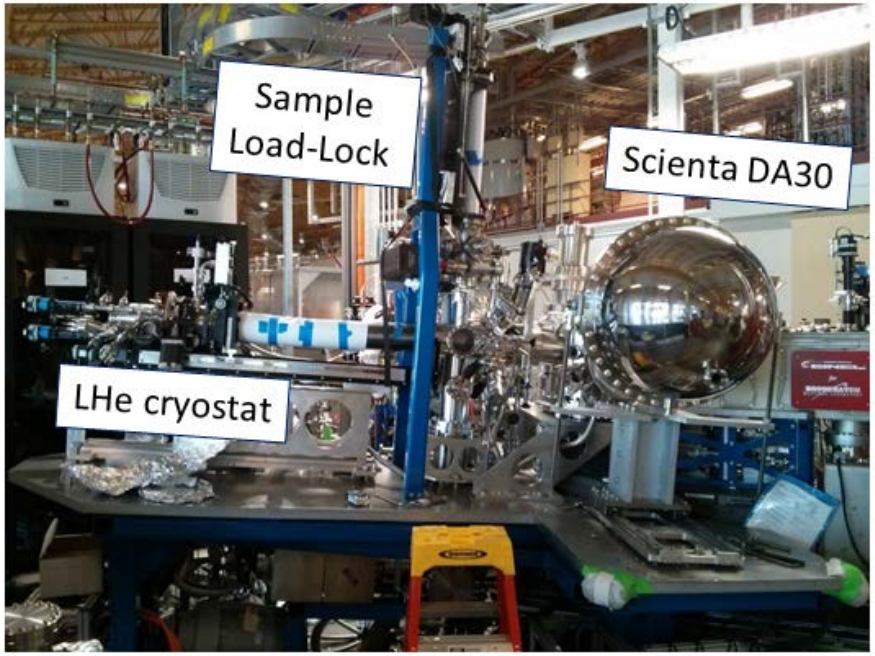
PGM, transport downstream of FOE

Exit slits, refocusing mirrors

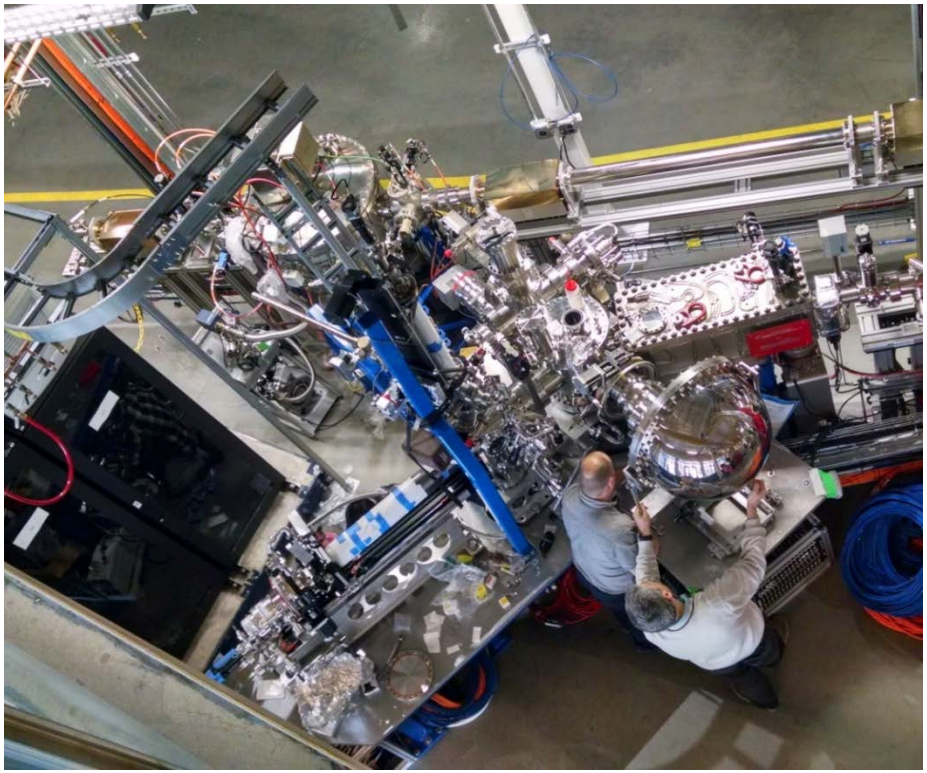


M4 mirror, inboard branch

ESM µARPES Endstation

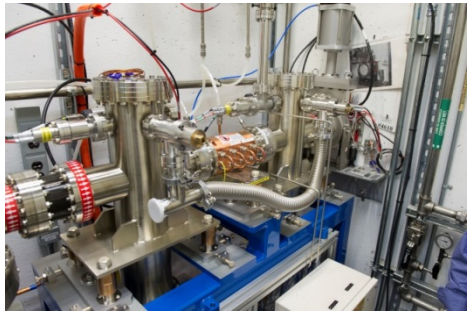


µARPES endstation. The main components of the system are the electron energy analyzer (Scienta DA30), the LHe cryostat, and the sample load-lock system.

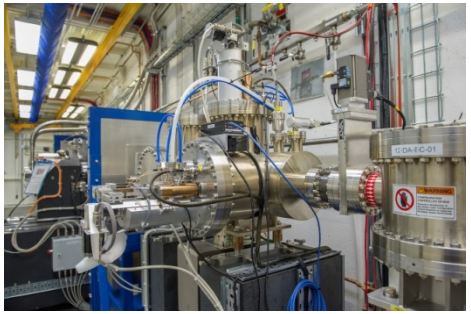


Top view of KB focusing mirror chmber and µARPES endstation.

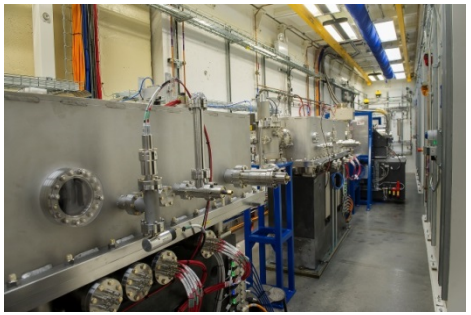
SMI Photon Delivery System



White beam components (FOE)

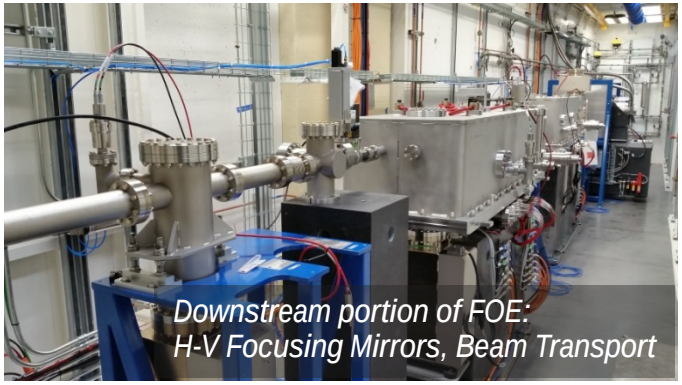


Mono (FOE)



H-V Mirrors

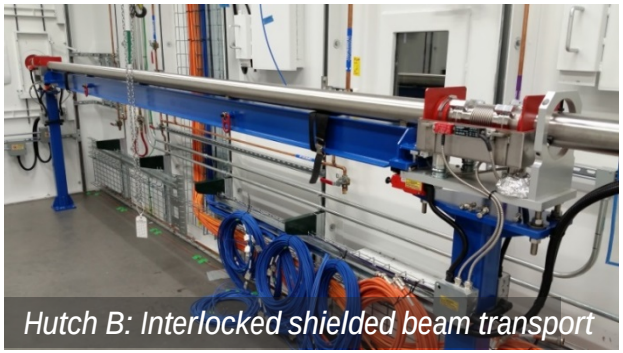
Upstream portion of FOE:
PPS aperture, gas handling system



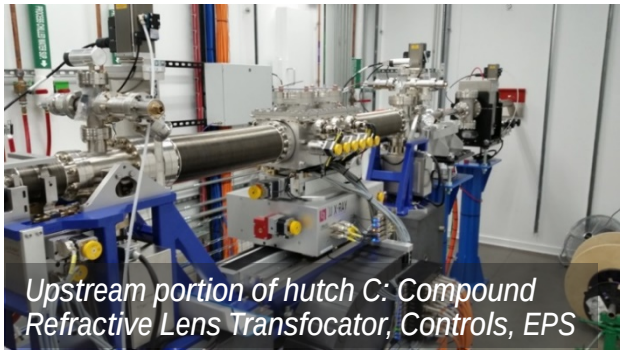
Downstream portion of FOE:
H-V Focusing Mirrors, Beam Transport

