CHARGE FOR THE PDR OF ESS ODH DETECTION SYSTEM OVERALL ARCHITECTURE AND ACCELERATOR ODHDS

Preliminary Design Review (PDR)

10-11 February 2022, Lund, Sweden

Charge for the PDR

1. PURPOSE OF THIS PDR

The purpose of this PDR is:

- to confirm the overall scope of ESS ODH detection systems (ODHDS);
- to agree on high level requirements for ESS ODHDS;
- to agree on development plan (e.g. standards to be followed) for ESS ODHDS;
- to clarify the hand-over process for the ODH detection systems;
- to confirm that physical and functional architecture for ESS ODHDS sufficiently cover required functions and interfaces;
- to clarify ODHDS power supply requirements;
- to confirm that preliminary design for Accelerator ODHDS sufficiently covers ODHDS high-level requirements and requirements from the ODH risk assessment;
- to confirm that installation of ODH micro-pipes for the Accelerator can proceed as planned;
- to follow up on action items from the ODH safety review, which was held in 2016 (https://indico.esss.lu.se/event/625/)

The PDR also covers planning for future ODHDS activities.

2. SUPPORTING DOCUMENTATION

The expected outputs of ESS ODHDS development plan, requirements, technical descriptions, architectures, and preliminary design of Accelerator ODHDS, which should be presented and reviewed in this PDR, will be documented in the following documents:

- ODH assessment of the accelerator buildings (ESS-0063324)
- ODH Safety Review of the accelerator buildings - Report by the Review Committee (ESS-0068327)
- High Level Requirement Specification for ODH Detection Systems (ESS-3236032)

- ESS Handbook for Engineering Management of ODH Detection Systems (ESS-3438946)
- Technical Description of ESS ODH Detection Systems (ESS-3137044)
- ODH Monitor Instruction Manual (ESS-0196791)
- ESS ODH Detection Systems Functional Architecture (ESS-3739365)
- ESS ODH Detection Systems Physical Architecture (ESS-3739366)
- The layout of ODH monitors sampling points for the accelerator tunnel (ESS-3836683)

3. PDR COMMITTEE AND OBSERVERS

The PDR committee consists of:

- John G Weisend II (chair), Deputy ACCSYS Sub/Project Lead, Accelerator Division
    - *to review overall system functions, ODH development plan and high level requirements*
- Timo Korhonen, ICS, Chief Engineer
    - *to review as ICS division technical lead, and also integration into ICS*
- Helen Boyer, Group Leader for Occupational Health & Safety Group
    - *to review overall system functions and its communications with on-site and off-site services, ODH development plan and high level requirements*
- Philipp Arnold, Group Leader for Cryogenic Group, AD
    - *to review ACC requirements to ESS ODH detection system*
- Atefeh Sadeghzadeh, Control Engineer, Target Control Group
    - *to review Target requirements to ESS ODH detection system*
- Helena Ramsing, Occupational Health and Safety Engineer, NSS
    - *to review NSS requirements to ESS ODH detection system*
- Ralf Trant, Associate Director Environment, Safety, Health & Quality, ESH&Q Directorate
    - *to review overall system functions & architecture, ODH development plan and high level requirements*
- Nicolas Broca, CERN, Access & Alarms Group, EN/AA/AS
    - *to review overall system functions and architecture, ODH development plan and high level requirements*
- Kelly Mahoney, SNS, Personnel Protection System Group Leader
    - *to review overall system functions & architecture, ODH development plan and high level requirements*

Observers:

- Joanna Weng ZHAW, Switzerland
- Silvia Grau, CERN, Switzerland
- Ari Benderly, Senior Security Officer, ESH&Q Directorate
- Tom Winsemius, Engineering manager at Oxigraf
- Jarsolaw Fydrych, Cryogenics Engineer Distribution System, ACCSYS Project group

4. COMMITTEE CHARGE

The supporting documentation will be provided to the committee at least 1 week in advance. The agenda and presentations will be available on the following Indico page:

https://indico.esss.lu.se/event/2935/

4.1. Agenda

Day 1: 2022-02-10 (Thursday):

- 14:00 Introduction
  - *Presented by: Morteza Mansouri*
- 14:10 ODH risk assessment methodology at ESS
  - *Presented by: Helen Boyer*
- 14:40 ODHDS Development Plan, V&V, and High-Level Requirements
  - *Presented by: Donya Daryadel*
- 15:40 Coffee break
- 15:55 Requirements from risk assessments to ESS ODHDS
  - *Presented by: Morteza Mansouri*
- 16:25 Questions
- 16:40 Virtual tour of the ESS site

Day 2: 2022-02-11 (Friday):

- 14:00 ODH Detection Systems Technical Description and Architecture
  - *Presented by: Donya Daryadel*
- 15:00 Coffee break
- 15:10 Power requirements for ODH detection systems
  - *Presented by: Anton Andersson*
- 16:10 Coffee break
- 16:20 Accelerator ODHDS Preliminary Design
  - *Presented by: Donya Daryadel, Peter Holgersson*
- 17:20 Experience with O2iM operation at ESS
  - *Presented by: Mattias Eriksson*
- 17:35 ESS ODHDS plan and schedule
  - *Presented by:* Annika Nordt
- 17:50 Questions

Day 3: 2022-02-14 – 2022-02-18 (TBD by committee chair)

- 15:00 Committee deliberations (closed)
- 17:00 Closeout

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 all high-level requirements for the ODHDS clear and acceptable?

3. Is there any recommendation on the need for redundancy of ODH monitors and setting the sound levels of ODH alarm devices in various ODH areas?
4. Is the plan for identifying requirements, development, verification and validation of ODHDS at ESS clear and properly documented?
5. Are the physical and functional architectures clear and mature enough for this stage of the project?
6. With respect to power supply requirements, should ODHDS be treated similar to fire detection system?
7. Is the proposed power and UPS requirement from the presented in "Power requirements for ODH detection systems" considered reasonable and acceptable considering a deviation from the proposed standard (SBF110)?
8. Should each ODH detection system at ESS be handed over to operations?
9. Have all action items from the ODH Safety Review of the Accelerator Buildings in 2016 been addressed appropriately to allow preparation of PDR for the Accelerator ODHDS?
10. Have all requirements from the ODH assessment of the accelerator buildings document been addressed in Accelerator ODHDS design?
11. Is the proposed design of the Accelerator ODHDS acceptable?
12. Can the PSS team proceed with an installation of ODH micro-pipes in the Accelerator?
13. Does the presented planning for ODHDS follow high-level ESS commissioning planning?
14. 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?

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