

The only official copy of this document is the one online in the NSLS-II SharePoint Document Center. Before using a printed copy, verify that it is current by checking the printed document's revision history with that of the online version.

TRANSITION TO OPERATIONS PLAN (TOP)

FOR

NSLS-II EXPERIMENTAL TOOLS (NEXT) PROJECT



APRIL 21, 2017

NSLSII-NX-PLN-002

REVISION 2

Prepared by:
Brookhaven National Laboratory
P. O. Box 5000
Upton, NY 11973-5000

Managed by:

Brookhaven Science Associates

For the U. S. Department of Energy
Office of Science
Basic Energy Science
Under Contract DE-SC0012704

TRANSITION TO OPERATIONS PLAN (TOP) FOR NSLS-II EXPERIMENTAL TOOLS (NEXT) PROJECT

APRIL 21, 2017

PREPARED BY:

4/21/2017

X 

Steven Hulbert
NEXT Project Manager
Signed by: Hulbert, Steven

APPROVED BY:

4/21/2017

X John Hill

John Hill
NSLS-II Director
Signed by: Hill, John

By approving this plan I acknowledge the requirements set forth herein and agree with its implementation.

REVISION HISTORY

REVISION	DESCRIPTION	LIST OF REVIEWERS	DATE
1	First Issue	See Cover	15AUG2016
2	Second Version. Minor updates to: Dated referenced, documents referenced, staff roles and functions	See Cover	21APR2017

TABLE OF CONTENTS

ACRONYMS	V
1.0 SCOPE.....	1
1.1 Approach.....	1
1.2 Objective	1
1.3 Structure	2
2.0 REFERENCE DOCUMENTS	2
2.1 Government Documents.....	2
2.2 BNL Documents.....	2
2.3 NSLS-II Experimental Tools (NEXT) Project Documents.....	3
2.4 Operations Authorization Documents	3
3.0 TRANSITION TO OPERATIONS PLAN.....	3
3.1 Project Description and Mission	3
3.2 Planning Management, Organization and Control	3
3.3 DOE Orders and Program Guidance.....	4
3.4 Key Transition Phase Steps and Deliverables	4
3.5 Strategy	6
3.6 Operation Cost	6
3.7 Organizations, Stakeholders and Public Interfaces.....	6
3.7.1 Management Organization	6
3.7.2 Stakeholders.....	8
3.8 Transition Team Roles and Responsibilities.....	9
3.9 Configuration Control	9
3.10 Key Performance Parameters (KPPs) and Completion Criteria	9
3.11 Schedule and Key Milestones	10
3.12 Readiness Reviews	10
3.13 Operations and Maintenance Management	11
3.14 Facility Support, Operation, and Maintenance Training.....	12
3.15 ES&H and QA.....	12
3.16 Safeguards and Security.....	13
3.17 Permits and Licenses.....	13
3.18 Authorization and Notification	14
3.19 Project Acceptance, Beneficial Occupancy and Transfer to Operations	14
3.20 Business Functions	14
3.21 Project Information and Records Turnover	15
3.22 Transition to Operations Reporting	15
3.23 User/Operating Organization Staff Planning	15
3.24 Lessons Learned and Process Improvement.....	16
3.25 Project Organization De-staffing Plan.....	16

ACRONYMS

AB	Authorization Basis
ABS	Authorized Beamline Staff
ARR	Accelerator Readiness Review
ASE	Accelerator Safety Envelope
ATS	Assessment Tracking System
BES	Basic Energy Sciences
BHSD	Brookhaven Site Office
BNL	Brookhaven National Laboratory
BORE	Beneficial Occupancy Readiness Evaluation
BSA	Brookhaven Science Associates
CD	Critical Decision
CFR	Code of Federal Regulations
DO	Deputy for Operations
DOE	Department of Energy
EMS	Environmental Management System
ES&H	Environment, Safety, and Health
ESR	Experimental Safety Review
ESSH&Q	Environment, Safety, Security, Health, and Quality
F&O	Facilities and Operations
IRC	Instrument Readiness Coordinator
IRP	Instrument Readiness Plan
IRR	Instrument Readiness Review
ISO	International Organization for Standardization
KPP	Key Performance Parameter
LBS	Lead Beamline Scientist
LESHC	Laboratory Environmental, Safety & Health Committee (BNL)
LOB	Laboratory Office Building
NLSL	National Synchrotron Light Source
NLSL-II	National Synchrotron Light Source II
O&M	Operations and Maintenance
OHSAS	Occupational Health and Safety Advisory Services
QA	Quality Assurance
SAC	Science Advisory Committee
SAD	Safety Assessment Document
SAE	Secretarial Acquisition Executive
SBMS	Standards-Based Management System
SME	Subject Matter Expert
TOP	Transition to Operations Plan
UEC	Users Executive Committee
WBS	Work Breakdown Structure

1.0 SCOPE

1.1 Approach

The purpose of this Transition to Operations Plan (TOP) for the NSLS-II Experimental Tools (NEXT) Project is to describe the actions taken to ensure the successful transfer of the completed scope of the project to “operations,” defined here as having obtained the authorization for the start of beamline technical commissioning and having confirmed validation of the beamline flux key performance parameters.

The documents and processes it describes have been approved for use by NSLS-II through the routine operations authorization process conducted on the NSLS-II facility in accordance with DOE Order 420.2C Safety of Accelerator Facilities. The readiness of the NSLS-II accelerator for routine operations was reviewed by an independent Accelerator Readiness Review (ARR) team which, after all pre-start findings were closed, recommended that the NSLS-II Project Manager seek DOE authorization for “Routine Operations,” DOE granted that authorization on September 22, 2014.

