OCEANOGRAPHIC SHIP COMMON SCALABLE HULL STUDY

Proposed Scope of Work for Phase I – Requirements Analysis

21 Feb 2002

STUDY GOAL:

To reduce the Navy's acquisition cost for new oceanographic ships by investigating the feasibility of using a common hull platform for future T-AGS(X) and UNOLS Ocean Class ships.

TASKS:

1) Establish Requirements:

a) In cooperation with program participants (ONR, UNOLS, Oceanographer, NSF, NAVSEA), establish requirements and desired operational capabilities for future UNOLS Ocean Class and T-AGS(X) ships.

b) Establish a prioritized set of requirements and desired capabilities. Wherever possible, requirements should be expressed in ranges (threshold and objective values) rather than discrete values to improve the possibility of arriving at common hull attributes.

2) Data Collection and Parametric Studies:

a) Continue to gather parametric data for recent oceanographic ships. Expand data collection to include foreign research vessels. Include as many vessels as possible that incorporate key desired features – i.e. moon pool, higher speed. Since it is unlikely that existing research vessels incorporate all of the desired capabilities of the Multi Mission Ship (MMS) (particularly speed), expand data collection to include other types of ships whose designs might be adapted to oceanographic missions.

b) Identify selected ships of interest for further investigation. Arrange ship visits to obtain more information and feedback from operators.

c) Perform in-depth analysis of parametric data to establish ranges of parameters to investigate in ROM studies. Provide feedback to program participants for refinement of requirements and desired operational capabilities.

3) ROM Ship Sizing Studies:

a) Perform ROM studies to determine platform size and characteristics that would meet requirements and desired operational capabilities. Studies should address a variety of hull types including monohull, SWATH, trimaran, catamaran, HSV and SLICE. Study each ship type, to determine the ship size that accommodates requirements.

b) Investigate innovative ways that a common hull platform could be cost effectively modified to meet different user requirements

   i) Hull size – i.e. parallel midbody, scalability
   ii) Modularity – mission equipment, laboratories, propulsion plant, generating plant, sonars

c) Determine characteristics of each candidate platform including:

- Principal dimensions
- Weight estimate using NAVSEA Ship Work Breakdown Structure (SWBS)
- General arrangements including mission spaces and working deck areas
- Intact and damaged stability characteristics
- Sonar transducer arrangements
- Speed and power
- Seakeeping Operability

d) Acoustic analysis - Assess sonar self noise, bubble sweep down, and overall sonar performance for each platform. Investigate acoustic impacts of moon pool.

e) Develop arrangements covering AUV handling alternatives

f) Determine advantages and disadvantages of each candidate hull type. Identify compromises (shortfalls) of common hull design.

g) Identify requirements that drive design features and their associated costs.

h) Identify features of design not required by all sponsors. Also identify areas of commonality. Investigate modifications that could be made to requirements to get closer to commonality.

i) Provide feedback for refinement of requirements and desired operational capabilities.

4) <u>Cost Estimates</u> –

a) Prepare Class R acquisition cost estimates for candidate platforms.

b) Assess platform operating cost and total ownership cost.

c) Identify the requirements that drive cost and provide feedback and recommendations to participants on ways to reduce cost impact.

5) <u>Refine requirements</u> –

a) In cooperation with participants, identify refinements to requirements and desired operational capabilities that would improve the likelihood of arriving at a common hull platform.

