

LT-ESH-0001/Rev. 2

Environment, Safety, and Health Plan
for the
National Synchrotron Light Source-II

Revision 2
October 2008

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Environment, Safety, and Health Plan

for the

National Synchrotron Light Source II

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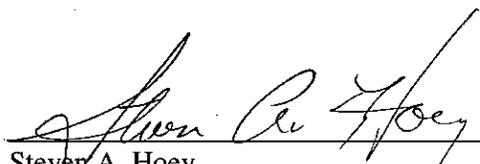
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**ENVIRONMENT, SAFETY, AND HEALTH PLAN
FOR THE
NATIONAL SYNCHROTRON LIGHT SOURCE II**

APPROVALS

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October 8, 2008

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ACRONYMS

ACGIH	American Conference of Government Industrial Hygienists
AE	Architect/Engineer
ALARA	As Low As Reasonably Achievable
ARR	Accelerator Readiness Review
ASE	Accelerator Safety Envelopes
BES	Basic Energy Sciences
BHSO	Brookhaven Site Office
BNL	Brookhaven National Laboratory
BSA	Brookhaven Science Associates
CDR	Conceptual Design Report
CFR	Code of Federal Regulations
CM	Construction Manager
D&D	Decommissioning & Decontamination
DART	Days Away, Restricted, or Transfer
DOE	Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESH	Environment, Safety, and Health
ESSH	Environment, Safety, Security, and Health
FHA	Fire Hazard Analysis
FONSI	Finding of No Significant Impact
FSAD	Final Safety Assessment Document
HQ	Headquarters
ISMS	Integrated Safety Management System
ISO	International Standards Organization
JRA	Job Risk Assessment
JTA	Job Training Assessment
LEED	Leadership in Energy and Environmental Design
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NLS	National Synchrotron Light Source
NLS-II	National Synchrotron Light Source II
OHSAS	Occupation Health and Safety Assessment Series
OSHA	Occupational Safety & Health Administration
PEP	Project Execution Plan
PHA	Preliminary Hazards Assessment
QA	Quality Assurance
R&D	Research and Development
R2A2	Roles, Responsibilities, Accountabilities, and Authorities
RF	Radio Frequency
SAD	Safety Assessment Document
SBMS	Standards Based Management System
SC	Office of Science

ENVIRONMENT, SAFETY, AND HEALTH PLAN FOR THE NATIONAL SYNCHROTRON LIGHT SOURCE II

1. NSLS-II Environmental, Safety, and Health Policy

A strong Environment, Safety, and Health (ESH) program is essential to the successful completion of the NSLS-II project at Brookhaven National Laboratory. We are committed to ensuring a safe work environment for NSLS-II workers and BNL site-wide workers and to protecting the public from hazards associated with construction and operation of NSLS-II. In addition, all work related to NSLS-II will be performed in a manner that preserves the quality of the environment and prevents property damage. Accidents and injuries are preventable and it is important that we work together to establish an injury free workplace.

We comply with the BNL Environmental, Safety, Security, and Health (ESSH) policy and all applicable requirements, and commit to enforcing these requirements in all our work. We will ensure that procedures are established to support the following NSLS-II ESH policy statements:

- Line managers are responsible for environmental stewardship and personal safety at the NSLS-II project site.
- Line managers, supported by the NSLS-II and BNL ESH organizations, will provide consistent guidance and enforcement of the ESH program that governs the activities of workers at the site.
- Incidents, whether they involve personal injuries or other losses, can be prevented through proper planning. All NSLS-II project work is planned.
- Workers are involved in the work planning process and continuous improvement, including the identification of hazards and controls.
- Working safely and in compliance with requirements is vital to a safe work environment. Line managers will enforce disciplinary policies for violations of safety rules.
- Each of us is responsible for our own safety, and for that of our co-workers. Together we create a safe work environment.
- A strong program of independent audits, self-assessments, and surveillance will be employed to periodically evaluate the effectiveness of the ESH program.
- Any incidents that result or could have resulted in personal injury or illness, significant damage to buildings or equipment, or impact of the environment, will be investigated to determine corrective actions and lessons that can be applied to prevent recurrence. We encourage open reporting of errors and events.

