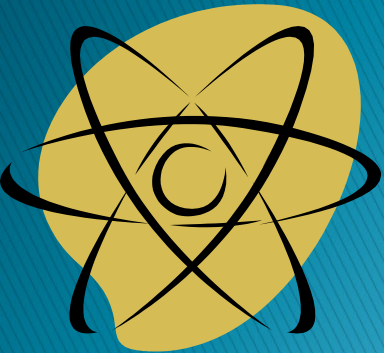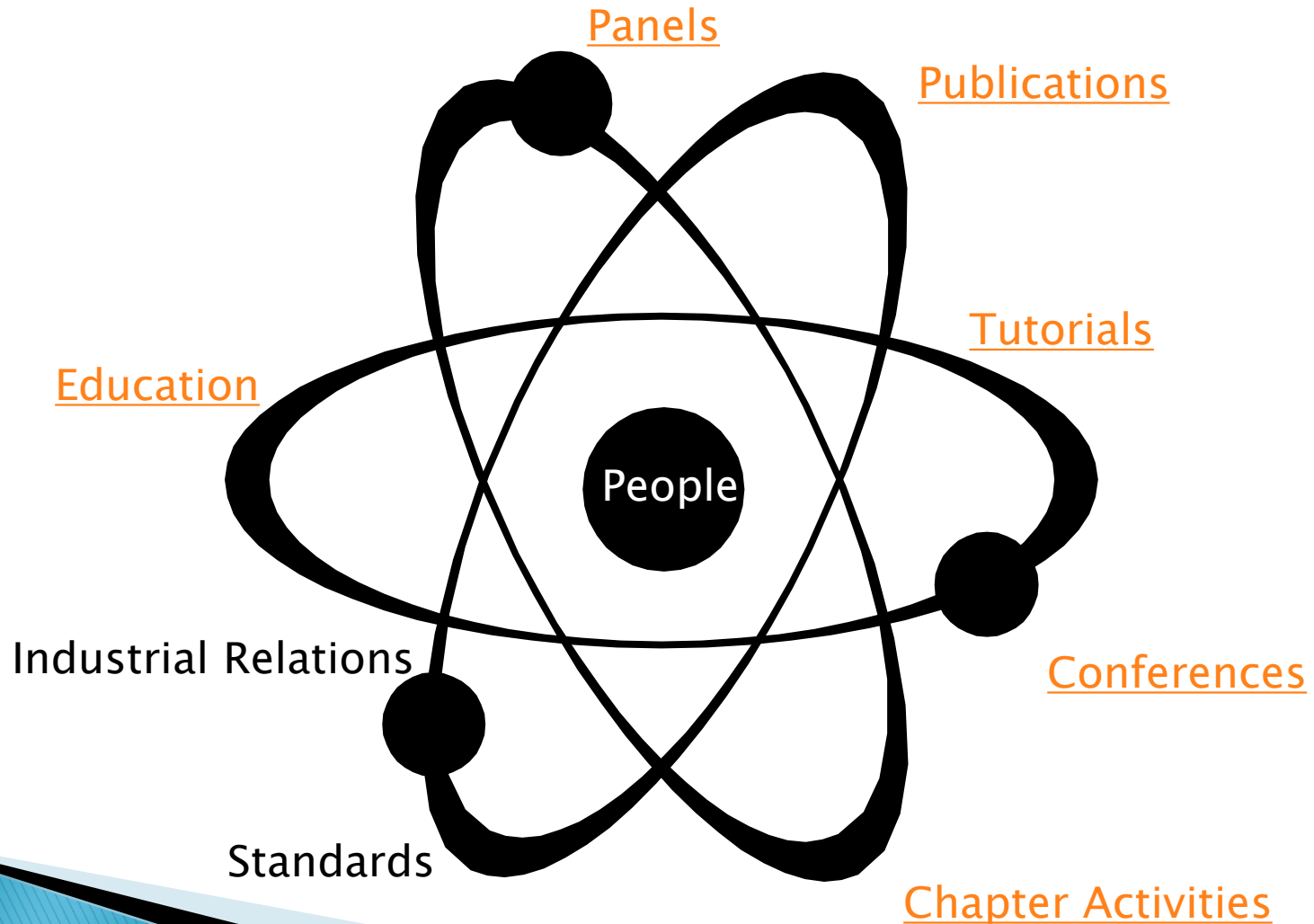# AESS Technical Operations

Presented to Board of Governors
by Roger Oliva, VP Technical Operations
May 4th, 2013

What is at the nucleus of AESS Technical Operations?

