

Subject: Preparation and Revision of Engineering Calculations and Analyses			
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*Approval signatures on file with master copy.

[Revision Log](#)

1.0 PURPOSE

To establish responsibilities and procedures for documenting engineering calculations and analyses in the Light Sources Directorate (DL).

2.0 SCOPE

This procedure is applicable to NSLS and NSLS II staff who perform Engineering calculations and analyses for tasks requiring an Engineering Design Plan.

3.0 REFERENCES

3.1 [Elements of Calculations and Analyses](#) - DL-QAI-4.2

3.2 [Engineering Design Plans \(EDP\)](#) - DL-QAP-0411

3.3 Calculation cover and worksheets:

- [Cover Page](#)
- [Blank Page Worksheet](#)
- [Large Grid Worksheet](#)
- [Small Grid Worksheet](#)

4.0 DEFINITIONS

4.1 Independent reviewer - An NSLS or NSLS II individual knowledgeable in the appropriate discipline, an external Department/Division, or an organization outside of BNL.

5.0 PROCEDURE

5.1 Preparing Engineering Calculations and Analyses

5.1.1 The staff member prepares the calculations and analyses with details sufficient for a qualified person to understand the design process involved.

Hand calculations and analyses must:

- be hard copy documented;
- document reference sources;

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- provide a copy of commercial equipment catalog page (if applicable);
- follow an easily understood logic and methodology;
- be legible and reproducible by photocopy methods;
- be in accordance with the [Elements of Calculations and Analyses exhibit](#).

Finite Element Analyses (FEA) or other computer based calculations must be:

- hard copy documented;
- stored on dedicated and backed up hard drives or partitioned hard drives in the design room;
- in accordance with the [Elements of Calculations and Analyses exhibit](#)

5.1.2 For projects with Environment, Safety, Health and Quality (ESH&Q) Risk Levels High (A1- Critical) or Moderate (A2 - Major), an independent reviewer or qualified staff member reviews the calculations and analyses.

5.1.3 The originator and reviewer sign and date the calculations and analyses.

5.1.4 The originator gives the calculations or analysis to the NSLS [QCC](#) or the NSLS II DRA for filing.

5.2 **Revising Calculations and Analyses**

5.2.1 A staff member revises the existing calculations and analyses, and changes the revision letter and date to reflect the changes. Revisions to calculations and analyses must include the same requirements stated in section [5.1.1](#).

5.2.2 For projects with Environment, Safety, Health and Quality (ESH&Q) Risk Levels High (A1- Critical) or Moderate (A2 - Major), an independent reviewer reviews the revisions.

5.2.3 The reviser and reviewer sign and date the changes to the calculations and analyses.

5.2.4 The reviser gives the changes to the calculations or analysis to the NSLS [QCC](#) or the NSLS II DRA for filing.

5.2.5 The NSLS [QCC](#) or NSLS II DRA enters revisions to the calculations or analyses

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in the calculation database including the new revision letter and date to reflect the changes.