The scope of the NSLS-II routine operations ARR team’s review also included the readiness processes and procedures that would govern all future facility additions and modifications including construction of future beamlines and their transition to operations. Subsequent to their approval through the ARR process, these processes and procedures have been institutionalized and documented at NSLS-II, and are maintained and controlled through the NSLS-II document control system.

The activities contained in this Plan represent the full set of requirements to assure that the NSLS-II Experimental Tools (NEXT) Project can be commissioned in a safe, secure, and environmentally sound manner once transition is completed.

1.2 Objective

This TOP provides the comprehensive plan to manage the smooth turnover of the project deliverables and a seamless hand-off of responsibility/ownership from construction to the start of commissioning and confirmation of validation of key performance parameters. It will ensure efficient and effective management of the transition scope, alignment of schedules, and identification of resources required to facilitate project transition, all in compliance with DOE and BSA requirements.

The Plan includes essential program requirements, the criteria for, and testing of, installed technical equipment and supporting utilities, the calibration, testing and independent inspection and certification of all credited controls, ensuring adequate staffing is in place, with roles, responsibilities, accountabilities and authorities clearly defined, development of all required operating procedures, and training appropriate staff in procedure execution. It also describes the key reviews required to validate beamline readiness for commissioning and authorize the start of commissioning.

This plan is designed to ensure that the project transition to operations is consistent with the following:

- DOE Orders
- Other BSA contract requirements and performance objectives
- BSA/BNL Environment, Safety, Security, Health, and Quality (ESSH&Q) Vision and Policy
- Specific requirements from the Brookhaven Site Office (BHSO)
- NSLS-II mission goals
- User community needs
- Lessons Learned

This Plan was prepared in accordance with DOE Guide 413.3-16A, Project Transition/Closeout. It is required by DOE Order 413.3B as a prerequisite for Critical Decision 4 (CD-4).

1.3 Structure

The basic scope and supporting documentation for the NSLS-II Experimental Tools (NEXT) Project TOP are provided in sections 1 and 2. Section 3 outlines the elements of the transition to operation of the NSLS-II Experimental Tools (NEXT) Project scope. They are numbered to align with section 5 of DOE G 413.3-16 Project Transition/Closeout (CD-4).

This TOP is being maintained as a controlled document under the NSLS-II document control process and, once fully executed, will be retained in accordance with BSA records management program requirements.

2.0 REFERENCE DOCUMENTS

2.1 Government Documents

- DOE Order 413.3B Program Management for the Acquisition of Capital Assets
- DOE Order 420.2C Safety of Accelerator Facilities
- DOE Guide 420.2-1 Accelerator Facility Safety Implementation Guide
- DOE Guide 420.2-1A Accelerator Facility Safety Implementation Guide
- DOE Order 422.1 Conduct of Operations
- 10 CFR 835 Occupational Radiation Protection Program
- 10 CFR 851 Worker Safety and Health Program

2.2 BNL Documents

- BNL Policy and Management Guidance
- BNL ESSH&Q Vision and Policy
- Standards Based Management System (SBMS)
 - SBMS Subject Area “Accelerator Safety”
 - SBMS Subject Area “Conduct of Operations Matrix Development”
 - SBMS Subject Area “Engineering Design”
 - SBMS Program Description “Configuration Management”
 - SBMS Subject Area “Records Management”
 - SBMS Subject Area “Facility Safety”
- NSLS-II Documents
 - NSLS-II Process Description: “Review Process for Facility Additions and Modifications”

2.3 NSLS-II Experimental Tools (NEXT) Project Documents

- Project Execution Plan
- Acquisition Strategy
- Configuration Management Plan
- Risk Management Plan
- Final Design Report
- Instrument Readiness Plan (IRP)
 - IRR findings closure documentation
- IRR report
 - IRR Tailored Review Plans (if applicable)
- IRR Findings closure documentation
 - Project Tailored Review Plan (if applicable)
- Beamline Commissioning Plan
- Beamline-specific procedures

2.4 Operations Authorization Documents

- DOE-BHSD Authorization to Commence NSLS-II Routine Operations [Letter: 9-22-14]
- NSLS-II Project Manager's authorization to commence routine operations at NSLS-II
- NSLS-II Director's authorization for the start of beamline commissioning
- NSLS-II Photon Science Division Director's acceptance of beamlines into NSLS-II Facility Operations

3.0 TRANSITION TO OPERATIONS PLAN

The elements of this section are numbered to align with the components of the DOE G 413.3-16 Project Transition/Closeout (CD-4). The DOE guide numbers are retained to assist the user of the document and if they do not apply for this project it is so noted.

3.1 Project Description and Mission

The NSLS-II Experimental Tools (NEXT) Project construction project, which started construction in July 2014, will be completed in 4Q17. It provided NSLS-II with five additional state-of-the-art beamlines, and the design and engineering for a sixth, to deliver advanced experimental capabilities complementary to those provided by the six NSLS-II Project beamlines. During the operations phase, the NEXT project beamlines will provide additional user capacity as a significant fraction of the NSLS-II operating beamline portfolio, supporting a wide range of research programs and approximately 300 to 400 users per year.

3.2 Planning Management, Organization and Control

As part of the NSLS-II Experimental Tools (NEXT) Project planning, various documents were developed and processes utilized that related to the validation of the project scope and readiness for/transition to operations. These include the PEP and, for each beamline, an Instrument Readiness Plan (IRP), IRR Report, and Commissioning Plan. These have all been created during the course of managing the project, coordinated by project management.

