Statement of Works

for the
Supply of Fasteners for RFDS waveguide at ESS

Abstract

This requirement is for the supply, testing and delivery of components for the RF distribution system of the European Spallation Source (ESS) in Lund. These are the fasteners for 15 Units in the ESS.

1 SCOPE OF SUPPLY

1.1 Introduction to ESS

The European Spallation Source (ESS) will be one of the largest infrastructures in Europe and will be used for materials research. It will use a long pulsed superconducting linac and accelerate a 62.5 mA proton beam current to the energy of 2000 MeV. Peak beam power to the target will be 125 MW, 7 times more than the highest power existing facility.

STFC are providing a number of goods and services on behalf of the ESS. This tender is for the supply of fasteners to assemble the RF distribution waveguide system.

1.2 List of acronyms

EIA - Electronic Industries Alliance
ESS - European Spallation Source
HB/MB - High Beta/Medium Beta elliptical cavities
ISO - International Organization for Standardization
RFDS - Radio Frequency Distribution System
ITQ - Invitation to Quote
RoHS - Restriction of Hazardous Substances
STFC - Science and Technology Facilities Council

1.3 Objective

A set of fasteners are required to assemble the RFDS system at the ESS. This will be for the HB/MB sections of the ESS.

1.3.1 Items included in the supply

The supply shall comprise the components shown in Table 1-1. The details can be found in section 4.

Table 1-1 Components of the RFDS included in this tender

Item Number	Item Area	Component	Length (mm)	Width across flats (mm) (Nom.)	Number required
1	HB/MB	Hex Bolt M10	80	17	36600
2		Hex Bolt M10	90	17	2700
3		Hex Bolt M10	110	17	4700
4		Hex Bolt M10	65	17	134200
5	HB/MB	Hex Nut M10 (Coated with	N/A	17	178200

		Molybdenum disulphide)			
6	HB/MB	Washer M10	N/A	N/A	356400

Pricing should be submitted on the Price Schedule in question AW5.2 of the tender for all the components in Table 1-1.

Site acceptance testing (SAT) will be performed for the fasteners following delivery at the ESS, Lund, Sweden. If any of the fasteners are deemed not to meet the specification, they will be replaced; the supplier will bear all costs.

1.3.2 Items not included in the supply

The following products and services are not included in the supply:

1. Pedestals;
2. Support structures for Spoke units;
3. Support structures for Tunnel units;
4. Support structures for Gallery units;
5. Installation at ESS site, including lifting equipment and tooling;
6. Waveguides, bellows and bends.

1.3.3 Items supplied by STFC

None.

1.4 Delivery

The delivery schedule is shown in Table 1-2. The first column in Table 1-2 is the date, in which a delivery must take place. The 2 hour time slot can only be changed by applying 48hrs notice in advance during a working week. For each delivery date, the quantity of fasteners to be delivered is given. This is a 25% of all the total components specified in Table 1-1, therefore enabling a set of fasteners to be constructed. Proposals to combine deliveries can be discussed after contract award, but all the required fasteners must be available on or before the specified timetable. The cost of delivery should be included in the bid, and delivery using DAP Incoterms 2015 should be applied.

Table 1-2 Delivery schedule
Deliveries must be made on a Thursday between the hours of 09:00 and 11:00

Date	Qty
Four weeks from Contract Signature	25%
Nine weeks from Contract Signature	25%
Fourteen weeks from Contract Signature	25%
Nineteen weeks from Contract Signature	25%

STFC on behalf of ESS reserve the right to delay delivery due to any unforeseen circumstances. Notice will be given should this occur, and the goods shall be stored by the supplier. There shall be no additional charges to STFC as a result of delay.

1.5 Warranty

The equipment shall be warranted for at least two years from the date of site acceptance or from three months after delivery if site acceptance is delayed.

2 GENERAL REQUIREMENTS

2.1 Supplier's responsibilities

The Supplier is solely responsible for meeting all the requirements of this Statement of Works in accordance with Table 3-1 and Section 4.

The Supplier will be required to work in close contact with the Project Manager at STFC at all stages of the contract, in order to resolve any technical issues or problems that arise in the timeliest and efficient manner. All contact with STFC referred to below should also take place with the Project Manager.

2.2 Contract management

2.2.1 Contract engineer

The Supplier shall assign an engineer to be responsible for the technical execution of the Contract and its follow-up, including all contacts with STFC, throughout the duration of the Contract.

2.2.2 Time schedule

The Supplier will inform STFC immediately in writing where a delay of more than one week against any milestone in the agreed programme is anticipated. The Supplier shall make available evidence of all corrective actions being undertaken to mitigate the impact on the contract deliverables.

Throughout the project the Supplier shall report any risks or concerns that specifications cannot be met as soon as possible, with a full explanation of why they cannot be met. Submitting such reports shall not result in the Supplier being released of their responsibility for meeting their contractual liabilities under the contract.

2.2.3 Factory access and inspections

STFC reserves the right to carry out regular and/or spot inspections at the Supplier's premises and where deemed necessary that of its sub Suppliers. Contract inspections concern all contract compliance issues including schedule and quality performance.

STFC and the ESS reserve the right to be present to witness any tests carried out at the Supplier's or any sub-contractor's premises.

3 ENGINEERING STANDARDS AND MANUFACTURING SPECIFICATIONS

3.1 Materials and workmanship

3.1.1 Metric system

The fasteners shall be in accordance with the metric system.

3.2 Design principles

Unless stated otherwise in this Statement of Works, the following design principles shall apply.

