

Brookhaven National Laboratory/ Light Sources Directorate						
<b>Subject:</b>	<b>Installation Readiness Review</b>					
<b>Number:</b>	<b>LS-QAP-0417</b>	<b>Revision:</b>	<b>A</b>	<b>Effective:</b>	<b>3/29/2010</b>	<b>Page 1 of 7</b>
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\*Approval signatures on file with master copy.

Revision Log

## 1.0 PURPOSE

To establish responsibilities and procedures for reviewing and documenting the installation of key components in the NSLS accelerators, front ends, or transfer lines.

## 2.0 SCOPE

- 2.1 This procedure is applicable for all components and systems having an ESH&Q risk level of High (A1- Critical) and Moderate (A2- Major) that will be installed into the accelerator (LINAC, storage rings, or transport line) at NSLS. Items having an ESH&Q risk level of Low (A3- Minor) may also be scheduled for installation readiness review due to potential safety hazard, uniqueness of design, construction techniques, or environmental impact as determined by the responsible NSLS Engineering Section Head.
- 2.2 Installation of beamline components that are determined to be a high risk by the responsible NSLS Engineering Section Head or designee will be reviewed by the NSLS Beamline Safety Review Committee utilizing NSLS procedure [Beamline Safety Review](#). The Committee normally reviews all components, including beam line shielding, monochromators, mirror tanks, slit assemblies, and beam stops and shutters.
- 2.3 The Installation Readiness Review procedures defined in this document require that the responsible NSLS engineering section, operations head, or designee choose an Installation Review chair and review members. For radiation and laser personnel protection interlock systems, the practice at the Light Sources Directorate is to use the NSLS [Interlock Working Group](#) and its procedures for this review. Additional installation readiness review(s) as deemed necessary by the responsible NSLS engineering section head is/are not precluded by this current practice.

## 3.0 POLICY

- 3.1 All components and systems for use in the Light Sources Directorate, having a ESH&Q risk level of High (A1-Critical), Moderate (A2-Major) and possibly Low (A3-Minor) (as determined by the cognizant NSLS Engineering Section Head or designee in consultation with the head of operations) shall require an installation review by knowledgeable personnel. These reviews shall be called "Installation Readiness Reviews (IRR)." In addition, the NSLS head of operations may request an IRR if he/she determines it to be necessary due the potential impact to operations of a particular installation. In the case of any disputes, the determination shall be made by the head of operations or his/her designee.

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- 3.2 Design Review packages, inspection test results, work/job plans, travelers, accompanying layouts, drawings, and/or sketches, shall be the basis of information for an IRR.
- 3.3 Since test results, installation schedule, and work planning form a necessary part of IRR's, it is suggested that the IRR be scheduled when all of the necessary elements will be available for review.
- 3.4 An additional Installation Readiness Review may be scheduled when parameters such as schedule or component performance change.
- 3.5 All Installation Readiness Reviews shall address Significant Environmental Aspects associated with the reviewed project, applicable regulatory requirements, and where applicable, the Facility Use Agreement (FUA), and the Safety Assessment Document (SAD)/Accelerator Safety Envelope (ASE). An appropriate safety member of the NSLS ESH&Q Group or designee shall complete the "EMS, FUA, and SAD/ASE checklist for Light Sources Directorate Reviews" to record the ES&H issues associated with the review. Note this checklist is not required for an installation review if already completed as part of a design review or for repairs whereby a failed (or failing) accelerator component is being replaced with an equivalent component and the accelerator is essentially restored to its' prior state.  
  
Electrical Equipment Inspection (EEI) requirements are located in Appendix VI of the BNL "Electrical Safety" subject area ["Review and Approval of Electrical Equipment and Installations"](#) and on the [NSLS EEI website](#).
- 3.6 After the completion of an Installation Readiness Review, an [Installation Readiness Review Report](#) shall be completed to document all pertinent installation information and the results of the Installation Readiness Review.
- 3.7 All Installation Readiness Review Reports shall be filed in the controlled master file by the NSLS Quality Control Coordinator (QCC) along with copies of the presentation(s) given during the IRR.

#### 4.0 REFERENCES

- 4.1 ["Graded Approach for Quality Requirements"](#) - SBMS Subject Area.
- 4.2 [Application of the Graded Approach Table](#)- SBMS.
- 4.3 ["Preparation and Control of Completed Drawings and Specifications"](#) - (DL-QAP-0403).
- 4.4 [EMS, FUA, and SAD/ASE checklist for Light Sources Directorate Reviews](#).
- 4.5 ["Installation Readiness Review Report"](#) - (QF-063).

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4.8 “Design Reviews” – (DL-QAP-0412)

4.9 “Electrical Safety” – SBMS Subject Area

## 5.0 DEFINITIONS

5.1 **Layout** - An Informal Engineering Drawing of a component or system containing, in pictorial and descriptive language, sufficient information to reflect the requirements of the Installation Criteria.

5.2 **ESH&Q Risk Level** - An indicator using a weighted scale that is used once the ES&H and programmatic risks have been evaluated, e.g., High (A1-Critical), Moderate (A2-Major), Low (A3-Minor), and Negligible (A4-Negligible).

## 6.0 PROCEDURE

6.1 The responsible NSLS engineering section head, operations head, or designee shall schedule a Installation Readiness Review when:

6.1.1 an item is required for use in the Light Sources Directorate that has a ESH&Q risk level of High (A1-Critical) or Moderate (A2-Major); and,

6.1.2 an item having a ESH&Q risk level designation of Low (A3-Minor) which is of concern due to its complexity, uniqueness, potential safety hazard, programmatic impact, or environmental impact.

