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| Follow-up PDR Target Helium Cooling System |
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| Meeting Date | Location | |
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| Chairman | Secretary | |
| Ulf Odén | Oden, Ulf | |
|  |  | |
| Attendees |  | |
| Jens Harborn |  | |
| John Haines |  | |
| Eric Pitcher |  | |
| Absentees |  | |
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# Introduction

The meeting was a follow up on the performed PDR Target Helium Cooling System. The PDR was carried out during 4-5/9-2014 and is documented in Meeting Minutes (ESS-0020169). In the Meeting Minutes PDR Committee recommendations are categorised in two levels:

C1 = Needs to be solved before approved Preliminary Design

C2 = To be solved during Final Design

All C1 were discussed during the Follow Up and a number of action points were listed. Action points and measures are listed below. These action points needs to be closed before the Preliminary

As mentioned C1 recommendation needs to be closed before the Preliminary Design can be approved.

# Minutes and List of Actions

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| Responsible | Action |
| JH | **Interface requirement document, one document for each interface. The idea is that this document is the agreement between two systems or subsystem of important requirements.**  All interface documents are listed in ESS-0037260 |
| JH | VoV-plan Verification and Validation plan. List of all requirements and how they are verified or validated.  The VoV Plan is documented in ESS-0020647 |
| UO | Safety classification according to 1, 2, 3, 4 or 4a. Look in to the difference between 3 and 4 and what is the correct classification to our system based on Lennart’s proposal.  SDD-Req Target Helium Cooling System ESS-0012524:  “Requirements for the design, fabrication, assembly and testing  Detailed accident analyses for ESS systems remain to be performed, so final specification of measures required for safety are yet to be finalized. The current basis for design and fabrication of the Target Helium Cooling System is that the cooling is not a safety function, but the mechanical integrity of the system is assumed to be a safety function (SaF). To ensure that we provide the required mechanical integrity, the IKC partner must follow the RCC-MRx Class 3 requirements in designing, fabricating, assembling, and testing this system. RCC-MRx Class 3 can be fulfilled by compliance with the usual PED standards EN 13445 and 13480 plus some additions, which are given in the RCC-MRx code. See also the comparison in ESS-0037516. Any additional third party review and inspections beyond those required in RCC-MRx that may be imposed by the Swedish regulator (SSM) will be coordinated and paid by ESS AB, i.e. the IKC partner is only responsible for meeting the documentation, review, and inspection requirements specified in RCC-MRx (Class 3), working with ESS AB to facilitate the additional SSMrequired reviews and inspections, and providing allowances in the schedule for such activities. Refer to requirement PCool-157.  Should these requirements change, the ESS change control process will be used to evaluate the cost and schedule implications. Adjustments to delivery dates and budget will be negotiated with the IKC partner and implemented into a revised baseline. The change control process, including the IKC partner’s role, is described in the Target Baseline Management Process document (ESS-0016499)” |
| UO | Ensure that a decision is taken as soon as possible regarding safety classification to fulfil SSM's requirements.  The system will be built according to RCC MRx class 3. If there is needs to safety classify the system, or a part of the system, the CCB process will handle this. |
| EP | Availability and Reliability allocated to each system. Brake down top to bottom Target system to subsystems.  Target System: Reliability = 0.999 Availability = 0.99 |
|  | Radiation analysis. What will the radiation inventory be in the He loop? With the assumption of fraction to the Purification loop of f/F 0.1% and a leak rate of 0.5%  He leak rate is assumed to be 1 g/h (8.8 kg/y) (req. PCool-102)  The dos calculation is presented in ESS-0044590 |
|  | What is the reasonable leak rate?  1g/h (req. PCool-102) |
|  | What is the cost of He?  100-200 €/Kg => 1g/h\*5000h= 500-1000 €/year (leakge) |
|  | What are the He purity requirements  Purity requirements are documented in ICD-R Target Helium Cooling System – Pcool ESS-0043689 |
|  | In the System Requirements and Description clarify how the system is designed and why. Follow the idea of the TDR.  SDD Solution Document is updated (ESS-0012524) |
|  | In the System Requirements and Description clarify each requirement and background to the requirement.  SDD Requirement Document is updated (ESS-0012527) |