



SNS-OPM 2.H-7.8

Temporary Shielding of the Target Monolith and Neutron Beamlines

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Temporary Shielding of the Target Monolith and Neutron Beam Lines

1. Purpose

- 1.1 Temporary shielding is used to ensure that Experimental Hall 1 (aka. Target Building) maintains a radiologically safe working environment (as defined in Ref. 7.1). It is used on uninstrumented beam lines, on operating instrument beam lines without a neighbor (on one or both sides), and for instrument beam lines with incomplete shielding (due to the construction process).
- 1.2 Temporary shielding shall provide protection against anticipated radiation levels and shall be configured in a manner which meets industrial safety requirements.
- 1.3 Temporary shielding is primarily required to compensate for inadequate shielding. The shielding includes, but is not limited to, concrete blocks designed specifically for this purpose and various other materials (i.e. high-density concrete bricks, trench covers, and borated polyethylene). The concrete blocks designed specifically for temporary shielding are described and analyzed in Refs. 7.2-7.4.
- 1.4 The term “temporary” is intended to describe time periods lasting no more than one year. If a Temporary Shielding application goes beyond this intended time frame, the Neutron Sciences Directorate (NScD) Operations Manager will be requested to evaluate the application (refer to Ref. 2, Section 2.1).

2. Responsibilities

- 2.1 The following personnel meet to generate a plan for temporary shielding as described in Section 1: Neutron Facilities Development Division (NFDD) Neutronics Team Leader, NFDD Instrument Installation Supervisor, and NFDD Instrument Engineer.
- 2.2 The following personnel are required to approve the plan and to ensure that it is correctly installed: NFDD Neutronics Team Leader, Neutron Scattering Science Division ES&H/Operations Manager, SNS Fire Protection Engineer, NScD Operations Manager (or designee), NFDD Instrument Engineer, and SNS Radiation Safety Officer (RSO).
- 2.3 The RSO follows the installation of the temporary shielding plan and communicates any changes to the Radiation Safety Committee (RSC). The RSO ensures that the applicable subject matter experts verify the as-built configuration.
- 2.4 The NFDD Instrument Installation Supervisor verifies that the installation of the temporary shielding plan is done according to the drawing and associated documentation. The NFDD Instrument Installation Supervisor communicates any changes due to installation issues to the RSO.

2.5 The NScD Operations Manager evaluates the recommendation of the RSC prior to allowing operations to commence. The NScD Operations Manager may also be requested to evaluate the temporary shielding plan for waivers of seismic or other safety-related requirements.

3. Prerequisites

3.1 None.

4. Precautions

4.1 Seismic considerations are described in “Temporary Shielding for Multiple Applications, Seismic Analysis” (Ref. 7.2). Section 2.1 of the analysis describes the process that applies when seismic requirements cannot be met.

5. Procedure

The process described below shall be applied to plan, install, and verify temporary shielding (1) prior to starting operations at the end of a maintenance outage, (2) prior to allowing an instrument to open its primary or secondary shutter (as applicable) after construction completion or after a modification, or (3) when beam line permanent shielding configurations are changed.

5.1 The NFDD Neutronics Team Leader coordinates with the NFDD Instrument Engineer to begin a plan for Temporary Shielding.

5.2 The NFDD Instrument Engineer generates a layout drawing (Ref. 7.4) based on the information provided by the NFDD Neutronics Team Leader, and incorporates changes in instrument beam line construction since the last verified temporary shielding configuration.

5.3 The draft of the layout drawing is reviewed by the NFDD Neutronics Team Leader and NFDD Instrument Installation Supervisor.

5.4 The RSO is informed of the temporary shielding plan and follows the installation of the temporary shielding.

5.5 Any changes identified during the installation of the temporary shielding shall be incorporated into the drawing by the NFDD Instrument Engineer, with concurrence from the RSO.

5.6 The NFDD Neutronics Team Leader revises the “Status of the Beam Line Core Vessel Inserts, Shutters, and Bulk Shield Inserts”, if required (Ref. 7.5).

- 5.7 The NFDD Instrument Engineer revises the “Temporary Shielding for Multiple Applications, Seismic Analysis”, if required (Ref. 7.2).
- 5.8 The NFDD Neutronics Team Leader informs the chair of the Radiation Safety Committee (RSC) that the plan, including the drawing and associated documents, is ready for review.
- 5.9 The RSC Chair convenes a meeting with the RSC.
- 5.10 The RSC shall review the temporary shielding plan. Any concerns raised by the RSC shall be resolved and any documentation shall be updated as necessary.
- 5.11 When satisfied that the temporary shielding plan meets the purpose described in Section 1, the RSC shall recommend commencement of operations to the NScD Operations Manager, contingent upon verification of the as-built configuration.
- 5.12 Any changes to the RSC-recommended plan shall be presented to the RSC for concurrence. The RSC shall inform the NScD Operations Manager of the changes.
- 5.13 After installation of the temporary shielding plan, a walkdown is scheduled with responsible personnel (see 2.2) to verify the as-built configuration.
- 5.14 The “Approved As-Built” signature block (see Section 2.2) will be signed by the responsible personnel indicating their concurrence. The RSO shall be the last to sign and shall verify that all other signatures have been obtained.

6. Documentation

- 6.1 All relevant documents are transmitted to ProjectWise for Record Copy:
 - 6.1.1 Refs. 7.2-7.4 are submitted to [ProjectWise\Documents\Record Copy\Spallation Neutron Source Project\Instrument Systems\Shared Design_Construction - 107030000\107030700 - Shielding\.](#)
 - 6.1.2 Ref. 7.5 is submitted to [ProjectWise\Documents\Record Copy\Spallation Neutron Source Project\Target Systems\Technical Support\Accel/Target Sta Neut and Shldg Analysis\Shielding Documents\.](#)

7. References

- 7.1 [SNS OPM 2.H-5](#), SNS Radiation Safety Policy.
- 7.2 107030700-DA0005, “Temporary Shielding for Multiple Applications, Seismic Analysis”.
- 7.3 107030700M8U8700A031, “Temporary Shielding Block Configuration Examples”.
- 7.4 107030700M8U8700A061, “Configuration Controlled Temporary Shielding Layout”.
- 7.5 SNS-106100200-TR0153, “Status of the Beam Line Core Vessel Inserts, Shutters, and Bulk Shield Inserts”.

8. Attachments

- 8.1 None.