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| Target and Dump Imaging CDR |
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| Critical Design Review (CDR)  23-25 October 2017, Oslo, Norway |
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| **Charge for the CDR** |
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**Purpose of the CDR**

The purpose of the preliminary design review is to verify that the design fulfils the requirements, and is well matched to these boundary conditions. Also, the CDR covers documentation, verification, planning, risks and safety issues.

Passing the CDR is a prerequisite for starting production.

**Scope of the CDR**

The focus of the CDR is the Target and tuning dump imaging systems.

**CDR Committee**

The CDR committee consists of:

* Knud Thomsen, PSI
* Win Blokland, SNS
* Andreas Jansson, ESS (review secretary)
* Thomas Shea, ESS, BI
* Timo Korhonen, ICS
* Szandra Kövecses, ICS/MPS
* Enric Bargallo, ESS RAMI (via Vidyo)
* Natalia Milas, ESS Beam Physics
* Inigo Alonso, ESS Linac
* Marcelo Ferreira, ESS Vacuum
* Fabien Rey, ESS Alignment
* Mattias Wilborgsen, ESS Target
* Raul Vinvaco, ESS Bilbao
* Lali Tchelidze, ESS AD Safety (via Vidyo)
* Kent Wigren, ESS Quality (via Vidyo)

**Presenters and Observers**

* Cyrille Thomas, ESS
* Erik Adli, Oslo
* Håvard Gjersdal, Oslo
* Ole Røhne, Oslo
* Grey Christoforo, Oslo
* Ole Dorholt, Oslo
* David Bang-Hauge, Oslo
* Maren Lithun, Oslo
* Jonas Nilsen, Oslo
* Hinko Kocevar, ESS
* Yngve Levinsen, ESS
* Thomas Grandsaert, ESS (via Vidyo?)
* Heine Dølrath Thomsen? (via Vidyo?)
* Shrikant Joshi, University West
* Mark Ibison, Oslo/Cockcroft

**Supporting Documents**

The supporting documentation will be provided to the committee about two weeks in advance, on the review Indico page, which also contains the agenda. Documents will include (**green** means included in CDR\_package\_1 and CDR\_package\_2):

**ESS-0149761 System Overview**

ESS-0149762 RAMI and risk analysis

ESS-0149763 Project Quality Plan

ESS-0153770 Project adaptation to updated ESS accelerator schedule

ESS-0149764 Target System Design and Prototyping

ESS-0149765 Target System Thermal Load Analysis First Mirror

ESS-0149766 Target System Tolerances

ESS-0153500 Target System Integration, Alignment and Verification

ESS-0153782 Target System CAD Integration

ESS-0150756 Tuning Dump System Design

ESS-0150754 Tuning Dump Radiation Calculations

ESS-0150758 Tuning Dump Interface Definitions

ESS-0150746 Electronics Architecture

ESS-0150748 Electronics Functionality

ESS-0150750 Electronics Prototyping

ESS-0150753 Electronics Status of EPICS tools

ESS-0150759 Thermal Spray Processing of Luminescent Coatings

ESS-0150760 Luminescent Coating R&D Status and Plans

ESS-0150766 Protective Coating Status and Plans

In addition the following background documents from the PDR are still valid and considered supporting documents to the CDR :

ESS-0042178 Imaging System Technical Specification

ESS-0044049 Oslo-ESS in-kind contract

The document **ESS-0149761 System Overview** gives an update of the project since the PDR, and places the other documents in context. We therefore recommend to read this document first.

Presentations will also be available on Indico site <https://indico.esss.lu.se/event/912/>

**Committee Charge**

The committee is asked to consider the following questions. Where appropriate, please organize the responses by component/system.

1. Does the design fulfil all requirements and respect all interfaces, and is the design sufficiently mature and level of documentation appropriate to start manufacturing/procurement?
2. Given that the CDR is also a Tollgate review for the in-kind agreement with the University of Oslo, have the contractual obligations been met such that Milestone #4 can be declared complete? Specifically, have the Oslo team contributed their part to the 4 tasks shared by ESS and Oslo?
   1. Documentation of the final design
   2. Tests of coatings
   3. Prototyping the optical system
   4. Prototyping the electronics on the ESS platform
3. Is the planning appropriate and consistent with the overall ESS plans and milestones?
4. Is there an acquisition plan for any major or long lead time procurements, and is the lead time for procurements and contracts properly accounted for in the planning?
5. Is the verification strategy appropriate, particularly given the delayed date for beam on target?
6. Have potential safety hazards been properly identified and considered in the design choices? If required, is there a mitigation plan?
7. Have reliability aspects been considered in the design choices?
8. Have the project risks and opportunities been properly identified and their impact considered in the design? If required, is there a mitigation plan?
9. Were any other issues identified during the review?

The results of the review should be summarized in a short report, outlining the answers to the above review questions and whether the review is considered passed, passed with action items, or failed. The report may also provide findings, comments, and recommended actions. Actions should be clearly categorized as one of the following:

* Must be addressed before CDR is considered closed and production starts
* Must be addressed prior to the TRR
* Must be addressed at some time during the project