To assist in the integration and coordination of these activities, the Project Manager worked closely with the following NSLS-II Department Staff, many of whom collaborated on the preparation of this Plan and participated in the activities described within it.

- Deputy for Science
- Deputy for Construction
- Photon Science Division Director
- Deputy for Operations
- Manager, ESH&Q
- Authorization Basis Manager
- Training Manager

3.3 DOE Orders and Program Guidance

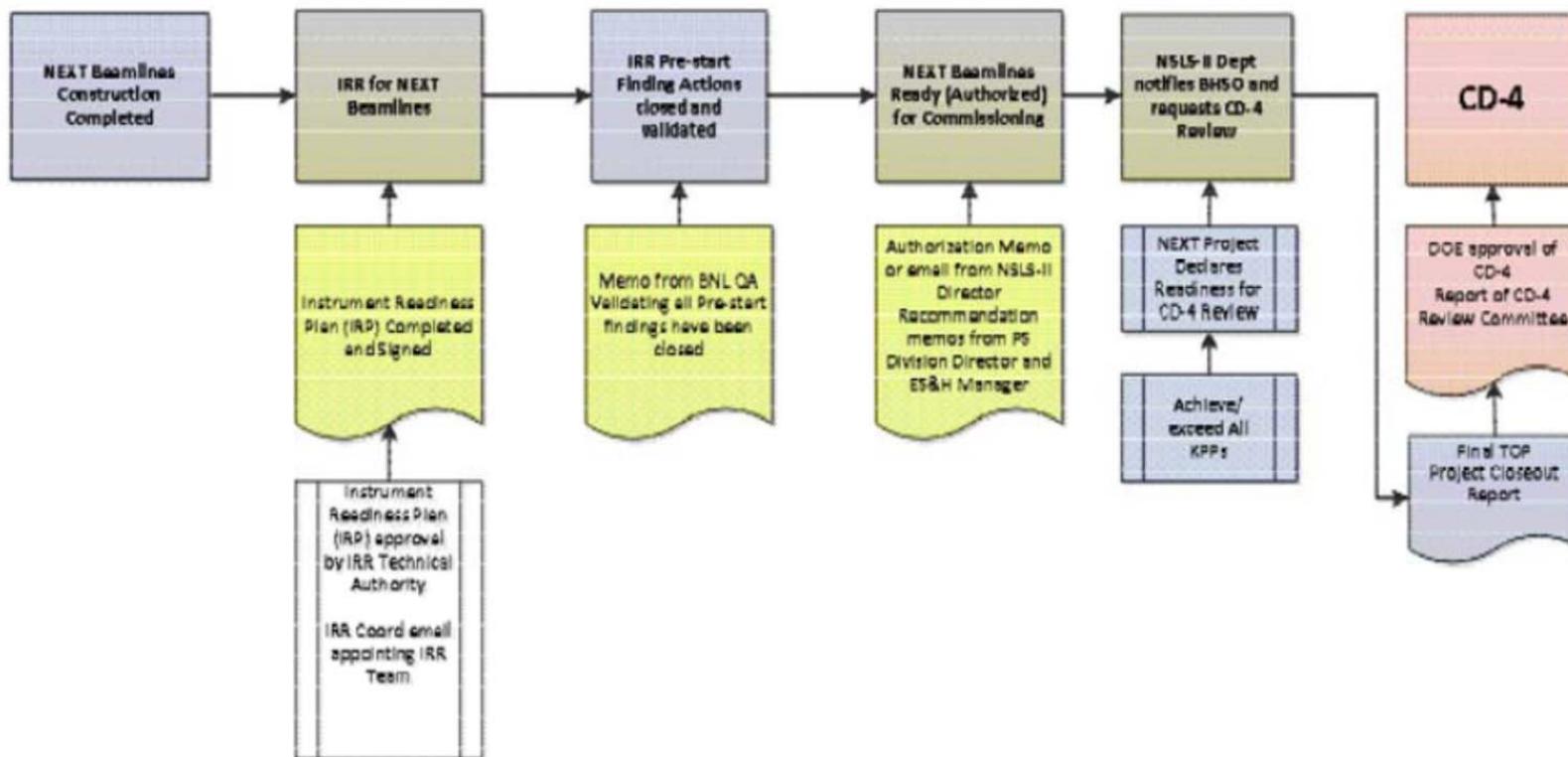
DOE Orders and Guidance documents are referenced in Section 2.1 of this document.

3.4 Key Transition Phase Steps and Deliverables

The key steps in the transition to operations process include:

- Completion of the installation of project systems, structures, and components
- Activation of supporting utility systems (electric power, cooling water, cryogenics, fire protection, etc.)
- Functional testing and performance validation of project systems, structures, and components
- Independent inspection of credited control systems
- Independent certification of Personnel Protection System (PPS)
- Completion of all preparations needed to satisfy readiness criteria (see para 3.12 below)
- IRR and closure of pre-start findings (see para 3.12 below)
- Authorization by NSLS-II Director for the start of commissioning
- Acceptance of beamlines into NSLS-II Facility Operations by the NSLS-II Photon Science Division Director

Figure 3.4.1A NSLS-II NEXT Project Transition to Operations Flow
Readiness Process



3.5 Strategy

For the NEXT Project, the transition to operations consists of project completion, test, and independent inspection/certification, meeting all readiness criteria, completing the IRR process described in paragraph 3.12 below, authorization for the start of commissioning, and confirmation of validation of the project's Key Performance Parameters.

