SCHEDULE TECHNICAL ANNEX - GENERIC TO THE IN-KIND CONTRIBUTION AGREEMENT SIGNED BETWEEN ESS AND PARTNER ON DATE

1. SCOPE

This document describes the Scope of Work (SoW) required to complete the <<In Kind name>> contribution to the ESS programme. It is an integral part of the In-Kind Contribution Agreement and is agreed upon by all undersigning Parties. The SoW contains an appropriate level of detail so all parties clearly understand what work is required, the duration of the work involved, the deliverables and the conditions of acceptance. 4

2. RELATED DOCUMENTS

2.1. Applicable Documents

<<Please input all applicable references that will support the execution of the SoW. It should contain technical documentation e.g. a system requirement document provided by European Spallation Source ERIC, applicable templates for the documentary deliverables. This section might refer to an ESS programme management plan.>>

[CCP] ESS-0001879 Procedure of Change Control of ESS Facility, 27 Feb 2017, Rev.5 Released

[CMP] ESS-0003688 Configuration Management Plan, 1 May 2016, Rev.2 Released

[DRP] ESS-0008910 Design Review Standard Operating Procedure, 27 Oct 2014, Rev.1 Released

[ESM] ESS-0013139 EV-Schedule-Milestone Template and Instructions, 10 Feb 2016, Rev.2 Released

[IMP] ESS-0002917 Interface Management Plan, 7 Nov 2013, Rev.1 Released

[ISS] ESS-0017560 TS, AD, NSS and ICS Plan and Implementation Strategy for Hazardous Materials and Sustainability, 8 Feb 2016, Rev.1 Released

[LOG] ESS-0042559 ESS Logistics Guidelines, 26 Oct 2015, Rev.1 Released

[OLH] ESS-0048868 ESS Procedure for Offsite Lending of Hardware, 22 Apr 2016, Rev.1 Released

[PQP] ESS-0037830 ESS Template for Project Quality Plan, 22 Sep 2015, Rev.1 Released

[RCM] ESS-0127031 ESS Rules for CE Marking, 29 Dec 2017, Rev.1 Released

[RMP] ESS-0000263 ESS Process for Risk Management Process, 24 Nov 2014, Rev. 4 Released

[SEM] ESS-0002908 System Engineering Management Plan, 17 Feb 2012, Rev. 1 Released

2.2. Reference documents

<<Please input references that may support the execution of the project. This section may refer to ESS guidelines.>>

3. TERMS AND DEFINITIONS

CDR	Critical Design Review
CHESS	ESS Data Management Software
COMM	Component Operation and Maintenance Manual
Facility element	This item corresponds to the product contribution of the partner. It is an element of the ESS Product Breakdown Structure.
DAP Incoterms	Delivered at Place. ESS is responsible for any import costs and applicable taxes.
EV	Earned Value, the value of the work completed.
FAT	Factory Acceptance Test
IKC	In-Kind Contribution
RAMS	Reliability Availability Maintainability and Safety
P&ID	Piping and Instrumentation Drawings
SAR	System Acceptance Review
SDD	System Design Definition
SoW	Scope of Work
WBS	Work Breakdown Structure
WU	Work Unit

4. PROJECT DEFINITION

4.1. Deliverable Item definition

The Partner shall provide its contributions in accordance with the following time schedule:

Start date: [date]

End date: [date]

Task no.	Deliverables	Delivery Deadline / Delivery MS
WBS number	description of deliverable	date
WBS number	description of deliverable	date
WBS number	description of deliverable	date
WBS number	description of deliverable	date

This overall contribution is set to the ESS Cost Book value of <<xx>>.

Each of the delivery milestones are also part of the Earned Value tracking (chapter 5.1).

The ESS element concepts have been developed by the ESS and its partners and have been incorporated into a baseline reference design.

4.2. Project stages Definition

4.2.1. Stage 1: detailed design phase

Stage 1 of the contribution is the detailed design and engineering phase that prepares for and precedes potential procurement of the facility element. Within Stage 1 the design is detailed and verified by way of analysis and/or test down to the lowest level selected by the Partner. This includes but is not necessarily limited to:

- Carrying out detailed optimization of the facility element mechanical, fluid, thermal, optical, electro- optical, electronic and electrical subsystems in relation to the requirements.
- Expanding and consolidating the Interface Control Document(s) for the facility element including description of the interfaces with the Site Infrastructure and the Integrated Control System (e.g. clearance for stations, access, power, storage, pre-assembly areas, data format and rate, signals).
- Scheduling for the manufacture, assembly and testing and establishing integrated logistics requirements and solutions for the future operation of the facility elements.