Secondary Source Aperture (12-ID-B-1)

SMI Endstations

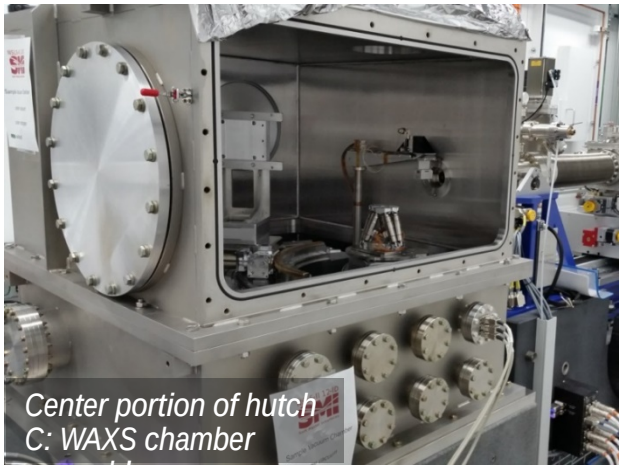


Hutch B: Interlocked shielded beam transport



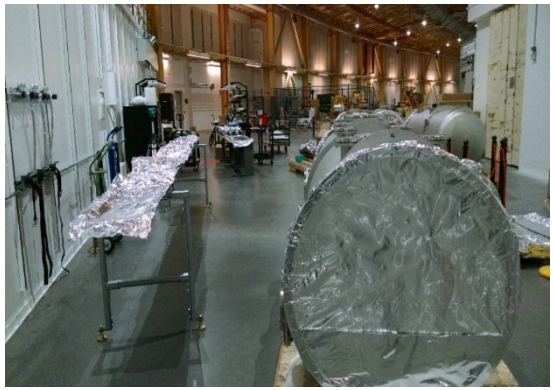
Upstream portion of hutch C: Compound Refractive Lens Transfocator, Controls, EPS

SAXS Beam Chamber



Center portion of hutch C: WAXS chamber

WAXS chamber close-up: bounce-down mirror, hexapods, goniometer, detector mounting bracket



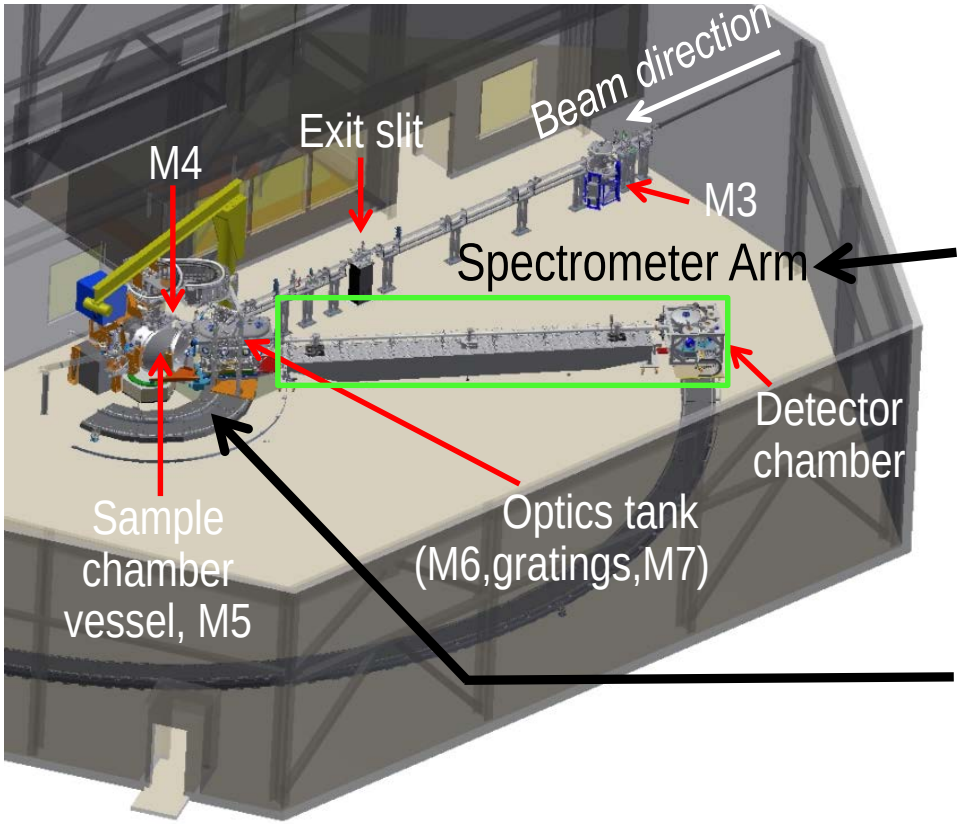
Cable assembly area near 12-ID-C

SIX Photon Delivery System

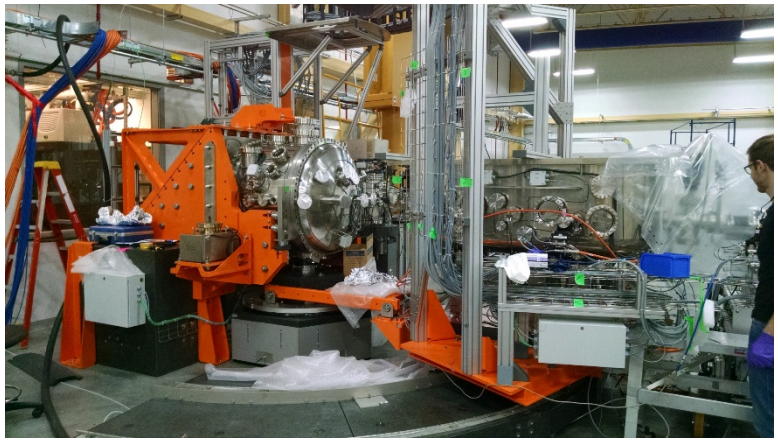
FOE, PGM, on NSLS-II
Experimental floor

M3 through M4 (in SEB-II)

SIX endstation construction progress



15-m Spectrometer Arm



Sample Chamber, Optics Tank

- Sample Chamber & Spectrometer Arm in place
- Optics installation & cabling well underway
- Installation to complete in March, except:
  - TRF, Cryostat B Manipulator

NEXT Milestones to Completion

NEXT Milestones to Completion (26-Feb-17)		Planned	Actual	Projected
Common	PPS installation complete	30-Sep-16	16-Dec-16	
	EPS installation complete	30-Sep-16	21-Feb-17	
	All Common Beamline Systems Complete	30-Jan-17		31-Mar-17
Control Systems	Beamline Control Systems Complete	14-Sep-16		10-Mar-17
ESM	Receipt & acceptance of electron energy analyzer software	Sep-16	15-Dec-16	
	Receipt & acceptance of M4 mirror	Oct-16		31-Mar-17
ISR	Receipt & installation of Dual Phase Plate Assembly	Oct-16	11-Nov-16	
	Receipt, metrology/acceptance, & installation of KB mirrors	Nov-16	21-Dec-16	
	Receipt & installation of 6-circle diffractometer	Nov-16	8-Feb-17	
SIX	Receipt & installation of upgraded shielding components	16-Jan-17	17-Jan-17	
	Complete PDS IRR	10-Jan-17	15-Feb-17	
	Take first light, begin commissioning with beam	15-Jan-17	21-Feb-17	
	Achieve flux KPP	30-Jan-17	25-Feb-17	
	Receipt & acceptance of M4 mirror	Oct-16		31-Mar-17
	Receipt & installation of spectrometer detector arm	30-Sep-16	15-Dec-16	
	Endstation: Receipt & acceptance of M6 mirror	Dec-16	15-Feb-17	
	Receipt & installation of sample chamber & spectrometer optics tank	30-Sep-16		10-Mar-17
	Receipt acceptance of 5th (last) grating	30-Dec-16	14-Jan-17	
	Installation of spectrometer optics (M5, M6, grating, M7)	30-Jan-17		3-Mar-17
	Endstation: Receipt of cryostat B manipulator	30-Jan-17		31-Mar-17
	Endstation: receipt of vacuum manifold	30-Jan-17	3-Feb-17	
	Endstation: Receipt & acceptance of Triple Rotating Flange	30-Jan-17		19-May-17
	Misc. items: sample holder parts	Various		21-Mar-17
SMI	Assembly & testing of WAXS positioning system	Oct-16	30-Jan-17	
	SAXS chamber mechanics: Final design completion & issuance of procurements/shops jobs	Oct-16	12-Dec-16	
	Procurement/fabrication of SAXS table components	Dec-16		15-Mar-17
	Assembly & installation of SAXS beam chamber components	Jan-17		31-Mar-17
IDs	Shimming & correction of ESM EPU105, ready for installation (final ID for NEXT)	15-Dec-16	15-Dec-16	
	Early Project Completion	31-Jan-17		19-May-17