The IRR process for the NEXT Project was tailored to achieve its objectives and scheduled to optimize project progress, and approved by the NSLS-II Director. In general a modular "review when ready" philosophy was adopted that ensured that IRRs were conducted when a beamline's Insertion Device and Front End was ready and a separate IRR performed on the beamline itself when it was declared ready.

3.6 Operation Cost

Estimates for the operating cost of NEXT were provided in the PEP and reviewed by DOE-BHSD and BES, meeting the requirement for CD-4.

3.7 Organizations, Stakeholders and Public Interfaces

The principal organization and stakeholder interfaces associated with the operations of the NEXT project beamlines include the NSLS-II: User community, Leadership Team, ESH&Q Manager, Control Room Operators, Mechanical Utilities Group Manager, Business Operations Manager, and Facilities Manager. The BNL Facilities and Operations directorate maintains the NSLS-II conventional facilities, and is required to coordinate their work planning with NSLS-II. There may be occasional interface in the field between F&O Staff and Authorized Beamline Staff.

The details of these interfaces are well established in staff R2A2s, operating procedures, the NSLS-II Communications Plan, and the Memorandum of Understanding between NSLS-II and F&O.

3.7.1 Management Organization

The following organizations and individuals form the chain of authority and communications for the NEXT Project. This represents the line of accountability for the project down to the transition team assigned to facilitate its transfer to operations.

DOE Office of Basic Energy Sciences

The DOE Office of Basic Energy Sciences (BES) is the DOE/headquarters organization that has programmatic and financial responsibility for construction and operation of the NEXT Project, including oversight of the transition activities.

DOE Brookhaven Site Office

BHSD provides Federal oversight for the operation of all DOE-funded NSLS-II projects after CD-4 including legal, contracting, and environmental management. Ongoing oversight of NSLS-II operations is provided under the auspices of the DOE-BHSD Site Manager, primarily through the Facility Representative Program.

BNL NSLS-II Department

The NSLS-II Department carried out the transition activities through the functional organization, illustrated in Figure 3.7.1.

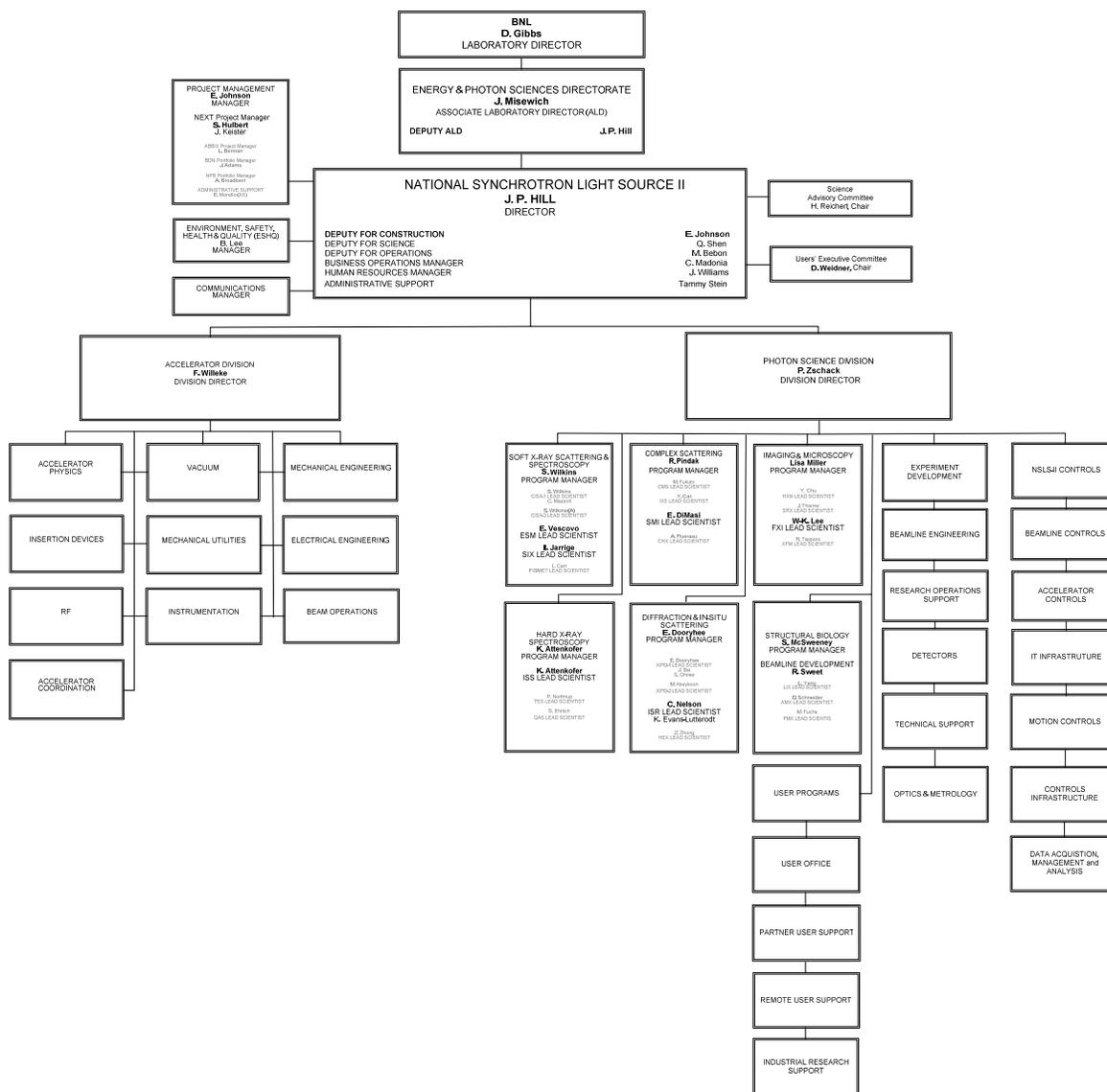


Figure 3.7.1 NSLS-II High Level Organization Chart

NSLS-II Director

The NSLS-II Director had overall responsibility for the transition activities. The NSLS-II Director appointed IRR Team members, declared readiness for conducting the IRR, authorized the start of commissioning of these facilities upon closure of all IRR pre-start findings.

