



An Assessment of Procurement Strategies

for the Polar Research Vessel (PRV)

Prepared for: National Science Foundation
Office of Polar Programs

Prepared by: Maritime Administration
Raytheon Polar Services Co.
Science and Technology Corp.

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Background

Initial technical studies have provided insight into the size, characteristics, and cost of a vessel that could satisfy the scientific and operational requirements for a new generation Polar Research Vessel (PRV).

Before proceeding with more refined technical studies and a Technical Specification for the RFP, the issue of a preferred procurement strategy for the vessel needed to be investigated.

Differences between 1989 and 2007 icebreaking research vessel procurements

NBP Procurement of 1989

NBP had traditional set of missions that allowed procurement to employ performance based technical specifications.

Bidder's risk were assumed low as the potential existed for alternate uses of vessel after the lease period.

Multiple proposals were received from industry with concept designs.

Low initial procurement costs to Government was achieved and multiple proposals were received.

PRV 2007

Today, the PRV is a more complex and specialized vessel (mission specific or purpose built) with little potential for secondary use by industry after the lease period.

Costs to each Bidder will probably exceed \$250,000 and may be viewed by them as a high financial risk. There is a high uncertainty of winning the award as an incumbent exists for providing Antarctic marine science platforms to NSF.

Study Objective

Develop competitive procurement strategy
while seeking

best value to the Government
....low cost and low risk....

The Challenge

How best to balance the up-front procurement costs to the Government with the up-front costs to Bidders while ensuring competition and innovation?

How best to balance up-front Government costs to life-time Government costs such as vessel modifications, special dry-dockings and the like?

How best to capture the 15 years of operational and managerial experience gained from NATHANIEL B. PALMER (NBP), as well as other U.S. and foreign research vessels, in a new PRV?

Three phases to the study

- (1) Make an assessment of the preferred acquisition strategy for the PRV - by Maritime Administration (MARAD), Raytheon Polar Services Company (RPSC) and Science and Technology Corp. (STC)
- (2) Provide information on preferred acquisition strategy by several other Government agencies engaged in similar types of ship procurements, independent of (1) above
- (3) Compare results of (1) and (2) and recommend a strategy that maximizes competition and mitigates risk to the Government (financial and performance of the product)

Phase 1 of the Study

Four alternative types of Technical Specifications
can be developed for the RFP.

They are evaluated in this phase of the study.

Technical Specifications for the RFP

Increasing level
of detail

- Vessel performance specification
- Vessel performance specification
+ guidance drawings and specifications
(concept design)
- Vessel performance specification
+ guidance drawings and specifications
+ model test to verify vessel performance
- Contract design and specification



Definitions


Performance specification – several pages that only describe operational and performance requirements and needs of the vessel

Guidance drawings and specifications – initial design effort that satisfies, but not optimizes, operational and performance requirements into a vessel having approximately the correct size and characteristics and includes a cost estimate

Guidance drawings and specifications with model tests – same as above with the addition of Government furnished model test results that verify the hull and machinery meet requirements such as open water speed, seakeeping (roll and pitch in waves), stationkeeping, and icebreaking

Contract design – a detail and optimal design with specifications where all requirements are satisfied

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To evaluate these alternatives,
a “set of factors”
that influence decision making were defined.

These are defined in terms of
costs and risks....

“Set of Factors” Affecting Decision Making

COSTS

Costs to Government

- a. Preparation, evaluation and award of solicitation
- b. Actual vessel acquisition (contract price)
- c. Construction oversight
- d. Total cost

Costs to Industry (Bidder)

- e. Preparation of response to solicitation

“Set of Factors” Affecting Decision Making

RISKS to Government

- f. Competition in bidding process
- g. Ability of vessel to satisfy mission requirements
- h. Industry innovation
- i. Cost over-run potential
- j. Time from Pre-RFP to Contract Award
- k. Time for vessel construction

These cost and risk factors were rated

1 – lowest

to

4 – highest

Evaluation of Factors

(1 = lowest, 4 = highest dollars or risk)

Set of Factors	Technical Specification in the RFP			
	Performance Based Requirements	Performance Based + Guidance Drawings	Performance Based + Guidance Drawings + Model Tests	Contract Design
Costs to Government				
a. Preparation, evaluation and award of solicitation	1	2	3	4
b. Actual vessel acquisition (contract price)	3	2	1	4
c. Construction oversight	2	2	2	4
d. Total cost	4	3	2	4
Costs to Industry (Bidders)				
e. Preparation of response to solicitation	4	3	2	1
Risks				
f. Competition in bidding process	4	3	2	1
g. Ability of vessel to satisfy mission requirements	4	3	2	1
h. Industry innovation	1	2	2	4
i. Cost over-run potential	4	3	2	4
j. Time from Pre-RFP to Contract Award	1	2	2	4
k. Time for vessel construction	2	2	2	2

Recommended Procurement Approach

Technical Specification should include
performance based requirements
(scientific and operational),
guidance drawings, and
model test results that verify the vessel can
meet scientific and operational requirements.

Recommended approach offers benefits to the Government

- Provides a vessel construction cost estimate needed by the Government for budgeting purposes before the RFP is issued
- Allows scientific community to rethink some of the requirements based on evolving technical studies
- Generates background and knowledge to technical team for evaluation of proposals

A few words on why other alternatives
were not the preferred alternative

Contract Design Eliminated

All details of the vessel design are specified and industry innovation is discouraged and minimized.

Higher up-front cost to the Government while having the greatest risk for cost overrun after construction award.

Performance Based Requirements Eliminated

Bidders must expend considerable energy and costs to provide quote and respond to RFP.

Potential bidders are aware that an incumbent exists for the type of services sought.

Greatest potential for only a single responsive bid from Industry as high risk may be perceived by potential bidders.

Furthermore

Use of only a performance based specification
in the procurement
increases Government risk
as vessel complexity grows.

Specifically, it becomes unclear if missions are
compatible and realistic for an affordable and
buildable vessel.

Performance Based Requirements with Guidance Drawings Eliminated

Risks by Industry (Bidders) may still be of a magnitude that it limits competition in response to the RFP. Specifically, without model testing, the Bidder remains responsible for compliance with the scientific and operational requirements. In a highly specialized vessel such as the PRV, there exists uncertainty in the amount of time and added costs to satisfy requirements.

The added up-front costs by the Government for the model tests to verify performance are relatively small compared to the cost of the entire procurement. However, it does offers the potential for a lower contract cost for the vessel.

Next Phase of Study

Phase 2 of the study will address the same issue, but will be based on procurement experiences from several Government Agencies.

A future meeting, of about two hours, will be held in NSF's Office of Polar Programs. A brief presentation by each Agency will be followed by a question and answer session. MARAD, RPSC, and STC will be in attendance.

National Oceanic and Atmospheric Agency (NOAA)

Mr. John Hotaling and Mr. Geoffrey Fuller, both are engaged in procuring of fisheries research (survey) vessels

U.S. Coast Guard (USCG)

CAPT Ian Grunther, Program Manager, for the procurement of an icebreaker with buoy tender capabilities for Great Lakes

Military Sealift Command (MSC)

Mr. , Title, procurement

National Science Foundation (NSF)

Mr. , Title, procurement

Remember that

- RPSC is an author of this presentation
- Another issue that has yet to be tasked by NSF, but will need to be studied and endorsed by the Government ...

before the RFP is issued

“Operational” Lease versus Buy
for the PRV