TECHNICAL ACTIVITY PROPOSAL (TAP)

ACTIVITY REFERENCE NUMBER	TBD	ACTIVITY TITLE Assess the Ability to Optimize Hull Forms of Sea Vehicles for Best Performance in a Sea Environment	APPROVAL TBA
TYPE AND SERIAL NUMBER	**RTG**		START 01/2012
LOCATION(S) AND DATES		Meetings in conjunction with AVT Panel Business Meetings	END 12/2014
COORDINATION WITH OTHER BODIES		MSG, SCI; NNAG	
NATO CLASSIFICATION OF ACTIVITY		NATO Unclassified+PfP	Non-NATO Invited NO
PUBLICATION DATA		TR	NPU
KEYWORDS	Hydrodynamic Designs, Hull From Design, Optimization Methods, Fluid Dynamics Techniques, CFD, Resistance & Propulsion, Maneuvering, Seakeeping		

I. BACKGROUND AND JUSTIFICATION (Relevance to NATO):

In order to reduce costs, navies are reducing the numbers and/or the sizes of their ships and vessels. They are reducing crew sizes through the use of automation. At the same time they are demanding better performance of a variety of missions in order to counter emerging threats. To address this dilemma, research teams have assembled various combinations of computational methods to generate large numbers of hull variants, to evaluate their hydrodynamic performance against selected sets of mission criteria, and to select the best ones. So far the teams have used similar approaches, but have used different performance criteria. It should be possible to bring the various approaches together to develop a more comprehensive set of methods for a wider range of applications to achieve even better mission performance for a range of ships and vessels.

The relevance to NATO is based on the following: (1) many member states have naval fleets; (2) there are strong pressures to reduce manning on naval vessels; and (3) there are strong pressures to use more small vessels, rather than a few large vessels. Smaller vessels with smaller crews demand more efficient and robust hull form designs with better seakeeping.

II. OBJECTIVE(S):

The objectives are to improve the hydrodynamic performance of naval vessels by developing a greater understanding of the variety of computational methods used to generate and evaluate the performance of large numbers of hull form and appendage variants. The aim will be to develop a more comprehensive set of methods for a wider range of applications to achieve even better mission performance for a range of ships and vessels.

III. TOPICS TO BE COVERED:

- Numerical methods to generate hull form variants, and to select those with the best hydrodynamic performance.
- Experimental modeling to verify the numerical methods used to predict hydrodynamics performance.
- Warship performance criteria for a range of missions.
- Design studies to demonstrate the best combinations of methods and criteria for a variety of applications.

IV. DELIVERABLE (e.g. S/W Engage Model, Database,…) AND/OR END PRODUCT (e.g. Final Report):

Final Report.

V. TECHNICAL TEAM LEADER AND LEAD NATION:

Chair: Dr. Paul Rispin, United States
Co- or Vice-Chair ?
Lead nation: USA
Panel mentor:

VI. NATIONS WILLING/INVITED TO PARTICIPATE:

Canada, Greece, Italy, Netherlands, United Kingdom, United States

VII. NATIONAL AND/OR NATO RESOURCES NEEDED (Physical and non-physical Assets):

National manpower (including travel), national data, computer models, computer time.

VIII. RTA RESOURCES NEEDED (e.g. Consultant Funding):
Meeting spaces at AVT Panel Business Weeks, Spring and Fall.