Component: NAVY

Topic #: N201-080

Title: Remote Telescope Control Software (RTC SW) System

Technology Areas: Info Systems

Acquisition Program: Trident II (D5) ACAT I

ITAR: The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with section 3.5 of the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Develop a standardized, accredited software application that will run on the proposed Remote Telescope Control Hardware (RTC HW) and interface with the United States Naval Observatory (USNO)’s Telescope Control System (TCS) already under development at USNO, allowing for secure client-server access to telescope sites around the world. (Note: USNO has access to numerous sites around the world, but does not staff these sites on a permanent basis, and must thus develop a solution for collecting this data remotely.)

DESCRIPTION: The Trident II (D5) weapon system utilizes information and data collected by various telescope systems. These astronomical data sets need to be measured and monitored periodically to ensure weapons system utility and performance. Today, data gaps exist that require USNO to measure stars from various remote telescopes around the world. These data gaps include current collections of numerous bright stars’ photometry and astrometry. A Remote Telescope Control Software (RTC SW) solution will fill this data gap in a manner that is repeatable, affordable and enduring. Current software technology requires human on-site interaction and site-specific software applications to collect and store astronomical data. An innovative software application will allow remote data collections from various sites around the world and will save much labor in manning the telescopes. This SBIR topic is expected to work in conjunction with a proposed hardware counterpart. This sort of HW/SW solution and the access it provides will be required to support future plans for USNO collection of data supporting Naval Surface Warfare Center, Dahlgren Division (NSWCDD) programs. Commercialization of this system would involve providing this solution to DoD and other observatories and laboratories who are facing similar challenges.

PHASE I: Develop and define a concept design that standardizes RTC SW that will run on the proposed RTC HW and interface with USNO’s TCS, preferred software language is, either, Python or C++. The TCS description from the Navy will mature during Phase I and be provided to topic proposers. Work with the Navy to construct tests that will ensure the SW application runs on the RTC HW and USNO’s TCS. Establish the proper standards and accreditation procedures for the SW application. Identify any risks in the proposed concept. Develop Phase II plans to include ways to mitigate those risks.

PHASE II: Produce and deliver a prototype RTC SW application that will allow for secure client-server access to RTC HW boxes with Navy telescopes at various places around the world and that interface with USNO’s TCS. Work with the Navy to fully understand the software standards and software accreditation procedures that must be met to ensure that the SW application meets cyber secure client-server access requirements. Establish a feedback loop for implementing changes during prototype testing. For software and associated hardware configurations, apply appropriate cybersecurity standards as addressed by Security Technical Implementation Guides (STIGS) that is provided by the DoD cyber exchange.

PHASE III DUAL-USE APPLICATIONS: Deliver a RTC SW application that is executed on RTC HW and interfaces with USNO’s TCS and enables secure client-server access. Provide design and test cases that demonstrate the RTC SW application function. Support remote field qualification testing with USNO on several Navy telescope systems and RTC HW applications in development. Assist USNO in setting up RTC SW including trouble-shooting plus resolving implementation and execution issues at various Navy, DoD, and civilian
telescope observatories.

REFERENCES:
7. DDA-URAT (uploaded in SITIS 01/21/2020).

KEYWORDS: Remote Telescope; Interfaces; Client-server; Remote Telescope; Software Standards; Software Accreditation; Software Application