Achieved

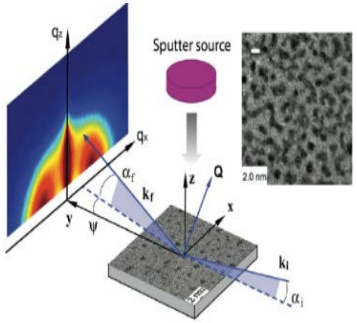
NEXT Scope Verification - Overview

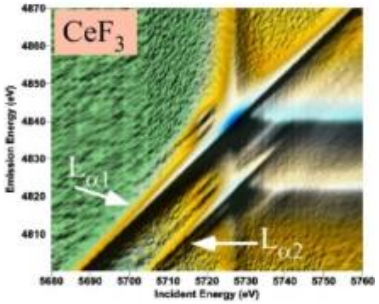
Jeff Keister
NEXT Project Deputy Project Manager
NEXT Scope Verification Overview
February 27, 2017

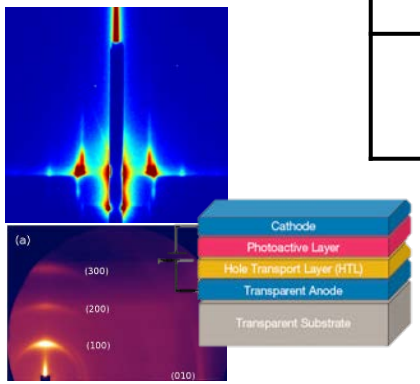
U.S. DEPARTMENT OF ENERGY | Office of Science
BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES

NSLS-II Experimental Tools (NEXT) Beamlines

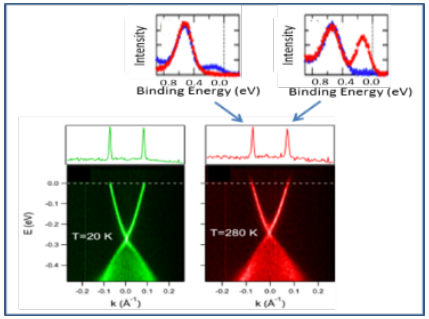
DOE-BES funded $90M MIE project

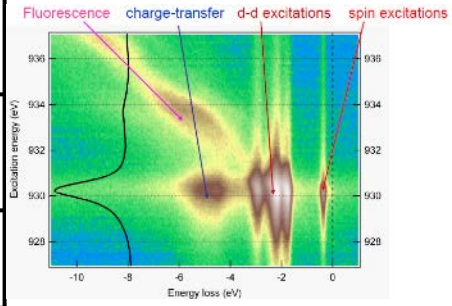


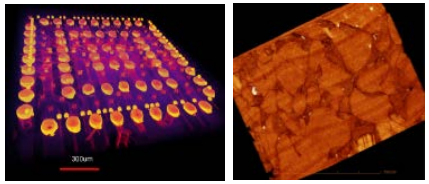




Beamline	Endstation	Energy Range (keV)	Location
ESM	μ-ARPES	0.015–1.5	21-ID
ISR	6-circle Diffractometer	2.4–23	4-ID
ISS	X-ray Emission, X-ray Absorption	4.9–36	8-ID
SIX	Inelastic Soft X-ray Scattering	0.165–2.3	2-ID
SMI	GISAXS	2.05–24 keV	12-ID
FXI *	TXM	5-11	18-ID







* FXI scope: Full Beamline Design and Construction of Shielded Enclosures (hutches)

Supporting scope includes Common Systems, Controls, EPUs, FE/ID installation, and Project Management

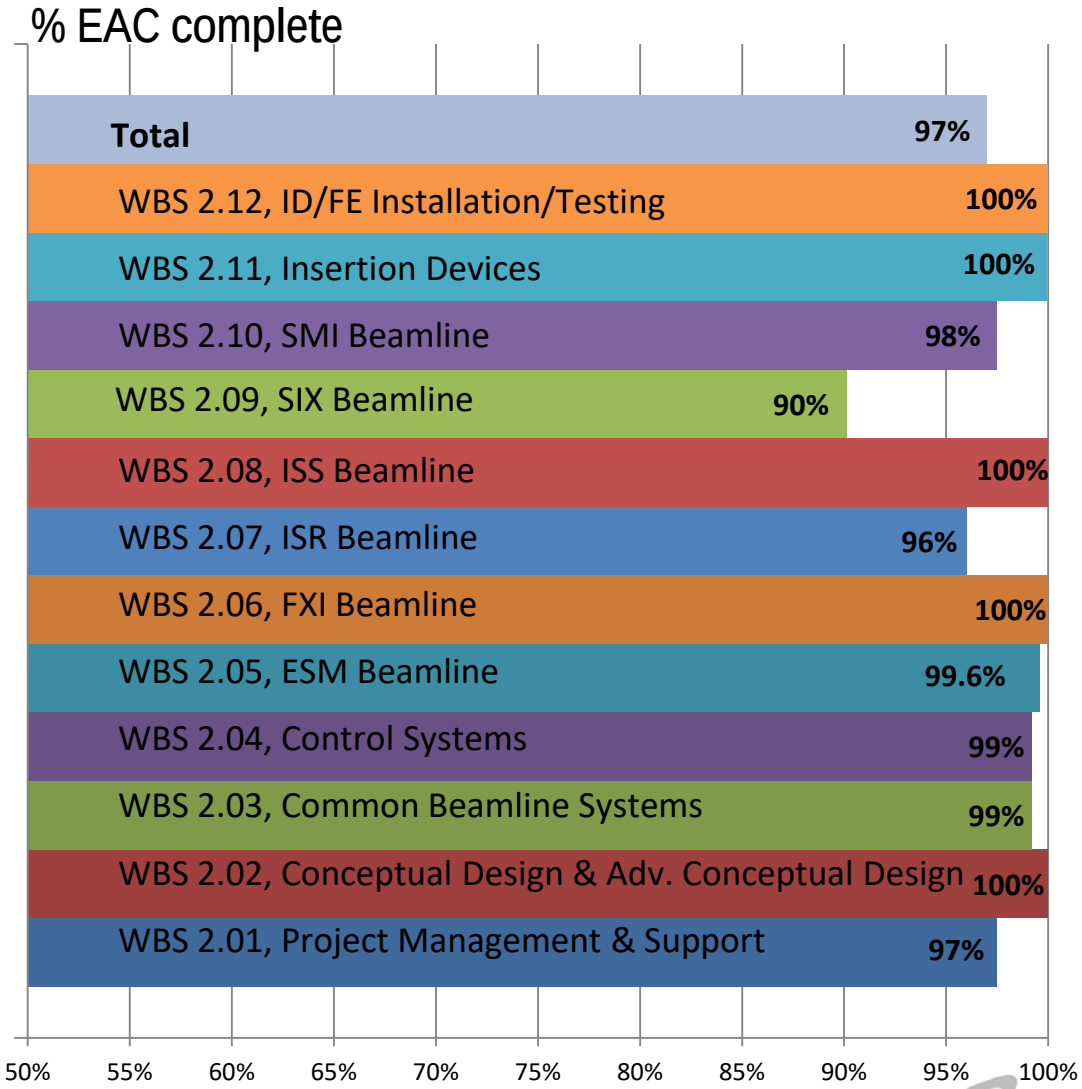
NEXT Project Status Overview

- All Accelerator Scope and Photon Delivery Systems Installed
- First light and Flux KPP's attained for 5 of 5 beamlines
- Endstations Complete for ISS and ESM
- Ongoing project work:
  - Completion of Photon Delivery scope for ESM & SIX (M4 mirrors)
  - Completion of endstation installation for ISR, SMI, and SIX
- Project Completion and Close-out

Project Completion Status

December 2016 Summary

- BAC = $83.0M; EAC = $88.9M
- 97.3% complete (BCWP/BAC)
  SPI_{cum} = 0.98, CPI_{cum} = 0.93
- 97.2% complete (ACWP/EAC)
- ETC = $2.54M
- Contingency $1.07M (39% of ETC)



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	Early Project Completion	31-Jan-17		19-May-17

