FAA | AST Commercial Space Transportation

COMSTAC

November 8, 2023

Federal Aviation Administration

Agenda

12:00 – 12:05: Welcome Remarks by DFO, Brian Verna
12:05 – 12:10: COMSTAC Chair Welcome Remarks and Introduction of FAA Deputy Associate Administrator Michael O'Donnell

Remarks

12:10 – 12:20: Mr. Michael O'Donnell, Deputy Associate Administrator, Office of Commercial Space Transportation
12:20 – 12:30: Ms. Polly Trottenberg, Deputy Secretary of Transportation
12:30 – 12:50: ARP (Airports) Industry Briefing, Michael Price, Office of Airports, Federal Aviation Administration
12:50 – 1:30: TASK #1: FAA's Proposed Lessons Learned Information System (LLIS), James Hatt, Space Policy Division Manager, Office of Commercial Space COMSTAC Feedback
1:30 – 1:45: Break

COMSTAC Discussion and Deliberation

1:45 – 3:30: FAA updated on COMSTAC recommendations and future plans, Randy Repcheck, Deputy Director, Office of Strategic Management, Office of Commercial Space Transportation
TASK #2: Provide FAA a list of industry challenges and COMSTAC priorities
COMSTAC response
3:30 – 3:35: Public Comment Period
3:35 – 3:55: Closing remarks by COMSTAC Chair and Vice-Chair
4:00: Closing remarks and Adjournment by DFO Brian Verna

Michael O’Donnell

Deputy Associate Administrator, Office of Commercial Space Transportation

Polly Trottenberg

Deputy Secretary of Transportation

ARP (Airports) Industry Briefing

Michael Price
ACO-100, Office of Airports
Federal Aviation Administration

Updated “Aeronautical Activity” Definition

Presented to: **2023 ARP AST Industry Briefing**

By: **Michael Price (ACO-100)**

Date: **November 2023**

FAA Office of Airports

Overview

- Background
- Purpose and Applicability
- Relevant Federal Obligations
- Updated “Aeronautical Activity” Definition Benefits
- Federal Register Notice

Background

Civil Aeronautics Act of 1938

- Formed a new independent agency (CAA)
- Defined "Aeronautical Activity" and included examples of non-aeronautical activities
- Established a prohibition on "Exclusive Rights"
- Later FRN's issued updated definition

Purpose and Applicability

- ARP's baseline for determining whether an airport sponsor is providing reasonable aeronautical access to a federally-obligated airport
- Applies to aeronautical activities requiring aeronautical access to airport ground facilities (e.g., pavements, hangars, land use, aeronautical services)
- Within the geographical boundaries identified by the sponsor's Exhibit "A" Property Map (ALP)
- Airspace activities within and outside the geographical bounds of the airport remain under the purview of the FAA Air Traffic Organization
- Land uses outside of the airport property are generally not subject to the airport sponsor's Federal grant obligations

Relevant Federal Obligations

- Ensuring the airport is available to aeronautical users in a safe and serviceable condition. (Grant Assurance 19, *Operations and Maintenance*)
- Ensuring open access to aeronautical activities on terms that are reasonable and without unjust discrimination (Grant Assurance 22, *Economic Nondiscrimination*)
- Maintaining an updated airport layout plan (ALP) approved by the FAA depicting safe and serviceable aviation and non-aviation facilities. (Grant Assurance 29, *Airport Layout Plan*)

"Aeronautical Activity"

"Any activity that involves, makes possible, or is required for the operation of an aircraft, launch or reentry vehicle, or that contributes to or is required for the safety of such operations. It includes, but is not limited to:

"… repair and maintenance of aircraft, repair and maintenance of launch or reentry vehicles, construction of amateur-built/recreational aircraft, sale of aircraft, launch or reentry vehicle parts, parachute or ultralight activities, certain unmanned aircraft systems (UAS), advanced air mobility (AAM) operations, commercial space vehicle operations, and any other activities that because of their direct relationship to the operation of aircraft, UAS, or space launch and re-entry vehicles can appropriately be regarded as aeronautical activities."

"Aeronautical Activity"

Definition Provides Limitations:

"Activities such as aircraft and parts manufacturing and storage, aerospace design, research and development, flight simulation/training/management facilities, and/or engine testing facilities that are not associated with the final assembly of an aircraft or commercial space vehicle are not considered aeronautical activities for the purposes of airport access. Model rocket, model aircraft, and recreational UAS operations are not aeronautical activities for the purposes of airport access."

Benefits

If Aeronautical:

- Access is protected under the federal obligations
  - Provide access on terms that are reasonable and not unjustly discriminatory (GA22); No Exclusive Rights (GA23)
- Lease Rates/Cost of Access (GA24)
  - Can be lower than Fair Market Value (FMV)
  - Rates must be fair/reasonable/transparent methodology
- Complaints can be adjudicated under Parts 13 and 16

Disadvantages

If Non-Aeronautical:

- Access is not protected under the federal obligations
  - Sponsor has no federal obligation to provide access to a non-aeronautical activity
  - If the sponsor chooses to provide access, it can set whatever terms/conditions/requirements it wants, including restrictions
  - Federally-funded non-aero land use requires FAA approval
- Lease Rates/Cost of Access
  - Must be FMV – Appraisal, Higher, Not Subject to FAA Review
- Complaints not subject to review under Parts 13 and 16

Federal Register Notice

- *Policy on the Definition of Aeronautical Activities*
  - Adds – Commercial Space, UAS, and AAM for the purpose of aeronautical access to a federally-obligated airport
  - Airport sponsor compliance requirement only – does not interfere with other FAA LOBs or international agreements.
  - Seeking public comments – CY23

COMSTAC Feedback on FAA's Proposed Lessons Learned Information System (LLIS)

James Hatt

Manager, Space Policy Division

Office of Commercial Space Transportation

Task 1

Provide initial COMSTAC feedback on FAA's proposed Lessons Learned Information System (LLIS).

