

Brookhaven National Laboratory/ Light Sources Directorate			
Subject:	Engineering Design Plans (EDP)		
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*Approval signatures on file with master copy.

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1.0 PURPOSE

To establish responsibilities and procedures for documenting design information when requesting an engineering effort in the Light Sources Directorate (DL).

2.0 SCOPE

This procedure is applicable for all components and systems having an ESH&Q Risk Level of High (A1- Critical) or Moderate (A2-Major) requiring design by NSLS or NSLS II Personnel.

Items having an ESH&Q Risk Level of Low (A3-Minor) will also require an EDP if there are potential safety hazards, uniqueness or complexity of design, novel construction techniques, or an environmental impact.

3.0 POLICY

- 3.1 Scientists or others who have a need for components or systems having an ESH&Q Risk Level of High (A1-Critical), Moderate (A2-Major), and if applicable, Low (A3-Minor), shall initiate their design by preparing a document package which will be called the "Engineering Design Plan" or "EDP." The EDP will play a major role in developing the components or systems.
- 3.2 The completed EDP and accompanying documentation will be reviewed and authorized by the cognizant NSLS engineering section head or the NSLS II Division Director, the requestor, the requestor's section head/division director/designee, ES&H (as appropriate), and QA (for A1 EDPs).
- 3.3 The completed EDP, including conceptual layout(s) or sketches shall be stored in a controlled master file.
- 3.4 A [Light Sources Directorate Design Checklist](#) will be utilized during the design review process to assure important Design elements have been addressed. In addition to the Design Checklist, electrical equipment designs must meet the requirements stated within BNL "[Electrical Safety](#)" and "[Design and Installation of Electrical Equipment](#)" SBMS subject areas. 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](#).

4.0 REFERENCES

- 4.1 "[Graded Approach for Quality Requirements](#)- SBMS Subject Area.
- 4.2 [Application of the Graded Approach Table](#)
- 4.3 [DL-QAP-0412, "Design Reviews."](#)

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- 4.4 ["Engineering Design"](#) - SBMS Subject Area.
- 4.5 **Engineering Design Plan (EDP) Form**, [QF-033](#).
- 4.6 Engineering Design Plan (EDP) - *Change Form*, [QF-034](#).
- 4.7 "Light Sources Directorate Design Checklist" - ([QF-060](#)).

5.0 DEFINITIONS

- 5.1 **Cognizant Engineer** - Specific individual assigned technical design responsibility for item(s) described in the EDP.
- 5.2 **Cognizant Scientist** - Specific individual assigned scientific responsibility for an item, research activity or function.
- 5.3 **Design Requirements** - A compilation of information necessary to allow the generation of a design for the component or system.
- 5.4 **Conceptual Layout** - An Informal Engineering Drawing of an assembly or system containing in pictorial and descriptive language sufficient information to reflect the Design requirements. .
- 5.5 **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).
- 5.6 **Sketch** - An informal drawing of a system, assembly or portion thereof depicting some aspect of the design.

6.0 PROCEDURE

- 6.1 A preliminary EDP shall be prepared by the originating NSLS or NSLS II staff member for all design requests for a component or system which has an assigned ESH&Q Risk Level of High (A1-Critical) or Moderate (A2-Major). For an ESH&Q Risk Level of Low (A-3-Minor), a preliminary EDP may be required per Par. 2.0.

The NSLS or NSLS II staff member shall fill-out an [EDP form](#) and include the following preliminary information:

- Title of component or system;
- Date;
- Revision;
- Environmental, Safety, & Health Considerations;
- Design Requirements - This may be brief, but will contain sufficient information allowing for correct interpretation by the cognizant engineer for the preparation of a "design";
- Required/Requested Schedule;
- Funding Account;

Note: Consult the [Graded Approach for Quality Requirements](#) subject area and the [Application of the Graded Approach Table](#) within for guidance in determining the

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ESH&Q risk level.

- 6.2 The requestor shall furnish a copy of the [EDP form](#) to the cognizant NSLS engineering section head or NSLS II Division Director to initiate the engineering effort.
- 6.3 The cognizant NSLS engineering section head or NSLS II Division Director shall assign an engineer to the project.
- 6.4 The requestor and the assigned engineer shall review the preliminary EDP to ensure that the information is sufficient for the task and also shall include the following information on the [EDP form](#):
 - ESH&Q Risk Level;
 - Other controlling Documents (e.g. Work Planning and Control for Experiments and Operations, Facility Use Agreements, etc.);
 - EDP number (contact NSLS [QCC](#) or NSLS II DRA);
 - Distribution list;
 - Additional items, as required.
- 6.5 The Design Requirements may be adjusted as the design evolves, but major changes should be documented by a revision to the EDP using form [QF-034](#) and circulated to individuals on the original distribution list for notification.
- 6.6 Guided by the cognizant engineer, a conceptual layout, sketch, or schematic may be prepared to augment the Design Requirements.
- 6.7 The decision of whether a Design Review is required shall be included on the EDP form. The cognizant NSLS engineering section head or NSLS II Division Director will initiate a Design Review in accordance with [DL-QAP-0412](#) when appropriate.
- 6.8 The cognizant engineer, requestor, and the affected NSLS section heads or NSLS II Division Directors will review and approve the EDP package to ensure that it is complete.
- 6.9 A member of the NSLS or NSLS II ES&H Staff, if appropriate, will review and approve the Environmental, Safety, & Health considerations.
- 6.10 The NSLS or NSLS II QA Manager shall review & approve QA requirements for A1 EDPs.
- 6.11 Submit the Original EDP form for retention to the NSLS [Quality Control Coordinator \(QCC\)](#) or the NSLS II Documents and Records Administrator upon completion, consisting of originals/masters of pertinent design documents and signature approvals.

