Aerospace Systems Integration Engineering Panel

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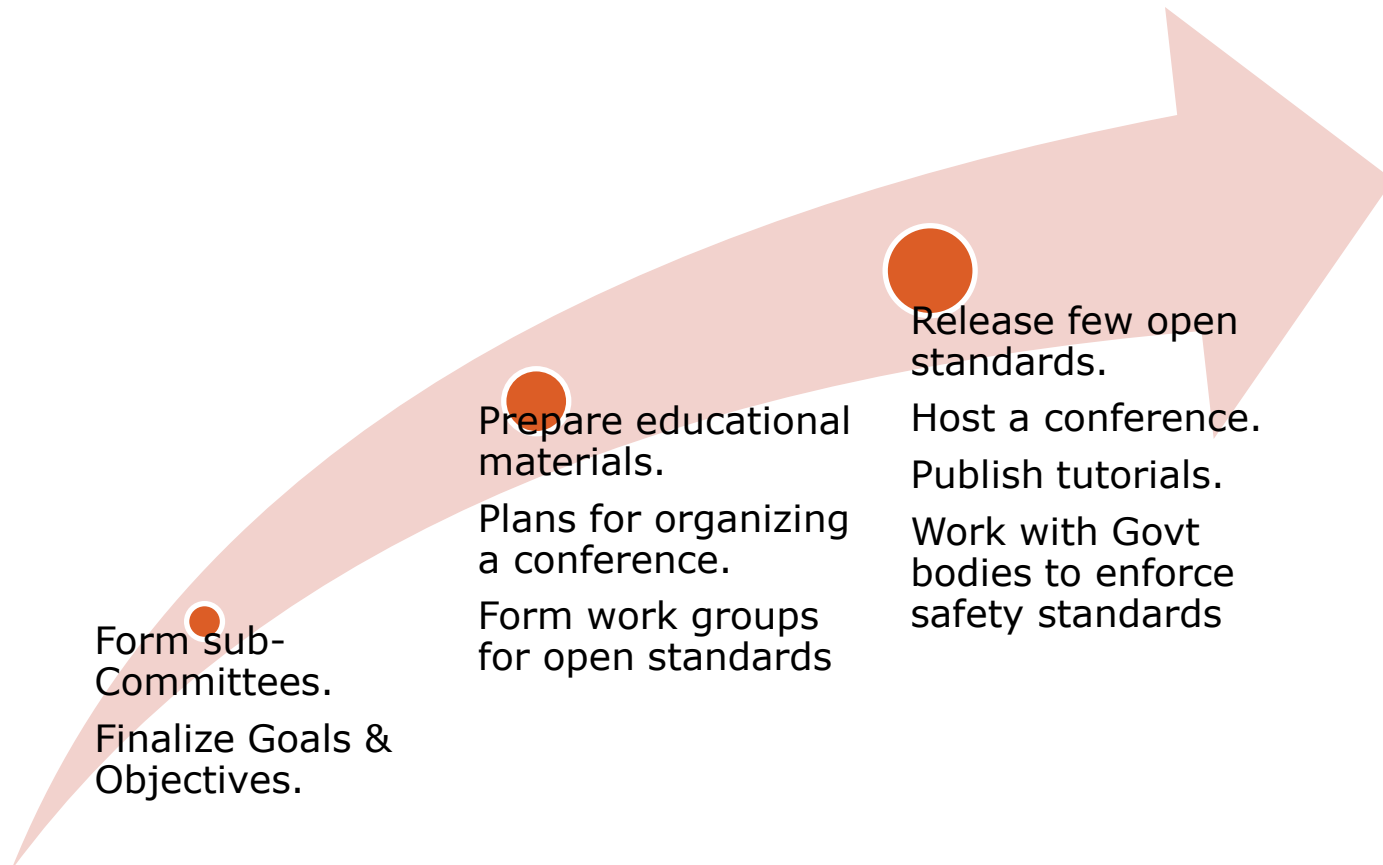**Koteswara Tatipamula**

Agenda

- Introduction
- 3-year strategic plan
- Sub-committees
- Conference plans
- Tutorial and educational materials
- Open standards for systems integration engineering
- Regional membership drives
- Academic outreach program
- Next Steps
- Conclusion

Introduction

- ASIEP: Aerospace Systems Integration Engineering Panel

- PURPOSE:
  - Promote the creation of open source standards.
  - Comprised of active committees with emphasize on division of responsibility for developing the integrated standards.
  - Co-ordinates with various governing bodies to implement the safety standards.
  - Enhances and leverages the best practices across other modes of transportation.