6.2 The Installation Readiness Review Committee may schedule additional Readiness Reviews if they deem it necessary.

6.3 The responsible NSLS engineering section, operations head, or designee may schedule any number of Intermediate Readiness Reviews if, during the review stage, significant changes are made to the original concept, or significant portions of the original installation plans could not be sufficiently completed.

The Installation Readiness Review Process should be completed 1 to 2 months prior to the actual scheduled installation. In the event data or components are not available an Initial IRR shall be completed. The subsequent/Final IRR shall be completed as soon as possible with consideration of completing in advance of actual installation.

6.4 When the responsible NSLS engineering section head, operations head, or designee schedules an installation readiness review, he/she shall appoint someone to act as Installation Readiness Review Chairman for the review. The selected chairman shall be familiar with the equipment and/or NSLS operations and engineering process; and,

6.4.1 Preferably did not directly participate in the design of the system, subsystem, or

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assembly requiring a review; and,

- 6.4.2 Preferably is not directly in the line of authority, either above or below, the designer of the item to be reviewed.
- 6.5 With the advice of the Installation Readiness Review Chairman, the responsible NSLS engineering section head, operations head, or designee shall appoint a group of reviewers who have experience and knowledge in the science and technology of the equipment. At least one of the reviewers shall be an appropriate safety member from the NSLS ESH&Q group and at least one reviewer shall be the NSLS head of operations or his/her designee. In the event of disputes, the NSLS head of operations shall serve as the chief reviewer who has the final responsibility for dispute settlement.
- 6.6 The responsible NSLS section/operations head(s) and the IRR Chairman shall determine if additional participants in the review should represent such disciplines as:
- Design;
  - Mechanical (Vacuum, Utilities, Survey, Mechanical Support technicians and engineers, etc.);
  - Electrical (Interlocks, Controls, RF, Power Systems technicians and engineers, etc.);
  - Accelerator and/or beamline Physicists;
  - Quality Assurance;
  - User;
  - Environmental, Safety and Health
  - BNL Facility and Operations Division (riggers, electricians, plumbers, masons, engineers, construction safety engineers, etc.)
- 6.7 The Installation Readiness Review Chairman shall notify the NSLS QCC of the scheduled review, the type of review, and review participants. The QCC shall maintain a log of Installation Readiness Reviews listing at a minimum, the titles of items reviewed, the types of reviews (e.g. Initial, Intermediate, Final Installation Readiness Review), the dates of the reviews, and a complete listing of those participating in each review and their associations.
- 6.8 The Installation Readiness Review Chairman or designee will notify those that are appointed to participate in the review, at least one week prior to the scheduled date of the review. The notification will also include copies of any installation requirements and related schematics, layouts, presentation material and/or drawings.

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6.9 The Installation Readiness Review Chairman, or designee, and the responsible engineer shall ascertain that the Installation Readiness Review Package contains sufficient information for the review scheduled.

6.9.1 Contents for the Installation Readiness Review Package should include:

- Any layout(s);
- Installation schedule;
- Design/installation specifications;
- Any supportive inspection test;
- Installation or work plan with any particular or unique expectations (e.g. affect on adjacent machine components, availability of workers, use of Travelers, utilities, overtime, holidays, etc.)
- Identification of permits required (e.g. Work Permit, Safety Work Permit, RWP)
- Presentation material for each component/system to be installed identifying installation requirements:
  - Including special equipment (crane, tools, etc.);
  - Personnel requirements (NSLS techs, BNL trades, etc.)
  - Utilities (water, electrical, signal, air, etc.)

6.9.2 Contents for any necessary Intermediate/Final Installation Readiness Review should include:

- All available assemblies or updated layouts;
- Revised design/installation specifications or plans;
- Any new inspection test results;
- Any new permit requirements;
- Any completed drawings and/or specifications for assemblies, subassemblies, and major components;
- Results or actions taken as a result of any prior reviews

6.10 The Installation Readiness Review Chairman, designee, or responsible engineer shall arrange a conference room for the review.

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- 6.11 The Installation Readiness Review Chairman, designee, or the responsible engineer shall contact all of the presenters and make the necessary arrangements to have available all audio/visual aids and supplies that may be required for the review.
- 6.12 The Installation Readiness Review Chairman or designee shall ensure that meeting results are taken and recorded in the [Installation Readiness Review Report \(QF-063\)](#).
- 6.13 The Installation Readiness Review Report shall include at a minimum:
- the title of the item or system
  - a description of the item;
  - The ESH&Q risk level;
  - the installation parameters/plan;
  - identification of required permits;
  - the type of installation review;
  - the date of the review;
  - the names and association of the reviewers;
  - the major comments and concerns of the reviewers;
  - Installation or work/job plan with any particular or unique expectations (e.g. affect on adjacent machine components, availability of workers, use of Travelers, utilities, overtime, holidays, etc.)
  - A completed "[EMS, FUA, and SAD/ASE Checklist for Light Sources Directorate Reviews](#)". Note this checklist is not required for an installation review if already completed as part of a design review or for repairs whereby a failed (or failing) accelerator component is being replaced with an equivalent and the accelerator is essentially restored to its' prior state. Only one completed checklist is required as part of the IRR report package unless the scope of the IRR changes.
- 6.14 After obtaining concurrence from the committee members, the Installation Readiness Review Chairman and the NSLS head of operations/designee will sign the completed Installation Readiness Review Report. He/she will request the NSLS QCC distribute the report to all reviewers, affected groups, and the Quality Representative.
- 6.15 The Installation Readiness Review Report shall be filed in the Master File by the NSLS QCC with the relevant documentation/references as indicated in section 6.13. A copy of the Installation Readiness Review Report shall be filed in the backup file.