Achieved

Closeout Requirements

Requirement	Status/Comments
• Verify achievement of KPP's	• **Scope verification** and KPP memos
• Readiness to Operate review	• IRRs and Operations Approval
• Transition to Operations Plan	• By reference to existing documents
• Conduct an IPR	• OPA – *April 18-19, 2017*
• Finalize HAR	• Complete
• Revise EMS	• NEPA exclusion for NEXT in place
• Draft Project Closeout Report	• *Draft in Progress*
• Finalize in PARS II	• FPD w/Project support
• Final administrative closeout	• Detail planning under way
• Lessons Learned Document	• Draft prepared – finalize after CD-4
• Final Project Closeout Report	• FPD w/Project support

- Blue bullets Prior to CD-4
- Green bullets Post CD-4 and Project Closeout

Scope Verification Process

- Control Account documents distributed to CAMs
- CAMs validate delivery of scope and reconcile any WBS dictionary errors
- Validation signed by CAM and Project Manager
- Validation documents summarized at level 3 with open items identified
- Validation to be reviewed by independent team at BNL (which includes BHSO)
- Independent review presents findings to Project Manager to establish completeness of project scope
- Documentation to be available at OPA review

Scope Closeout Forms

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT
CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**12/13/16**
WBS/Control Account Number:	**2.08.02**		
Control Account Manager	**Klaus Attenkofer**	**Extension:**	**5146**
Control Account Title:	**ISS Beamline Systems**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

   NA

2. **WBS Dictionary requires the following changes:**

Acknowledgements:
I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Klaus Attenkofer	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:		**Signature:**	
Date:	01/11/2017	**Date:**	12 January 2017

- CAMs Compare the Control Account Work Authorization plan with the WBS dictionary and the actual scope attained
- CAM signs off on status
- Project manager also signs off
- NEXT has
  - 35 Control Accounts
  - 12 CAMs
- Becomes basis for independent validation
- All closeout forms are completed, with remaining items and dates identified

Scope Verification Review

- CAMs validate delivery of scope and reconcile any WBS dictionary errors
- Validation to be reviewed by independent team at BNL

Review Committee membership:

Committee Member	Assignment
Michael Cowell – BES DCOO	Committee Chair
Lonny Berman – NSLS-II	Beamlines
Dean Haeffner – ANL/APS	Beamlines
Peter Wanderer – SMD	Accelerator, Common Systems & Controls
Kerry Mirabella – C-AD	Project Management & Infrastructure
Khianne Williams – C-AD	Observer
Robert Caradonna – BHSO	DOE/BHSO observer
Cheuk Kwok – BHSO	DOE/BHSO observer

- Charge
  1. Verification Documentation: Does the documentation cover the entire scope of the NEXT project? Has the completed and as yet to be completed scope been clearly identified?
  2. Scope Verification: Through sampling of representative project scope, are the verification documentation, the WBS dictionary and the project scope itself consistent? Are there discrepancies that must be resolved to assure that the scope of the project has been fully completed?
- Committee In-brief and walkdown for WBS 2.11 and 2.12: 14 Feb 2017
- Full Committee Review (Including Walkdowns and Interviews): 27-28 Feb 2017
- Documentation to be available by 17 Mar 2017 (in support of OPA review in April)

Control Account Information

WBS Level 2	Cumulative to Date BCWS	BCWP	ACWP	BAC	SPI	CPI	completion
2.01 Project Management and Support	9,757,601	9,757,601	10,563,266	9,918,233	1.00	0.92	98.4%
2.02 Conceptual Design	1,807,316	1,807,316	1,807,316	1,807,316	1.00	1.00	100.0%
2.03 Common Beamline Systems	7,335,838	7,275,603	8,464,717	7,340,417	0.99	0.86	99.1%
2.04 Control System	4,646,250	4,640,643	4,932,002	4,648,844	1.00	0.94	99.8%
2.05 ESM Beamline	9,422,464	9,350,687	10,132,222	9,422,464	0.99	0.92	99.2%
2.06 FXI Beamline	1,818,324	1,818,324	1,793,424	1,818,324	1.00	1.01	100.0%
2.07 ISR Beamline	10,390,306	9,962,319	10,106,913	10,392,425	0.96	0.99	95.9%
2.08 ISS Beamline	10,470,092	10,470,092	11,236,444	10,472,212	1.00	0.93	100.0%
2.09 SIX Beamline	11,762,716	10,467,690	12,186,994	11,764,836	0.89	0.86	89.0%
2.10 SMI Beamline	9,124,718	8,973,069	9,291,332	9,126,837	0.98	0.97	98.3%
2.11 ESM and SIX Insertion Devices	4,803,273	4,770,234	4,563,262	4,805,392	0.99	1.05	99.3%
2.12 ID & FE Installation & Testing	1,452,816	1,452,816	1,452,959	1,452,816	1.00	1.00	100.0%
TOTAL	82,791,714	80,746,394	86,530,851	82,970,116	0.98	0.93	97.3%

- 35 Control Accounts (Level 3)
- 12 CAMs – see RAM
- Some alternative or additional CAM representatives

CAM	Alternate / Additional
M. Bromfield	C. Stebbins (Level 2 CAM for 2.03)
G. Fries	C. Stebbins (Level 2 CAM for 2.03)
C. Kitegi	T. Tanabe

CAM List

CAM	CA's
S. Hulbert	3
C. Stebbins	1
M. Bromfield	2
G. Fries	5
Z. Yin	3
E. Vescovo	3
W. Lee	3
C. Nelson	3
K. Attenkofer	3
I. Jarrige	3
E. Dimasi	3
C. Kitegi	3

- Total of 12 CAMS on NEXT
- All are available for Interview
- Interviews will be mix of walkdowns and looking at closeout packages / back-up documentation
- See RAM for CA assignments
- See WBS Dictionary for scope description

Control Accounts - Status

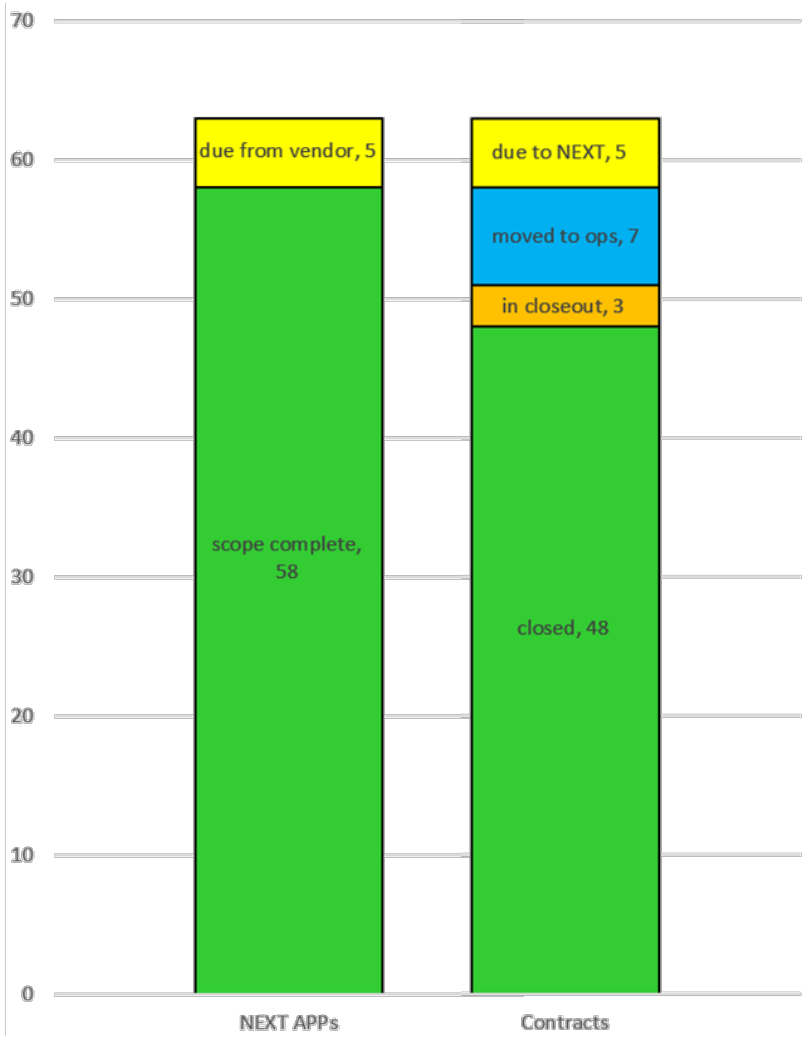
L3 WBS Number	Proj/Act #	WBS Description	CAM	Cost Account status
2.01.01	50178	NEXT Project Management	Hulbert	OPEN & active
2.01.02	50179	NEXT Project Support	Hulbert	OPEN & active
2.02.02	12553	NEXT Optical Design and Analysis	Hulbert	closed
2.02.04	12567	NEXT ESM Advanced Conceptual Design	Vescovo	closed
2.02.05	12568	NEXT FXI Advanced Conceptual Design	Lee	closed
2.02.06	12569	NEXT ISR Advanced Conceptual Design	Nelson	closed
2.02.07	12570	NEXT ISS Advanced Conceptual Design	Attenkofer	closed
2.02.08	12571	NEXT SIX Advanced Conceptual Design	Jarrige	closed
2.02.09	12561	NEXT SMI Advanced Conceptual Design	Dimasi	closed
2.03.01	50181	NEXT Utilities	Bromfield	OPEN & active
2.03.02	50182	NEXT Personnel Protection System (PPS)	Fries	closure upcoming
2.03.03	50183	NEXT Equipment Protection System (EPS)	Fries	closure in progress
2.03.04	50185	NEXT Control Station	Bromfield	closure upcoming
2.03.05	50202	NEXT Common Beamline Systems Management	Stebbins	OPEN & active
2.04.01	50186	NEXT Control System Management	Yin	closure upcoming
2.04.02	50187	NEXT Control System Design & Implementation	Yin	OPEN & active
2.04.03	50188	NEXT Control System Equipment	Yin	closure upcoming
2.05.01	50189	NEXT ESM Beamline Management	Vescovo	closure in progress
2.05.02	50190	NEXT ESM Beamline Systems	Vescovo	OPEN & active
2.06.01	50191	NEXT FXI Beamline Management	Lee	closed
2.06.02	50192	NEXT FXI Beamline Systems	Lee	closed
2.07.01	50193	NEXT ISR Beamline Management	Nelson	closure in progress
2.07.02	50194	NEXT ISR Beamline Systems	Nelson	OPEN & active
2.08.01	50195	NEXT ISS Beamline Management	Attenkofer	closed
2.08.02	50196	NEXT ISS Beamline Systems	Attenkofer	closed
2.09.01	50197	NEXT SIX Beamline Management	Jarrige	closure upcoming
2.09.02	50198	NEXT SIX Beamline Systems	Jarrige	OPEN & active
2.10.01	50199	NEXT SMI Beamline Management	Dimasi	closure in progress
2.10.02	50200	NEXT SMI Beamline Systems	Dimasi	OPEN & active
2.11.01	50216	ESM EPU Insertion Device	Kitegi	closure in progress
2.11.02	50217	SIX EPU Insertion Device	Kitegi	closed
2.11.03	50220	Insertion Device Mgmt	Kitegi	closure in progress
2.12.01	50270	ID/FE Assembly & Install Management	Fries	closed
2.12.02	50271	ID Assembly & Install	Fries	closed
2.12.03	50272	FE Assembly & Install	Fries	closed

