Interoperability Breakout Panel

- Examine current interoperability standards for unmanned systems and develop a path forward for achieving interoperability across all unmanned systems.

Panelists

- Robert Wade
  - Chair of SAE AS-4A (JAUS)
- Keith Wheeler
  - Custodian of STANAG 4586
- LTC (ret.) Kerry Pavek & MAJ Clarence White
  - FCS User Requirements

Session Framework

- Interoperability means different things to different people
  - Interfaces
  - Architectures
  - Software and hardware
- Group concentrated on the command and control (C2) standards impact on interoperability

Session Summary

- Identified key issues surrounding interoperability for unmanned systems
- Generated a list of recommended actions based on those issues identified during the session

Key Issues

- Definition of “interoperability”
  - Joint Pubs update to include this new arena?
    - •Current interoperability definitions concentrate on data exchange, not control of UMS
  - Related to other UMS vernacular issues
    - • Difficult without a common way to dialog (language/definitions)
    - • NIST ALFUS/AS-4D/ASTM F41/NATO/EDA-EDU/Joint Pubs/Service Pubs are just some of the places with definitions

Key Issues

- **Better definition needed in the expression of "how interoperable we are/need to be"**
  - **e.g. Levels of Interoperability (STANAG 4586) and Levels of Control (TCS and FCS ORDs)**
  - **How should the services decide what will be interoperable?**

- **Need for Physical standards?**
  - **Or is that too deep/too complex to address from OSD level**
  - **"plug and play" issue**

Key Issues

- **Assured Compliance**
  - **Is there a solid method of measuring compliance?**
  - **Do we need the "Underwriters Lab" of UMS control?**
    - **JFCOM, JITC for Joint interoperability certifications?**

- **Multiplicity of Standards**
  - **Multiple standards may or may not be an issue**
  - **Answer is bedded in the "vision"**
    - **How many "languages" will be allowed or will we neck down to ONE.**
  - **Costs are a key element of that decision**
    - **Can we afford to continue with multiple standards?**
  - **Need to ID what is the commonality/differences to support the decision**

Key Issues

- **Security**
  - **Authorizations**
    - **Permissions**
    - **Training**
  - **Authentication**
    - **UMS only responds to authorized user**
  - **Impact of Open Architectures direction?**
    - **Classification guide implications?**
  - **COMSEC**
    - **Where is appropriate place for that security layer**
  - **Anti-Tamper and Layered Self-defense of UMS**

Key Issues

- **Safety**
  - **Improvement in “Hand off” of control**
    - **TTP development support**
  - **Other Safety considerations**
    - **Control interface functionalities match the UMS functionalities**
    - **Software safety (safety critical code)**
  - **E-Stop guidelines**
    - **Interference**

- **Lessons Learned library of UMS implementation?**
  - **Documenting and sharing experiences**

Key Issues

- **Policy Guidance Needed**
  - **Clear articulation of the intent and scope**
    - **What is OSD's business model for acquiring UMS?**
    - **How deep should the policy apply – to payloads?**
  - **Determination of the appropriate agency**
    - **OSD is consensus**
  - **Would provide industry motivation for "participation"**

Recommended Actions

- **Better define “Interoperability” in the Joint Publications and Service Publications**
- **Find consensus on levels of interoperability within the standards; understand the business model for acquisition of unmanned systems**
- **Determine viability of specifying physical standards**
- **Identify method of assuring compliance of C2 standards**
- **Identify commonalities/differences in existing standards**

Recommended Actions

- Investigate implications of security issues related to C2 standards
- Validate software safety and other safety issues
- Document lessons learned from various UMS
- Generate guidance/policy to encourage standardization
- Determine if Government/industry is willing to incur the costs of supporting multiple standards