Specification for D-100X Procurement

System Removal, Packaging, Insurance and Delivery to XFEL HED Beamline Facility in Hamburg, Germany

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Contents

Introduction and Purpose of Document

The D-100X Laser System is a large assembly of interconnected optical tables occupying a floor space of approximately 10 m by 5 m (excluding ancillaries and the 100 J cryostat), having a total mass of ~16 tonnes. The Laser System must be removed from its current location, suitably packaged and transported from STFC Rutherford Appleton Laboratory (RAL) to our Client in Hamburg, Germany.

All elements that make up the Laser System are currently housed within an ISO 7 cleanroom. Following disconnection by STFC personnel, all items must be removed through a series of laboratory doorways into designated packaging and holding areas whilst maintaining a high degree of cleanliness, before loading and eventual transportation. The System is supported by a number of services, including liquid nitrogen cooling vessels, electrical control racks, gas, data and water supplies. Each optical table contains a large number of delicate optics, lasers systems, amplifier components and diagnostic cameras, which are fragile by nature. To minimise the risk of damage to equipment during packaging, loading, transit, offloading and other movements, it is intended to break-down the Laser System into the largest sections that are practical. The crated items may be relocated to a temporary storage facility or transported directly to the Client.

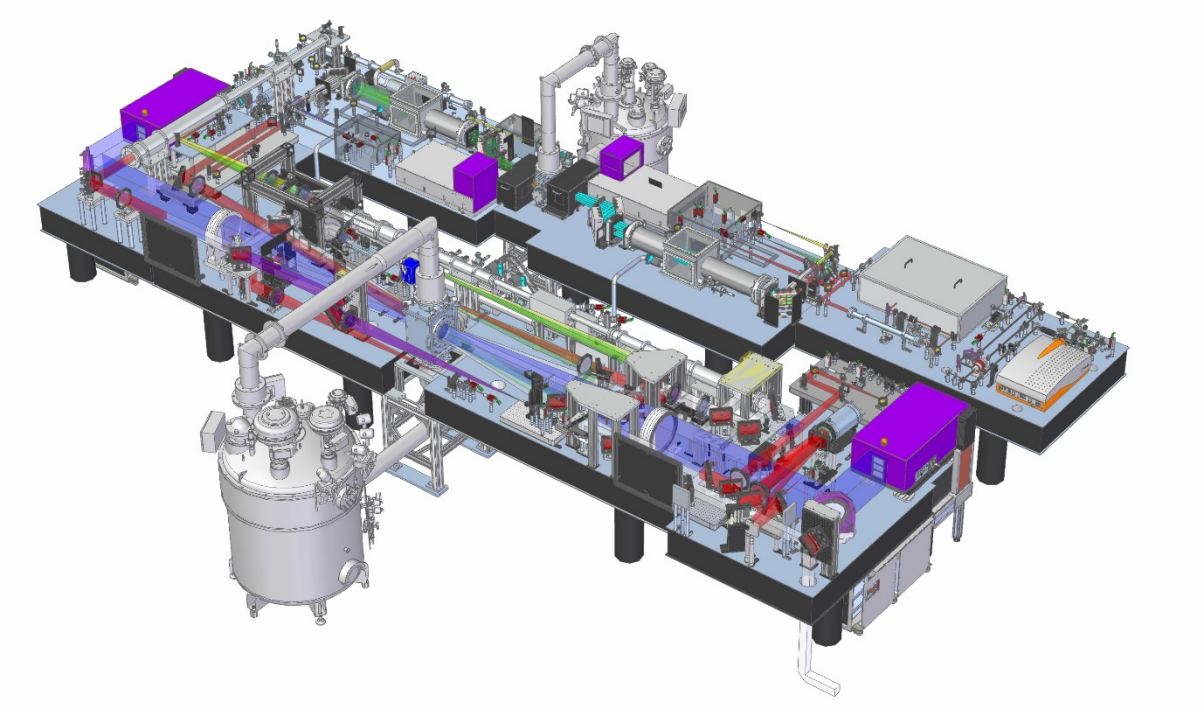

Figure 1: CAD model of D-100X Laser system

Requirements

Project Management

The contractor will provide the name of an assigned Project Manager who will act as the main liaison and responsible person during all stages of the contract. The assigned person is expected to provide all relevant details, including direct phone contact, certification documents, equipment specifications and planning schedules relating to the contract.