- Documenting:
  - The logistics needs in a Component Operation and Maintenance Manual - COMM - for the facility element (e.g. test equipment, storage, transportation, handling and packaging, expected preventive and corrective maintenance activities),
  - The design descriptions of the facility element in a System Design Description document– SDD – with its associated references (e.g. drawings, P&ID).
  - The updates of the verification activities in the related Verification Plan,
  - The updates of the related Requirement Document,
- Contributing to the RAMS (Reliability Availability Maintainability and Safety) analyses, including analyses to validate the initial maintenance planning defined in the COMM.

The analyses performed before Stage 1 shall be expanded and consolidated. The detailed conformity between the proposed design and the requirements shall be developed and demonstrated. The detailed design shall be elaborated such that:

a) A thorough and complete evaluation of the ability of the design to fulfil the requirements is possible and is supported by an appropriate traceability between the requirements and the proposed design features.
b) The development process for hardware and software is well established including manufacturing methods, processing and tooling requirements.
c) The procurement documentation for each sub-system of the facility element is ready for competitive procurement. This includes technical specifications and statements of work for vendors or manufacturers.
d) The partner is able to provide the documentation for the supply of the facility element.

Stage 1 starts upon successful completion of Preliminary Design Review of the facility system owning the facility element and the sign off of the parties of this SoW. Stage 1 ends with the successful completion of the Stage 1 design review (CDR- Critical Design Review).

4.2.2. Stage 2: Realization and verification

Stage 2 is the phase for realizing the design descriptions produced during Stage 1 and carrying out the verification of the facility element. The product will be verified by way of analysis and/or test and/or inspection and/or demonstration. This includes but is not necessarily limited to:

- Contracting with a screened supplier, screening being based on a fair and well balanced list of criteria,
- Following up when applicable the fabrication actions and transportation process,
- Carrying out intermediate verifications during the fabrication at the factory and/or at the site (ESS or partner premises) e.g. inspection of material certificates, part dimensions before welding,
- Taking over the documentation provided by the supplier,

- Storing and handling the product in conditions that ensure its integrity,
- Carrying out the verification activities as defined in the consolidated verification plan of the facility element,
- Reporting and documenting in a System Verification Report the outcomes of the verification activities,
- Presenting the verification outcomes during the System Acceptance Review of the facility element.
- Transporting the product to the site <<to be defined>> and mailing or uploading its corresponding documentation to the ESS WU coordinator.

Stage 2 starts upon successful completion of Critical Design Review of the facility element. Stage 2 ends with the successful completion of the Stage 2 design review (SAR-System Acceptance Review).

4.3. Project Schedule and Key Milestones

Milestone ID	Short description	Planned/Baseline date	Location	Weighting/Value (if known)	Comment
	Kick-off meeting	T0			
	Progress meetings	T0+ x weeks			
	….				
	CDR		Partner premises		
	….				
	SAR		ESS premises		

4.3.1. Kick-off meeting

The main objective of the kick-off meeting is to confirm the mutual understanding of the Scope of Work specified herein, including the applicable specifications.

In particular the partners shall:

- Present and review the project plan, schedule and work breakdown structure (the baseline proposals),
- Introduce the key resources and team members,
- Review the risk register and establish an agreed prioritization of risks
- Complete the milestone definition list with weightings (if not present in the TA)

. Make a technical presentation of the proposed solution,
. Present management plans as applicable.

The participants shall take the minutes of the meeting and record the action items.

4.3.2. Status meetings

A status meeting shall be held every month during the whole duration of the project. Status meetings may be held at the ESS or partner's premises or over the telephone/video conferencing facilities available.

The purpose with the meeting is to review progress, risks, review/decide on change requests and discuss upcoming activities and potential challenges.

The Partner is responsible for carrying out the SoW in a timely manner, fully in accordance with the time schedule referred to above.

The Partner shall provide a written progress Monthly Status Report at least 3 working days in advance of the meeting.

The Parties shall take the minutes of the meeting and record the action items.

4.3.3. Stage 1: critical design review

The Critical Design Review concludes Stage 1. The CDR assesses if the design meets all facility element requirements with acceptable risk and within the cost and schedule constraints.

The CDR demonstrates that the maturity of the design is appropriate to support proceeding with full-scale fabrication, assembly, integration, test, and future operation and decommissioning.

The contents of the CDR data package shall be established as a minimum <<5?>> weeks before the review. As a minimum it shall contain all deliverables as specified in 4.4.2.