To achieve the culture and safety performance required for this project, it is essential that ESH be fully integrated into the project and be managed as tightly as quality, cost, and schedule. We will develop and implement an Integrated Safety Management System consistent with the requirements of DOE Policy 450.4 as a means of achieving this vision.

2. BNL Environmental, Safety, Security, and Health Policy

The BNL Director has issued an ESSH Policy that applies to all work performed by employees, contractors, and guests while working at BNL. All workers are expected to take personal responsibility to adhere to these principles. Accordingly, NSLS-II will be designed, constructed, and operated in a manner consistent with these values:

- **Environment:** We protect the environment, conserve resources, and prevent pollution.
- **Safety:** We maintain a safe workplace and we plan our work and perform it safely. We take responsibility for the safety of ourselves, coworkers, and guests.
- **Security:** We protect people, property, information, computing systems, and facilities.
- **Health:** We protect human health within our boundaries and in the surrounding community.
- **Compliance:** We achieve and maintain compliance with applicable ESSH requirements.
- **Community:** We maintain open, proactive and constructive relationships with our employees, neighbors, regulators, DOE, and our other stakeholders.
- **Continual Improvement:** We continually improve ESSH performance.

All parties are invited to provide NSLS-II management or the BNL Director with input on our performance relative to either the NSLS-II ESH Policy or the BNL ESSH Policy, or on the policies themselves.

3. Purpose and Scope

This plan establishes the framework and expectations for the ESH program for the NSLS-II project. It is based on the premise that a strong ESH program is essential to the successful completion of the NSLS-II project. We believe that accidents and injuries are preventable and that an injury-free workplace can be achieved through implementation of the program described in this document.

This plan will be supplemented by additional documents that provide more detailed ESH program requirements and establish implementing procedures to carry out the program elements described in this document. This plan and its requirements apply to all work carried out by project staff. An NSLS-II Project Construction ESH Plan and an ESH Management Plan for Construction have been developed to define additional program requirements that will be implemented by Contractors while working on the NSLS-II site.

4. Integrated Safety Management System

The project utilizes the concept of an Integrated Safety Management System (ISMS) as its overarching philosophy and approach to integrating safety systematically into work activities. ISMS is an organized process whereby work is planned, performed, assessed, and systematically improved to promote the safe conduct of work. These concepts will be described as they apply to this project in the balance of this section.

4.1 Principles of Integrated Safety Management

The fundamental principles described in DOE P 450.4 are incorporated into NSLS-II project processes to ensure that all work is planned and conducted safely. The project is committed to conducting our work efficiently and in a manner that ensures protection of workers, the public, and the environment.

4.1.1 Worker and Line Management Responsibility for Safety

Line management is responsible and accountable for establishing a safe working environment. Management expectations are to be clearly communicated to all personnel. Management is responsible for assuring that the tools necessary to perform work safely are provided and to solicit feedback to continuously improve the safe execution of work.

Line managers are responsible for training, motivating, and enabling their workers to understand and comply with the project's commitment to safety as expressed in this plan. They are also to ensure that work is executed as defined in relevant work planning documents and in compliance with ESH requirements. Line managers are also responsible, by personal example and by involving their workers, for providing a working environment in which everyone is involved in meeting the project's commitment to safety. It is equally important for managers and supervisors to ensure that guests or visitors are properly trained and understand their personal responsibility for safety.

All workers within the project facilities or at the NSLS-II construction site are expected to plan their work in compliance with ESH requirements. It is very important for each worker to:

1. Take personal responsibility for his/her own safety and that of co-workers while performing work.
2. Follow established procedures for safe work practices.
3. Conduct work as trained and as authorized by his/her supervisor.
4. Be thoughtful at all times and maintain vigilance even when performing simple and routine tasks.
5. Re-evaluate controls and discuss with supervisors or other knowledgeable persons when conditions change or are not found to be as expected.
6. Provide feedback to supervisors regarding work experiences in an effort to continuously improve safety and performance.

