

STATEMENT OF WORK

In relazione alla fornitura di interferometri per STILES, nell'ambito della proposta progettuale IR0000034 STILES "Strengthening the Italian leadership in ELT and SKA", ammessa a finanziamento nell'ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2", denominata "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata "Rafforzamento e creazione di Infrastrutture di Ricerca", del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") – WP5000 – 5102-5103

CIG (LOTTO 1): B108779D97 CIG (LOTTO 2): B10877AE6A CUP: C33C22000640006

STATEMENT OF WORK FOR THE SUPPLY

OF A TWYMAN-GREEN AND A FIZEAU INTERFEROMETERS AND ACCESSORIES

SUBJECT OF THE CONTRACT

The contract is related to the supply of a dynamic Twyman-Green interferometer, including control workstation, software and accessories, and a dynamic Fizeau interferometer, including its control workstation, software and accessories. The supply is composed of two separated lots. The technical specifications for the supply are in the document:

"GAS002_2023-0303_STILES_OAA_WP5000_5102-5103_v01__TechnicalSpecifications".

SUPPORTING AND APPLICABLE DOCUMENTS

The following documents are applicable to the present Statement of work and in case of disputes or inconsistencies in the informations or interpretation, the priority is assigned as in the following list:

1. Contract
2. Statement of work (this document)
3. Technical Specifications

SCOPE

This document describes the conditions and deliverables for the procurement procedure as in Section "Subject of the contract". The project phases, timeline and associated deliverable drops are indicated, together with the acceptance process, warranty and general conditions. The informations provided herein are integrally applicable for both procurement lots, while the specific hardware deliverables for each lot are detailed in Section: "Procurement deliverable".

The document shall be signed by the contractor for acknowledgement and as a technical addendum to the contract.

PROJECT TIMELINE

Phases

The project is articulated in 3 phases, described below.

- **Contract:** this phase includes the verification of the administrative clauses and deliverables in order to finalize and sign the contract.
- **Factory integration:** this phase includes the instrument and components factory integration (if requested) and the verification of the compliance items on behalf of the manufacturer. The system is then shipped to the customer.
- **Acceptance and support:** this phase includes the shipment, incoming inspection, installation and customer verification to produce a final acceptance record; it also includes the support and warranty period provided by the contractor.

Milestones

Descending from the project phases as indicated above, the following milestones are identified:

- KM0: Kick-Off. End of the tender, when the contractor is identified.
- KM1: Contract signature.
- KM2: Factory verification, ready for shipment
- KM3: Shipment from factory
- KM4: Delivery to INAF, ready for installation
- KM5: Customer acceptance

Timeline and deliverables

The timeline of the project is indicated in the following table.

Phase	Milestone	Time start	Time end	Deliverable
Contract	KM0: Awarding of the tender	T0		
Contract	KM1: contract signature	T0	T1 = T0 + 2 ww	- Contract signed by INAF and contractor.
Factory integration	KM2: Factory verification	T1	T2 = T1 + 20 ww	- Instrument user manual; - SW user manual; - Scripts reference guide; - Interface documents and drawings.

				<ul style="list-style-type: none"> - Manufacturer Verification/certification report - Man. Compliance matrix (if necessary) - Shipment instructions - Bill of lading - Shipment documents
Factory integration	KM3: Shipment	T2	$T3 = T2 + 3 \text{ ww}$	
Acceptance	KM4: delivery	T3	T3	
Acceptance	KM5: Customer acceptance	T3	$T4 = T3 + 3 \text{ ww}$	<ul style="list-style-type: none"> - Cust. Verification report - Cust. Compliance matrix
Acceptance		T4	$T5 = T4 + 1 \text{ y}$	Support and warranty
End of the project				

DELIVERABLES

Hardware deliverables

The complete list of hardware deliverables is described in the Technical Specification documents and reported here for completeness:

Lot #	Lot description	Q.ty
1	Dynamic Fizeau interferometer, 100 mm beam aperture, including control workstation and associated accessories: <ul style="list-style-type: none"> ● 1x Fizeau interferometer compliant to the technical specification in the associated table; ● 1x 100 mm, Transmission Flat, $2\% < \text{Reflectivity} < 4\%$, $\lambda/10 \text{ PV}$ ● 1x 100mm reference sphere, $5 < F/\# < 8$ ● 1x 100mm Mounted Pellicle Attenuator ($25\% < \text{attenuation} < 35\%$) 	1
2	Dynamic Twyman Green interferometer, equipped with motorized controls, provided with control workstation and accessories: <ul style="list-style-type: none"> ● 1x Dynamic Twyman-Green interferometer, compliant to the technical specification in the associated table; ● 1x Test Mount #1: optics mount for 100 mm, three jaw chuck, tiptilt 	1

	adjustment with micrometer <ul style="list-style-type: none"> ● 1x Test Mount #2: optics mount for 100 mm, three jaw chuck, 5 axis adjustment with micrometer ● 1x Optical bench guide for opto-mech mounts translation, 40 cm min length 	
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Project deliverables

Project deliverables are those documents requested as part of the procurement and necessary for the usage and verification of the system. These items are described in the following and are applicable for both lots. The requested format is given in the section "General conditions".