Photon Science Division Director

The Photon Science Division Director had lead responsibility for direction and oversight of the readiness process and accepted the NEXT beamlines into NSLS-II Facility Operations.

NEXT Project Manager

The NEXT Project Manager served as the Technical Authority for the IRR process and had line management responsibility for preparation and implementation of the Transition to Operations Plan, using project staff as well as other NSLS-II Staff under a matrix model. Specific responsibilities included:

- develop and participate in transition planning;
- develop and implement key transition documentation;
- ensure all interfaces are identified, completely defined, and managed;
- support the preparation, review, and approval of project documentation;
- proactively identify and ensure timely resolution of critical issues impacting transition;
- identify and manage risks related to the project transition to operations;
- plan and participate in reviews, assessments, and appraisals as necessary;
- plan and participate in operational readiness assessments; and
- support the preparation, review, and approval of project completion and closeout documentation.

NSLS-II Deputy for Operations

The NSLS-II Deputy for Operations guided an integrated readiness support staff group that supported the NEXT Project Manager through the readiness phase. Matrix participants included the ES&H Manager, Instrument Readiness Coordinator (IRC), IRR Technical Authority, Readiness Team, Training Manager, Authorization Basis Manager, Procedure Manager, and QA Manager. This group was responsible for developing the plan to achieve readiness, (the IRP) coordinating completion of the plan, coordinating the agenda, presentations and supporting the IRR team, hosting the on-site IRR review, developing action plans to address all findings and tracking actions and findings to completion and closure.

ESH&Q Manager

The ESH&Q Manager had overall support responsibility for the IRR process. The ESH&Q Manager provided a member of his staff to serve as the Instrument Readiness Coordinator for the IRR, reviewed all process documents, concurred in the Technical Authority's declaration of readiness for the IRR, and communicated readiness for the start of commissioning to the NSLS-II Director. The ESH&Q Manager also interacted with ES&H Subject Matter Experts on the review teams to resolve issues and facilitate the closure of findings.

3.7.2 Stakeholders

In addition to the management chain, there is a further community of stakeholders who were interested parties in the status of the NEXT Project and its transition to operations.

NSLS-II User Community

The NSLS-II operates as a DOE Office of Science User Facility. A subset of the NSLS-II user community will be using the resources constructed by the NEXT Project, once the project is complete and scientific commissioning begins. Several of these users will participate in "user-assisted commissioning" of the beamlines.

NSLS-II Users Executive Committee (UEC)

The UEC is the leadership group for the NSLS-II Users' Association which has the objectives of promoting and encouraging research at Brookhaven's world leading synchrotron user facilities, to provide opportunities for the user community to exchange ideas and concerns, and to communicate user needs to facility management. Facility management includes NSLS-II, BNL, and DOE management. The Association also serves as a channel of dissemination of relevant information on facility plans and prospects to the user community.

NEXT Project Staff

These are the people responsible for the construction, testing, and integrated testing of the beamlines in the NEXT Project. At the conclusion of the Transition to Operations process, a subset of this group (Authorized Beamline Staff) will continue the development of the beamline through completion of commissioning and authorization for General User Operations.

Science Advisory Committee (SAC)

The SAC is advisory to the NSLS-II Director. The SAC has the responsibility to provide recommendations on all scientific and policy issues that bear on the full and effective utilization of NSLS-II facilities and on future developments required to maintain the scientific productivity of NSLS-II programs at the highest possible level.

3.8 Transition Team Roles and Responsibilities

The NEXT Project Transition to Operations was managed by the Project Manager and supported by the integrated readiness support staff working with the NSLS-II Deputy for Operations as noted in paragraph 3.7.1 above. The key responsibilities were to:

- develop and manage transition plans and documentation;
- ensure that all interfaces are identified, defined and managed;
- ensure that ES&H and QA goals are achieved for transition activities;
- support the preparation, review and approval of project documentation, including project closeout; and
- identify and manage transition related risks and issues.

3.9 Configuration Control

The process for the configuration of the baseline scope was well defined for the NEXT Project and will continue to be followed during the transition to operations phase until the approval of CD-4, project completion, is granted. When changes became necessary, the change control process was used, as defined by the NEXT PEP and detailed in the NEXT Configuration Management Plan. The technical baseline was defined in the NEXT Work Breakdown Structure (WBS) Dictionary.

Upon project completion, any changes necessary will follow the change control and documentation processes according to the NSLS-II Configuration Management System. Credited Controls associated with the beamlines are designated as BNL Configuration Management Structures, Systems and Components (CM-SSCs) and follow more stringent configuration management requirements.

3.10 Key Performance Parameters (KPPs) and Completion Criteria

The achievement of the Threshold KPPs is a prerequisite for approval of CD-4, Project Completion. After

installation, the Project conducted equipment testing, at the component and system levels, required to confirm that the hardware design performance specifications had been achieved. As required, credited controls were inspected, calibrated, and independently certified.

Successful completion of an IRR, described in Section 3.12, was required for each beamline. Following successful completion of IRR and closure of all pre-start findings, NSLS-II Facility Operations oversaw, and funded, the acceptance testing phase, including the first measurement of synchrotron flux at each beamline. This measurement verified achievement of the associated KPP, for that beamline, and led to formal acceptance of that beamline for operation by the NSLS-II facility.