Workers and supervisors are accountable for the implementation of their responsibilities.

4.1.2 Clear Roles and Responsibilities

The project organizational structure defines reporting lines within the project. Clear and unambiguous roles and lines of responsibility, authority, and accountability at all organizational levels will be established through the development of individual R2A2s for all staff. ESH responsibility will be integrated into the project work activities, and interfaces for processes and organizations will be clearly established during work planning to provide for clear understanding and communication.

4.1.3 Personnel Experience, Knowledge, and Skill

Each individual associated with the project shall possess the experience, knowledge, skills, and abilities necessary to discharge his or her responsibilities effectively and safely. Line managers must ensure that their workers are competent to safely accomplish the work through the hiring and training processes. A Job Training Assessment (JTA) will be conducted for all project members, and applicable training

requirements will be established based on job duties. Line management is responsible to ensure that training and qualification requirements are established for their personnel, and workers are responsible to maintain their training current, as defined by BNL and NSLS-II project requirements.

Each contractor and subcontractor working at the project site will also be required as a part of their ESH Plan to provide a competent workforce on the project that has the ability to do work safely and efficiently.

4.1.4 Balanced Priorities

A strong ESH program is essential to the successful completion of the NSLS-II project. We will allocate sufficient time and resources to ensure that work is performed safely. All staff and contractors must take the time to complete training, plan work properly, and conduct their work in a manner that adequately controls hazards. It is essential that ESH be fully integrated into the project and be treated with the same priority as cost and schedule. Safety cannot be compromised because of cost or schedule pressures.

Every employee and subcontractor has the responsibility and authority to stop work when he or she believes the activity in which they are involved, or which they observe, is unsafe.

4.1.5 Safety Standards and Requirements

Before work is performed, hazards associated with the activity are evaluated and an agreed-upon set of controls is established which, if properly implemented, provides adequate assurance that the workers, the public, the environment, and property are protected from adverse consequences. For the NSLS-II project, these controls will be established based on the requirements established in the BNL Standards Based Management System (SBMS) subject areas, supplemented by requirements specific to NSLS-II that will be developed as needed.

4.1.6 Hazard Controls Tailored to Work Being Performed

Engineering controls and administrative controls are established to address hazards of the work. Wherever feasible, preference should be given to engineered controls; administrative controls are used to supplement engineered controls as appropriate. These controls are established through the work planning process for ongoing work or through review for the evolving design of the new facility. It is important that the controls are tailored appropriately to match the hazard and associated risk using a graded approach.

4.1.7 Authorization Agreement

The conditions and requirements necessary for operations to be initiated and conducted are clearly established and agreed on by the responsible line managers and workers prior to the start of work. This authorization agreement can take many different forms, ranging from a simple discussion at the work site between supervisor and worker to a complex Accelerator Safety Envelope signed by NSLS-II, Laboratory, and DOE management.

4.2 Core Functions of an Integrated Safety Management System

DOE P 450.4 describes the core functions of an Integrated Safety Management System. The five core functions provide a necessary structure for any work activity that may affect the worker, the public, or the environment. The functions form a continuous cycle which is not necessarily sequential. Rather, the functions are linked and interdependent, such that outcomes during the accomplishment of one may affect others. In particular, identifying and implementing opportunities for improvement may arise at any stage of the work process.

The five core functions that constitute the work planning process are: Define the Scope of Work, Identify and Analyze Hazards, Develop and Implement Hazard Controls, Perform Work within Controls, and Provide Feedback and Continuous Improvement. It is important to apply this process to all work that is performed, but it should be understood that the method of planning and its degree of rigor and formality depends on the hazards and complexity of the work being discussed. Some work will require extensive work planning documents and a formal work permit. Other work may be addressed through standing job risk assessments conducted by supervisor, workers, and ESH staff.

4.2.1 Define the Scope of the Work

Defining the scope of work entails identifying and describing all the steps needed to complete a particular job safely. Defining the scope of work is a critical element of the work planning process, since it sets the stage for the scope and depth of hazard identification and analysis.