Insurance

The contractor is required to insure the equipment during all phases of the works and activities under the contractor's purview. The goods shall be valued at £7M for insurance purposes. The contractor shall provide a certificate of insurance to STFC a minimum of one month in advance of the movement of any goods.

Removal from Cleanroom area

When STFC disconnection work is complete, the main components that make up the Laser System will be in a position to be removed from the cleanroom area by the contractor, then packaged, handled, labelled and prepared for transportation. These items together with the remaining service elements shall be manoeuvred into an allocated packaging area at STFC RAL. The allocated packaging area and the associated logistics shall be agreed between STFC and the contractor during finalisation of the planning. Once packaging has been completed, the equipment must be secured within crates and these items shall then be transferred to a holding area where the units will be arranged for loading onto the transport vehicles.

The contractor and STFC will identify heavy items. A lifting and movement plan shall be developed for these by the contractor. The contractor will supply all lifting equipment required to fulfil the plan. Where necessary, timing of the movement of individual large items will be managed between the contractor and STFC.

All lifting equipment will comply with the relevant STFC Codes of Practice. Any third party equipment, including that supplied by the contractor, must be made available for inspection, along with associated test records and calibration certificates as these will be required by STFC for approval at least two weeks before works commence.

Packaging of Items

The general approach to packaging is that it is completed in a safe manner, whilst maintaining the integrity of the Laser System sub-assemblies during storage and transportation.

The main large sub-assemblies and items must be individually covered and vacuum sealed prior to secure placement within a transportation crate. In the case of the optical tables, it may be necessary to seal at least twice before crating and prior to storage and final transportation to the Client's facility. All items shall be wrapped within an appropriate clean and dust-free plastic covering prior to placement within the wooden crates.

A standard approach to crating will be taken by the contractor; these containers will be delivered flat packed, made from plywood with foam inserts and will be compatible with standard EU pallet and

packaging lifting methods. They will be assembled on site. The crates should be designed and built to be structurally sound and able to support other crates during storage and transportation (all proposals to be approved by STFC). The expected final number of packages is not known; however, it is expected to be in the region of 40. The major items and approximate sizes of packages are listed in the table below (Table 1.). Those not listed will be expected to be packaged in standard wooden crates of approximate size 2 m x 1 m x 1 m that will be supplied to STFC in advance of packaging and transportation:

Table 1: Table of the main Laser sub-assemblies and approximate sizes

PACKAGE DESIGNATION	**SIZE** metres (approx.) length x width x depth	**NUMBER** of	**WEIGHT** kg (approx.)
Optical Tables			
Front End	2.5 x 1.5 x 1.11	1	1000
10 Joule (Table 1)	3.35 x 1.5 x 1.26	1	1100
10 Joule (Table 2)	3.35 x 1.5 x 1.26	1	1100
100 Joule (Table 1)	2.35 x 1.5 x 1.5	1	1000
100 Joule (Table 2)	3.125 x 1.5 x 1.62	1	1100
100 Joule (Table 3)	3.125 x 1.5 x 1.62	1	1100
100 Joule (Table 4)	2.5 x 1.5 x 1.56	1	1000
Laser Sub-Systems			
10J Amplifier Head/Support	0.75 x 0.69 x 1.54	1	190
100J Amplifier Head/Support	0.85 x 0.73 x 1.9	1	340
Laser Services			
Control Racks - large	0.8 x 0.6 x 1.95	6	1200
	0.6 x 0.6 x 2.0	2	200
	1.0 x 0.6 x 1.95	1	200
Control Racks - small (two in each crate)	0.6 x 0.55 x 0.5	11	1200
Vacuum Pump Sets	0.7 x 0.57 x 0.57	2	130
Optical Table Legs 22 off	1.3 x 0.7 x 1.25	1	220
Service Ancillaries (large)	2.38 x 1.58 x 1.2	3	300
Service Ancillaries (small)	2.38 x 0.83 x 1.2	2	200
Cryostats			
10J	1.35 x 1.2 x 1.8	1	800
100J	1.5 x 1.45 x 2.15	1	1800
Transfer Lines (10+100J)	2.8 x 1.2 x 1.4	1	400
Blast Shields	1.65 x 1.1 x 0.76	2	400
TOTAL		42	14980

All equipment being carried within wooden packaging crates shall be vacuum packed. Where wooden supports for packing crates require to be placed internal to the vacuum packing, these supports shall be covered with a thick layer of cling film to prevent dust from wood contaminating the internal surfaces of the packaging.

