

CHARGE DOCUMENT FOR THE PRELIMINARY DESIGN REVIEW FOR ODIN PSS, TBL PSS AND BIFROST PSS

Preliminary Design Review (PDR)

15 June 2023, Lund, Sweden

Charge for the PDR

1. PURPOSE OF THIS PDR

The purpose of this PDR is:

- To confirm that the required safety functions and safety integrity requirements are well understood, defined and documented for ODIN PSS, TBL PSS and BIFROST PSS.
- To confirm that preliminary design, interfaces and concepts of operation for ODIN PSS, TBL PSS and BIFROST PSS sufficiently cover the functions and interfaces required by the instruments.

2. SUPPORTING DOCUMENTATION

The expected outputs of ODIN PSS, TBL PSS and BIFROST PSS safety analysis and preliminary design, which should be presented and reviewed in this PDR, will be documented in the following documents:

General documents (applicable to all Instrument PSS):

- *Concepts of Operations for ESS Personnel Safety Systems* (ESS-2595616)
- *Architecture Specification for Personnel Safety Systems* (ESS-3739363)
- *Instrument PSS Prototype Key Exchange System Requirements Specifications* (ESS-4121252)

ODIN PSS:

- *Concepts of Operations for ODIN PSS* (ESS-3540345)
- *Interface Control Document for ODIN PSS* (ESS-3540346)
- *ODIN - Instrument Hazard Analysis* (ESS-1075652)
- *SIL Assessment for ODIN Personnel Safety System* (ESS-4979098)
- *Safety Requirements Specification for ODIN PSS* (ESS-4979099)

BIFROST PSS:

- *Concepts of Operations for BIFROST PSS* (ESS-4007029)

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Document Number	ESS-5011503	State	Preliminary
Revision	1 (1)	Confidentiality Level	Internal

- *Interface Control Document for BIFROST PSS* (ESS-4007048)
- *BIFROST Risk Assessment* (ESS-1075596)
- *SIL Assessment for BIFROST Personnel Safety System* (ESS-4970134)
- *Safety Requirements Specification for BIFROST PSS* (ESS-4982907)

TBL PSS:

- *Concepts of Operations for TBL PSS* (ESS-3532917)
- *Interface Control Document for TBL PSS* (ESS-3585807)
- *TBL Instrument Hazard Analysis* (ESS-3078238)
- *SIL Assessment for TBL Personnel Safety System* (ESS-4050543)
- *Safety Requirements Specification for TBL PSS* (ESS-4982904)

The spatial integration checklist is tracked in <https://jira.esss.lu.se/browse/SPATIAL-1577>

3. CDR COMMITTEE AND OBSERVERS

The CDR committee consists of:

- Helen Boyer (chair), Group Leader for Occupational Health & Safety Group, ES&H
- Per Roos, Group Leader, Radiation Protection, Radiation Protection Group
- Gábor László, Instrument Engineer Section Leader, NSS Instrument Engineering
- Pascale Deen, Instr. Scientist-Cold Neutron Spectroscopy, Instrument Scientists Group
- Anders Rosborg, Research engineer at Radiation safety, MAX IV
- Jimmy Malmqvist, Research engineer - Radiation safety, MAX IV

Observers:

- Aureliano Tartaglione, In-Kind Collaborator, NSS Project Division
- Elbio Calzada, In-Kind Collaborator, Neutron Instruments Division
- Manuel Morgano, Instrument Scientist for ODIN, Instrument Scientists Group
- Rasmus Toft-Petersen, Instrument scientist for BIFROST, Instrument Scientists Group
- Robin Woracek, Instrument Scientist for test beamlines and engineering, Instrument Scientists Group
- Alejandro Tobias Quispe Mamani, Mechanical Design Engineer, NSS Instrument Engineering
- Fredrik Tidholm, Radiation Protection Engineer, Radiation Protection Group
- Joanna Weng, ZHAW, Switzerland

4. COMMITTEE CHARGE

The supporting documentation will be provided to the committee at least 5 days in advance. The agenda and presentations will be available on the following Indico page:

<https://indico.esss.lu.se/event/3304/>

4.1. Agenda

2023-06-15 (Thursday):

- 08:30 Committee introduction (closed session)

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- 08:45 Introduction and ESS PSS Overview
 - *Presented by: Morteza Mansouri*
- 09:30 ODIN PSS overview, ConOps and interfaces
 - *Presented by: Afshin Farshidfar*
- 10:30 Coffee break
- 10:45 BIFROST PSS overview, ConOps and interfaces
 - *Presented by: Yaser Takzare*
- 11:30 Lunch break
- 12:30 TBL PSS overview, ConOps and interfaces
 - *Presented by: Jessica Lastow*
- 13:15 SIL Assessment and Safety Requirements for TBL PSS, ODIN PSS and BIFROST PSS
 - *Presented by: Jonathan Gale*
- 14:00 Coffee break
- 14:10 Site visit (optional)
- 15:10 Committee deliberations (closed)
- 16:30 Closeout
 - *Presented by: Helen Boyer*

4.2. Questions to the committee

The committee is asked to consider the following questions:

1. Are all or a sufficient coverage of requirements and specifications within the scope of this PDR documented and understood?
2. Are the proposed conceptual designs for BIFROST PSS, ODIN PSS and TBL PSS acceptable for this PDR, and consistent with the previous instrument PSS designs at ESS?
3. Are the operating concepts for ESS PSS and interfaces with Instrument PSS (e.g. BIFROST PSS, ODIN PSS and TBL PSS) understood and properly documented?
4. Are the identified Safety Instrumented Functions (SIFs) for BIFROST PSS, ODIN PSS and TBL PSS properly formulated, and fulfil the overall safety functions derived from the Instrument Hazard Analysis (IHA) documents?
5. Are there any outstanding agreements to be made or other actions necessary to allow the PSS team to proceed with system design and preparation for the critical design review for each of the presented systems?

The report may also provide findings, comments, and recommended actions.

All actions should be clearly categorized as one of the following:

- Shall be addressed before PDR is considered closed
- Shall be addressed prior to the CDR