The review shall be organized as defined in the ESS Design Review Standard Operating Procedure [DRP].

The review board shall review the documentation provided and submit written comments to the ESS and Partner no less than <<3?>> working weeks before the review meeting. The Partner shall consolidate the comments and provide written answers to the board no less than <<1?>> working week before the review meeting.

The agenda of the review meeting shall be communicated to the Parties no less than <<1?>> week before the review meeting. The review meeting may include in depth presentations by the Partner of the work undertaken and responses to the review findings.

No detailed schedule of a review meeting is requested but for planning purposes it can be expected that a review may last 3 working days.

4.3.4. Stage 2: system acceptance review

The System Acceptance Review examines the facility element and its documentation, and inspection, demonstration, test data and analyses that support its verification as defined in the Verification Plan and Report. The SAR ensures that the all system requirements have been satisfied and that the integration activities of the facility element can start as defined in the facility element Integration Plan.

The review shall be organized by European Spallation Source ERIC and will involve programme members of the partner as well as any other stakeholders at the discretion of the review chairman. The chair of the review board is appointed by European Spallation Source ERIC. The membership of the board is communicated to the review participants at the earliest possible time.

The contents of the SAR data package shall be established as a minimum <<5?>> weeks before the review. As a minimum it shall contain all deliverables as specified in 4.4.3.

The review shall be organized as defined in the ESS Design Review Standard Operating Procedure [DRP]. No detailed schedule of a review meeting is requested but for planning purposes it can be expected that a review may last 3 working days.

The review board shall review the documentation provided and submit written comments no less than <<3?>> working weeks before the review meeting. The partner shall consolidate the comments and provide written answers to the board no less than <<1?>> working week before the review meeting.

The agenda of the review meeting shall be communicated to the review participants no less than <<1?>> week before the review meeting. The review meeting may include in depth presentations by the partner of the work undertaken and responses to the review findings.

The successful completion of the System Acceptance Review is a prerequisite for crediting values to the Partner.

4.4. Deliverables

4.4.1. Status reports

During the execution of the SoW, the Partner shall submit to the European Spallation Source ERIC monthly status reports containing (as according to Enclosure 1: Monthly Status Report):

1. The status of the SoW since the preceding report;
2. The progress expected to be made in the next following period and any other pertinent issues related to the Project Results;
3. Updated Milestone Tracking Table
4. Desired changes to existing baseline
5. Risk Management
6. Updated electronic versions of the partner plans

During the execution of the SoW, the System Status Report related to the facility element will be maintained by the European Spallation Source ERIC WU Coordinator. The European Spallation Source ERIC WU Coordinator and the Partner will ensure that the System Status Report reflects the current development maturity of the facility element and especially that testing or operating restrictions and limitations due to an uncompleted development are reported.

4.4.2. Stage 1 data package

The Stage 1 data package shall cover all activities undertaken during Stage 1. The data package shall document the technical baseline items and the trade offs that lead to this definition, the detailed design of the facility element, including the design and operation documentation for all the equipment (software and hardware) that are necessary for handling, transport, storage, installation, maintenance and operation thereof when applicable. The data package shall demonstrate compliance with the applicable requirements and establish verification plans. The data package shall rely on templates provided by European Spallation Source ERIC.

This package shall include but not be limited to:

- System Requirement Document,
- System Design Description and related documents and data (drawings, general arrangement drawings, P&ID, FE models, etc.),
- Updated Interface Control Documents,
- System Integration Plan,
- Certificate of Conformity for Hazardous Materials and Sustainability [ISS]
- Component Operation and Maintenance Manual,
- System Verification Plan.
- Plan for sustainable selection of materials

The Stage 1 data package shall also contain documentation to initiate a competitive tender for the procurement of the facility element and to support the project activities. The Stage 1 data package should <<shall if the contribution is only design>> additionally include but not necessarily be limited to:

- a complete documentation package for the procurement of the facility element including as a minimum a statement of work, manufacturing follow-up description, applicable and reference documentation
- The Project Schedule for construction
- Risk register

4.4.3. Stage 2 data package

The Stage 2 data package shall cover all activities undertaken during Stage 2. The data package shall contain the “as-built” documentation and verification records showing the compliance with the facility element requirements.

This package shall include but not be limited to:

- “as-built” design descriptions (drawings, P&ID, etc.),

. Verification Report.
. Updated Interface Control Document(s) when applicable,
. System Integration Plan.