Packaging Areas and Temporary Local Storage

Space available for packaging and storage of the Laser System at STFC RAL is limited; a careful, well-planned and structured approach to the removal of large components from the laser laboratory is therefore needed. With the current laboratory arrangement, large components must be removed through the double doors at the east end of the laboratory. These double doors open out into another cleanroom facility, where an area will be made available to deal with bagging and part of the packaging operation of the larger components. This will be designated as the 'Bagging and Packaging Area'. A range of lifting and wheeled equipment must be provided by the contractor and used to move the large components from the Laser laboratory through the Bagging and Packaging Area and eventually to the 'Holding and Crating Area'. Once here all components must be enclosed within their designated crates, suitably labelled and transferred to a temporary storage facility, or to the back of a lorry where storage is at STFC site. All equipment used during lifting and handling operations must be fit for the task at hand. The minimum door aperture through the exit route is 1.76 m width x 2.05 m height.

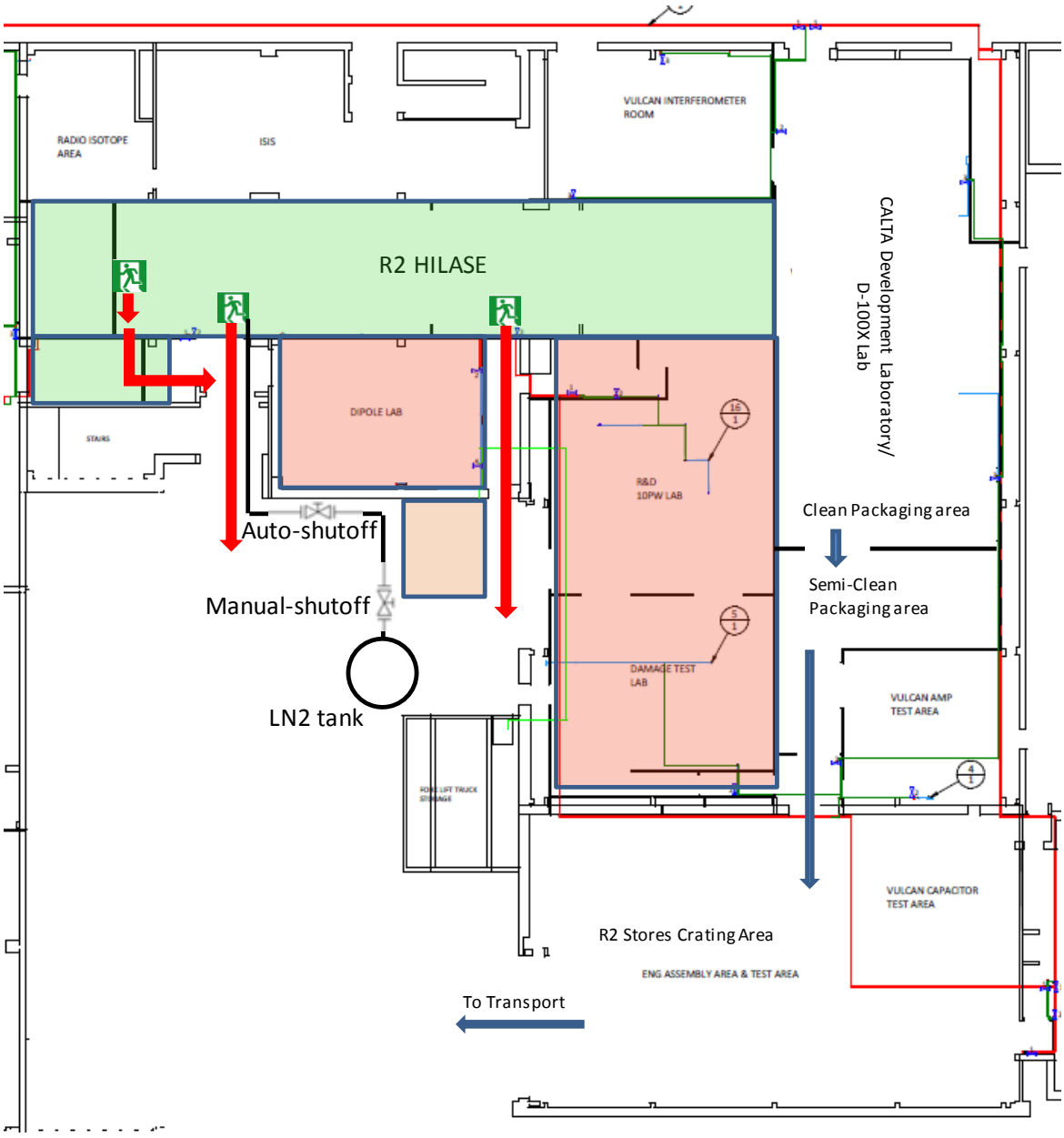

Figure 2: Layout of STFC RAL Laser Laboratory and associated removal areas

All crates and packages relating to the Laser System being transported to the XFEL HED Beamline Facility must be fitted with shock/tilt monitor labels. These must indicate any loading and in-transit impacts that may lead to subsequent accidental damage of the goods. A set of typical monitor labels arise shown below (Figure 3.) The contractor may suggest alternatives for STFC approval however, if STFC is dissatisfied with the alternative, those below shall be provided.

Figure 3: Impact ShockWatch (left) and TiltWatch (right) monitors

Transportation

The Laser System shall be transported from STFC RAL to the XFEL HED Beamline Facility in Hamburg. An agreed documentation and transport plan will be coordinated between STFC and the Contractor. The XFEL/HiBEF Facility co-ordinator for this move shall be informed of transport arrangements and provided with a full delivery manifesto prior to arrival of the packages in Hamburg.

The Laser System requires appropriate strategic export control documentation complying with the Regulations currently in force within the United Kingdom and Europe. An 'End User Agreement' signed by representatives of XFEL/HiBEF has been concluded attesting to the fact that the equipment will remain within the EU.

