

ASTM International Committee F41

Unmanned Maritime Vehicle Systems Standards - Update -

AUVSI's
Unmanned Systems North America
17 August 2011

Donald Parker
ASTM Committee F41 Chairman
donald.parker@ngc.com



F41 on Unmanned Maritime Vehicle Systems

AUVSI Unmanned Systems North America 2011 • 17 August 2011



Introduction

- Welcome
- Different format than in past
 - Provide brief overview and status ASTM and F41
 - CAPT Duane Ashton (PMS-406)
 - Dr Lora Weiss – Autonomy Discussions
- Need your active participation and support
 - Maintain relevance of the standards & subcommittees
 - Support transition to specifications



About ASTM International

- ASTM's primary objective is to be the foremost provider of consensus standards, related technical information, and services having globally recognized quality and market relevance.



Standards Development

- A Proven and Practical System Driven by Direct-Stakeholder Participation, for Developing Voluntary, Consensus Standards for Materials, Products, Systems & Services.
- A Portfolio of Approximately 12,000 Standards Used Internationally; 3,500 are the Basis of National Standards and Regulation in 76 Countries.
- Always Reflect Current Technology as they are Continually Revised.
- Over 33,000 Members from 130 Countries Participate on ASTM International Committees; Users from 175 countries.
- Standards Development Process complies with WTO's Technical Barriers to Trade (TBT) Requirements.
- No Project Costs.



ASTM – Power of Partnership

- All stakeholders involved
- Neutral forum with consensus-based procedures
- Private and public sector cooperation
- MOUs with NATO, DOD, and Standards Bodies of 62 Countries
- Adoptions of standards from DHS Applications, Light Support Aircraft, Unmanned Aircraft, and Aircraft Wiring Systems by DoD, FAA, CASA, DHS and other entities

Participation:

Product manufacturers • Gov't agencies • Associations • Professional societies • UMVS professionals and consultants • Financial organizations • Academia • Research institutions and laboratories



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ASTM Committee F41 Scope

The development of standards and guidance materials for Unmanned Undersea Vehicle (UUV) and Unmanned Surface Vehicle (USV) systems to facilitate an interoperable, modular, and multifunctional family of platforms.

The work of this Committee will be coordinated with other ASTM Committees and organizations having mutual interest.



Rationale and Product Development Approach

- Concentrate domain experts in subcommittees to work Standard Guides with common UMV (UUV & USV) functions
- F41 Product Development:
 - Five Standard Guides: Autonomy & Control, Comms, Payloads, Data Formats, Maritime Regulations (In Process)
 - Each Standard Guide intended to cover UUVs & USVs
 - Each Standard Guide includes Sections for each Type and Class (e.g. UUV MP, UUV HWV, USV X-Class, USV Harbor Class, Glider, etc.) as appropriate
- When a particular type/class has sufficiently mature sections, compile into separate Specification Standards

Driving Factor: Focus Available and Motivated SMEs on Standard Guides



Leadership

- *Chairman:* Donald Parker, Northrop Grumman Corporation
- *Vice-Chairman:* Gary Bullock, NSWCCD
- *Recording Secretary:* Lindsay Voss, AUVSI (New officer req'd)
- *Membership Secretary:* Justin Manley, Teledyne Benthos (New officer req'd)
- *Staff Manager:* Ashley Wiand, ASTM

F41.01 [*Autonomy S/C Chair:* Lora Weiss, Georgia Tech
Autonomy S/C Vice-Chair: Lou Larkin, Lockheed Martin

F41.02 [*Communications S/C Chair:* Chair – *Vacant*
Communications S/C Vice-Chair: *Vacant*

F41.03 [*Payloads S/C Chair:* Eric Shea, Argon ST
Payloads S/C Vice-Chair: Steve Castelin, NSWCCD

F41.04 [*Sensor Data Formats S/C Chair:* *Vacant*
Sensor Data Formats S/C Vice-Chair: *Vacant*

F41.05- *Maritime Regulations S/C Chair:* Eric Hansen, NSWCCD

- *Members-At-Large to the Executive Subcommittee:*
 - John Miech, NUWC (SAE AS-4 JAUS Liaison)



ASTM Sub-Committee F41.01

Autonomy & Control

- Covers the need for UUVs to operate autonomously, without constant human intervention, and with flexibility based on their payloads and missions
- Includes those characteristics which result in a UUV that is capable of operating for extended periods of time without external intervention
- Contains a table of terminology
- Defines high level functional capabilities of the AC, VC, and the PC with high-level interfaces defined
- Set of tables that index the system autonomy capabilities by (Situational Awareness, Decision-making, Planning, and Control, and External Interactions) and, defines Levels of Autonomy



ASTM Sub-Committee F41.02

UMV Communications

- Focus on standardization of communications system architecture, interfaces and capability requirements vice physical layer definitions
- Define the boundaries of the UUV/USV communications system standard
- Develop appendices for specific communications modalities, such as AComms, to address standardization and interoperability
- Provide preferred methods of controlling communications system (i.e. SNMP, XML, etc)
- Related standards and tabulates widely recognized network standards and RF communications standards, including line of sight (LOS) and beyond line of sight (BLOS)



ASTM Sub-Committee F41.03

UMV Physical Payload Interface

- Heavy Weight UUV only
- Provides general guidelines for the physical, electrical, and operational interfaces between the host UUV and the modular payload sections
- Provides the developer with parameters necessary to integrate various combinations of system components and mission payload packages into the UUV



ASTM Sub-Committee F41.04

UMV Sensor Data Formats

- UUV only
- Provides general guidelines for sensor data: water column parameters, ocean bottom undersea search and survey measurements, geophysical data, above water-line data
- Provides related mission data formats, such as timing and brief discussions on external interface and command and control formats
- Introduces the topic of metadata formats
- Briefly identifies general data storage issues
- Leverages standard U.S. Department of Defense (DOD) formats, World Meteorological Organization (WMO) and Intergovernmental Oceanographic Commission (IOC) standards



ASTM Sub-Committee F41.05

Maritime Regulations

- Addresses the impact of Maritime Regulations on the emergence of the UMV community and the introduction of unmanned vessels into a manned vessel community
- Initially aimed at USVs for COLREGs compliance; issue of safe operations is being studied for applicability and impact to UUVs
- Focusing on standardization of UMV systems with regards to risk management, implementable rules of the road and maritime lights, shapes, flags and sounds consistent with existing COLREGs and future COLREGS UMV supplements
- Seeks to develop common guidance for safe UMV physical configurations and operations in public waterspace where existing COLREGs do not apply
- Looking outside the normal technical community of interest



Summary

- Four Heavy Weight UUV Based Standard Guides
- Committee to Support Both UUVs and USVs
- Guides will Continue to Develop and Refine Common Material as required and with community support
- Specific Type/Class Specification Standards to Follow
- Need new Leadership and Members to Assist in direction and development



Thank you

- Don Parker, Chairman
donald.parker@ngc.com
410.428.7671
- Ashley Wiand, Manager
ASTM International Tech. Committee Operations
awiand@astm.org
610-832-9551