4.4.4. Final report

The Partner shall issue a final written report to the European Spallation Source ERIC within four (4) weeks of the earliest occurrence of the following: (a) completion of the stages, or (b) the expiration of this Agreement, or (c) prior termination of this Agreement. Such report shall include a comprehensive summary of the contributions made, works and services undertaken and Project Results achieved.

4.4.5. Documentation package for supply

The Partner shall deliver at the completion of the project:

- Stage 1 data package,
- Stage 2 data package,
- Data sheets,
- Certificates,
- CAD models

5. TASKS APPLICABLE TO ALL PROJECT STAGES

5.1. Project management and control

ESS is mandated to use Earned Value Management as a tool for managing progress and performance. This translates into a requirement for tracking deliverables from partners. Below, chapter 5.1.1 – 5.1.6 , the requirements concerning scheduling and progress reporting in order to comply with this requirement. Templates and instructions for managing the milestone schedule, including the associated earn value basis are found within the Applicable documents.

5.1.1. Use of a Planning Tool

The partner should use a planning tool (MS Project, Oracle Primavera, Deltek Open Plan or similar). The purpose with this requirement is to enforce a systematic approach to planning, both creating and maintaining the plan.

As part of the monthly status report, the current schedule should be made available for ESS (electronic format).

5.1.2. Delivery Milestones

Each distinct delivery should have a milestone with a date. This also includes part or incremental deliveries.

5.1.3. Milestone Definition List

Each Milestone should have a number, name and a definition (captured in a Milestone Definition List). The definition should both explain the content and fulfilment of the milestone and delivery.

5.1.4. Interim Milestones

If the duration of the project work producing the deliverable is more than 6 months, the plan should also contain interim milestones. The purpose with interim milestones is to measure progress and to be used for signalling issues in the fulfilment of the delivery (in the interest of both parties).

5.1.5. EV – Weighted MS value

Each milestone, both interim and delivery milestones, should be associated with a weight (percentage between 0-100). The aggregated fulfilment of all milestones should result in 100%.

5.1.6. Monthly Forecasting

In conjunction with the status reporting, the partner should also provide an updated forecast for the upcoming milestones, as well as the final delivery milestone.

5.2. Risk Management

ESS uses Risk Management as one of the Project Management tools to assist the execution of the Programme. The Partner's contribution in this field is vital and shall therefor form a part of ESS Risk Management Process.

The contribution shall be characterized by risk awareness and open communication regarding risks. The common view of risks and uncertainties are utilized as a stepping-stone to the identification and exploitation of opportunities.

5.2.1. ESS Risk Management Process

Risk Management shall be incorporated as a part of the day-to-day work with the contribution. The partner shall work according to ESS Risk Management Process, including:

- Plan Risk Management
- Identify risk,
- Analyse risk,
- Risk treatment, and
- Monitor and control risk.

5.2.2. ESS risk criteria

When analysing risk, ESS' risk criteria shall be used. Using ESS' criteria for likelihood and consequence enables partner and ESS to analyse risks in a uniformed way.

The ESS acceptance criteria clarify what risk level that ESS accepts, and when risk treatments are required. All combinations of likelihoods and consequences correspond to a risk level, either being high, medium or low. This is graphically presented in the ESS risk matrix.

Risk treatments are the measures being taken in order to treat the risk to an acceptable level. High-level risks can never be accepted and require treatment. Medium-level risks can be accepted without treatment if the treatment is not proportional to the gained improvements. Low-level risks can be accepted without treatments.

5.2.3. Risk register

The risk register shall contain the gathered knowledge of identified risks, including the assessed risk exposure. The register shall show identified risks in order of priority, including risk treatment plans.

The Partner should preferably use ESS Risk Management software system, used for systematic documentation of risk registers. If not, the partner risk register format shall be according to ESS' requirements.

5.2.4. Risk status report

Risk status reports shall include summary describing news and relevant changes to the risk exposure, including on-going Risk Management activities. It shall furthermore contain an updated risk register including risk treatment status.

5.3. Configuration management

The ESS programme participants shall develop the baseline of the facility elements and is free to redefine the architecture of the facility elements. Full and part delivery milestones should be under change control. This means that both parties need to agree on changes to the milestones. Each baseline change shall be documented as defined in the Change Control Process [ESS-0001879].

The ESS programme participants shall follow the principles of configuration management as laid down in the ESS configuration management plan [CMP], or equivalent best practices. In particular:

1. The ESS programme participants shall identify each document, drawing, subsystem or part, establishing the item configuration and relation to the hardware and software at any time in the study.

