

JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION

Upon the basis of the following justification, I as Contracting Officer hereby approve use of the other than Full and Open competition for the proposed contractual action pursuant to the authority of 10 USC 2304(c)(1), only one responsible source and no other supplier or servicing activity will satisfy agency requirements, as implemented by FAR 6.302-1.

1. Contracting Activity

Naval Postgraduate School
Department of Contracting and Logistics
1 University Circle
Monterey, CA 93943

2. Description of the Action Being Approved

This justification covers the procurement of research and development services from “Washburn, Alan”, DUNS 192270846. This justification for other than full and open competition will be posted at the Government wide Point of Entry.

3. Description of Supplies/Services

The Operations Research Department at the Naval Postgraduate School has an immediate and urgent requirement for contractual services to be performed from the period 29 August 2015 through 01 December 2015. The essential elements of the service are to:

- Prove a series of mathematical theorems about the correctness of spherical routing algorithms embedded in the Replenishment at Sea Planner (RASP);
- Validate the RASP route-finding model to determine whether it is correct and is the most efficient model;
- Edit the current RASP routing model to incorporate the validation results;
- Create a similar set of route-finding algorithms with proofs of their correctness which incorporate the spherical geometric assumption into the RASP logic;
- Re-write the RASP route-finding model embedding the new spherical-assumption algorithms;
- Test and evaluate the updated RASP model;
- Document proofs of the spherical route-finding model’s correctness by submitting a white paper that is suitable for publication in the open academic literature.



4. Statutory Authority Permitting Sole Source

FAR 6.302 -- Circumstances Permitting Other Than Full and Open Competition.

6.302-1-- Only One Responsible Source and No Other Supplies or Services Will Satisfy Agency Requirements.

(a) Authority.

(1) Citations: 10 U.S.C. 2304(c)(1) or 41 U.S.C. 3304(a)(1).

(2) When the supplies or services required by the agency are available from only one responsible source, or, for DoD, NASA, and the Coast Guard, from only one or a limited number of responsible sources, and no other type of supplies or services will satisfy agency requirements, full and open competition need not be provided for....

(iii) For DoD, NASA, and the Coast Guard, services may be deemed to be available only from the original source in the case of follow-on contracts for the continued provision of highly specialized services when it is likely that award to any other source would result in--

(A) Substantial duplication of cost to the Government that is not expected to be recovered through competition, or

(B) Unacceptable delays in fulfilling the agency's requirements. (See 10 U.S.C. 2304(d)(1)(B).)

5. Rational Justifying Use of Cited Statutory Authority

The Replenishment at Sea Planner (RASP) is a classified Mathematics Linear Programming Model that was created and developed by the Naval Postgraduate School Operations Research Department. The primary sponsors for this effort are the Military Sealift Command and Office of Naval Research (ONR). RASP is currently installed and used by Commander, Task Force (CTF) 53 (Bahrain, 5th Fleet) and Commander, Task Force (CTF) 73 (Singapore, 7th Fleet). It is used to schedule Combat Logistics Force supply shuttle ships that serve our combatants and coalition partners.

Central to RASP is the repetitive computation of the shortest route from one wet point in the ocean to another, without running aground. These potential wet points cannot be enumerated because it is not possible to predict beforehand where ships might be when the need arises for resupply. Therefore, it is not possible to make shortest route approximations in a conventional fashion between fixed pairs of wet points on the globe because there are an infinite number of these pairs. Furthermore, because the earth's shape is spherical, the routing problems are essentially spherical. RASP, therefore, cannot make conventional planar geometric assumptions, because these are woefully inaccurate for the large distances involved in the 5th and 7th Fleet areas of operation. It is important that RASP be able to make these computations quickly (one millisecond or less) because of the need to make thousands of such comparisons for any given planning scenario in quick, elapsed time, while the planner waits for screen-refreshed results.

One of these algorithms serves as the basis for the Oceanic Routing Service (ORS). ORS is a program that is a critical "widget" for the functioning of the Navy's "MTC2: Maritime NAVSUPINST 4200.85D, Encl (1)
Office of Contracting and Logistics Management
Revised 10/12/2012

Tactical Command and Control system”. (ref: Navy Program Management, Warfare, Command and Control Program Office -PMW 150-, Space and Naval Warfare Systems Command, 4301 Pacific Hwy, San Diego 92110.) It is embedded in the RASP and functions as the key, real-time component for all of the RASP Model scheduling. A Navy patent application for ORS is pending.

ONR has identified the immediate need to verify that the algorithms and code used in the ORS provide an accurate result based on a spherical rather than planar assumption. ONR has sponsored the research project managed by the OR Department at NPS with a period of performance to end 01 December 2015. Hence, a thorough review, assessment, documentation, edit, and validation of the code are necessary prior to that date for review by the project manager in the OR Department. Assessment requires that certain “theorems” currently employed by the code need to be mathematically proven; documenting ORS will require the proofs of several theorems in the area of spherical trigonometry and topology; editing requires changing the code as necessary upon discovery of logic errors; validation requires testing and evaluation of the RASP and ORS.