The project completion criteria noted above have been delivered and demonstrated to be functioning by achieving/exceeding the Threshold KPPs at Project Completion. As a result, the project and DOE managers have recommended approval of CD-4.

3.11 Schedule and Key Milestones

The lists of Level 1 and Level 2 milestones and completion criteria for the NEXT Project are given in the PEP.

3.12 Readiness Reviews

The readiness of the project to transition to operations is assured and validated through the NSLS-II IRR process as more fully described in NSLS-II “Instrument Readiness Review Procedure” PS-C-ESH-PRC-001. The IRR process begins with the preparation, review and approval of an IRP. The IRP describes the documentation, hardware and personnel elements needed to transition to operations, provides specific readiness criteria for each, and the individual assigned to assure that a given readiness element is completed – the group of individuals assigned these readiness elements constitutes the Readiness Team. When their assigned element is completed, the assigned readiness team member signs the IRP. Once all readiness elements have been completed and the IRP is signed, the IRR Technical Authority certifies that the project is ready and the IRR can proceed. The IRR Coordinator appoints the IRR team and initiates the IRR.

A “performance-based” IRR is then conducted by a team of subject matter experts from BNL. In some cases SMEs from other laboratories may be invited to participate. NSLS-II staff will be used on IRR teams, however all team members are required to be independent of the project being reviewed. The IRR team validates that the scope of the IRP elements is comprehensive, the readiness criteria appropriate, and that all elements have been completed. Any pre-start findings from the IRR must be closed out prior to requesting the NSLS-II Director to grant authorization to start commissioning.

For each beamline in the NEXT Project, the IRR process has been completed, all pre-start findings have been closed and validated, and the NSLS-II Director has authorized the start of commissioning.

The full process for Transition to Operations is provided in the flow chart in Figure 3.4.1A.

The NSLS-II IRR process follows the guidance in DOE 420.2C Safety of Accelerator Facilities and builds on the documentation, hardware, and personnel elements and their implementing processes and procedures validated in previous readiness reviews. Where modification to any of these “institutionalized” processes and procedures has been required to accommodate the scope of the project, the revisions are included in the IRP. Some of the key operational processes previously validated

included:

The Routine Operations IRR and ARR scope for the NSLS-II Facility included review and validation of the programs processes and documentation needed for successful turnover and transition to operations. These included the applicable elements from the DOE Project Completion/Closeout Guide [DOE G 413.3-16], and the Accelerator Facility Safety Implementation Guide for DOE O 420.2C, Safety of Accelerator Facilities. The specific areas reviewed and validated were:

- Authorization Basis Documentation [*SAD and ASE; final documents developed and staff and process in place for maintaining them; Un-reviewed safety Issue (USI) process*]
- Procedures [*required procedures and staffing in place to support operations; process for creating, reviewing, approving, controlling, and revising procedures*]
- Conduct of Operations Program [*BNL and DOE approved Conduct of Operations matrix in place*]
- ESH & QA Programs [*procedures and staffing in place, with reach-back capability to Laboratory SMEs as needed to provide full ESH&Q, security, and emergency management support to, and oversight of, operations*]
- Work Planning and Control [*procedures in place, work control staff identified and trained; program being executed*]
- Maintenance and Operations of Conventional Facilities [*Facility Use Agreements and Memorandum of Understanding in place with Laboratory Facilities & Operations directorate for predictive/preventive maintenance and repair; definition of programmatic vs conventional systems structures and equipment*]
- Maintenance of Credited Controls and Safety Systems and Equipment [*procedures and staff in place to ensure controls and safety systems are controlled and maintained*]
- Beamline Enable Process [*process to be used to verify beamlines can safely receive beam and to authorize beam to be provided*]
- Operator and Floor Coordinator Training and Qualifications [*process for training and qualifying Lead Operators and Floor Coordinators, for ensuring an individual's training is kept current, and a notification process to managers when training expires*]
- User Training, Qualification, and Oversight [*processes for establishing user training requirements (for access and operations) and ensuring users have, and maintain required training*]
- User Authority Limits [*defining operations users can perform unilaterally*]
- Experimental Safety Review [*process for conducting targeted work planning and control reviews on installation and use of experimental apparatus in end stations, conduct of laboratory experiments, and other scientific operations*]
- NSLS-II Staff Training and Qualifications [*verifying that a sufficient number of NSLS-II Staff are trained and qualified to operate the facility*]

3.13 Operations and Maintenance Management

A key component for the project's transition to operations is to ensure the necessary staff, training, and resources are in place to operate and maintain the NEXT project's facilities after CD-4, through commissioning, and ultimately into general user operations at the beamline in a safe, secure, and environmentally sound manner.

At NSLS-II, in most cases, a subset of the team that designed, installed, and tested the beamline has ongoing responsibility for its operation and maintenance after CD-4. These "Authorized Beamline Staff" (ABS), including the Lead Beamline Scientist (LBS), prepare the operating procedures, develop the training required, establish the maintenance protocols and frequencies, schedule and conduct the maintenance, and analyze equipment failure history. In other instances, large beamline components and/or

systems were constructed by vendors. Typically, the vendors participate in the installation and/or commissioning of those systems. The necessary information for operations and maintenance has been captured from the vendors and made accessible for the ongoing operation and maintenance of these systems by the ABS.