2. The ESS programme participants shall apply the change control process [CCP], in agreement with best practices.
3. The ESS programme participants shall ensure that all personnel that use or generate information can easily access in the tools implemented to ensure configuration control. European Spallation Source ERIC shall provide a central repository for all information and that this repository is properly backed up.

5.4. Organization

The persons nominated as the Work-Unit Coordinator according to 6.3 in the agreement are:

For the Partner (local coordinator): [name]

For European Spallation Source ERIC: [name]

The following personnel of the Partner will take part in the provision of the works and services:

[name]

5.5. Product & Quality assurance and safety

5.5.1. Applicable law, legislation and standards

All Partner national safety laws and legislation applicable to the design, development, manufacturing, installation, testing and operation of the supply shall be followed and fulfilled. Further, and without limiting the foregoing, the Partner is responsible for checking that the [products] delivered or supplied to ESS ERIC meet EU safety, health and environmental protection requirements. It is the Partner's responsibility to ensure that all such [products] are compliant with European Directives, and CE marked if applicable, and that the following obligations have been carried out and complied with:

a. Identify the applicable directive(s) and harmonized standards;
b. Perform a documented risk assessment;
c. Identify whether an independent conformity assessment (by a notified body) is necessary;
d. Test the [product] and check its conformity;
e. Verify [product] specific requirements;
f. Draw up and make available, upon request, all the required technical documentation (in
English). Keep such technical documentation for the time periods specified in the applicable directives;

g. Draw up and issue an Operations Manual or Instructions for incorporation (in English);
h. Draw up and issue the EU Declaration of Conformity (in English);
i. Affix CE marking, if applicable.

The Partner acknowledges that the above steps may differ by [product] as the conformity assessment procedures vary, in which case the Partner shall comply with all the relevant procedures and applicable legal requirements.

All operator national safety laws and legislation applicable to the design, development, manufacturing, installation, testing and operation of the supply shall be followed and fulfilled as defined in the requirement document for the facility element by European Spallation Source ERIC.

The Parties shall implement and maintain throughout the Project a quality assurance and safety approach that covers all relevant aspects of ISO9001 with respect to the scope of the IKC delivery and all specified reliability, quality assurance and safety requirements.

5.5.2. Quality Plan

[name] shall prepare a consistent and comprehensive Quality plan (based on the [PQP] template] for its contribution and submit it to approval by the ESS WU Coordinator on [date] the latest. The Quality plan shall generally comply with the recommendations of the ISO 10005:2005 Standard.

The documentation required might be principally generated from the Partner's Quality Management System when applying a system manual with defined procedures. However, a Quality plan does not replace such a quality management system, but may complement to the issues of the cooperation.

6. DOCUMENTATION FORMAT

All documentation and correspondence shall be in English.

All office documents shall be in a MS Word and PDF format.

The civil design models and drawings shall be based on Revit.

The electrical drawings shall be in editable EPlan format.

All mechanical models and drawings shall be editable Catia V6 format.

Drawings shall be also provided in PDF.

All technical information stipulated to be delivered to ESS shall be submitted through ESS PLM system, CHESS

7. TRANSPORTATION AND DELIVERY

All tangible deliverables shall be delivered DAP 2010 Incoterms, unloaded at the final destination of on defined by ESS

<<Further include if applicable>>All deliveries shall be pre advised 48h prior to the arrival at destination via email to logistics@esss.se, a confirmation with slot time for unloading will follow to the sender of the pre advise - any costs caused by delays by shipper is on shipper account. All deliverables shall be executed in accordance with the Logistics Guidelines [LOG] (i.e. technical guideline re. transportation further specifying: delivery notice time, minimum packaging specs, delivery notes, open hrs. of receiving at ESS or warehouse, time of storage at partner premises without charge after FAT etc. For goods/material/equipment purchased by ESS and delivered to the partner for use in development detailed in this Schedule (Technical Annex), that are expected to be returned to ESS please consult the ESS procedure for the Off-site Lending of Hardware [OLH]. The procedure describes the responsibilities, routines and processes in regards to lending. >>

8. WARRANTY

<<Please include specific warranty requirements>>

9. EXCLUDED BACKGROUND

The Partner excludes the following Background in accordance with paragraphs 13.3.1.2 and 13.3.2.2 of the Agreement:
[*INSERT DETAIL*]

IN WITNESS WHEREOF, the Agreement has been executed in two (2) originals, of which the Parties have received one (1) each.

European Spallation Source ERIC	**Name of Partner**
_____	_____
Date	*Date*

_____	_____
Signature	*Signature*
_____	_____
Name (in block letters)	*Name (in block letters)*
_____	_____
Position	*Position*