Much consideration will be given to specialist knowledge and experience, as well as to ensuring that the contractor has the right equipment for the job at hand. Suitable storage facilities at the contractor's site could also prove advantageous, as this could aid the loading and unloading process prior to final transportation to Hamburg. It is expected that the Laser System will be delivered by two Heavy Goods Vehicles though it is possible that three may be required. Vehicle specifications are to be provided with the tender. STFC would consider tri-axle trailers with air-ride suspension, and provision for ramped rear access along with side access trailers as suitable.

Security during Transportation

Security and the safe transportation of goods through Europe shall be considered.

The transported freight is not expected to be attractive to thieves, although it could be subject to damage and vandalism during the journey through continental Europe. The contractor must examine the risk and consider mitigating this by parking the lorry in secure compounds during the journey.

STFC will discuss the journey options with the Contractor. Initially, based on previous experience, STFC would recommend a non-stop journey with a back-up driver as the most secure, preferred

option. Assessment of risk with the contractor may alter this recommendation. Routes will be planned in advance and any road restrictions in Hamburg must be reviewed in advance.

Delivery requirements at the XFEL HED Beamline Facility

The Laser System will be delivered to the XFEL HED Beamline Facility in Germany under Incoterms 2010, DDP. Where possible the delivery shall be palletised to provide for removal from the transport vehicle using a standard 1 to 1.5T fork lift truck. Maximum width of the crated packages must not exceed 2.2 m.

Offloading at the XFEL HED Beamline Facility

On delivery of the Laser System, the crated packages will require off-loading from the HGV transport vehicle(s) and manoeuvring to within the allocated offloading and temporary storage area allocated by XFEL. This area is likely to be a demarcated tented area of hardstanding. Such operations are the responsibility of the Contractor. STFC will have a technical representative present during these operations to ensure safe offloading and to visually inspect all packages being offloaded whilst recording the data monitors of each item. Due to the variety of sizes and package weights, appropriate equipment shall be supplied by the Contractor to undertake these operations. The Contractor shall supply suitably trained staff shall to operate the assigned machinery.

