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| System Review of the Particle Free LWU InstallationNovember 29, 2017 |
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| **Charge for the System Review**  |
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Purpose of this review

 The system review will examine plans for the particle free installation of the LWUs in the ESS Linac. It examines design, cleaning and installation steps for the beam tube vacuum of the LWUs in the linac. The review will also examine the schedule for this work. It is not meant as a detailed design review of the LWUs as that was dealt with during the LWU PDR and CDR.

**Charge to the Committee**

 The Review Committee is composed of the Chairman and members as identified in Appendix 2. This list also shows reviewers, who provide comments and review but are not on the formal committee and presenters.

 The Review Committee is asked to:

1. REVIEW: Scrutinize and assess the deliverables listed in Appendix 1 and the presentations given during the Review.

2. ANSWER: Answer each question listed in Appendix 3.

3. DECIDE: The Review Committee is to elaborate and deliver at the conclusion of this review, a clear recommendation to ESS about the suitability of the plans for the particle free installation of the LWU vacuum chambers in the ESS linac.

Suggested forms for the decision are:

* Approved, without qualifying comments or further actions.
* Approved, but with recommended actions and or clarifications.
* Not approved, but with recommended actions, for further inputs and activities, and a proposal for a follow-on review.

4. REPORT: The Review Committee is to document in a short report to be delivered as soon as possible after the System Review, its recommendation and any specific actions and other guidance for assisting planning and future success of the Work Unit in for its scope and deliverables.

If the System Review is “Approved but with recommended actions”, there shall be a summary list of requested actions defined .

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| Appendix 1**Scope and Deliverables for Review** |
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Scope

The review will examine the basic design, cleaning processes and installation plans for the LWU beam vacuum in the ESS linac.

Deliverables for System Review - Information to be reviewed

The information identified below is to be described and communicated through presentation at the System Review, and the source information is to be available to reviewers for reference during the System Review.

The associated work packages should deliver to the Review Chairman for distribution to the Review Committee and other reviewers, an agreed subset of the following information for pre-review and comments no later than Five (5) working days prior to the Review.

1. Detailed design of the LWUs sufficient to answer the charge questions.
2. Cleaning and handling procedures for the LWU Beam Tubes.
3. Installation Procedures for the LWUs and their beam vacuum into the ESS linac.
4. Description LWU beam pumping cart.
5. Description of local clean rooms.
6. Installation schedule.

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| Appendix 2**Review Committee and other Reviewers, Presenters and Observers** |

The System Committee conducts this review of design with the authority of ACCSYS Project Leader, Mats Lindroos, and ESS Chief Executive Officer, John Womersley.

The Committee serves in an advisory capacity to:

* the ACCSYS WP12 Work Package Leaders
* the ACCSYS management team

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| Name | Organisation | Appointment for IRR |
| John Weisend II | ESS, ACCSYS Deputy Project Leader | Chairman of the Review Committee  |
| Mats Lindroos | ESS, ACCSYS Project Leader | Review Committee member |
| Hakan Danared | ESS, Linac Group Leader | Review Committee member |
| Duy Phan | ESS, ACCSYS Safety Group  | Review Committee member |
| Mattias Skafar | ESS, Quality Division | Reviewer Committee member |
| Paolo Pierini | ESS, SCRF Section | Review Committee member |
| Rongli Geng | Jefferson Laboratory | Review Committee member |
| Lutz Lilje | DESY Laboratory | Review Committee member |
| Marcelo Ferreira | ESS, WP12 Work Package Manager | Presenter |
| Paul Aden | STFC Daresbury | Presenter |
| Fabio Ravelli | ESS, Vacuum Section | Presenter |
| Christophe Jarrige | ESS, Vacuum Section | Presenter |
| TBD | CEA Saclay | Reviewer |
| TBD  | IPNO | Reviewer |
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| Appendix 3**Cryomodule Testing System Review Charge Questions** |

1. Is the design, cleaning process and installation procedure for the LWU beam tube vacuum sufficient to result in a particle free environment that will protect SRF cavity performance?
2. Is the time allotted for this installation appropriate?
3. Have all safety issues been defined and dealt with? Are additional separate safety reviews or inspections required?
4. Have all QA/QC plans been defined and implemented?
5. Has a suitable strategy been developed for the collection and dissemination of documentation resulting from this installation process? Is this approach consistent with ESS Wide standards?