The procedures and vendor information are readily retrievable electronically by ABS when needed in conjunction with performing maintenance. As commissioning and General User Operations evolve following CD-4, the procedures continue to be revised to ensure that experience gained on the performance of the equipment, and other lessons-learned, are captured. Staff are trained on procedures on an established cycle and when major changes occur.

3.14 Facility Support, Operation, and Maintenance Training

The ABS and other NSLS-II Staff supporting the NEXT Project are trained according to Job Training Assessments (JTAs) established by the NSLS-II Training Manager in consultation with the NSLS-II LBS, support group manager (e.g. Manager, Mechanical Utilities Group), Deputy for Operations, and ES&H Manager. The NSLS-II Training Group tracks each worker's training performance to ensure workers are always up to date in their training. Expired training is reported to the individual's supervisor to ensure that workers whose training has expired are not assigned to perform tasks requiring that training.

3.15 ES&H and QA

Each beamline is reviewed to determine if its commissioning and operation will create new hazards not included in the NSLS-II SAD, which describes in sufficient detail all significant hazards presented by the commissioning and operation of beamlines and the controls by which these hazards will be managed. The SAD defines the hazard controls that must be incorporated into the beamline commissioning and operating procedures. If a beamline does introduce a new hazard, the SAD must be revised accordingly and revisions reviewed and approved by the BNL ES&H Committee (LESHC). Based on the revisions to the SAD, a revision to the ASE may be required. ASE revisions require LESHC and DOE approval.

The NEXT Project scope was reviewed to determine if it would create new hazards not analyzed in the SAD during commissioning and operations. No new hazards were identified and no changes to the SAD or ASE were required.

The NEXT Project was designed, constructed, tested and certified, and its Commissioning Plan and subsequent operations plans developed in compliance with the NSLS-II Integrated Safety Management (ISM) program as implemented through the NSLS-II procedures.

The NEXT Project has been supported by the NSLS-II Quality Group staffed by Quality Management SMEs deployed from the BNL Quality Management Office. The NSLS-II Quality Program follows the provisions of the approved BNL Quality Program Plan.

In addition, The Laboratory's Environmental Management System (EMS) (including NSLS-II) is registered under International Organization for Standardization (ISO) 14001 and its Worker Safety and Health System registered under the Occupational Health and Safety Assessment Series (OHSAS) 18001 Health and Safety Management System. Maintenance of these registrations requires rigorous internal and external reviews to assure compliance with the management system requirements. The NSLS-II EMS and Occupational Safety and Health System are updated at least annually or when new significant aspects are introduced. All personnel involved in a significant aspect receive specific training which emphasizes the operational controls to ensure safe, secure, and environmentally sound work practices. In addition, the

enhanced work planning program ensures additional reviews of on-going work as needed. NSLS-II Department ES&H personnel monitor changes in the BNL environmental requirements. Supervisors will be advised of any changes that require modification of work practices or training in environmental and waste management programs.

Emergency plans have been developed as per Laboratory guidelines for the NSLS-II facilities. Local Emergency Coordinators have been appointed and trained, and Local Emergency Plans are in place.

3.16 Safeguards and Security

The site security vulnerabilities and risks at the BNL site are addressed by a laboratory wide “Report on Assessment of Security Risk at BNL.” This site wide report initially developed in June of 2001, preceded the design of NSLS-II. Revisions to this document have addressed the design, construction, and ultimate operations of the NSLS-II facility beginning with a revision in September 2006. NSLS-II is included in all subsequent revisions, most recently December 2010. This is an “Official Use Only” document and under the purview of the Laboratory Protection Division. This document was developed in concert with the Site Security Plan, Local Threat Statement, Local Counterintelligence Threat Statement, and Federal and Local Agencies. The document includes a risk assessment for a target based on identified threats, vulnerabilities, and consequences. The September 2006 revision covered NSLS-II and identified that the construction project security is ongoing and that physical and intellectual security recommendations have been submitted to the project. To meet the requirement in DOE Order 413.3 to update the “Security Vulnerability Assessment Report” and to finalize it prior to CD-4, the Laboratory Protection Division provided a memorandum to the project stating that NSLS-II is in fact addressed in the Report of Assessment of Security Risk at BNL and its current revision. In a subsequent memo dated November 20, 2013, the BNL Security Operations Manager indicated that the NEXT Project does not pose additional risks beyond those already determined for the NSLS-II Project.

The physical security systems at NSLS-II were designed to meet the requirements of the Laboratory and include intrusion detection and a card reader access control system. These security systems were designed with input from the Laboratory Protection Division and meet the requirements set forth in DOE Order 470.4-2A “Physical Protection” and all other applicable DOE orders, policies and standards.

Laboratory assets (including NSLS-II) are further protected by a highly trained, armed protective force of trained and certified Security Police Officers-Level One. They are on duty around the clock, ensuring an effective response to acts of theft, sabotage, vandalism, terrorism, arson, etc. This protective force is also trained to respond and provide assistance during natural disasters such as fire storms, and radiological/toxicological accidents. The protective force is an integral part of the aforementioned program initiatives and provides the most effective response and defense against potential malevolent acts to the laboratory population and assets.

Cybersecurity is a significant threat. NSLS-II implements the Laboratory’s cybersecurity requirements and all NSLS-II systems, including critical control systems have been designed and installed to provide the maximum protection against malevolent activity. NSLS-II Staff will continue to interact with Laboratory IT SMEs to ensure NSLS-II cybersecurity defenses remain robust and current.

3.17 Permits and Licenses

DOE authorized “routine operations” of NSLS-II in September 2014. No permits or licenses from regulatory authorities are required for full operation of the NEXT project facilities. Operations of the NEXT beamlines will comply with the terms and conditions of DOE’s contract with Brookhaven Science Associates.