Panels

Publications

Tutorials

Education

People

Industrial Relations

Conferences

Standards

Chapter Activities

Panel Structure

1) Gyro and Accelerometer Panel — Randall Curry
2) Radar Systems Panel — Mark Davis
3) Space Systems Panel — Cosimo Stallo
4) Target Tracking Systems Panel — Hody Lambert
5) Aerospace Systems Integration Panel — Open – w/Rassa & Rao
6) Aerospace Control & Guidance — Lou Knotts
7) Aerospace Workforce Panel — Open – w/Russell Lefevre
8) Cyber Security Panel — Fred Wright
9) Unmanned Aerospace Vehicles Panel — Open – w/Dean & Leonard
10) Avionics Systems Panel — Paul Kostek

Standards — Rich Hochberg

AESS – Technical Pursuits

Goals and Objectives

– Collaboration Panels and Chapters
– Develop a formal peer review
– TP 's, best practices, methods & tools
– Synergy for education activities
  Development modules

Concept Developments

– Consider Workshops Similar to
    – 2011 Chapter Summit
      – DASC:Future of Aviation Exercise
– See TP's

RDT&E Activities

– Identify need for New Standards
– See TP's

DOTLMPF

– Help floundering TP's
– Promote conference development
– Reach out to Chapters for inputs
– Engage industry for insight
– See TP's

Doctrine, organization, training, leader development,
materiel, personnel, and facilities (DOTLMPF)

GYRO and ACCELEROMETER

- Develop standards and test procedures
  - promote understanding of systems to measure linear/angular motion
- Expand IMU Membership

- Identify new sensor technologies
- Single-Axis Interferometric Fiber Optic Gyros
- Linear, Single-Axis, Non-gyroscopic Accelerometers

Strategic initiatives:
- inertial sensor specification format guide
- test procedures, emerging new sensor technologies

- Implementation?

RADAR

- Radar Conference Leadership
- Standards and terminology
- Education

- Civilian Radar
- Waveform Diversity

- Emerging capabilities
- US SAR capabilities

- Conference-centric

SPACE SYSTEMS

- Standardization
- System analysis & design
- Applications, constellations,
- Integration, dual use.
- Organizing conferences

- Exploring new concepts like weather?
- What is a reasonable goal for Space Access? $500 /lb?
- EHF technologies

- Satellite Communications
- Space Exploration and ISS
- Space-based Navigation and Synthetic Aperture Radars
- Launch infrastructure, Range Safety and Debris mitigation

- Where are workforce concerns?
- Involve South Africa and Brazil
- *Estel Conference* and *ISaCoNaS* workshop

– Standard terminology, specification formats, and test procedures,
– Promote understanding of algorithms and components of
sensor data processing systems
– Trackipedia wiki engine as a collaboration tool, design and promote the use of standard "test-to" scenarios to improve algorithm performance

– Lack of sponsorship killing them. Fold under RADAR Panel?

– Support advancement of systems engineering techniques
– Building "real" way forward to plan, program, and execute Summit Topics

–Aerospace to Solve Nuclear Power Safety
–Help IEEE/USA CTAP with Software Complexity concern?
– Link with Systems Council?

AEROSPACE CONTROL and GUIDANCE

- Control/guidance systems
- NextGen air traffic control
- Single day short course
- Introduce a lecture series

- Adaptive control concept
- Integration of UAS in NAS

- Research Institutions, Industry, University, Government Agencies
- Dynamics, Computations, and Analysis
- Flight, Propulsion, and Autonomous Vehicle Control Systems
- Aeronautic and Surface Vehicles
- Missiles and Space
- Avionics and System Integration

CYBER SECURITY

- Embedded systems
- Standards and regulations
- Education/public outreach

- Focus: embedded system exploration because vulnerability reaches across many functional areas.

- Does FCC have a suitable controls/standards/metrics/certification processes
- Should NIST be involved?

- Public can be educated to reduce fear
- What near-term safeguards will exist against identify theft and industrial espionage?

Goals and Plans: to be reported soon

"...would like someone else to lead but I would like to contribute."

