



Justification of Purposefulness of Public Contract (Updated)

Public Contract name: Vacuum compressor of PW laser pulses for the ELI-Beamlines L3 system

Type of Public Contract and Procedure: above-the-threshold public contract for supplies in negotiated procedure without publication.

Negotiated procedure without publication is applicable since conditions stated in Sec. 23 (5) (a) of the Act are met and the supplied products are manufactured purely for the purposes of research or development.

Number in the Official Information System of Public Contracts: 506008

Contracting Authority: Fyzikální ústav AV ČR, v. v. i.
Seat: Na Slovance 2, 182 21 Praha 8
Identification No.: 68378271
Tax Identification No.: CZ68378271
Person authorized to represent the Contracting Authority: prof. Jan Řídký, DrSc., Director

Contracting Authority is publishing updated Justification of Purposefulness to the above stated Public Contract awarded in negotiated procedure without publication as the negotiation phase has been concluded.

The Contracting Authority has not changed the qualification criteria, nor the technical conditions, the justification is stated below and it corresponds to the previous Justification of Purposefulness of Public Contract.

No business condition in the final version of the Tender Documentation have been stated in a manner demanding justification pursuant to the Decree n. 232/2012 Coll.

The Contracting Authority has justified the concrete evaluation criteria, the justification is stated below.

Statement of Reasons for Purposefulness of Public Contract Pursuant to Sec. 2 of the Decree n. 232/2012 Coll.
The data pursuant to Sec. 1, where a modification occurred in contrast to the facts pursuant to Sec. 1 of the regulation (modifications in contrast to Justification of Purposefulness of Public Contract for Purposes of Contracting Authority Prior Information Notice):



a) description of the needs to be accomplished through the performance of a public contract	No changes
b) description of the subject matter of a public contract	No changes
c) a mutual relationship between the subject matter of a public contract and the needs of the contracting entity	No changes
d) foreseen deadline of the performance of a public contract	Amended. Pursuant to indicative time schedule of the performance the foreseen deadline of the performance of a public contract shall be 19 months following the Contract award.
The description of the risks attaching to the performance of a public contract which were taken into account by the contracting entity in setting forth tender conditions. It particularly involves the risks of failure to execute a public contract, delay with the performance of a public contract, reduced quality of the performance, expending additional financial costs	Not realizing the Public Contract might jeopardize a fulfilment of aims and conditions emerging from a realization of the projects, whose proper realization the Contracting Authority has pledged to.
The contracting authority may delimit the variants of the accomplishment of the need and justification of the selected variant of the public contract (<i>optional</i>)	The Contracting Authority is not aware of any other way of accomplishing its needs.
The contracting authority may delimit to what extent the public contract will influence the performance of envisaged target. (<i>optional</i>)	A successful realization of the public contract achieves a fulfilment of the Contracting Authority needs and a reaching of the envisaged target.
Supplementary information justifying the purposefulness of a public contract (<i>optional</i>)	



Statement of Reasons for Proportionality of the Requirements on Technical Qualifications Prerequisites for the Performance of a Public Supply Contract Pursuant to Sec. 3 (1) of the Decree n. 232/2012 Coll. (justification of proportionality of the requirements on technical qualifications prerequisites in relation to the subject matter of the public contract and to the risks attaching to the performance of the public contract)	
Justification of proportionality of the requirements for the list of principal deliveries. <i>(The contracting entity shall fill it in compulsorily, where the required financial value of all principal deliveries amounts in the aggregate to at least three times the estimated value of the public contract.)</i>	Not required within the final tender conditions
Justification of proportionality of the requirement for submission of the list of technicians or technical bodies. <i>(The contracting authority shall fill it in compulsorily, where it requires the submission of the list of more than three technicians or technical bodies).</i>	Not required within the final tender conditions
Justification of proportionality of the requirement for production of the description of technical facilities and measures used by the economic operator for ensuring quality control, and description of facilities or equipment of the economic operator designed for research.	The required technical facility (cleanroom space of sufficient size) is a fundamental prerequisite for realization of critical and technologically rigorous steps of the contract fulfilment, namely for realization of assembly, testing and validation of performance of the compressor system and its individual components.
Justification of proportionality of the requirement on the check carried out on the production capacities by the contracting authority or on its behalf by another person and, if necessary, a check on measures relating to assurance of quality and research.	Not required within the final tender conditions
Justification of proportionality of the requirement for submission of samples, descriptions or photographs of the	Not required within the final tender conditions



products to be supplied.	
Justification of proportionality of the requirement for production of evidence attesting conformity of a required product issued by the relevant authority.	Not required within the final tender conditions