Project Requirements:

Documentation

The contractor shall provide a work programme and detailed, logically-linked schedule describing the removal, packaging and transportation of the Laser System. This document shall be provided in a reproducible (soft - Adobe Acrobat or similar) format and as two hard copies. These documents will be updated every two weeks where necessary during the course of the contract.

Health and Safety

It is necessary for any of the contractor's or their subcontractor's personnel attending STFC's site to undergo induction training. Where a visit is for less than three days in total, this may be managed at a local level however the contractor should make an allowance for one half day for this to occur each and every individual concerned.

Where the contractor or their subcontractor's personnel attending site are to be present for more than three days in total, there will be mandatory site training of half a day plus a local briefing of half a day for each and every individual concerned.

In either event, the contractor's or his subcontractor's personnel will be expected to adhere to STFC's Safety Health and Environmental Policies and Safety Codes, copies of which can be made available on application. Local management will provide advice as requested during the work on sites.

The booklet "Safety Health and Environmental Essentials for Contractors Working at the Rutherford Appleton Laboratory", available on request, provides a precis of expected behaviours.

Timescales

STFC's expectation is that the Laser System will be delivered to the XFEL HED Beamline Facility late September 2018. Disconnection work related to the Laser System at RAL is expected to be complete early-September 2018; removal and packaging of the complete Laser System could therefore commence at RAL in mid-September 2018. Removal and packaging of the system is expected to take no longer than 10 working days. STFC staff will be present at all times to advise and work with the contractor's staff. The client has asked for an option where the delivery is undertaken in two or three stages, each one offset by a week. In this case, due to the lack of storage facilities at RAL, the contractor may be asked to arrange temporary secure and weatherproof storage for the remaining packages. This is to be priced as an option.

In order to attain these schedules, we would expect an agreement to be reached by end May 2018 on final delivery dates. The Contractor shall provide and maintain a logically-linked Microsoft project (or similar) plan covering the removal, packaging and delivery of the complete Laser System.

Reporting

The Contractor will continuously maintain an up-to-date project plan and make this available to STFC. Further, there will be regular reporting, as agreed between the Contractor and STFC.

Quality Assurance

The contractor shall provide evidence attesting to international transport accreditations that they hold and associated procedures that they follow.

The Contractor shall be required to provide full contact details of their Quality Manager, or member of staff responsible for the sign-off of quality approvals and generation of quality processes.

The contractor shall generate a Quality Plan (QP) for the works. This shall be submitted in draft, with the tender and in completed form a minimum of two weeks prior to commencement of the work. STFC and the contractor will work together to finalise this plan in a mutually acceptable form. It shall include detail of inspections, lifting and handling equipment specifications and current test certificates, documented processes and quality control record proforma.

A list of the lifting equipment proposed for use for this contract, including test and calibration certification, shall be provided to STFC for review with the tender return.

The contractor shall be required to grant access to their work premises for STFC staff to undertake periodic quality control inspections as are deemed necessary.

Visit to RAL CLF during Tender Period

STFC have arranged for two half-day visits to the laboratory site that will occur during the tender period. The dates for these shall be published as a part of the web-based tender information. The visits shall be open to companies that register an interest in the tender. Information shall be shared between all attendees at these meetings. Each visit shall be of 3.5 hours in duration and shall broadly follow the agenda below:

1) Reception and coffee (0.5hrs)

2) STFC presentation of needs and challenges (0.5hrs)
3) Questions (0.25hrs)
4) Walk to laboratory and attire appropriate outer garments
5) Visit to laboratory and associated areas (1.0hrs)
6) Remove laboratory garments and return to presentation room (0.25hrs)
7) Questions (0.75hrs)

Please note that all questions asked shall be channelled through a single point of contact. Both questions and answers given shall be published for the use of all tenderers.

The address for the visit is:

Science and Technology Facilities Council, Rutherford Appleton Laboratory, Harwell Campus, Didcot, Oxfordshire. OX11 0QX.

Information and a map of how to get to the site can be found at the STFC website on:

http://www.stfc.ac.uk/