The generic basic services to be contracted, mathematical theorem proofs or creating algorithms that embed a particular assumption may not seem unique. However, testing the RASP model with planar assumptions for correctness and efficiency, editing the current model, and creating a second set of algorithms that incorporate a spherical assumption and testing and evaluating the updated RASP model and preparing an academic literature standard white paper within the period of performance require unique knowledge of RASP and ORS, as well as the prior prototype testing of the RASP model. The RASP is the only program of its kind in the world. It was developed at NPS exclusively for the specific purpose of planning Underway Replenishment of US Navy ships operating in the Pacific and Indian Oceans. It is used exclusively and successfully by US Navy planners for CTF 53 and CTF 73. Proving the shortest route algorithm is the first step in validating the “correctness” of the RASP. The proof requires intimate knowledge of RASP and ORS code and logic. It also requires knowledge of how the algorithm is imbedded in the ORS logic. Verifying ORS will require familiarity with the code that implements it.

“Washburn, Alan” has unique knowledge of the RASP model, its development and prototype testing, and current deployment in Naval systems on vessels in CTF 53 and CTF 73. Washburn Alan also has unique knowledge of ORS Visual Basic code as a co-inventor and is intimately knowledgeable and the foremost expert on the structure and peculiarities of both RASP and ORS. “Washburn, Alan” is uniquely positioned to assume follow-on development of the RASP model, the services required, without the need to review and assess the current models because it is already intimately familiar with the RASP model and ORS. The start-up time and learning curve, estimated to be 13 months, reviewing and assessing the code and logic would substantially delay the effort beyond the period of performance. Any other firm would need immediate and significant assistance from the navy’s planning organizations (i.e., 5th fleet and 7th fleet) to understand the logic and nuances embedded in RASP and ORS as deployed in operating vessels. “Washburn, Alan” already has this knowledge and special expertise by virtue of its engagement in the development and proto-type testing of RASP.

In addition to Washburn Alan’s intimate knowledge of RASP and OSR, its employee and founder, has an extensive list of publications indicative of the firm’s unique knowledge in the area of spherical geometry and mathematical proof. It is heavily mathematical and is indicative of the firm’s unique capability to perform the work and prepare a white paper that

fully substantiates the proofs, algorithms, correctness of the existing RASP model or need to include and create algorithms that include a spherical assumption.

Validation requires testing and evaluation. Experience in the prior operational testing is required to perform current services to assist reducing time to complete the project. "Washburn, Alan" has the experiential knowledge and background of the original prototype testing and evaluation of the RASP and ORS. The "Washburn, Alan" firm has this specialized knowledge that will enable timely validation within the period of performance. Any other firm would require substantial time in re-creating the testing and evaluation, jeopardizing the ability to complete the project during the period of performance.

RASP is classified at the Secret level. Because testing requires access to RASP the testor would have to access RASP in a secure environment. RASP is only available in limited locations, one of which is situated in the Secured Tactical Battle Lab at NPS.

6. Description of Efforts Made to Solicit Offers from as Many Offerors as Practicable

A solicitation for minimum requirements, mathematical proofs, and algorithms was issued on 04 August 2014. Two independent contractors responded. However, only one was considered technically acceptable. No award was made to the single technically acceptable offeror; the single technically acceptable offeror is the firm named here for the sole source effort justified here. The earlier solicitation did not address additional special requirements for experience with RASP on ORS models and their operational use in CTF 53 and CTF 73, as well as prior prototype testing of RASP which are necessary to complete the work required within the period of performance.

7. Determination of Fair and Reasonable Cost

Costs will be determined fair and reasonable at time of award by the Contracting Officer and based on previous contracts and similar contracting efforts.

8. Market Research

Market research was conducted by contacting knowledgeable individuals in Government and industry regarding market capabilities to meet the requirements and by participating in interactive communication among industry, acquisition personnel, and customers. Market research was conducted through a global literature search which resulted in correspondence with an executive of a Norwegian shipping company who has done related research. Their research was hampered by the linear geometric approximations that are required. The market research results as well as the prior solicitation and response reveals that there is only one source capable of satisfying the government's requirements within the period of performance.

9. Other Facts Supporting Use of Other Than Full and Open Competition

No other additional information.

10. Actions to Remove Barriers to Future Competition

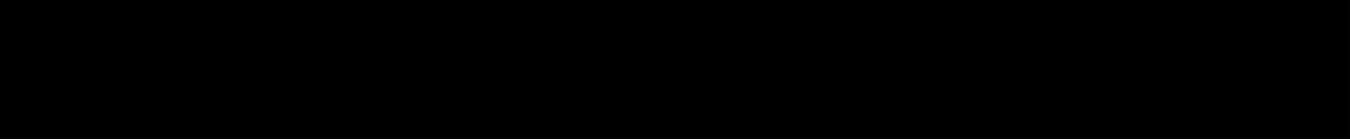
Future research needs related to the Navy's RASP model for operational use cannot be predicted. For this reason, it's not clear what actions to remove barriers should be taken at present. If additional requirements arise for similar RASP, actions to remove barriers to competition will be considered and addressed prior to any further sole source procurement.

CERTIFICATIONS AND APPROVAL

TECHNICAL/REQUIREMENTS CERTIFICATION

I certify that the facts and representations under my cognizance which are included in this Justification and its supporting acquisition planning documents, except as noted herein, are complete and accurate to the best of my knowledge and belief.

Technical and Requirement Cognizance:



CONTRACTING OFFICER CERTIFICATION

To the extent that the LSJ value is between \$2,500 and \$150K for services and between \$3K and \$150K for products, the Contracting Officer's signature below also represents approval of the J&A/LSJ.

I certify that this Justification is accurate and complete to the best of my knowledge and belief.

