UNREVIEWED SAFETY ISSUE DETERMINATION (USID) FORM

Title of USID: IERC Construction & Building Adjacent to P3-SY Beamline

Description of Proposed Activity: Construction activities for and eventual occupation of the new IERC Building, adjacent to the P3-SwitchYard Beamline.

Does the proposed activity or discovered condition affect information in the Fermilab SAD regarding safety analyses, administrative controls, or credited controls? If so specify the relevant sections. Yes - SAD Section II Chapter 14 "Switchyard Fixed Target Beamline" will need updates for Operating Intensities Limit and inclusion of updated references for the new Shielding Assessment and associated memos.

Does the proposed activity or discovered condition affect any of the requirements in the Fermilab ASE? If so specify the relevant sections. No.

USI Determination Criteria:

- ☐ Yes ☒ No Could the change significantly increase the probability of occurrence of an accident previously evaluated in the SAD?
- ☒ Yes ☐ No Could the change significantly increase the consequence of an accident previously evaluated in the SAD?
- ☐ Yes ☒ No Could the change significantly increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAD?
- ☐ Yes ☒ No Could the change significantly increase the consequence of a malfunction of equipment important to safety previously evaluated in the SAD?
- ☐ Yes ☒ No Could the change create the possibility of a different type of accident than previously evaluated in the SAD that would have a potentially significant safety consequence?
- ☐ Yes ☒ No Could the change increase the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAD?

Justification: (use attachment if necessary) See attached.

USI Determination: A USI is determined to exist if the answer to any of the 6 questions above is "Yes". If the answer to all 6 questions id "No", then no USI exists.

☐ No Proposed activity may be implemented following the applicable FESHM or FRCM chapter requirements.

☒ Yes Director's approval is required prior to implementation.

For a positive USI Determination, does the ASE require changes?

☒ No Proposed activity may be implemented following the applicable FESHM or FRCM chapter requirements. Attach a copy of this USI Determination after Director's approval to the applicable SAD Chapter.

☐ Yes DOE-FSO Manager's approval is required prior to operation.

Check documents requiring creation or modification

☐ PHAR/PHAD

☒ SAD

☒ Shielding Assessment

☐ ASE

Madelyn Schoell — Preparer — 11/15/2019 — Date

Senior Radiation Safety Officer — 11/15/19 — Date

Approval:

Chief Safety Officer — 11/18/19 — Date

Director (for positive USIDs) — 11/18/19 — Date

Note: Contact your Division Safety Officer with any questions regarding this form.

Justification

The IERC Building is being constructed, and will eventually be occupied, adjacent to the P3-SwitchYard beamline. As part of the construction activity, a new road will be built into the berm.

A new Shielding Assessment has been performed to evaluate potential new consequences of an accident scenario; in the construction area, in the building, and the new road. This new Shielding Assessment [1] relies on TLMs being interlocked to the Radiation Safety Interlock System (RSIS) for personnel protection. This shielding assessment uses a beam operating intensity limit for P3 to Switchyard of 7.8e14 protons per hour, assuming beam is running to all available secondary beamlines. Additional post-assessment memos describe operating intensity limits for each individual secondary beamline [2][3].

Relevant sections of the SAD Section II Chapter 14 *Switchyard Fixed Target BeamLine* should be updated to reflect the operating limit of 7.8e14 protons per hour and the new references listed below.

References

[1] *Addendum to P3 to Switchyard Absorber Incremental Shielding Assessment for IERC,* A. Watts, *et. al.*, October 15, 2019.

[2] *Further Explanation of Assessed Beam Intensity for P3 to SY Absorber*, M. Vincent, November 14, 2017, post-assessment memo in *P3 to Switchyard Absorber Incremental Shielding Assessment*, M. Geelhoed, *et. al,* September 20, 2017.

[3] MC7 NOvA beam intensity limit, W. Schmitt, November 20, 2018, post-assessment memo in *Addendum to the SY 120 Shielding assessment for the Continued Operation of the Meson Center Beam Line,* T. Kobilarcik and W. Schmitt, November 25, 2013.