6) Develop Initial Common Hull Assessment -

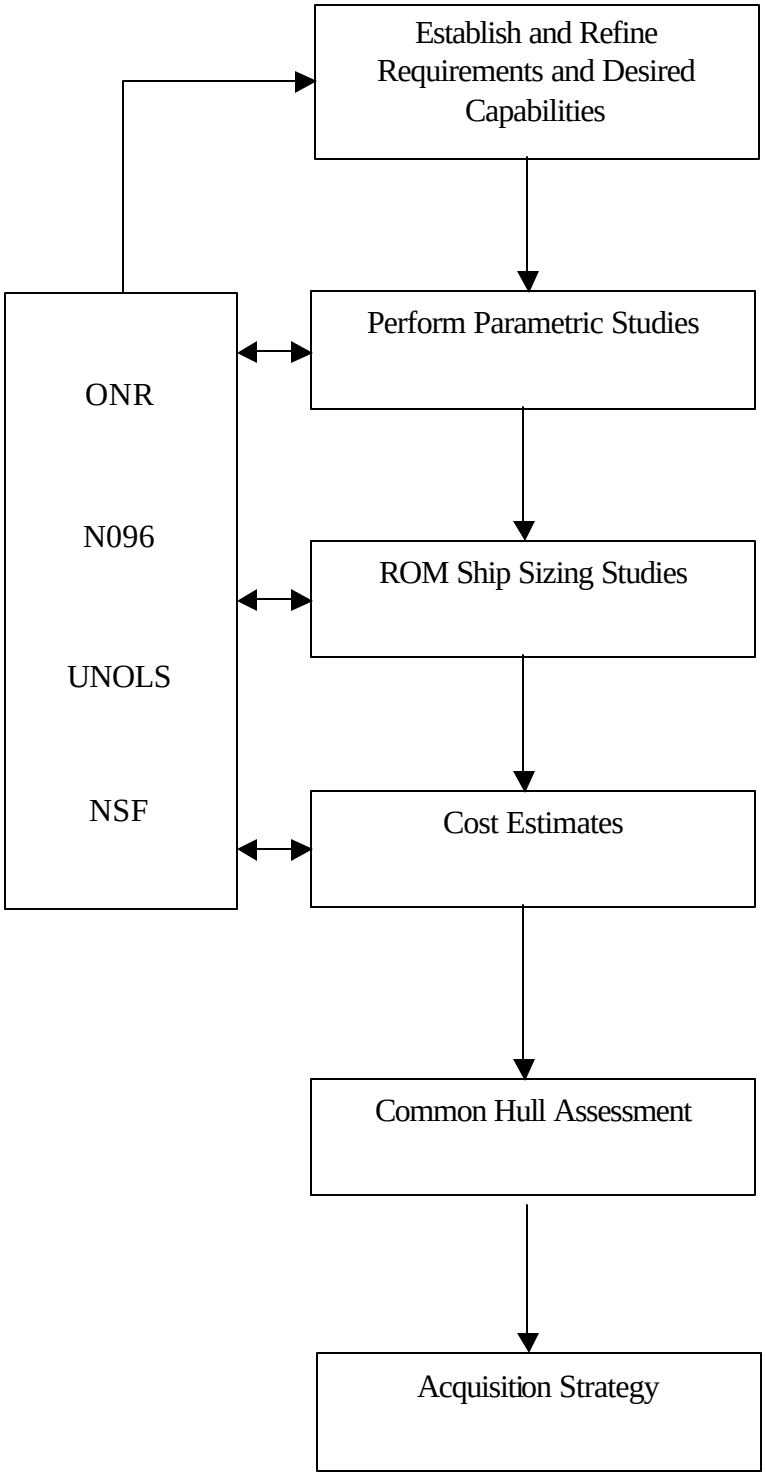
a) Prepare report to document results of study including conclusions and recommendations.

7) Acquisition

a) Develop a potential acquisition strategy and schedule to support sponsor's desired lead ship award year.

8) Deliverables –

a) Oceanographic Ship Common Hull Assessment Report including conclusion and recommendations on feasibility of common hull
b) ROM Ship Sizing Studies – Prepare the following for each selected hull type (note that some candidate hulls may not merit full consideration):
   - Principal characteristics
   - Speed and power characteristics
   - Weight estimate (SWBS 1 digit)
   - General Arrangements – sketches of deck plans and topsides
   - Sketch of sonar transducer arrangements
   - Acoustic assessment
   - Seakeeping assessment
   - Stability assessment
   - AUV handling arrangement sketches
   - Discussion of advantages and disadvantages, design driving features, areas of commonality and areas of difference
   - Class R cost estimates
   - Assessment of platform operating cost
c) Parametric data and analysis results (tabular and graphical)
d) Complete summary of requirements and desired operational capabilities for UNOLS Ocean Class and T-AGS(X) ships
e) Trip reports from ship visits
f) Meeting minutes
g) Proposed Acquisition Strategy


Establish and Refine Requirements and Desired Capabilities
Perform Parametric Studies
ROM Ship Sizing Studies
Cost Estimates
Common Hull Assessment
Acquisition Strategy
ONR
N096
UNOLS
NSF