ID	Item	Description	Issuer	Milestone	Drop
P0	Contract	Contract signed by both parties	INAF and Contractor	KM1	D0
P1	Instrument user manual	Document describing the installation, usage and troubleshooting of the interferometer.	Contractor	KM2	D1
P2	SW user manual	Document describing how to use the SW and its functionalities.	Contractor	KM2	D1
P3	Scripts reference guide	Documents describing how to setup a remote scripting interface; describes the functions and modules available for development.	Contractor	KM2	D1
P4	Interface documents and drawings	(if not described elsewhere) Document package describing the electrical, mechanical, optical interfaces and constraints for the instrument. It is requested to setup the verification bench	Contractor	KM2	D1
P5	Manufacturing Verification/certification report	Document reporting the verification tests performed at the integration premise. May be in the form of a test report or a QA statement, or product certification.	Contractor	KM2	D2
P6	Man. Compliance matrix	Compliance matrix, after factory verification (update of the CM presented during the tender, if modified)	Contractor	KM2	D2
P7	Shipment instructions	Description of the packaging and shipment directions, as agreed with the contractor.	INAF	KM2	D3

P8	Bill of lading	Complete packing list	Contractor	KM2	D4
P9	Shipment document	Forwarding agent documents	Contractor	KM2	D4
P10	Cust. Verification report	Document describing the inspection and verification tests as performed by the customer	INAF	KM5	D5
P11	Cust. Compliance matrix	Compliance matrix, after customer tests.	INAF	KM5	D5
P12	Updates	The periodic SW updates delivered by the manufacturer.	Contractor	-	-
P13	Bug-fixes and Tech support	Includes the correction of errors/issues found by the user during the warranty period.	Contractor	-	-

DELIVERY

The agreement for the delivery shall be issued by INAF after successful conclusion of KM2 at document drop D3.

The delivery address, to be indicated in the shipment documentation, is:

INAF - Osservatorio Astrofisico di Arcetri

Piazza Enrico Fermi 5, 50125, Firenze ITALY

Att. to dr Nicolò Azzaroli

ACCEPTANCE PROCESS

The acceptance process is arranged in the following steps.

Factory verification by the contractor

The manufacturer completes the verification tests at the end of the integration, as part of his own PA/QA process. The contractor prepares a report/certificate for the customer (P5). In add, fills the compliance matrix updating the specification values with the as-tested results (where applicable, and as agreed with the customer).

Incoming inspection by the customer

The customer (in the person of the nominated DEC - Direttore di Esecuzione dei Lavori) checks for the following items:

Id	Item	Status	Notes	Action
Ins0	Check for package integrity	PASS /FAIL		If package is broken, take pictures and agrees with contractor about opening or not the package
Ins1	Checks for shock/tilt indicators activated (if appl).	PASS /FAIL		If indicators are activated, agrees with contractor about opening or not the package
Ins2	Open the boxes and unpacks the items. Checks for packing defects or humidity indicators activated (if applicable)	PASS /FAIL		If defects are found, agrees with contractor to continue unpacking
Ins3	Inspects the individual hardware and checks for: - delivered items vs bill of lading - scratches, bumps, exterior defects in general - missing screws, components, parts (e.g.)	PASS /FAIL		Takes pictures of the parts and reports missing/defective items. Informs the contractors and agrees corrective actions.
Ins4	Inspects the individual hardware and checks for functionalities issues (externally)	PASS /FAIL		Reports functionality issues to the contractors and agrees with him corrective actions.

Acceptance test by the customer

The customer (in the person of the nominated DEC - Direttore di Esecuzione dei Lavori) checks for the following items:

Id	Item	Status	Notes	Action
CV0	Installs the instrument, its workstation and powers-up the system	PASS /FAIL		If issues are encountered, reports them to contractor and agrees a corrective action
CV1	Checks for installation or interfacing issues	PASS /FAIL		If issues are encountered, reports them to contractor and agrees a corrective action
CV2	Installs a flat (reference) return	PASS /FAIL		If issues are

	mirror in front of the interferometer and aligns it with the live monitor.			encountered, reports them to contractor and agrees a corrective action
CV3	Takes a sequence of (10) frames, stores them to disk, checks the repeatability and stability of the results.	PASS /FAIL		If issues are encountered, reports them to contractor and agrees a corrective action

Software verification

The customer (in the person of the nominated DEC - Direttore di Esecuzione dei Lavori) checks for the following items:

