Legion 400 Installation and service support

28/1/2023

PCR or DSCPR - PCR

Value – £340K

Have there been any negotiations or approaches to the contractor – if so , when. This is to determine whether the pre or post Brexit regs apply. – Supplier has been approached post Brexit.

What is the contract for? – The site preparation, installation and service support for two Large (3.9M) Legion 400 Tracking antennas.

Supply, services or works? Supply and works

Framework? This will go via the Defence Sourcing Portal.

What are your reasons for single source. – SSJ below:

SINGLE SOURCE JUSTIFICATION: Legion 400 Installation and service support

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1. Introduction

The 2 off Legion 400's are 3.9M dia Low Earth Orbit tracking systems that have been purchased to support multiple projects with in the Space group. They cover S, X and Ka band with dedicated configurable modems to support a variety of applications including TT&C, Data download and bespoke experimental waveform design. They also have the ability to engage with Prometheus, SDR systems and other low classification research based tools. They can operate as a pair, in isolation or in conjunction with the Dstl Hermes ground station. The antennas are mounted on a xy pedestal and have an option for monopulse tracking meaning that they can track any object in any LEO orbit or otherwise. Their size, spacing requirements and supporting infrastructure required for operating these systems limits the customer options base.

2. Issue

Dstl has purchased two large Legion tracking antennas that need installing on a dedicated prepared site with the appropriate power and network services supplied. Following installation, the antennas will need general servicing on a monthly basis by skilled service teams that are usually associated with dedicated ground stations sites and infrastructure. Line of site restrictions and the required spacing between the two antennas are mandatory requirements for the system to work effectively and further impose limitations on suitable ground stations.

3. Approved SSJ Criteria

In accordance with the Public Contracts Regulations (PCR) 2015, an SSJ must meet one or more of the following approved criteria.

a. Absence of tenders or suitable tenders.
b. Artistic reasons, technical reasons or exclusive rights.
c. Extreme urgency.
d. Research and Development (R&D) goods.
e. Additional purchase or hire of goods.
f. Purchase or hire of goods on commodity markets.
g. Closing down sale or bankrupt stock.
h. Design contests.
i. Repetition of works and services.

4. SSJ Rationale

The Space Group Leader has assessed that this procurement is compliant with criteria (a), (b) and (d) specified above.

SSJ PCR (a). Absence of suitable tenders. Goonhilly is a dedicated ground station offering wide spread line of site coverage, space for installation, and have the infrastructure and facilities to install the groundworks, cabling and network connectivity. It is a large site which makes it suitable to meet the line of site restrictions and the minimum separation, azimuth and elevation requirements. It is also a site registered as 'Critical to National Infrastructure', which will enable a high priority service support. The site is ideally located to support the new UK launch facility (at Newquay) and these antennas will further compliment the current Dstl Jerry system, already at Goonhilly, used as part of the launch tracking capability. There is no other site located in the vicinity of the Newquay launch station, which is critical as:

- The site already has the expertise and facilities to go, meaning no further infrastructure upgrade would be required.
- The proximity to the new UK launch facility.
- Already meets the security requirements.

SSJ PCR (b). Artistic reasons, technical reasons or exclusive rights (b) . The size and versatility of these systems puts heavy constraints on the suitability of a ground station location. Applications involving coherent changeover between systems will require near horizon to horizon coverage (depending upon constellations) across 360 azimuth minimum 5 degree elevation coverage. Land mass, building obscuration and boundary fencing are key considerations for a suitable ground station. 400m spacing between the two systems will also be required to avoid line of sight interferences which dictate a minimum ground area footprint.

There are specialised mounting arrangements including embedded bespoke brackets supplied with the systems that will require ground works to be conducted; this is standard business practice for purpose built ground stations.

S Band transmission RF licencing is a requirement prior to their use and existing ground stations with the appropriate licences is a prerequisite for this installation. Goonhilly is also a known Telemetry Tracking and Command site with appropriate registration.

Market Research

A comprehensive review of potential Ground stations has been conducted, study DSTL/TR146715. The study concentrated on MoD sites and concluded that the restrictions imposed on MOD sites were such that they were not suitable for LEO tracking antenna systems. Many of the MoD sites with suitable ground, and unrestricted views are used for active air operations. Air operations would directly conflict with the required monitoring of the EM spectrum severely limiting any utility making such sites unsuitable for LEO applications and impose heavy restrictions on licencing.

Based on the outcome of an internet search, the commercial options considered included [REDACTED], [REDACTED], [REDACTED] and Goonhilly. The [REDACTED] site at [REACTED] was found to be unsuitable due to line of site issues, conflict with the antenna and RCS measurement range, and it is not registered or equipped as a ground station. [REDACTED] has severe access limitations and the inclusion of the Spaceport under construction brought about too many unknowns, particularly with transmission licensing – furthermore there is currently little or no security making the site unsuitable irrespective of other issues. [REDACTED] is not readily equipped for the specified requirements, including the limitation of requiring council planning permission prior to installation, making any solution non-viable in timescales and cost. Spacing between the two antennas is also a limitation on the site due to the site size restrictions
The Goonhilly proposal could meet all of the requirements as specified for the project with no restrictions and has the added benefit of access to the Newquay Space Port which has potential benefits for future UK space launch support activity.

Summary

The installation of two large LEO tracking antenna and the supporting infrastructure required for their on-going operation imposes many restrictions on ground station requirements. The comprehensive studies looking into suitable sites has demonstrated that the Goonhilly is the only option available that can meet all the requirements for the project. The key requirements include line of site, supporting ground infrastructure and the RF licencing. Suitability.