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| nBLM final CDR |
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| Critical Design Review (CDR) 11-12 February 2019, Paris, France |
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| **Charge for the CDR**  |
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 **Purpose of the CDR**

The purpose of the critical design review is to verify that the system 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 scope of this CDR is the nBLM overall system. A previous CDR was dedicated to the detector mechanical assembly and has authorized detector production. Therefore, this review will focus on readiness of the electronics for production. This review is referred to in the CEA Saclay in-kind contract as CDR 1.2.

**CDR Committee**

The CDR committee consists of:

* Aleksander Zhukov, SNS
* Andreas Jansson, ESS/AD (review secretary)
* Thomas Shea, ESS/AD/ Beam Instrumentation
* Karl Vestin, ESS/ICS
* Stephane Gabourin, ESS/ICS/MPS
* Yngve Levinsen, ESS/AD Beam Physics
* Marcelo Ferreira, ESS/AD Vacuum
* Inigio Alonso, ESS/AD Linac

**Supporting Documents**

The supporting documentation will be provided to the committee about a week in advance, on the review Indico page <https://indico.esss.lu.se/event/1173/>,which also contains the agenda.

**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?
2. Is the design sufficiently mature and the level of testing/analysis appropriate to begin procurement and manufacturing of the remaining components?
3. Given that the CDR is also a Tollgate review for the in-kind agreement with the CEA Saclay, has CEA Saclay delivered their part such that Milestone “CDR 1.2” can be declared complete?
4. Is the planning appropriate and consistent with the overall ESS plans and milestones?
5. 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?
6. Has verification plan been developed? Does it cover the system features required for first protons?
7. Have the potential safety hazards been identified and considered in the design choices? If required, is there a mitigation plan?
8. Have reliability aspects been considered in the design choices?
9. Have the project risks and opportunities been properly identified and their impact considered in the design? If required, is there a mitigation plan?
10. 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 1.2 is considered closed and remaining production starts
* Must be addressed prior to the SAR
* Must be addressed at some time during the project