35 CAs:

- 15 closed
- 11 closures upcoming or in progress
- 9 open / active

Significant Procurements - Status

NEXT APP	Description	Budgeted Value	NEXT Status	Ops Status	Contract Status
001NX	SIX/ESM M1 Tanks, M3 Mirrors + Tanks	$ 1,694,503	Complete	N/A	Complete
002NX	ESM Plane Grating Monochromator Tank & Slits package	$ 655,827	Complete	N/A	Complete
004NX	ESM Grating rulings	$ 261,939	Complete	N/A	Complete
006NX	ESM KB Mirror	$ 677,200	Complete	N/A	Complete
007NX	SIX/ESM M4/refocusing Mirrors and Tanks	$ 998,200	Optics Due March	N/A	OPEN
012NX	ESM/SIX nonoptics (pumps and controllers)	$ 289,000	Complete	N/A	Complete
019NX	SR Optical Components package	$ 2,172,266	Complete	Beam Commiss. Due	OPEN
020NX	SR Dual Phase Plate Assembly	$ 679,000	Report Due March	N/A	OPEN
022NX	SR nonoptics (beam transport)	$ 88,800	Complete	N/A	Complete
024NX	SR KB & Harmonic Rejection Mirror system	$ 1,216,400	Complete	N/A	In Progress
025NX	SR gas handling system	$ 595,162	Complete	N/A	Complete
026NX	SS Collimating Mirror and Tank	$ 881,500	Complete	Beam Commiss. Due	OPEN
027NX	SS High Heat Load Monochromator	$ 1,326,435	Complete	Beam Commiss. Due	OPEN
028NX	SS focusing Mirror	$ 629,760	Complete	Beam Commiss. Due	OPEN
029NX	SS nonoptics (gate valves)	$ 147,884	Complete	N/A	Complete
032NX	SS filterbox	$ 120,838	Complete	N/A	Complete
033NX	SS XES spectrometer	$ 458,446	Complete	N/A	Complete
034NX	SS XAFS detector system	$ 175,644	Complete	N/A	Complete
036NX	SS higher harmonic rejection mirror	$ 301,500	Complete	N/A	In Progress
037NX	SS Gas Handling System	$ 741,597	Complete	N/A	Complete
038NX	SS sample chamber assembly	$ 718,000	Complete	N/A	Complete
039NX	SS DAQ	$ 117,085	Complete	N/A	Complete
044NX	ESM/SIX Grating substrates	$ 375,804	Complete	N/A	Complete
045NX	SIX/ESM M1 & M2 High Heat Load Mirrors package	$ 358,816	Complete	N/A	Complete
046NX	SIX monochromator grating rulings	$ 124,000	Complete	N/A	Complete
047NX	SIX Plane Grating Monochromator Tank & Slits package	$ 588,750	Complete	N/A	Complete
048NX	SIX spectrometer gratings substrates	$ 176,000	Complete	N/A	Complete
049NX	ESM / SIX nonoptics (crosses and bellows)	$ 80,889	Complete	N/A	Complete
050NX	SIX sample chamber vessel	$ 435,300	TRF due May	Commissioning Due	OPEN
051NX	SIX sample manipulator	$ 140,239	Complete	N/A	Complete
052NX	SIX spectrometer vertical focusing mirror	$ 99,000	Complete	N/A	Complete
054NX	SIX spectrometer arm system	$ 2,592,100	Install due March	Beam Commiss. Due	OPEN
055NX	SIX spectrometer grating rulings	$ 244,000	Complete	N/A	Complete
056NX	SIX detector	$ 550,672	Complete	Beam Commiss. Due	OPEN
058NX	SMI White Beam Components package	$ 1,255,943	Complete	Complete	Complete
060NX	SMI Focusing Mirrors and Secondary Source Aperture package	$ 1,743,235	Complete	Beam Commiss. Due	OPEN
061NX	FXI Hutches	$ 772,453	Complete	N/A	Complete
063NX	SMI CRL optics	$ 388,951	Complete	N/A	Complete
065NX	SMI SAXS/WAXS table (SAXS tube)	$ 244,250	Complete	N/A	Complete
067NX	SMI sample chamber	$ 69,791	Complete	N/A	Complete
071NX	CONtrols cables	$ 380,508	Complete	N/A	Complete
072NX	CONtrols servers	$ 86,750	Complete	N/A	Complete
073NX	CON Motion controllers	$ 490,841	Complete	N/A	Complete
074NX	SS High Heat Load Flat Mirror	$ 175,000	Complete	N/A	Complete
077NX	EPUs: ESM Long Period EPU (2.8 m) & SIX EPU57 (3.5 m)	$ 1,807,468	Complete	N/A	Complete
081NX	EPUs: ESM & SIX EPU Vacuum Chamber(s)	$ 497,000	Complete	N/A	Complete
082NX	EPUs: ESM Short Period EPU57 (1.4m)	$ 649,000	Complete	N/A	Complete
086NX	SIX/ESM Deflection optical metrology system	$ 98,659	Complete	N/A	Complete
087NX	ESM Microscanning Stages	$ 132,350	Complete	N/A	Complete
089NX	SMI Cryo-Cooler	$ 177,050	Complete	N/A	Complete
090NX	ESM Wavefront Sensor	$ 214,449	Complete	Beam Commiss. Due	OPEN
091NX	SS photon beam transport	$ 179,860	Complete	Complete	In Progress
092NX	CBS LN2 Piping	$ 180,054	Complete	N/A	Complete
093NX	SMI Detectors	$ 922,980	Complete	N/A	Complete
094NX	SMI vacuum sample stages	$ 324,816	Complete	N/A	Complete
095NX	ESM Analyzer	$ 473,660	Complete	N/A	Complete
096NX	SR area detector	$ 327,700	Complete	N/A	Complete
097NX	SR instrumented 6-circle diffractometer	$ 968,000	Report Due March	N/A	OPEN
098NX	SS Mythen Detector System	$ 150,160	Complete	N/A	Complete
104NX	SS sample handling system	$ 439,400	Complete	N/A	Complete
105NX	SR diamond window and phase plates	$ 171,460	Complete	N/A	Complete
107NX	EPU current strip power supplies	$ 99,200	Complete	N/A	Complete
110NX	SIX cryostat	$ 129,366	Complete	N/A	Complete