Statement of Reasons for Proportionality of the Requirements on Technical Qualifications Prerequisites for the Performance of a Public Service Contract Pursuant to Sec. 3(2) of the Decree n. 232/2012 Coll. (justification of proportionality of the requirements on technical qualifications prerequisites in relation to the subject matter of the public contract and to the risks attaching to the performance of the public contract)	
Justification of proportionality of the requirements for the list of principal services. <i>(The contracting entity shall fill it in compulsorily, where the required financial value of all principal services is in the aggregate at least three times the amount of the estimated value of the public contract.)</i>	Not required within the final tender conditions
Justification of proportionality of the requirement for submission of the list of technicians or technical bodies. <i>(The contracting authority shall fill it in compulsorily, where it requires the submission of the list of more than three technicians or technical bodies).</i>	The subject matter of the procurement is design, manufacture, assembly and detailed testing of a highly complex and unique technology system. Realization of this work needs substantial competences and experience of the supplier's team. The list of required technical personnel therefore includes sufficiently qualified and experienced specialists in the fields of design of vacuum chambers and high-precision vacuum positioning units, design and implementation of relevant electronic control systems, certified coordinator of welding-related activities, and certified welders for specific steel welding.
Justification of proportionality of the requirement for production of the	Not required within the final tender conditions



description of technical facilities and measures used by the economic operator for ensuring quality control, and description of facilities or equipment of the economic operator designed for research.	
Justification of proportionality of the requirement on the check carried out on the production capacities by the contracting authority or on its behalf by another person and, if necessary, a check on measures relating to assurance of quality and research.	Not required within the final tender conditions
Justification of proportionality of the requirement for production of a certificate of education and professional qualifications of the economic operator or those of the economic operator's managerial staff or of persons with equal status and persons responsible for providing relevant services (<i>The contracting entity shall fill it in compulsorily, where it requires submission of a certificate of education higher than secondary education with GCSE (general certificate of secondary education) exam, or a certificate of professional qualifications longer than three years</i>).	The subject matter of this procurement involves, amongst other, design activities in the field of advanced technologies. Another critical part of the required scope of work is specialized testing and performance validation of the produced hardware. These activities require extensive expert knowledge and also significant hands-on experience in the respective fields. Therefore university degree and practical experience longer than three years are required for two key members of the supplier's team, as minimum requirement for the ability to perform this public contract.
Justification of proportionality of the requirement for production of the statement of the average annual manpower of the economic operator or of other persons engaged in the performance of contracts of similar nature and of the number of economic operator's managerial staff or of persons with equal status.	Not required within the final tender conditions
Justification of proportionality of the requirement for production of the statement of tools or aids, operating and technical equipment available to	Not required within the final tender conditions



the economic operator for carrying out the public contract	
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Statement of Reasons for Delimitation of Commercial Terms and Conditions for Public Supply Contracts and Public Service Contracts Pursuant to Sec. 4 of the Decree n. 232/2012 Coll.	
Justification of delimitation of the commercial term setting forth maturity of invoices longer than 30 days	Not required within the final tender conditions
Justification of delimitation of the commercial term setting forth the requirement for third party liability insurance for the damage brought about by the economic operator to third persons amounting to twice the estimated value of the public contract.	Not required within the final tender conditions
Justification of delimitation of the commercial term setting forth the requirement for a bank guarantee higher than 5 % of the public contract value.	Not required within the final tender conditions
Justification of delimitation of the commercial term setting forth the requirement for a guarantee period longer than 24 months	Not required within the final tender conditions
Justification of delimitation of the commercial term setting forth a contractual penalty in the event of default of the economic operator higher than 0.2 % of the estimated value of the public contract for each day of delay.	Not required within the final tender conditions
Justification of delimitation of the commercial term setting forth a contractual penalty in the event of default of the contracting entity higher than 0.05 % of the due	Not required within the final tender conditions
Justification of delimitation of other	Not required within the final tender conditions