4.2.2 Identify and Analyze Hazards associated with the Work

Hazard identification requires a definition of the hazards which will be encountered during the course of performing a particular task, as well as those that are introduced from other work in progress. A Job Risk Analysis (JRA) shall be performed for each type of work activity to identify such hazards. There is the potential that unexpected hazards may be encountered or the nature of the known hazards might change as work activities proceed. Should this occur, the JRA shall be amended to incorporate the new conditions.

4.2.3 Develop and Implement Hazard Controls

The development and implementation of hazard controls require the identification of those controls to prevent and mitigate hazards, and establishing safe work limits. It is important that the controls and their application be fully understood by all workers who are involved in the work.

4.2.4 Confirm Readiness and Perform Work within Controls

Confirmation of readiness is the process of verifying that safety controls that have been identified have been implemented before starting work. Performing work within controls entails adherence to the established requirements such that activities remain within the safety envelope. Readiness assessments may entail a wide range of complexity, ranging from as simple as a pre-job review by a worker to ensure that conditions and controls are as expected, to as complicated as an extensive and lengthy review conducted by BNL and DOE management prior to the start of an accelerator for the first time.

4.2.5 Provide Feedback and Seek Continuous Improvement

Feedback on the adequacy of controls and the work planning process is vital to continuous improvement. Such feedback may be collected from several sources; it is particularly important to get feedback from workers performing the task, but information collected from oversight provided by management or independent organizations is also an essential source of feedback. It is important that feedback information be assessed and opportunities for improvement be identified and implemented.

4.3 Roles and Responsibilities for ISM Implementation

4.3.1 Senior Management

The NSLS-II Project Director is responsible for overall successful execution of the NSLS-II project and has overall responsibility for ESH performance for the duration of the project. The managers of the principal organization units within the project (i.e., the Accelerator Systems Division, Conventional

Facilities Division, Experimental Facilities Division, and Project Support Division) are responsible to ensure implementation of ESH requirements applicable to the activities within their groups.

4.3.2 Line Managers

Line managers provide the primary operating interface with employees, as well as with guests, visitors, and contractor/vendors. Within the framework of the ISMS, line managers are expected to contribute to work planning, pre-job communication of hazards and controls, work monitoring, and evaluation of results.

Effective integration of support from ESH professionals into line activities is essential to achieving excellence in ISMS. Line management is responsible for defining and providing an adequate level of subject matter expert support, either from its own staff or from external sources, as appropriate for the particular line organization and ESH discipline involved.

4.3.3 NSLS-II ESH Manager

The NSLS-II ESH Manager is responsible for providing overall policy and guidance on ESH issues, and for working with the line organizations to make available necessary input from ESH professionals and other support. BNL ESH personnel will be enlisted to assist the project in ensuring that the standards, requirements, and ESH policies are effectively translated into suitable controls for work activities.

The NSLS-II ESH Manager will also regularly assess the effectiveness with which ISMS is being applied, and will coordinate the ESH assessments conducted by others.

The ESH Manager is responsible for safety analyses, determining hazard classification, generating safety assessment documents as defined in Sections 5.3 and 5.4 below, and obtaining appropriate approvals.

4.3.4 NSLS-II Staff

All NSLS-II personnel are responsible to uphold the NSLS-II ESH and BNL ESSH policies. All personnel are expected to conduct their work in compliance with ESH requirements applicable to their work, including prescribed safety and health equipment, reporting unsafe conditions/activities, preventing avoidable accidents, and working in a safe manner.

All staff are responsible for becoming knowledgeable of and maintaining awareness of the hazards associated with their work, for contributing to the formulation of hazard controls, for conducting their work safely in accordance with those controls, and to exercise stop-work authority in cases of imminent danger to health and safety of workers or the public, or threat to the environment or property.

All staff are responsible to identify ESH issues in their workplace and to work with their management to identify improvements and to resolve concerns.

4.3.5 Contractors and Subcontractors

NSLS-II contractors are expected to incorporate safety into the planning of each task, assure the safety of their personnel, provide all personal protective equipment necessary for their employees, establish a safe and drug-free work environment, and confirm that their equipment meets the applicable safety standards. NSLS-II contractors are responsible for any actions of their personnel that may endanger or otherwise expose other participants to potential hazards on the project.