– No need to re-invent the propeller. Partner with the Civil Air Patrol and we will reach the youth!

UNMANNED AEROSPACE VEHICLES

Goals and Plans: to be reported soon

"…has not done much as a panel per se but some of the members have been active with the universities and with other organizations that are active with remote piloted vehicles."

– Activities cross-over into the ACGS and Avionics Panels

Recent AUVSI Activities

– US Military UAS Perspectives
– Yamaha RMAX Unmanned Helicopter: Potential for Agriculture use in the U.S.
–Future UAS Trends, Technologies and Challenges in the Next Decade
– NextGen on UAS Integration Efforts
– International UAS Markets and Emerging Opportunities

AVIONICS SYSTEMS

Goals and Plans: to be reported soon

"… is just starting off and we're still defining our interest areas, so any input thoughts would be appreciated."

– ACGS Panel is looking into Track–level participation at 32nd DASC in Syracuse
– Aviation International News will keep you abreast of the industry.

– NAVAIDS.
– Siting, power, and other technical requirements for ILS, DME, and VORs.
– VOR discontinuance. Its affects on the cockpit and takeoff/landing procedures.
– Automatic Dependent Surveillance – Broadcast (ADS–B)

– Build it, they "may" come!
– Where are workforce concerns?
– 787 Batteries
– NextGen: $260B program?

STANDARDS

– See individual TPs

–Exploring new concepts?

– CENELEC: European Committee for Electrotechnical Standardization with IEC.
– No IEEE relationship, yet.

– Some Panels have headstart!
– Others, seeking help!

–– How well does AESS do Standards?
–– IEEE seems to be available to help.
–– They have a robust list of recently worked standards.

AESS Technical Operations

– What would best serve the membership?

– Is our Panel Structure right?

– How do we better collaborate between Panels and between Chapters, Educational/Tutorial Options, Conferences, Chapters, Publications, Industrial Relations?

–IDEAS?

--Spend $40k, get Panels into shape (a WAG…but close)
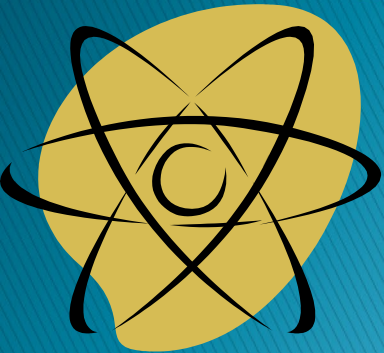
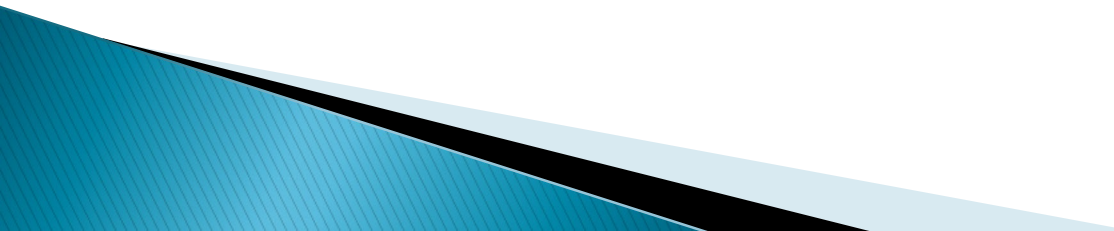# Doctrine, organization, training, leader development, materiel, personnel, and facilities (DOTLMPF)

Improve Sustainability and Quality of Life

BACKUP SLIDES

What We Do?

The field of interest shall be the organization, systems engineering, **design**, development, integration, and operation of complex systems for space, air, **ocean**, or ground environments. These systems include but are not limited to navigation, avionics, **mobile electric power** and electronics, radar, **sonar**, **telemetry,** military, **law-enforcement**, **automatic test**, **simulators,** and **command and control**.

PANEL STATUS

–Gyro and Accelerometer: more robust plan recommended

– RADAR: seems on track

– Space: seems on track

– Target Tracking: dying

– Aerospace Control and Guidance: fantastic info but more robust plan recommended

– Aerospace Systems Integration Engineering: more robust plan recommended (not staffed at the moment)

– Aerospace Workforce: more robust plan recommended (not staffed at the moment)

– Avionics: more robust plan recommended

– Cyber Security: more robust plan recommended

– UAVs: more robust plan recommended