commercial terms and conditions pursuant to Sec. 5(2). The contracting authority shall justify delimitation of commercial terms and conditions of a public supply contract and public service contract in proportion to its needs and to the risks attaching to the performance of the public contract.	
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Justification for Technical Conditions specification of Public Contract Pursuant to Sec. 5 of the Decree	
Technical Condition Statement	Technical Condition Statement Reasons
The compressor vacuum chamber has outer dimensions of approximately 5.1 m (length) x 2.6 m (width) x 2.7 m (height). The chamber is designed as ribbed structure.	Dimensions of the compressor chamber are given by configuration of the internal optical components (diffraction gratings) and were defined by the supplier of the L3 laser system. Ribbed structure is necessary to minimize deformations of the compressor vacuum vessel.
The compressor chamber body and the beam injector system body shall be manufactured from stainless steel.	From analysis (made by the Client and reviewed by the supplier of the L3 laser) it follows that stainless steel is the most appropriate material with respect to structural stiffness and with respect to future maintenance of the system.
All elements of the detailed design of the compressor and of the beam injector system must be coordinated	The vacuum chambers and internal optomechanical systems of the compressor and injector are interconnected and constitute one integrated functional structure, and their design must thus be thoroughly coordinated.
The optomechanical mounts must not exhibit any resonant frequency below 30 Hz, and also must not have resonant frequency close to 50 Hz.	From the analysis of vibrational properties it follows that resonant frequencies below 30 Hz must be avoided to ensure stability of the compressor structure; also the structure must be free of resonant frequencies near 50 Hz to avoid interferences from electrical power network.
Each individual optomechanical mount must provide short- and long-term angular mechanical stability (drift) of the optical element better than 1 μ rad.	This requirement follows from the need to maintain the duration of the compressed laser pulse to <30 fs, which is one of the main performance goals of the L3 laser system.
The compressor chamber must provide structural stability resulting in	This requirement follows from the need to avoid mechanical clashing of the chamber



deformations less than 1 mm of its walls when the chamber is pumped down from atmospheric pressure	vacuum envelope with the adjacent internal high-precision optomechanics.
The Supplier shall develop detailed and rigorous procedures of cleaning interior of the vacuum chamber and of all optomechanical components	Rigorous and well-documented process of vacuum cleaning is a fundamental condition of successful delivery of the subject matter of this procurement.
All optical components are mounted on an optical table located within the vacuum chamber and supported by an optimized structural support frame. The table is mechanically de-coupled from the vacuum vessel.	As it follows from the analysis of required precision of the optical components, extremely high stability of these components is needed in order to ensure stability of the compressed laser pulse duration of <20 fs. All components have thus be mounted on the internal high-stability optical table and any connection to the vacuum vessel must be avoided.
The compressor must be designed for vacuum 10^{-7} mbar. This pressure must be achievable with chamber installed optical table, by turbomolecular vacuum pumps permanently installed at the chamber, in time comparable to 48 hours.	The required vacuum level is dictated by the need of ultra-clean environment of the compressor chamber interior, in order to prevent damage of very expensive optical components of the compressor. Other requirements follow from the need for cost- and manpower-effective operation of the compressor in the ELI-Beamlines facility.
All materials used inside the chamber must comply with the regime of highly clean vacuum, ideally free of any hydrocarbons and other volatile molecules.	Hydrocarbons and volatile molecules can contribute to severe contamination of very expensive optical elements inside the compressor (large diffraction gratings) and must thus be avoided.
Certain flanges on the compressor vessel and on its large doors and on the beam injector chamber shall have a co-axial tolerance of ± 1 mm or better and angular tolerance of ± 0.5 degrees or better with respect to their ideal axis; for reasons of critical geometry.	This requirement is given by the need to match certain flanges to the optical geometry of the compressor, and also to match certain flanges with the support structure geometry of the internal optical table.
Pumps, valves, actuators, sensors and other instrumentation must be delivered with control systems, power and utilities connections as necessary for correct and safe operation of the compressor, and with full English-language documentation.	This requirement is given by the need to obtain a fully functional compressor structure, ready to be functional without supplementing by the Client any additional control and/or utility connections. The requirement for English language is given by the character of the ELI-Beamlines project.
All pumps, valves, actuators, sensors and other instrumentation must be provided with LabVIEW drivers and/or API and a basic demonstrative graphical user interface (GUI). All drivers must follow the NI Instrument Driver Guidelines.	The control system of the L3 laser into which the compressor controls will be integrated is based on LabVIEW. Integration and safe functioning of the compressor controls cannot be guaranteed if other control system is used, or if the delivered controls are incompatible with the corresponding NI Driver Guidelines. Also, absence of API (Application Programming Interface) or GUI (Graphical