NSLS-II contractors will submit a written ESH Plan for review and approval by BNL and NSLS-II management. Contractor ESH Plans will meet or exceed all applicable NSLS-II project safety requirements defined in the NSLS-II Project Construction ESH Plan, must comprehensively address all

anticipated hazards for executing the construction, and must identify the appropriate protective measures that will be used to mitigate the hazards. All subcontractors to any prime contractor must follow the requirements in the prime's ESH Plan.

5. ESH Program Elements

5.1 Introduction

All work associated with this project will be conducted in a manner that ensures protection of the workers, the public, and the environment. Implementing procedures and additional guidance to ensure accomplishment of these expectations will be established and communicated to all staff, contractors, and vendors. At the conclusion of the construction of NSLS-II and the commencement of routine operations, the NSLS-II ESH program will transition to the appropriate BNL institutional programs covering ESH.

5.2 Program Expectations

The NSLS-II project shall address its ESH responsibility by:

1. Establishing an Integrated Safety Management System, as defined above, that implements the DOE Policy 450.4, *Safety Management System Policy*, the BNL SBMS subject areas, and the requirements of the DOE Accelerator Safety Order, DOE O 420.2B, *Safety of Accelerator Facilities*. The program shall protect the environment and the safety of workers and the general public by assuring that:
 - a. Facilities, systems, and components needed to meet mission requirements are fully defined and are designed, constructed, and operated in accordance with applicable BNL and DOE requirements;
 - b. Potential hazards to personnel associated with all NSLS-II systems, structures, and components are identified and controlled through the timely preparation of safety assessment documents;
 - c. Potential risks to the environment are addressed through the timely and comprehensive preparation of appropriate National Environmental Protection Act documentation;
 - d. ISO 14001 and OHSAS 18001 criteria are implemented to assure that all ESH risks are identified and addressed;
 - e. Requirements in 10 CFR Part 835, Part 850, and Part 851 are fully implemented to protect worker safety and health;
 - f. Research and development activities and all other project work are conducted in accordance with BNL work planning requirements to ensure control of hazards and proper authorization of work; and
 - g. ESH program performance is monitored and assessed to evaluate effectiveness and to identify opportunities for improvement.
2. Implementing a QA program that follows DOE Order 414.1-2A, *Quality Assurance Management System Guide* and incorporates quality requirements from BNL's SBMS subject area on Quality Management and the SBMS subject area Graded Approach for Quality Requirements. The NSLS-II quality assurance program is documented in the NSLS-II QA Plan.

3. Implementing an effective construction safety program to ensure worker safety on the NSLS-II site during construction. All work performed on the NSLS-II site will be conducted in accordance with the NSLS-II Project Construction Environment, Safety, and Health Plan.
4. Performing independent design reviews on systems, structures, and components designated as safety significant in the Safety Assessment Document or as defined through QA classifications described in the NSLS-II QA Plan.
5. Providing appropriate training to ensure that project staff is adequately trained and qualified to perform their assigned work safely. Job Training Assessments will be conducted for all staff to ensure knowledge of job-related hazards and their controls. All project staff are responsible for ensuring that their training and qualification requirements are fulfilled, including continuing training to maintain proficiency and qualifications.
6. Developing and implementing operating procedures to control work on NSLS-II technical systems and to implement requirements of the ESH and work planning program.
7. Performing and documenting safety inspections of all project facilities and work areas, and ensuring prompt correction of any issues identified in the inspection..
8. Reporting and investigating occurrences in accordance with the BNL Occurrence Reporting Processing System as defined in the BNL SBMS. Any incident, accident, or other abnormal event will be properly communicated and investigated via established BNL procedures.