3.2.1 Reliability and lifetime

It is expected that the operational lifetime of the RFDS waveguide is higher than 20 years. Therefore, the fasteners should have an operational life of at least 20 years.

3.3 Applicable directives, regulations and standards

The following directives, regulations and standards are applicable for the execution of the Contract.

3.3.1 European standards and regulations

European directives and regulations applicable for the components include, but are not necessarily limited to, those listed in the table below. The table also references standards harmonized with the European directives and regulations list.

Table 3-1: Table listing of European Directives and Regulations applicable for the components

Subject of Directive / Regulation	Reference / link to Directive & Regulation)	E.g. of products	Reference / link to harmonized standards[1])
Restriction of the use of certain hazardous substances (RoHS)	2011/65/EU	RF Distribution components	RoHS
Hexagon head bolts	DIN 933	Bolts (Fully threaded)	
Hexagon regular nuts	DIN 934	Nuts (With MolyKote)	
Plain washers — Normal series — Product grade A	DIN 125 A	Washers	
1 Harmonized standards are technical specifications of products meeting essential requirements set out by European Directives and Regulations. These standards are usually used as means to demonstrate compliance with European Directives and Regulations.			

3.3.2 Other international standards

Unless noted otherwise in this specification, all equipment and drawings should comply with the relevant I.E.C. standards, recommendations and reports including the latest revision.

3.4 Documentation

All documentation shall be written in English.

4 TECHNICAL REQUIREMENTS

This section describes the technical requirements for all the RF distribution fasteners for this tender.

4.1 General data

The reliability of the structures must be at least 20 years, the operation of the accelerator must not be compromised by degradation of the fixtures and fittings.

4.1.1 Materials

The materials for all the bolts, nuts and washers must be 304 Stainless Steel specification A2-70.

4.1.2 Surface finish

All supplied components must be free of burs.

4.1.3 Surface cleaning, treatment and painting

The nuts must have a molybdenum disulphide coating; this is to prevent in-service galling of the fasteners. This must be pre-applied to the nuts, before shipment. MolyKote by Dow Corning's is one example of a Molybdenum disulphide coating (this example is not mandatory, others that meet the specification will be considered). A data sheet should be provided of the molybdenum disulphide coating for approval by STFC/ESS whom shall reserve the right to refuse a particular coating. PTFE is not allowed in the facility, and other materials can be broken down with the radiation in certain areas.

4.1.4 Mechanical tolerances

The tolerances for the different components should follow the respective DIN standards listed in section 3.3.1

4.1.5 Naming, Information and documentation

When delivered, each pallet or crate needs to be accompanied with a report written in English, indicating:

1. STFC Contract number;
2. Components total weight;
3. Packing list of included components;

A copy of these documents shall be sent to STFC prior to shipping.

4.1.6 Packing and delivery

The Supplier is responsible for the packing and the transport to the build site in Sweden, to the following address:

ESS Construction SITE
G02-L5
Odarslövsvägen 113
SE-225 92 Lund

The final delivery address will be confirmed for each delivery during the contract as ESS may request a different Swedish storage location, the supplier shall be responsible for all shipping costs.

The fasteners should arrive on site without being damaged. Should any damage occur during transport, the supplier shall be responsible for replacing the damaged components.

All items must be palletised or crated. Palletised items should be wrapped in a plastic to prevent the individual package from being damaged by the environment during loading and unloading. If the items are crated, then the crates should be accessible by a forklift from either side of the delivery truck.

Each component should be bagged or boxed in quantities of a hundred items. The items packaging should be clearly labelled with; component description, length, Size (M10), coating information.

The following must be clearly displayed on the outside of the Pallet(s)/Crate(s):

a. Contact name;

b. Delivery address;

c. The STFC contract number;

d. The weight of each loaded pallet/crate;

f. Unique identifiers of the contents

Access to the ESS delivery site is restricted to 2 hour delivery slots as detailed in the delivery schedule in Section 1.4 above. The supplier shall bear all costs for shipments turned away from site and for re-delivery due to non-compliance with these conditions. All communications relating to delivery scheduling should be directed to the Project Engineer at STFC, and any requests to re-schedule submitted 48hrs in advance. The supplier shall bear all costs for shipments turned away from site, due to not complying with these conditions. Please liaise with the project engineer at STFC.

The supplier will provide details of the transport to Sweden, indicating if third party contractors will be used. If the delivery will be unloaded and loaded onto different trucks during its journey to Sweden, then written notices of the handover of the goods should be supplied at each handover so that any damaged to the goods can be recorded and these details passed onto STFC.

5 INFORMATION ABOUT ESS REQUIREMENTS

5.1 Site acceptance tests

Acceptance tests will be carried out at ESS or ESS approved site in Sweden on selected items to establish that the fasteners meet the specification and that no damage has occurred during transport. These tests will be performed within four weeks of arrival at the ESS. Invoicing by Supplier shall only take place after written confirmation from STFC that all or part of the shipment has been accepted. The Supplier shall only invoice for accepted items.

In the event of any errors and/or damages being found during the site acceptance tests, the Supplier shall replace them immediately at their cost.

6 QUALITY ASSURANCE AND GUARANTEES

The Supplier shall maintain and apply a quality assurance program compliant with ISO-9001 or equivalent for the design, manufacture and testing of all systems and equipment provided by them.

CE marking or equivalent of equipment should be applied wherever required.

All components shall be designed and constructed with an expected operational lifetime of greater than 20 years. It is understood that maintenance may be required during this period.

Systems shall be designed and constructed for continuous use with minimal maintenance, i.e. no more often than twice per year for periods not exceeding 10 days. Maintenance outside of these periods should not be required.