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3-year strategic plan

Form sub-Committees.

Finalize Goals & Objectives.

Prepare educational materials.

Plans for organizing a conference.

Form work groups for open standards

Release few open standards.

Host a conference.

Publish tutorials.

Work with Govt bodies to enforce safety standards

Sub-committees

- Sub-committees dealing with wide range of areas based on the membership base will be formed, such as (but not limited to)
    - Electric Aircraft
    - Intelligent transportation systems
    - Air traffic control systems
    - Unmanned aerial vehicles
    - Small Satellite Technologies
    - Workforce development

Electric Aircraft Subcommittee

▣ Technical objectives:

▣ Establish technical advances required to provide electric-flight-based regional passenger and cargo transportation.

▣ Establish metrics and risk analysis leading to recommendations for value-based investment strategy for the following objectives

- Identification of technologies to increase the range and capacity of electric aircraft.
- Identification of current state of R&D in the area of battery technologies.
- Integration of electric aircraft development with the evolving battery technologies.
- Supporting design & development of hybrid technologies for generating electricity during the various phases of flight.

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Intelligent transportation systems

▪ Technical Objectives

- ▪ Identification of sensor systems for the autonomous or semi-autonomous transport systems.

- ▪ Identification of propulsion technologies

- ▪ Identification of the vehicle and passenger communications

- ▪ Identification of the technologies and policies that translates ground based systems to air.

Air traffic control systems

■ Technical Objectives
  - Identify the current state of art of technologies of ATC
  - Identify the technologies of the Next Gen ATC
  - Identification of SAR based systems for ATC

Unmanned Aerial Vehicles

- ▣ Technical Objectives
- ▣ Understand the privacy concerns in the field of UAVs.
- ▣ Provide recommendations/solutions to those concerns.
- ▣ Identification, evaluation, and recommendations for balloon technologies

Small Satellite Technologies

■ Technical Objectives

- Identify issues and recommendations for Testbed characterization
- Identify issues and recommendations for alternative space-based communications
- Identify issues and recommendations for alternative space-based sensors
- Identify issues and recommendations for opportunities in on-orbit maintenance
- Identify issues and recommendations for Nano-satellites applications
- Identify issues and recommendations for emerging imagery and sensing providers and communicate with them regarding their function, goals, and objectives.

Open Standards Development

■ Technical Objectives

  ▪ Identify E-flight standards that would benefit the community

  ▪ Identify Small Sat standards that would benefit the community

  ▪ Identify Intelligent Transportation System standards that would benefit the community

  ▪ charging technologies, battery safety, flight surfaces and controls, redundancies and others

Conference plans

- Host a conference in the next 3 year period on the area of Systems Integration Engineering for all the modes of transportation.

- Extend support in organizing the conferences by AESS's various technical panels.

- Collaborate with other IEEE societies, AIAA, ASME and SAE (requires coordination).

Tutorial and educational materials

- In order to engage working professionals and educators:
  - Prepare educational materials on the panel's areas of interest
  - Conduct webinars and tutorials through AESS and IEEE e-learning portals.
  - Work with SYSC to establish weaknesses and strategies for remediation.

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Open standards

- Each committee will identify an area where open standards are required

- Form an work group to define the standards.

- Review and approve the standards by the panel's experts

- Release to the industry/public for implementation.

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Regional membership drives

- Conduct awareness sessions at various IEEE events to increase the membership to AESS and the Panel.

- Retain the professional members by conducting programs which benefits them and adds value to the membership.

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Academic outreach program

- Develop relationship with educational institutions by mentoring the students

- Engaging the Professors in preparation of the educational materials/tutorials

- Sponsoring few events like paper presentations, project contents etc.

Next Steps

- Enhance each subcommittee activities.

- Build a robust core of volunteers

- Enable the sub-committees to identify and evolve goals & objectives based on membership base.

Conclusion

- Panel is looking for volunteers who wish to contribute on various activities in the field of systems integration engineering like:
  - Preparing the tutorial/educational materials
  - Defining the open standards
  - Organizing the conferences

Panel Contacts

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