

## **Unmanned and Autonomous Ships of the Future**

Friday, October 23, 2.30p-4.30p

### **Moderators**

**Paul Hess III**, Office of Naval Research

**Christer Broman**, ConocoPhillips Company

As we continue to expand our ocean horizons there are tremendous opportunities for the application of robotics, in and on the sea. Both remote-piloted and autonomous vehicles are already deployed to carry out a range of tasks and new vehicles and new capabilities are developing at a fast pace. The advent of unmanned ships being used for ocean transport and other duties, both naval and commercial, is seen as a possibility and something worth exploring although many technical and non-technical hurdles remain.

This Panel Session will explore these opportunities and discuss the hurdles. The presenters come from a variety of backgrounds, academia, regulatory-classification and commercial development organizations and they will each review a part of the challenge.

**Dr Wayne Neu** from the Virginia Tech. will present work that he has been leading on robotic research at that institution relating to both surface and subsurface craft. He will discuss two autonomous underwater vehicles; the high-speed AUV and the Virginia Tech 475. Design features of the vehicles and research being done with them will be presented. Features of an unmanned surface vehicle will also be presented and its use in research on simultaneous mapping and navigation in a riverine environment will be discussed. The presentation will conclude with an overview of a multi-objective, multi-disciplinary design optimization of an AUV

**Rich Delpizzo** of the American Bureau of Shipping will provide background on the evolution of the use of technology to reduce manpower on ships and to extend the capabilities of marine vehicles from a regulatory aspect. As an example commercial ships today operate with unmanned engine rooms which was not the case a couple of decades ago. How has this happened and what regulatory and policy decisions were required to allow this to happen? Further today offshore vessels and other regularly operate for extended periods in an autonomous dynamic positioning mode. Extensive regulatory control of the redundancy and potential failure modes has made this routinely acceptable.

**Dr. Ioseba Tena**, from Seebyte in Edinburgh, Scotland will make a presentation on how AUV operations can be improved through intelligent use of diagnostics and the world-model. This smart technology has been designed to make underwater vehicles fully aware of their operating environment and status, while enabling them to make optimum decisions about their actions –independently of any human operator. Dr. Tena will also describe how this approach may be applied to future large-scale autonomous naval and commercial marine operations, building on the rapid implementation of Dynamic Positioning systems.