58 of 63 (92%) presently complete

Interview Schedule

Monday, February 27

Team:	D. Haeffner / L. Berman	P. Wanderer / M. Cowell / K. Mirabella
Room*:	CR 156 - LOB5	CR 165 - LOB5

Overview Presentation

Break

Time	CAM(s)	CAM(s)
9:45 - 10:30	Vescovo (2.05)	Stebbins (2.03, 2.03.05), Bromfield (2.03.01, 2.03.04)
10:30 - 11:15	Attenkofer (2.08)	Stebbins (2.03, 2.03.05), Fries (2.03.02, 2.03.03)
11:15 - 12:00	Nelson (2.07)	Fries (2.12)

Break

2:00 - 2:45	Jarrige (2.09)	Yin (2.04)
2:45 - 3:30	Dimasi (2.10)	Kitegi, Tanabe (2.11)
3:30 - 4:00	Lee (2.06)	Hulbert (2.01, 2.02)

"In-tunnel" walk-down occurred at in-brief (2/14)

*Rooms are “base camp” : Plan to walk to locations of delivered scope, offices as needed

Website for Review

Review site link:
https://collab.external.bnl.gov/sites/PSNext (Log in with BNL or google credentials)

Website content:

Review Charge
Agenda & Interview Schedule
Presentations:
- Welcome
- NEXT Project Overview & Scope Verification

Project Execution Plan
WBS Dictionary
RAM (EAC, BAC)

December Project Reports:
- Detailed Project Schedule
- Summary Project Schedule
- Milestone Project Schedule
- Cost Performance Report
- Project Monthly Report

"Shared Documents" by WBS (35 control accounts):
- WAD
- Closeout Acknowledgment Form

Summary of Scope Changes

date	BAC add, $M	relevant PCR	WBS	Description of scope addition / change
14-Aug	1.13	14-51	2.10	Endstation scope additions: SMI Detectors "SMI Detector Scope Additions" (2 Pilatus3 detectors: 1M, 300K-W)
14-Aug	0.61	14-52	2.05	Endstation scope additions: ESM Analyzer "ESM Endstation Scope Additions" (Scienta)
14-Aug	1.99	14-56	2.07	Endstation scope additions: ISR instrumented 6-circle diffractometer and area detector "ISR Procurement Revisions & Endstation Scope Additions" Instrumented Six-Circle diffractometer (Huber), Area Detector (Dectris)
14-Dec	1.01	15-72	2.12	ID/FE Installation - FY15 portion (1st FY worth of effort added) "NEXT Insertion Devices and Front End Installation Scope Addition"
15-Jan	0.66	15-67	2.11	Current Strip Power Supplies "EPU and Vacuum Chamber Contract Awards and Current Strip Power Supplies" (Activities EPU22xx-23xx)
15-Jan	0.83	14-32	2.06	FXI hutches "Scope addition for construction of two additional hutches for FXI Beamline.."
15-Feb	1.30	14-49	All but 2.02 & 2.06	IRR preparation and closeout effort (and schedule) in beamline management accounts, to complete by January 2017 (extended from September 2016) "Addition of IRR & Project Close-Out Activities to the Project Scope" (All areas except 2.02 and 2.06) +1.30M
15-Jul	1.08	15-94	2.12	ID/FE Installation – FY16 portion (2nd FY worth of effort added) "Additional Labor and Material for ID and FE Installation & Testing"
15-Aug	0.24	15-90	2.03	Sprinklers & Smoke detectors "Additional Resources to complete Utilities, Fire Detection & Suppression, & Control Station"
15-Aug	-0.52	15-99	2.10	Deletion of Double Crystal Diffractometer (DCD) "All activities related to the Liquid Surface Scattering instrumentation in the 12-ID-B endstation hutch are being removed from NEXT base scope"
15-Nov	-0.65	16-105	2.12	Remaing accelerator scope removed "Delete Remaining Scope for Installation of IDs and FEs for the NEXT Beamlines"

Cost type	BAC

Sum of Cost	Org	CAM											
	Accelerator Division		Photon Science Division									Project Manag	Grand Total
WBS	Fries	Kitegi	Attenkofer	Bromfield	Dimasi	Jarrige	Lee	Nelson	Stebbins	Vescovo	Yin	Hulbert	
2.01.01 Project Management												4,598,029	4,598,029
2.01.02 Project Support												5,320,204	5,320,204
2.02.02 Conceptual Design and Analysis of Photon Delivery Systems												849,881	849,881
2.02.04 ESM Advanced Conceptual Design										101,376			101,376
2.02.05 FXI Advanced Conceptual Design							120,634						120,634
2.02.06 ISR Advanced Conceptual Design								210,700					210,700
2.02.07 ISS Advanced Conceptual Design			163,508										163,508
2.02.08 SIX Advanced Conceptual Design						179,533							179,533
2.02.09 SMI Advanced Conceptual Design					181,684								181,684
2.03.01 Utilities				4,210,031									4,210,031
2.03.02 Personnel Protection System (PPS)	1,620,824												1,620,824
2.03.03 Equipment Protection System (EPS)	680,294												680,294
2.03.04 Control Station				306,744									306,744
2.03.05 Common Beamline Systems Management									522,524				522,524
2.04.01 Control System Management											294,427		294,427
2.04.02 Control System Design & Implementation											2,929,314		2,929,314
2.04.03 Control System Equipment											1,425,103		1,425,103
2.05.01 ESM Management										610,744			610,744
2.05.02 ESM Beamline Systems										8,811,720			8,811,720
2.06.01 FXI Management							409,359						409,359
2.06.02 FXI Beamline Systems							1,408,965						1,408,965
2.07.01 ISR Management								1,105,394					1,105,394
2.07.02 ISR Beamline Systems								9,287,031					9,287,031
2.08.01 ISS Management			838,199										838,199
2.08.02 ISS Beamline Systems			9,634,013										9,634,013
2.09.01 SIX Management						729,841							729,841
2.09.02 SIX Beamline Systems						11,034,995							11,034,995
2.10.01 SMI Management					805,656								805,656
2.10.02 SMI Beamline Systems					8,321,181								8,321,181
2.11.01 ESM EPU Insertion Device		4,587,795											4,587,795
2.11.02 SIX EPU Insertion Device		117,137											117,137
2.11.03 Insertion Devices Management		100,460											100,460
2.12.01 ID & FE Installation & Testing Manage	20,739												20,739
2.12.02 ID Installation & Testing	584,560												584,560
2.12.03 FE Installation & Testing	847,517												847,517
Grand Total	3,753,934	4,805,392	10,635,720	4,516,775	9,308,521	11,944,369	1,938,958	10,603,125	522,524	9,523,840	4,648,844	10,768,114	82,970,116