5.3 Safety Assessments for Hazard Identification and Control

NSLS-II structures, systems, components, operations, and work processes will be analyzed to ensure proper identification and control of hazards. To accomplish this requirement, a series of safety assessments will be prepared as the design advances, to ensure a systematic identification and control of hazards. Hazards and potential accidents will be analyzed in progressively more detail in each stage of design. Safety personnel will work closely with project engineers to develop a common understanding of the facility, systems, and processes; possible hazards including hazardous materials; and the envisioned operation of the facility. These safety assessment documents will define requirements and standards for incorporation into the facility design. It is vital that designers know how to control the hazards posed by the systems, structures, and components within their scope of work. All safety assessment documents will be approved by the ESH Manager and the Project Director, and are subject to subsequent review and approval by the Lab ESH Committee and other committees as specified at a later time.

In addition, during the transition from construction to partial or complete use of a building, additional reviews are required to ensure that ESH requirements for the proposed use are addressed. These "readiness reviews" will be performed prior to initial occupancy of the building for installation and commissioning of equipment and will be conducted in accordance with BNL SBMS subject areas. Commissioning activities associated with operation of an accelerator will be subject to the readiness review requirements of the DOE Accelerator Safety Order 420.2B.

5.3.1 Preliminary Hazards Analysis

A Preliminary Hazards Analysis (PHA) was prepared during the conceptual design phase of the project. The PHA identifies all hazards anticipated with the construction and operation of NSLS-II and the mitigating controls that will be employed to eliminate or reduce risk of the hazards to manageable levels.

The fire hazard analysis section of the PHA reviews fire hazards associated with the construction and operation of NSLS-II and identifies building and facility fire protection criteria that are needed to reduce the risk of harm to workers and to minimize the potential of property loss due to fire. The PHA was updated as the design evolved and was used in developing the Final Hazard Analysis Report and the Preliminary and Safety Assessment Document.

5.3.2 Final Hazard Analysis Report

The Final Hazard Analysis (FHA) Report is a continuation of the analysis initiated with the PHA. This document was prepared as the preliminary design was developed and more rigorous analysis of NSLS-II hazards and controls became possible. However, it is understood that civil design and facility engineering may not have had sufficient detail to provide for a complete assessment at this stage. The FHA is prepared as a tool to identify issues that must be addressed during final design relating to construction, commissioning, operation, and decommissioning. The FHA was completed and approved prior to the award of CD-2.

5.3.3 Preliminary Safety Assessment and Final Safety Assessment Documents

The hazard analysis of NSLS-II design and operations continues to become more detailed as design advances. The next document in the series of hazard analyses is entitled the Preliminary Safety Assessment, which was prepared and approved during Title II design and prior to CD-3. The PSAD builds on the Final Hazard Analysis Report and takes into account design maturity of both the conventional construction as well as accelerator and experimental systems. However, it is understood that while the civil design is complete and well analyzed, the accelerator and experimental systems do not have sufficient detail to provide for a complete assessment at this stage. The PSAD provides a mechanism to document the issues that must be addressed during subsequent design, construction, operation, and decommissioning of the accelerator.

The Commissioning Safety Assessment Documents must be prepared prior to the commissioning of the accelerators and must be updated to a Final Safety Assessment Document prior to beginning routine operation. The purpose of the Final Safety Assessment Document (FSAD) is to describe in sufficient detail all significant hazards presented by the facility and its operations, and the controls by which these hazards will be managed. The safety analysis is used to identify hazards, credible impacting events, initiators of events, assumptions used in estimating impacts and consequences of an event, controls required to reduce risks, and post-mitigation risks to workers, the public, and the environment. The FSAD will define the controls and standards that must be incorporated into the facility design and operating procedures. It provides the basis for the Accelerator Safety Envelopes (ASE) that must be prepared and approved by BNL and DOE management prior to commissioning and eventual routine operation of the facility. It is anticipated that accelerator subsystems will be commissioned sequentially (linac first, then booster, and then storage ring) and that commissioning of the beamlines will be managed by NSLS-II and will not require approval by BNL or DOE. Approval to commission each subsystem will require the appropriate CSAD and ASE prior to the start of commissioning. A complete facility FSAD and ASE must be completed and approved prior to the award of CD-4.

