AST Commercial Space Transportation

In Briefing of the Safety Working Group

Presented to: SWG

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SWG Focus Areas 2019

1. **Comments on Report to Congress FAA Evaluation of Commercial Human Space Flight Safety Frameworks and Key Industry Indicators**

   - Safety Reporting Programs
   - Safety Standards
   - Safety Leadership
   - Safety and the Human Spaceflight Moratorium

2. **Current Industry Safety Issues**

   - **India Anti Satellite Event-Debris and Safety Implications**

SWG Focus Areas 2019 SAFETY FRAMEWORKS

1. **Comments on Report to Congress FAA Evaluation of Commercial Human Space Flight Safety Frameworks and Key Industry Indicators**

- **Safety Frameworks Elements**

  - **Voluntary Safety Reporting- ASTM F 47 Task group in place and progressing**

  - **Standards-ASTM F 47 Committee in place and progressing**

SWG Focus Areas 2019 SAFETY FRAMEWORKS

- **Safety Frameworks Elements**
  - **Voluntary Safety Reporting- ASTM F 47 Task group in place and progressing**
    - **Methodology in place, reportable and recommended events categories**
    - **Based on the severity of event using FAA and industry safety risk analysis processes**

REPORTABLE(REP)/RECOMMENDED (REC)			
EVENT SEVERITY	CATASTROPHIC/CRITICAL	MARGINAL	NEGLIGIBLE
EVENT DEFINITION	Death to Involved or Uninvolved Public or Safety-Critical System Loss Severe injury or illness to the involved and uninvolved public or major safety-critical system damage	Minor Injury or illness to the involved or uninvolved public or safety critical system damage	Less than minor Injury or illness to the involved or uninvolved public or safety critical system damage
EVENT CATEGORY	I/II	III	IV
Abnormality	REP	REC	REC
Accident	REP	REP	REP

SWG Focus Areas 2019 SAFETY FRAMEWORKS

1. **Comments on CSCLA Report to Congress on Human Space Flight Safety Frameworks**

- **Safety Frameworks <u>Elements</u>**

  - **Standards-ASTM F 47 Committee in place and progressing**
  - **ASTM F 47 Chair-Mike LA Briefing (next slide)**
  - **CSF preparing an SDO directory as a precursor to a possible SDO summit to exchange information, classify SDO's scopes and methodologies and to minimize duplicative efforts**

Consensus Standards Development

Updates ASTM F 47 Chair: Mike L-A

- Next F2F last full committee April 12th Colorado Springs, Space Symposium
- Momentum and results growing favorably:
  - 4 new Task Groups derived NPRM and ARC processes
  - Prioritization dialogue Industry-FAA (10 possible standards areas given by FAA)
- F47.01 – Occupant Safety of Suborbital Vehicles
  - Fault Tolerance TG – Ready for vote
- F47.02 F47.03 – Unoccupied Launch & Reentry Vehicles
  - Space Vehicle Types TG – Ready for vote
- F47.04 – Spaceports
  - Storage, Use and Handling of Liquid Rocket Propellants TG – standard published
- F47.05 – Crosscutting
  - WK F47.91 – Nomenclature-ready for vote
  - Reportable Incidents TG – in progress as per briefing

SWG Focus Areas 2019 SAFETY FRAMEWORKS

1. **Human SpaceFlight Regulations Moratorium (new discussion)**

   - **2019 humans spaceflight activities projected (CSS-Boeing , Space X, Blue, Virgin)**
   - **Future revisions to moratorium, should we start dialogue early?**

SWG Focus Areas 2019-SAFETY FRAMEWORKS-LEADERSHIP

Finding: The COMSTAC finds that industry is aligned and making progress related to the FAA's vision of **safety frameworks elements** such as standards and voluntary safety reporting systems, as described in its report to Congress*.

Recommendation: The COMSTAC recommends that FAA and industry collaborate to create a directory and classification of US and international commercial spaceflight SDO's (Standard Development Organizations) and their standards in progress or published.

*** FAA Evaluation of commercial Human Space Flight Safety Frameworks and Key Industry Indicators**

SWG Focus Areas 2019 SAFETY FRAMEWORKS

1. **Comments on Report to Congress FAA Evaluation of Commercial Human Space Flight Safety Frameworks and Key Industry Indicators**

- **Safety Frameworks Stakeholders and Leadership**
  - **Is there a need for an industry led Commercial Spaceflight Safety guiding entity?**
    - **The case for a US industry led Commercial Space Flight Safety guidance**
      - **The case for a non US (IAASS) led Spaceflight Safety Institute**
    - **To lead and co-lead with the FAA on safety oversight, adoption, compliance, development and implementation of standards, safety reporting, etc.**
    - **To confirm safety requirements have been made (i.e. third party audits)**

SAFETY FRAMEWORKS-CONSENSUS STANDARDS

Finding: The COMSTAC finds that industry is aligned and making progress related to the FAA's vision of **safety framework leadership** for safety oversight, adoption, compliance, development and implementation of standards, safety reporting, etc., as described in its report to congress*.

Finding: The COMSTAC finds that FAA and US industry are collaborating in the development of an effective safety framework leadership structure benefitting US industry.

*** FAA Evaluation of commercial Human Space Flight Safety Frameworks and Key Industry Indicators**

SWG Focus Areas 2019

2. Current Industry Safety Issues

- **India Anti Satellite Actions-Debris and Safety Implications**
  - **Impact on human and unmanned spaceflight safety in NEO and LEO**
  - **Precedent for future incidents**
  - **NASA ‘s Jim Bridenstine leadership**
  - **US Government reactions and proactive actions to avoid similar activities**

Reportable Safety-Related Events and Lessons Learned

Finding: The COMSTAC finds that the Indian government's intentional demonstration of an anti-satellite weapon has produced dangerous orbital debris negatively impacting the safety of space assets, humans in orbit, and the overall space environment.

Recommendation: The COMSTAC recommends that the FAA work with relevant domestic and international entities condemning debris-creating anti-satellite activities and to demand that such activities do not take place again as such activities create unnecessary safety risks to orbital assets and endangers the lives of humans in orbit.

Recommendation: The COMSTAC recommends that the FAA conduct a safety review relative to the impact of debris created by the Indian anti-satellite activity and publicly share the results with the domestic and international community.

COMSTAC LONG VIEW-CONTEXT

Medium and Long Term Taskers

Medium-term needs (delivery between now and 2020)

- Changes to Maximum Probable Loss (MPL)?
- Conceptual Vehicles OK for Site License Application?
- Define the Encourage, Facilitate and Promote mandate
- Space traffic management (STM) – How can AST support Department of Commerce as it rolls out STM? How does COMSTAC see STM implementation occurring on an operational level?
- Industry Participation in International Outreach?

Long-term needs (delivery between now and 2021)

- Changes to Part 420 and Operation of a Launch Site?
- AST R&D Topics?
- Regulating Point-to-Point Commercial Space Travel?