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INSTRUMENT READINESS REVIEW (IRR)

FOR

LARIAT II ENDSTATION AT SST-1

TAILORED REVIEW PLAN



NOVEMBER 16, 2018

NSLSII-17BM-PLN-001

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U.S. DEPARTMENT OF ENERGY
OFFICE OF SCIENCE BASIC ENERGY SCIENCE

UNDER CONTRACT DE-SC0012704

BROOKHAVEN
NATIONAL LABORATORY

**Instrument Readiness Review (IRR)
for
LARIAT II Endstation at SST-1
Tailored Review Plan**

NOVEMBER 16, 2018

PREPARED BY:

X 

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APPROVED BY:

X 

John Hill
NSLS-II Director

By approving this plan, I acknowledge the requirements set forth herein and agree with its implementation.

REVISION HISTORY

REVISION	DESCRIPTION	LIST OF REVIEWERS	DATE
1	First Issue	M. Bebon M. Benmerrouche D. Fischer E. Johnson R. Lee C. Weiland C. Stebbins L. Stiegler P. Zschack	16NOV2018

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ACRONYMS

ARR	Accelerator Readiness Review
BM	Bending Magnet
ESH	Environment, Safety & Health
FATS	Family Action Tracking System
IRP	Instrument Readiness Plan
IRR	Instrument Readiness Review
LARIAT-II	Large Area Rapid Image Analysis Tool II
NSLS-II	National Synchrotron Light Source II
PPS	Personnel Protection System
SME	Subject Matter Expert
SST-1	Spectroscopy Soft and Tender 1

1.0 INTRODUCTION

Processes for performing Accelerator Readiness Reviews (ARRs) and Instrument Readiness Reviews (IRRs) have been established for transitioning NSLS-II additions and modifications from construction and installation to readiness for commissioning. These processes include the *NSLS-II Process Description: Review Process for Facility Additions and Modifications* (PS-C-CMD-PLN-001), the *NSLS-II Process Description for performing IRRs* (NSLSII-DPT-PDN-008) and the BNL Accelerator Safety Subject Area requirements for Accelerator Readiness Reviews.

This document provides the strategy for review of the LARIAT-II end station chamber addition to the SST-1 beamline. This Tailored Review Plan meets the requirements established in the NSLS II IRR Process Description and the BNL Accelerator Safety Subject Area.

This plan will assure readiness to commission the LARIAT-II instrumentation and provides details for managing the review process. The LARIAT-II end-station is being added to the existing SST-1 beamline. The chamber installation changes the radiological control configuration but presents no significant radiological risk to this operating line. A superconducting magnet is included. Operation of this device will increase cryogen use but presents no Oxygen deficiency hazard and no significant static magnetic field risk. Other risks presented by the installation are common to this beamline.

2.0 REVIEW PROCESS TAILORING AUTHORITY

The *NSLS-II Process Description: Review Process for Facility Additions and Modifications* (PS-C-CMD-PLN-001) provides the basis for tailoring the review process for an NSLS-II facility addition or modification project and identifies the NSLS-II Director as the approval authority. The process description allows the Cognizant Scientist or Engineer, or the Project Manager, to propose a tailored review process to the NSLS-II Director for approval. Once approved, the tailored review process is documented and used for the project or the remaining activities under the project.

3.0 TAILORED REVIEW READINESS SCOPE

The Large Area Rapid Image Analysis Tool II, (LARIAT-II) is the downstream-most experimental station on the SST-1 beamline. LARIAT-II is designed for full-field soft x-ray, partial electron-yield imaging, over a 2 cm x 2 cm field of view. Equipment includes a pair of high temperature superconducting magnets, a high vacuum chamber with turbo pumps and vacuum gauging, a water-cooled CCD camera, sample-mounting platform, a motorized in-vacuum sample manipulator, and associated electrical equipment. Scope is limited to the new chamber and associated equipment including a new electromagnet.

4.0 TAILORED REVIEW READINESS PROCESS

Analysis of the risks presented indicates that readiness to begin technical commissioning with the LARIAT-II chamber is best managed through development of an Instrument Readiness Plan (IRP). The standard IRP template customized to the LARIAT-II circumstance will be used and owners will affirm that their systems are ready for safe commissioning to begin.

The LARIAT-II installation includes re-use and modification of older equipment for which no design documents are available. A modified traveler was developed to guide several Subject Matter Experts (SMEs) through physical inspection of the instruments and to capture findings. That traveler will be used as objective evidence for design review of the re-purposed equipment.

LARIAT-II specific IRP criteria include:

- Radiation safety component design, installation and configuration control
- PPS configuration
- Magnet quench protection interlock
- Electrical safety

Declaration of readiness will be documented through signature of the IRP. Owners will sign for each system. The completed IRP will be approved and signed by the beamline Program Manager. The NSLS-II ESH Program Oversight Manager will manage readiness preparation, coordinate completion of the IRP and lead readiness verification with a team of ESH and Systems Subject Matter Experts.

The NSLS-II Photon Science Division Director has line authority for final readiness approval to begin commissioning.

5.0 REVIEW TEAM CHARGE

The Review Team will be charged to interview personnel, review documents and inspect installed equipment. The Review Team will verify systems readiness and identify findings to be managed by NSLS-II Family Action Tracking System (FATS). Findings will be provided in two categories – pre-start and post-start. A final, written report will be generated to document review specifics and findings.

Subject Matter Experts for mechanical and electrical engineering, radiation physics, controls, interlocks, quality assurance, management, industrial safety and health physics will be included on the review team.

[If you have any questions or feedback regarding this document, please click this link.](#)