Cost type	EAC

Sum of Cost	Org	CAM											
	Accelerator Division		Photon Science Division									Project Manag	Grand Total
WBS	Fries	Kitegi	Attenkofer	Bromfield	Dimasi	Jarrige	Lee	Nelson	Stebbins	Vescovo	Yin	Hulbert	
2.01.01 Project Management												4,237,558	4,237,558
2.01.02 Project Support												6,600,949	6,600,949
2.02.02 Conceptual Design and Analysis of Photon Delivery Systems												849,881	849,881
2.02.04 ESM Advanced Conceptual Design										101,376			101,376
2.02.05 FXI Advanced Conceptual Design							120,634						120,634
2.02.06 ISR Advanced Conceptual Design								210,700					210,700
2.02.07 ISS Advanced Conceptual Design			163,508										163,508
2.02.08 SIX Advanced Conceptual Design						179,533							179,533
2.02.09 SMI Advanced Conceptual Design					181,684								181,684
2.03.01 Utilities				4,389,631									4,389,631
2.03.02 Personnel Protection System (PPS)	2,356,497												2,356,497
2.03.03 Equipment Protection System (EPS)	949,559												949,559
2.03.04 Control Station				223,470									223,470
2.03.05 Common Beamline Systems Management									612,566				612,566
2.04.01 Control System Management											257,792		257,792
2.04.02 Control System Design & Implementation											3,364,195		3,364,195
2.04.03 Control System Equipment											1,350,562		1,350,562
2.05.01 ESM Management										474,027			474,027
2.05.02 ESM Beamline Systems										9,702,213			9,702,213
2.06.01 FXI Management							470,908						470,908
2.06.02 FXI Beamline Systems							1,322,516						1,322,516
2.07.01 ISR Management								1,034,389					1,034,389
2.07.02 ISR Beamline Systems								9,489,712					9,489,712
2.08.01 ISS Management			681,035										681,035
2.08.02 ISS Beamline Systems			10,555,409										10,555,409
2.09.01 SIX Management						772,555							772,555
2.09.02 SIX Beamline Systems						12,748,874							12,748,874
2.10.01 SMI Management					708,626								708,626
2.10.02 SMI Beamline Systems					8,820,014								8,820,014
2.11.01 ESM EPU Insertion Device		4,398,606											4,398,606
2.11.02 SIX EPU Insertion Device		70,375											70,375
2.11.03 Insertion Devices Management		96,272											96,272
2.12.01 ID & FE Installation & Testing Manage	20,739												20,739
2.12.02 ID Installation & Testing	584,560												584,560
2.12.03 FE Installation & Testing	847,660												847,660
Grand Total	4,759,015	4,565,253	11,399,952	4,613,101	9,710,324	13,700,962	1,914,058	10,734,801	612,566	10,277,616	4,972,549	11,688,388	88,948,585

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.01.01**		
Control Account Manager	**Steve Hulbert**	**Extension:**	**7570**
Control Account Title:	**Project Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ○ **No** ⊗ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ⊗ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**
   PM0050, Project Management FY17, – expected finish ~~April~~ May 2017 SH
   including project closeout activities

2. **WBS Dictionary requires the following changes:**

13 February 2017

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Steve Hulbert	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Steven M. Hulbert	**Signature:**	Steven M. Hulbert
Date:	8 February 2017	**Date:**	8 February 2017

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.01.02**		
Control Account Manager	**Steve Hulbert**	**Extension:**	**7570**
Control Account Title:	**Project Support**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ○ **No** ⊗ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ⊗ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**
   PS 0055, Business Ops FY17 PS0270, Procurement FY17
   PS 0105, Project Controls FY17
   expected finish ~~April~~ 2017 May 31st

2. **WBS Dictionary requires the following changes:**

13 February 2017

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Steve Hulbert	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Steven L. Hulbert	**Signature:**	Steven L. Hulbert
Date:	8 February 2017	**Date:**	8 February 2017

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/24/2016**
WBS/Control Account Number:	**2.02.02**		
Control Account Manager	**Steve Hulbert**	**Extension:**	**7570**
Control Account Title:	**Conceptual Design and Analysis of Photon Delivery Systems**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:** None

2. **WBS Dictionary requires the following changes:** N/A

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Steve Hulbert	**Project Manager :** *[Print Name]*	Erik Johnson
Signature:	Steven L. Hulbert	**Signature:**	E. Johnson
Date:	29 August 2016	**Date:**	29 August 2016

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/23/16**
WBS/Control Account Number:	**2.02.04**		
Control Account Manager	**Elio Vescovo**	**Extension:**	**7399**
Control Account Title:	**ESM Advanced Conceptual Design**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Elio Vescovo	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Elio Vescovo	**Signature:**	Steven L. Hulbert
Date:	9/26/16	**Date:**	26 September 2016

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/23/16**
WBS/Control Account Number:	**2.02.05**		
Control Account Manager	**Wah-Keat Lee**	**Extension:**	**4085**
Control Account Title:	**FXI Advanced Conceptual Design**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	W. K. Lee	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Wah Keat Lee	**Signature:**	Steven L. Hulbert
Date:	8/29/2016	**Date:**	29 August 2016

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/23/16**
WBS/Control Account Number:	**2.02.06**		
Control Account Manager	**Christie Nelson**	**Extension:**	**4916**
Control Account Title:	**ISR Advanced Conceptual Design**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary: Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Christie Nelson	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Christie Nelson	**Signature:**	Steven Hulbert
Date:	8/26/16	**Date:**	26 August 2016

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/23/16**
WBS/Control Account Number:	**2.02.07**		
Control Account Manager	**Klaus Attenkofer**	**Extension:**	**5146**
Control Account Title:	**ISS Advanced Conceptual Design**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Klaus Attenkofer	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	Steven L. Hulbert
Date:	9/26/2016	**Date:**	26 September 2016

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/23/16**
WBS/Control Account Number:	**2.02.08**		
Control Account Manager	**Ignace Jarrige**	**Extension:**	**8814**
Control Account Title:	**SIX Advanced Conceptual Design**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ● **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ● **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Ignace Jarrige	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Jarrige	**Signature:**	Steven L. Hulbert
Date:	September 26 2016	**Date:**	26 September 2016

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/23/16**
WBS/Control Account Number:	**2.02.09**		
Control Account Manager	**Elaine DiMasi**	**Extension:**	**2211**
Control Account Title:	**SMI Advanced Conceptual Design**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☑ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☑ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		**Acknowledgement by Project Manager**	
CAM Name: *[Print Name]*	Elaine DiMasi	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Elaine DiMasi	**Signature:**	Steven L. Hulbert
Date:	19 Sept. 2016	**Date:**	19 September 2016

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.03.01**		
Control Account Manager	**Mike Bromfield**	**Extension:**	**7108**
Control Account Title:	**Utilities**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☒ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**
   Electrical & Mechanical utilities to the spectrometer arm pending vendor installations in March 2017. Completed as of 3/31/17

2. **WBS Dictionary requires the following changes:**

   NONE

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Mike Bromfield	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:		**Signature:**	
Date:	2/8/17	**Date:**	8 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT
CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.03.02**		
Control Account Manager	**Greg Fries**	**Extension:**	**4461**
Control Account Title:	**Personnel Protection System (PPS)**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ✓ **No** ✓ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ✓ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**
   Finishing remaining documentation in February.
   Done. 4/6/17

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Greg Fries	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:		**Signature:**	Steven L. Hulbert
Date:	2/8/17	**Date:**	8 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.03.03**		
Control Account Manager	**Greg Fries**	**Extension:**	**4461**
Control Account Title:	**Equipment Protection System (EPS)**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ✓ **No** ✓ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ✓ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**
   Support required until SIX First light (planned for Feb 21)

   Done. 4/6/17

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Greg Fries	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	[signature]
Date:	2/8/17	**Date:**	8 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT
CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.03.04**		
Control Account Manager	**Mike Bromfield**	**Extension:**	**7108**
Control Account Title:	**Control Station**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

   NONE

2. **WBS Dictionary requires the following changes:**

   NONE

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Mike Bromfield	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	Steven Hulbert
Date:	2/8/17	**Date:**	8 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.03.05**		
Control Account Manager	**Chris Stebbins**	**Extension:**	**8767**
Control Account Title:	**Common Beamline Systems Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ✓ **No** ● *[If NO, indicate in the space below when all work will be completed.]*

   CS SH

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ● **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

   All NEXT scope completed CS SH

   Continued support required through SIX IRR and NEXT CD-4. SIX IRR expected in late February. CD-4 expected in April 2017.

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Chris Stebbins	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Chris R Steb	**Signature:**	Steven Hulbert
Date:	2/8/2017	**Date:**	8 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT
CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.04.01**		
Control Account Manager	**Zhijan Yin**	**Extension:**	**5525**
Control Account Title:	**Control System Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

   ZY SH

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**
   cf Management oversight of Activities in 2.04.02, expected to complete in 03/2017 Completed! 3/31/17 SH ZY

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Zhijan Yin	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	[signature]
Date:	2/28/17	**Date:**	28 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/24/2017**
WBS/Control Account Number:	**2.04.02**		
Control Account Manager	**Zhijian Yin**	**Extension:**	**5525**
Control Account Title:	**Control System Design & Implementation**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes (X) **No** (X) *[If NO, indicate in the space below when all work will be completed.]*

   Not SH

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes (X) **No** ( ) *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

   CON1217, Terminate Controller Cables, 2/27/17 Complete! SH 2/
   CON1255, Controls Testing, 2/21/17 3/31/17

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Zhijian Yin	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	[signature]
Date:	2/7/17	**Date:**	7 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/24/2017**
WBS/Control Account Number:	**2.04.03**		
Control Account Manager	**Zhijian Yin**	**Extension:**	**5525**
Control Account Title:	**Control System Equipment**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Zhijian Yin	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:		**Signature:**	
Date:	2/7/17	**Date:**	7 February 2017