3.18 Authorization and Notification

As part of the DOE approval of NSLS-II routine operations, the NSLS-II IRR process was approved for use on future facility additions and modifications including beamlines. Authorizations and notifications related to the transition to operations for the NEXT Project will be as follows:

- When the IRR process has been successfully completed, upon the recommendation of the IRR Technical Authority, and concurrence of the ESH&Q Manager, the NSLS-II Director will authorize the start of commissioning.
- When beamline flux KPPs have been met via measurement of flux at an endstation position, the NSLS-II Photon Science Division Director will approve the validation of these KPPs.
- When beamline photon delivery system (PDS) and endstation construction is complete, the NSLS-II Photon Science Division Director will recommend their acceptance into the NSLS-II operating beamline portfolio.
- When all project completion criteria have been met, DOE will issue approval of CD-4.

3.19 Project Acceptance, Beneficial Occupancy and Transfer to Operations

The DOE Program/Project team will conduct a Project Completion Review to meet the objective of the ORR described in DOE Order 413.3A Program and Project Management for the Acquisition of Capital Assets. This review at completion of the performance tests will be documented in a Project Completion Report, which will serve as the basis for a request for SAE approval of CD-4. For project completion (CD-4), NEXT must have in place all capital facilities defined to level 3 in the WBS Dictionary, and have conducted initial performance tests to demonstrate operation to meet the NSLS-II Threshold KPPs at Project Completion. Approval of CD-4 completes the construction phase of the project, and the NEXT beamlines will enter the operations phase as a significant part of the NSLS-II facility portfolio of operating beamlines. This phase begins with technical commissioning and then makes the transition to research operations.

3.20 Business Functions

Business functions for NSLS-II, including all projects, are provided through a Service Level Agreement between the NSLS-II Department and the BNL Business Operations directorate. That agreement was put in place on February 16, 2011, periodically updated, and allows for the provision of business functions from BNL to NSLS-II. A 5-year plan was provided to the Business Operations directorate as part of the agreement which shows the level of staffing required over that time period to support accelerator operations, beamline development, and the user program. An updated staffing forecast will be provided to the BNL Business Operations directorate each year.

Upon completion of the NEXT Project, costs associated with that portion of the project will be transferred to the fixed assets accounts of the Laboratory. All records associated with the project have been identified, maintained, stored, and retained by the NSLS-II Records Management Representative in accordance with the requirements of BNL's Records Management Subject Area.

All NEXT contracts have either been closed out or, for contracts containing scope requiring operation with beam, transferred to the NSLS-II operating organization. Licenses and existing contracts have been transferred to the NSLS-II operating organization as appropriate through modifications to the agreements with suppliers and through coding changes to the BNL PeopleSoft financial system. Equipment and other assets purchased as a part of the NEXT project and no longer needed have been disposed of either by turning them in to the BNL Property Management Group, where they will either be added to the

laboratory-wide equipment pool, or disposed of through the formal excess disposal process. Both dispositions were in accordance with the BNL Procurement and Property Management Standard Operating Procedures.

Government-furnished equipment that was provided to contractors has been returned to BNL.

There are no unresolved project claims or litigation as of the date of this document. Any that may arise in the future will be handled through the Brookhaven Legal Office.

3.21 Project Information and Records Turnover

The Business Operations Manager in the NSLS-II Department coordinates department-wide information technology and information management systems. The NEXT Project has utilized the NSLS-II Document and Records Management Systems, which follow the BNL and NSLS-II Records Management process administered by the NSLS-II Documents and Records Administrator. The NEXT Project has provided electronic files for the following documents that were produced during the project lifetime:

- design basis documents
- specifications
- drawings
- equipment manuals
- warranties
- test reports
- operation and maintenance manuals
- training materials
- agreements and acceptance documents
- ES&H documents
- configuration management documents
- IRR documentation, including authorizations for commissioning

Following approval of CD-4, the NEXT Project documents and records will be retained in the NSLS-II Department document and records management system.

3.22 Transition to Operations Reporting

A variety of procedures and division-specific plans have been developed to provide details of responsibilities and to describe the materials, equipment, documentation, etc., to be turned over for operations.

3.23 User/Operating Organization Staff Planning

The Project Management Team has developed detailed estimates for the operation of the NEXT Project facilities under a number of different funding scenarios. These estimates include the materials, labor, and utilities costs associated with the operation of the facility under these various scenarios. The estimates include the type of labor required to accomplish the work, material lists, and anticipated utilities requirements.

3.24 Lessons Learned and Process Improvement

Lessons learned and best practices identified during the transition to operations period have been documented by following the same process which was implemented for the NSLS-II Project. The lessons learned documents describes best practices and opportunities for improvement identified by the NEXT Project in order to maximize the opportunities for future project successes; working safely, within cost and schedule, and meeting or exceeding performance objectives. The final document will be published as a part of the NEXT Project CD-4 approval documents and shared with future projects to be carried out by NSLS-II Staff, Partner Beamline Staff, other BNL Directorates, and other DOE Sites.

3.25 Project Organization De-staffing Plan

Operations plans were developed that show staff that will move to operating activities after completion of the NEXT Project. Detailed estimates for follow-on beamline projects are being developed and also include staffing requirements by year. Most NEXT Staff will have roles in either operations or follow-on projects. For those that don't, the Business Operations Manager and the appropriate technical Division Director will develop a plan, by individual or type of individual, which outlines the de-staffing strategy. This strategy may include working with Human Resources to find other roles within the Laboratory, with other projects throughout the DOE complex, or with outside organizations.