	User Interface) would imply for Client additional man-power efforts and costs.
All software must be provided fully open-source in LabVIEW.	This requirement for fully open source of all software is essential for integration of the delivered control systems into the L3 laser controls, for ensuring the machine safety, and for future upgrades by the Client in the years following delivery of the compressor.
Personnel Protection Systems and Machine Protection Systems shall be provided to ensure sufficient security against the hazards and failures. Where possible, components used in these systems must be certified to IEC 61508 SIL3 level.	This requirement is given by the mandatory obligation for the system to be safe for the personnel and also to provide machine protection. IEC 61508 is international standard for functional safety of electrical, electronic and programmable-electronic safety systems.
The compressor and all sub-systems must be transportable in the ELI-Beamlines facility by the cargo elevator necessary to bring it from the access ramp to the L3 laser hall, i.e. maximal dimensions of the chamber body when transported (including transporting envelope and wrapping) must not exceed 5.5 x 5.1 x 2.98 m ³ and its weight less than 10 tons including doors and port covers.	This requirement ensures that the delivered system can be transported to the L3 laser hall of the ELI-Beamlines facility. The indicated dimensions and mass relate to the capacity of the cargo elevator of ELI-Beamlines which is the only possible transport route from the access ramp to the L3 laser hall.

Justification for Basic and Partial Evaluation Criteria setting pursuant to Sec. 6 of the Decree		
Evaluation Criterion	Statement of Reasons	
The basic criterion for the selection of the potential contractor shall be, pursuant to Sec. 78 (2) of the Act, the economic value of the bid.	The Contracting Authority has stated below mentioned evaluation criteria with respect to the subject matter of the public contract and with respect to providing of a quality performance of given public contract due to requirements given by the Contracting Authority.	
	Partial Evaluation Criteria:	Weight (%)
	a) Total Bid Price [EUR or CZK excl. VAT]	70
	b) Remaining warranty duration (in calendar months) on the	6



	TMPs	
	c) Remaining warranty duration (in open/close cycles) on the vacuum valves	6
	d) Remaining warranty duration (in calendar months) of the control systems (Vacuum Control System and Motion Controls)	6
	e) Date of earlier delivery (in calendar months) of Deliverable D9	3
	f) Cleanliness of the cleanroom for assembling and testing (in classes according to ISO 14644 cleanroom standards)	6
	g) Time of insertion / retraction (in seconds) of the translation movement of IOM2	3
	The evaluation criteria and the evaluation process are described in detail in the final tender documentation. The extended warranty duration will reduce repair costs of the individual components (TMPs, vacuum valves, control systems) after delivery to the Client. Also the supplier, in the case of the extended warranty, is forced to use higher quality components in order to avoid their failure during the extended warranty period, which will increase uptime of the compressor system and minimize need for repairs. An earlier time of delivery will enable earlier installation of the compressor and thereby earlier commissioning of the L3 laser, which is highly desirable due to the terms of implementation of the project. A better cleanliness of the cleanroom for	



	assembling and testing will reduce undesirable contamination during assembling and testing of the vacuum compressor of PW laser pulses, which will ultimately lead to higher long-term reliability of the compressor. A shorter time of insertion / retraction of the IOM2 mirror will provide higher machine safety, due to the possibility to quickly isolate the laser light from the downstream systems of ELI-Bamlines.
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