5.3.4 Beneficial Occupancy

During the latter portions of conventional construction of the building structure, there will be a transition to installation, assembly, testing, and eventual operation of the accelerator and beamline systems. These incremental changes in occupancy of the building will be subject to formal review and approval. Readiness evaluations are performed to verify that personnel, hardware, administrative requirements, and procedures are ready to permit the activity to be undertaken in a safe and environmentally sound manner. These reviews will be performed in accordance with the BNL SBMS subject area Readiness Evaluations.

5.3.5 Commissioning and Accelerator Readiness Reviews

As noted previously, NSLS-II accelerator systems will be commissioned at different intervals. A Commissioning Program Plan of Action will be developed to describe the objectives of each phase of commissioning. All accelerator-commissioning activities will be conducted as prescribed in the Commissioning Plan and within the boundaries defined in an applicable Accelerator Safety Envelope.

Accelerator Readiness Reviews (ARRs) must be performed before approval for accelerator commissioning and routine operation or as directed by the Project or DOE management. An ARR is conducted to verify that the necessary safeguards and procedures are in place to permit safe operation of the facility or subfacilities. Where commissioning of an accelerator facility is accomplished in phased and discrete segments, the ARR must also be performed incrementally. All accelerator readiness reviews will be conducted as described in the BNL SBMS subject area Accelerator Safety. The scope and schedule of each commissioning module will be established in the Plan of Action prepared for the commissioning module. The NSLS-II Federal Project Director will monitor and/or arrange DOE participation in the ARR, and will authorize the module's commissioning and routine operations after determining that documentation and readiness are acceptable.

5.3.6 Work Performed During Construction, R&D, and Commissioning Activities

The NSLS-II Project Construction Environment, Safety and Health Plan will be prepared to define responsibilities and to establish health and safety expectations that all contractors must address during construction. Each contractor will be required to prepare an ESH plan addressing their phase of the work. Each contractor's ESH plan will be reviewed and approved by NSLS-II and BNL management and will be subject to enforcement during work by contractor, Project, and BNL safety personnel.

All routine non-administrative work conducted by NSLS-II staff shall be evaluated using a Job Risk Analysis. The JRA shall identify the work to be performed, the hazards anticipated, and the actions to be taken to address the hazards. The JRA shall be prepared with participation of worker(s) performing the tasks. When work changes or unanticipated conditions are encountered, the JRA shall be revisited and revised as necessary.

All work activities with significant environmental aspects will be evaluated through process reviews as a part of the ISO 14001 program, and are subject to additional work planning prior to authorization for work.

All routine work is subject to BNL work planning requirements and must be performed by workers who are trained and qualified and authorized by their supervisor to carry out the work.

5.4 NEPA Compliance

In compliance with the National Environmental Protection Act (NEPA) and its implementing regulations (10 CFR 1021 and 40 CFR 1500-1508) and in accordance with the requirements of DOE Order 451.1B, an Environmental Assessment (EA) to evaluate the potential environmental consequences of constructing and operating NSLS-II at DOE's preferred site (BNL) has been carried out. The EA analyzed the potential environmental consequences of the facility and compared them to the consequences of a No Action alternative. The assessment included detailed analysis of all potential environmental, safety, and health hazards anticipated as the design, construction, and operation of the facility progresses. The EA determined that there would be no significant impact from the construction and operation of the proposed facility and that an Environmental Impact Statement (EIS) was not required. A Finding of No Significant Impact (FONSI) was approved by the DOE Brookhaven Site Office (BHSO) Manager and made available to the general public and project stakeholders. The EA was evaluated in July 2008 to compare the Title II

Design specifications to the original EA. This evaluation determined that there were no new adverse environmental impacts as a result of the Title II Design specifications.

5.5 LEED Certification

The NSLS-II conventional facilities will be constructed to achieve Leadership in Energy and Environmental Design (LEED) certification, which sets requirements for sustainable design principles, pollution prevention, and waste minimization during construction and operations. Design reviews and safety assessments of facility systems and operations will be conducted during preliminary and final design to minimize waste generation in the operation of NSLS-II and to evaluate opportunities for pollution prevention. Members of the BNL Environmental and Waste Management Services Division will participate in the reviews during the preparation of preliminary and final designs.

