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| Installation Readiness Review for Gallery Racks  November 15, 2017  Atlantic Water Conference Room  ESS Site |
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| **Charge for the IRR** |
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Purpose of this IRR

The IRR is meant to be the final technical review of the system prior to the start of installation. As such, it examines the final technical design of the integrated system with an emphasis on interfaces between components and subsystems, controls integration and a detailed look at the plans, staff and tooling required for the installation work itself.

This IRR is for the Rack installation in the gallery. It will address interfaces between the racks and water, power and cable systems but does not review the installation of the water, power or cable systems.

**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, presented through the material presented and discussions, at the IRR. Note that the presentations themselves are means of communication only, and it is the documentation which must be reviewed.

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

3. DECIDE: The Review Committee is to elaborate and deliver at the conclusion of this IRR, a clear recommendation to ESS about the readiness of the racks to be installed in the gallery

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.

(If the committee rules for “Approved with recommended actions” or “Not approved” of the IRR, it is of essence that the actions/comments requested are very precise in their formulation and that the fulfilment decision is transferred to INFN-LNS and ESS, all this due to time constraints in the manufacturing schedule and sequence).

4. REPORT: The Review Committee is to document in a short report to be delivered as soon as possible after the IRR, 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 IRR 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 scope for the review includes:

* The electronics racks to be installed in the Gallery ( G02)
* Installation plans including: required permits, tooling, cranes, personnel requirements, training, schedule, alignment issues, material transport, laydown area requirements
* Readiness of supporting utilities (water, electrical power, cable trays). This will be provided by ESS staff.
* Quality Assurance and Quality Control Organisation
* Safety aspects
* Reliability

Deliverables for IRR - Information to be reviewed

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

WP15 and its vendors are requested to deliver to the IRR 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 5 working days prior to the IRR.

1. Mechanical design at a sufficient detail to answer interface, performance, alignment and installation questions below.
2. Applicable Electrical design including: single line drawings, instrumentation lists, cable designs and connector pin outs, calibrations etc.
3. A strategy for System Verification
4. Update of all related engineering documentation
5. Detailed Installation plan including alignment strategy.
6. Hazard analysis
7. Work Safety Coordination Plan including all its Annexes (Area Hazard Analysis, Job Hazard Analysis, System Deliverables, Equipment List etc.)
8. Results of relevant component and subsystem testing
9. List of needed spares for installation
10. Installation schedule
11. Transport and delivery plan including package sizes, weights, identification and handling instructions

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

The IRR 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 WP 15 Leader, and
* the ACCSYS management team

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| Name | Organisation | Appointment for IRR |
| TBD | TBD | Chairman of the Review Committee |
| Kent Wigen | ESS, ACCSYS QA Lead | Review Committee member |
| Duy Phan | ESS, ACCSYS Safety Group | Review Committee member |
| H. Danared | ESS, Installation Manager | Review Committee member |
| Morten Jensen | ESS, WP8 Manager | Review Committee member |
| Marcus Green | ESS, Area Manager, Gallery | Review Committee member |
| Fabien Rey | ESS, Alignment Group Leader | Reviewer |
| Frithiof Jensen | ESS, WP15 Leader | Presenter |
| Evangelia Vaena | ESS, Electrical Engineer | Presenter |
| TBD 1 | Rack Installation vendor | Presenter |

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| Appendix 3  **IRR Charge Questions** |

1. Will the racks meet their technical specifications? Do we know how to verify this?
2. Have all interfaces between this system and other systems been completely defined and agreed. Are all the connections on the ESS site in place? This applies to physical connections and physical parameters (flows, pressure, temperatures, current, voltage, UPS requirements)
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. Will the system fit within its allocated space and can be transported there within the give transport path (height of doors, pass by other equipment) with the available transport means?
6. Are the alignment requirements agreed upon and can the system components be aligned within these requirements?
7. Is the installation plan for the system adequate? Have all tools, including cranes, movement devices, stands, alignment fixtures etc. been defined. Has the staff for this work been identified? Is the installation sequence consistent with the overall installation plan?
8. Has the reliability and maintainability of the system been optimized? Have all the spare parts required from the first day of operation been identified and procured?
9. Have all inspections and permits required prior to installation been carried out? Have the inspections and permits required between installation and the Accelerator Readiness Review been identified?
10. Have all recommendations from component design reviews been addressed?