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.05.01**		
Control Account Manager	**Elio Vescovo**	**Extension:**	**7399**
Control Account Title:	**ESM Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Elio Vescovo	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Elio Vescovo	**Signature:**	Steve Hulbert
Date:	1/25/2017	**Date:**	25 January 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT
CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/24/2017**
WBS/Control Account Number:	**2.05.02**		
Control Account Manager	**Elio Vescovo**	**Extension:**	**7399**
Control Account Title:	**ESM Beamline Systems**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

JK EV

Yes ☒ **No** ☒ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

Receipt and acceptance of M4 mirror (expected date March 2017)

completed April 25 2017
EV JK

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		**Acknowledgement by Project Manager**	
CAM Name: *[Print Name]*	Elio Vescovo	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Elio Vescovo	**Signature:**	Steven L. Hulbert
Date:	1/25/2017	**Date:**	25 January 2017

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NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**10/17/2016**
WBS/Control Account Number:	**2.06.01**		
Control Account Manager	**Wah-Keat Lee**	**Extension:**	**4085**
Control Account Title:	**FXI Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	WAH-KEAT LEE	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Wah Keat Lee	**Signature:**	Steven L. Hulbert
Date:	10/18/2016	**Date:**	18 October 2016

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**10/17/2016**
WBS/Control Account Number:	**2.06.02**		
Control Account Manager	**Wah-Keat Lee**	**Extension:**	**4085**
Control Account Title:	**FXI Beamline Systems**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	WAH-KEAT LEE	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Wah Keat Lee	**Signature:**	Steven L Hulbert
Date:	10/18/2016	**Date:**	18 October 2016

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.07.01**		
Control Account Manager	**Christie Nelson**	**Extension:**	**4916**
Control Account Title:	**ISR Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Christie Nelson	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Christie Nelson	**Signature:**	Steve Hulbert
Date:	2/2/17	**Date:**	2 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/24/2017**
WBS/Control Account Number:	**2.07.02**		
Control Account Manager	**Christie Nelson**	**Extension:**	**4916**
Control Account Title:	**ISR Beamline systems**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**
   Installation and commissioning of 6-circle diffractometer – expected Feb. 2017
   Receipt and approval of Dual Rhodium Slab assembly and 6-circle commissioning reports – expected Feb. 2017

2. **WBS Dictionary requires the following changes:**

all activities completed
3/24/17 CN SH

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Christie Nelson	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Christie Nelson	**Signature:**	Steven L. Hulbert
Date:	2/2/17	**Date:**	2 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**12/13/16**
WBS/Control Account Number:	**2.08.01**		
Control Account Manager	**Klaus Attenkofer**	**Extension:**	**5146**
Control Account Title:	**ISS Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Klaus Attenkofer	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	[signature]
Date:	01/12/2017	**Date:**	12 January 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**12/13/16**
WBS/Control Account Number:	**2.08.02**		
Control Account Manager	**Klaus Attenkofer**	**Extension:**	**5146**
Control Account Title:	**ISS Beamline Systems**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

   NA

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Klaus Attenkofer	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	[signature]
Date:	01/11/2017	**Date:**	12 January 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.09.01**		
Control Account Manager	**Ignace Jarrige**	**Extension:**	**8814**
Control Account Title:	**SIX Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☑ **No** ☑ *[If NO, indicate in the space below when all work will be completed.]*

   IJ

2. Does the WBS Dictionary accurately represent ~~with~~ the work completed?

   Yes ☑ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**
   SIX beamline management activities through first light, expected in February. Completed February 21, 2017 IJ

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Ignace Jarrige	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:		**Signature:**	Steven L Hulbert
Date:	2-13 2017	**Date:**	13 February 2017

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/24/2017**
WBS/Control Account Number:	**2.09.02**		
Control Account Manager	**Ignace Jarrige**	**Extension:**	**8814**
Control Account Title:	**SIX Beamline**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

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If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ○ **No** ☑ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent the work completed?

   Yes ☑ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

- Installation of spectrometer optics, expected completion in March
- Delivery and acceptance of RL4 mirror, WFA stand, and sample holder parts, expected in March
- Delivery and acceptance of cryostat & manipulator, expected in April
- Delivery and acceptance of Triple Rotating Flange, expected in May

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Ignace Jarrige	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	Steven L. Hulbert
Date:	02.16.2017	**Date:**	16 February 2017

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.10.01**		
Control Account Manager	**Elaine DiMasi**	**Extension:**	**2211**
Control Account Title:	**SMI Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Elaine DiMasi	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	Elaine DiMasi	**Signature:**	Steven L. Hulbert
Date:	13 Feb 2017	**Date:**	13 February 2017

BROOKHAVEN NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT
CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/24/2017**
WBS/Control Account Number:	**2.10.02**		
Control Account Manager	**Elaine DiMasi**		**2211**
Control Account Title:	**SMI Beamline**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:** SAXS Beam Chamber assembly & test activities. SAXS XY/Z mechanics remaining MES: cable drag chain. MES to complete 15 march. Labor to complete 21 april.

2. **WBS Dictionary requires the following changes:**

Scope complete - 21 April 17
ED/MES

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Elaine DiMasi	Project Manager : *[Print Name]*	Steve Hulbert
Signature:	Elaine DiMasi	Signature:	Steven A. Hulbert
Date:	13 Feb 2017	Date:	13 February 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.11.01**		
Control Account Manager	**Charles Kitegi**	**Extension:**	**7792**
Control Account Title:	**ESM EPU Insertion Device**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

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If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Charles Kitegi	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	C Kitegi	**Signature:**	Steven L. Hulbert
Date:	01/17/17	**Date:**	17 January 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.11.02**		
Control Account Manager	**Charles Kitegi**	**Extension:**	**7792**
Control Account Title:	**SIX EPU Insertion Device**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ☐ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ☐ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Charles Kitegi	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	E Kitegi	**Signature:**	Steven L. Hulbert
Date:	01/17/17	**Date:**	17 January 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**1/17/2017**
WBS/Control Account Number:	**2.11.03**		
Control Account Manager	**Charles Kitegi**	**Extension:**	**7792**
Control Account Title:	**Insertion Devices**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ☒ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ☒ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

2. **WBS Dictionary requires the following changes:**

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Charles Kitegi	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	E Kitegi	**Signature:**	Steven L. Hulbert
Date:	01/19/17	**Date:**	17 January 2017

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/23/16**
WBS/Control Account Number:	**2.12.01**		
Control Account Manager	**Greg Fries**	**Extension:**	**4461**
Control Account Title:	**ID & FE Installation & Testing Management**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ✓ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ✓ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

   None

2. **WBS Dictionary requires the following changes:**

   None

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Greg Fries	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	[signature]
Date:	9/26/16	**Date:**	26 September 2016

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/23/16**
WBS/Control Account Number:	**2.12.02**		
Control Account Manager	**Greg Fries**	**Extension:**	**4461**
Control Account Title:	**ID Installation & Testing**		

Purpose:

The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary (Scope Definition) for the above Control Account.

By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 745.

Questions: *[Check Yes or No]*

1. Is all work scope for this Control Account complete per the activities in the attached Control Account Work Plan?

   Yes ✓ **No** ○ *[If NO, indicate in the space below when all work will be completed.]*

2. Does the WBS Dictionary accurately represent with the work completed?

   Yes ✓ **No** ○ *[If NO, explain in the space below.]*

Required Actions:
If "NO" is checked for either question, provide a detailed description of required actions necessary to reconcile. Use the existing WBS Dictionary to indicate any addition and/or deletions.

1. **Activities required to complete all work in this CA, with expected finish dates:**

   None

2. **WBS Dictionary requires the following changes:**

   None

Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Greg Fries	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	[signature]
Date:	9/26/16	**Date:**	26 September 2016

BROOKHAVEN
NATIONAL LABORATORY

NSLS-II Experimental Tools (NEXT) PROJECT CLOSEOUT ACKNOWLEDGEMENT

Project Name:	**NSLS-II Experimental Tools (NEXT)**	**Date Issued:**	**8/23/16**
WBS/Control Account Number:	**2.12.03**		
Control Account Manager	**Greg Fries**	**Extension:**	**4461**
Control Account Title:	**FE Installation & Testing**		

Purpose:

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1. **Activities required to complete all work in this CA, with expected finish dates:**

   None

2. **WBS Dictionary requires the following changes:**

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Acknowledgements:

I acknowledge all work is complete as defined in the WBS Dictionary for this Control Account.

Acknowledgement by CAM		Acknowledgement by Project Manager	
CAM Name: *[Print Name]*	Greg Fries	**Project Manager :** *[Print Name]*	Steve Hulbert
Signature:	[signature]	**Signature:**	[signature]
Date:	9/26/16	**Date:**	26 September 2016