Id	Item	Status	Notes	Action
SV0	Checks for installation or interfacing issues	PASS /FAIL		
SV1	Checks the functionalities requested as SW specifications	PASS /FAIL		If issues are encountered, reports them to contractor and agrees a corrective action (bugfix)
SV2	Checks for bugs or errors when launching/stopping functionalities or actions.	PASS /FAIL		If issues are encountered, reports them to contractor and agrees a corrective action (bugfix)

WARRANTY AND SUPPORT

The standard warranty and support provided by the contractor apply, provided the following conditions:

- Warranty shall be applicable for a period of at least 1 year from the date of delivery and shall include material and integration defects;
- support shall be provided for at least 1 year from the date of delivery;
- support shall include a pre-defined amount of man-hours for user training (as agreed between contractor and customer during the contract phase);
- support shall include SW upgrades and bugfixes during the warranty/support period;

- support shall include a pre-defined amount of man-hours (to be agreed with the contractor) to clarify those behavior and functionalities not documented in the user manual.

GENERAL CONDITIONS

Quality System

The Contractor shall implement a quality system: the certification of the Contractor with ISO 9001 standard is considered a plus. Alternatively, the Contractor should be able to demonstrate the existence and the use of an equivalent internal quality system.

More specifically the Contractor shall demonstrate the existence and use processes ensuring the final quality of the product by means of:

- Contractual management and validation
- Documentary management
- Manufacturing management
- Personnel Safety
- Production controls and calibration of the associated measuring tools

Traceability

The contractor shall ensure the traceability and the recording of the product's main components. The rules and conventions for the tracing components and elements of the system will be detailed in the relevant documentation produced by the contractor (Parts List/ Bill of Materials and CIDL).

For each delivered product and for each of the identified item the following information shall be available (if applicable):

- Identification number
- Batch or serial number
- Manufacturing or service date

Documentation

All deliverable documents produced during the project shall be written in English language and shall be transmitted under electronic format.

Applicable associated file formats are:

- Word, Excel and PDF under ISO A4 size for textual documents
- PDF, Autocad DWG, Inventor IDW under ISO A0 to A4 size for drawings
- Zemax ZMX for optical design files

- STEP, IGES, Inventor IAM and IPT for 3D models

Other formats must be agreed between the Contractor and INAF.

Templates for Change Request, Request for Waiver and Discrepancy Note will be provided and will be applicable.

The contractor is responsible for verifying all documentation made available by INAF for the contract execution including the present Statement of Work and its applicable documents. The contractor shall give notice to INAF of any errors, discrepancy, or missing information in this documentation. The contractor shall not modify documents made available by INAF. In case of errors, discrepancy or missing information, the correct information will be provided by INAF.

Confidentiality

Both parties undertake to ensure confidentiality of information communicated by the terms of the present contract and not to publish it, divulge it to third parties (apart from partners) for use or for any other purpose than those stated in the present contract, and the parties agree to do so for the entire duration of the contract and for a period of five years following expiry or termination of the contract. Confidential information must be sent only by registered letter with recorded delivery.

Modification Management

Change Request

During contract execution, the Contractor and INAF can propose modifications to the contract and to the Statement of work. Such proposals shall be addressed to the other party by means of a formal change request.

This change request shall include detailed motivation and explanation of the proposed change. It will identify clearly all the documents and products impacted by the change. When issued by the Contractor, it shall also include all potential impacts positive or negative in terms of quality, performance, schedule and cost. When issued by INAF, this information will be given by the Contractor in reply to the change request.

Each Change Request shall be identified by a unique identifier, which shall be used in all subsequent correspondence.

Provided the input is complete, the receiving party shall respond (change approved or rejected) to any such Change Request within 4 weeks of its receipt, or in the case of complex changes inform the other party on the expected completion date within 8 weeks of its receipt. If the input is not complete, the receiving part shall ask for the missing information within two weeks.

If the change of scope is significant an amendment of contract conditions may be agreed.

Request for Waiver

A request for waiver is an official request from the Contractor to INAF to release or use a non-compliant product. A request for waiver is limited to specific individual products or limited in time before repair. If this limitation does not apply, a change request shall be issued.

A request for waiver shall include detailed motivation and explanation of the waiver requested. It will identify clearly all the products impacted and if relevant the foreseen date of repair. It shall also include all potential impacts positive or negative in terms of quality, performance, schedule and cost. INAF will pronounce the acceptance decision of the request within 4 weeks after reception of the completed request. If the change of scope is significant an amendment of contract conditions may be agreed.

INAF will provide a template for Request for Waiver at Kick Off Meeting.

Non-Conformances

In case where a non-conformance or discrepancy of any kind is detected during the project execution, the Contractor shall give notice to INAF by means of a Non-Conformance Report within 1 week after detection. These Reports can refer to any technical, manufacturing, schedule and quality aspect, particularly in cases where a detected non-conformance may lead to a late delivery of products.