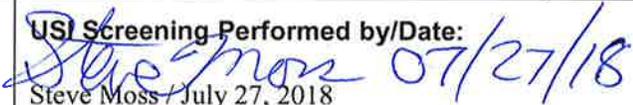


National Synchrotron Light Source II, Brookhaven National Laboratory			
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Title: Unreviewed Safety Issue Determination Procedure		Effective Date: 10NOV2017	

Attachment B

USI Screening Checklist

A) USI Screening Purpose: <input checked="" type="checkbox"/> Proposed Activity <input type="checkbox"/> Existing Condition	B) Description of Proposed Activity/Discovered Condition and Sponsor/Condition Owner: CSX New Holography Chamber / Beam Stop Radiation Safety Memo / M. Benmerrouche – Radiation Health Physicist NLSII
C) USI Screening Outcome: <input checked="" type="checkbox"/> No potential USI <input type="checkbox"/> Potential USI	USI Screening Performed by/Date:  Steve Moss / July 27, 2018 The Radiation Safety Memo analyzes the new monochromatic beam stop installed as part of the new holography chamber at 23-ID-1 (CSX) beamline. Based upon the design and construction of the fast CCD camera (which represents the new monochromatic beamstop), the monochromatic beam is completely stopped by the camera detector. The resulting dose rates, on contact with the new beamstop, are negligible (< 0.001mrem/h).

Qualified Screener answers the following questions; if:

- Any question is answered yes (i.e., "Y"), check "Potential USI" box in Part C, above.
- If all questions are answered no (i.e., "N"), check "No potential USI" box in Part C, above.

Does the proposed change or discovered condition impact or potentially impact:

1) The personnel protection system (PPS)?

Examples: Access doors, fencing, hutches, accelerator enclosures, software change, hardware modifications that are not, "replacement-in-kind."

Y or N

2) ODH Monitoring System?

Examples: Hutch ODH monitors, filling station ODH monitors.

Y or N

3) Radiation Safety Component?

Examples: Shielding, earthen berms, hutches, concrete walls, beam shutters, scatter shields, burn-through devices, exclusion zones, labyrinths, beam stops, beam masks, collimators, hutch guillotine and beam transport pipes.

Y or N

4) Area radiation monitoring system or components?

Examples: Changing instrument position or use of a new type of instrument used for area radiation monitoring, alarms and controls.

Y or N

5) Radiological source terms identified in the SAD?

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Examples: New insertion devices, change to the maximum synchrotron energy or accelerated charge values, accelerator modifications that are not "replacement-in-kind."

Y or N

6) Critical devices

Examples: Safety shutters, dipole magnets, top-off apertures.

Y or N

7) PS operating organization?

Examples: Control room operators, support staff responsible for PPS, radiation monitoring or shielding configuration management.

Y or N

8) Operational safety limits described in the Authorization Basis Documents?

Examples: Maximum current, beam energy, pulse rate.

Y or N

Forward the completed form to the Authorization Basis Manager

Managed by Brookhaven Science Associates
for the U.S. Department of Energy
<http://www.bnl.gov/nsls2>

Radiation Safety Memo

To: Robert Lee, NSLS-II ESH Manager
Claudio Mazzoli, Lead Beamline Scientist, 23ID Beamline
Stewart Wilkins, Program Manager, Soft X-ray Scattering and Spectroscopy
Zhong Zhong, NSLS-II RSC Chair

Cc: Sunil Chitra, Associate Radiation Physicist
Wen Hu, Assistant Physicist, 23ID (CSX)
Steve Moss, NSLS-II Authorization Basis Manager

From: Mo Benmerrouche, Radiation Health Physicist

Subject: Dose rates on contact with the New Beam Stop inside the Holography Chamber at 23ID-1 (CSX) Beamline

Date: July 17, 2018

This note describes the radiation analysis of the new monochromatic beam stop that is planned to be installed as part of the new holography chamber at 23ID-1 (CSX) beamline. The following storage ring and insertion device parameters [1] are used for the calculations herein:

- Electron Energy: 3 GeV
- Stored beam Current: 500 mA
- Elliptically Polarized Undulator Source:
 - Number of periods: 76
 - Period Length: 49.2 mm
 - Maximum Magnetic Field: 0.97 T

The analytical code STAC8 v. 2.3 [2] is used to estimate the dose rates on contact with copper beam stop. The monochromatic beam directly striking the monochromatic beam stop is conservatively simulated as a zero-order beam generated by a 3-mirror configuration (gold coated mirrors at 1.17 degrees angle of incidence) [1]. The current 23ID-1 beamline is equipped with a 2.75" diameter blank flange which acts as a monochromatic beam stop. The new holography chamber will be connected directly to 23ID-1 beamline by removing this blank flange and connecting to an upstream beam pipe with bellows. The fast CCD camera of the new chamber will be the new monochromatic beam stop for 23ID-1 and the monochromatic beam is completely stopped by the camera detector. There is a minimum of 3.56 mm thick Cu block covering the camera in addition to a thick cold finger made of copper just downstream of it [3].

The resulting dose rates on contact with the new beam stop are negligible (< 0.001 mrem/h).

References

1. Z. Xia , “23-ID CSX Beamline Radiation Shielding Analysis”, NSLS-II Technical Note 135, August 06 2014.
2. Y. Asano, “A study on radiation shielding and safety analysis for a synchrotron radiation beamline,” JAERI-Research-2001-006, March 2001. Y. Asano and N. Sasamoto, “Development of Shielding Design Code for Synchrotron Radiation Beamline,” Radia. Phys. Chem. 44 (1994) 133.
3. 23-ID-1 (CSX) Holography Chamber Final Design Review, PS-DRR-1067, July 17 2018