- The purpose of an LLIS is for the government and industry to provide lessons learned during any aspect of licensing, mishap investigation, or other regulatory based activity that will be general in nature and not attributable to any company. The National Transportation Safety Board (NTSB) recommended in safety recommendation A-15-26 that FAA adopt an LLIS. In response, the FAA stated that it was investigating the implementation of an LLIS with industry. Given the FAA briefing on an LLIS, provide industry consensus recommendations and advice on the implementation of this database.

Lessons Learned Information System

- FAA is developing a plan to deploy an LLIS database
  - Initially, the database would be populated with items from AST – from licensing, analysis, safety inspections, and mishap investigations. This information would be de-identified and provide broadly applicable lessons learned.
  - Industry will be invited to voluntarily submit their own lessons learned, in a manner that protects proprietary information via an Office of Management and Budget (OMB) approved form.

Lessons Learned Information System

- COMSTAC and FAA have discussed the creation of a Lessons Learned Database for several years.
- Due to few operators and their vehicles being so unique, possible identification, even through an anonymous reporting system, was a major concern (June 2018 COMSTAC).
- Increased launch and reentry rate provides more data points and allows us to more broadly classify lessons learned.
- Provide means to identify lessons learned to facilitate operators submitting applications under the new part 450 for launch and reentry.

Lessons Learned Information System

- In August 2015, NTSB issued Safety Recommendation A-15-26 recommending that FAA -
  - "…continue work to implement a database of lessons learned from commercial space mishap investigations and encourage commercial space industry to voluntarily submit lessons learned."

- In July 2023, AST responded -
  - "FAA envisions the LLIS will collect de-identified safety lessons learned, which are common across the CST industry from previous mishaps. Additionally, the FAA will provide the industry the opportunity to voluntarily submit general non-mishap related lessons learned directly to the agency, and the information will be made available to the public on the FAA.gov website."

Lessons Learned Information System

- Timeline
- 2015 – initiated an implementation plan but put it on hold
- Summer 2018 – presented plan to COMSTAC who expressed concerns about proposal due to possible identification of operators
- Spring/Summer 2023 – updating the previous plan to include obtaining approval of form to be used by industry to submit lessons learned
- Winter 2023 – providing the draft plan to COMSTAC for review, advice and recommendations on implementation
- Summer 2024 – potentially implement the LLIS

COMSTAC Response to Task #1

Lessons Learned Information System

COMSTAC Observations and Concerns

- Limited value to FAA
  - Unlike the aviation industry, commercial space operators have unique vehicle designs and systems. Therefore, some members feel there would be minimal benefit to the FAA as a data collection exercise.
  - A database can be a training tool to work the licensing process if it's robust and industry participates.
  - Potentially educational for junior AST staff and safety inspectors.

- Significant Risks to Operators
  - Because of the various vehicle designs and low launch cadence, the likelihood of exposure to proprietary information remains high.
  - Concern about whether there is an opportunity for operators to weigh in on what can be shared publicly.
  - The benefits to operators of providing this information is minimal or needs to be better understood.

Lessons Learned Information System

LLIS Considerations

- Rather than focus on mishap lessons learned, there is an opportunity for industry to share licensing challenges and lessons learned. Mishap information is not useful given various vehicle designs.
- Consider a Collaborative Decision Making (CDM) group for operators and AST to share information focused on licensing and processing.
- A knowledge graph database would need to link all data together and be discoverable to be useful to the user.

AST Updates to COMSTAC

Randy Repcheck
Deputy Director, Office of Strategic Management
Office of Commercial Space Transportation

Recommendation and Response

Recommendation	Response
The FAA should prioritize updating the 2014 Recommended Practices for Human Space Flight Occupant Safety document and seek additional resources if additional work is proposed for human spaceflight occupant safety.	The 2023 appropriations bill provided funding and authorization for 10 additional people as well as contract funding to support all efforts regarding HSF occupant safety. FAA/AST is hiring against these positions
In a limited resource environment, the FAA should ensure that activities in this area should not negatively impact the FAA's ability to manage the current and expected increase in launch and reentry licensing activity and other current statutory duties of the office.	The additional resources provided by Congress in the 2023 appropriations bill provides for FAA/AST to not impact the current safety activities and other statutory duties of the office.

Recommendation and Response

Recommendation	Response
Ensure harmonization between The Department for Transportation (DOT) STEM workforce efforts and the White House-led Space Industry Skilled Workforce Coalition.	FAA/AST is working closely with the FAA STEM AVSED office, the FAA Employee Associations, and other offices across the DOT to collaborate with the Department and the White House on this effort. AST has two members on the Interagency Committee on STEM Education and Workforce.
Create a space workforce messaging portal and newsletter to notify STEM workforce partners of opportunities.	FAA/AST is working with the entire FAA to do outreach to these communities including engaging the Employee Associations as well as STEM AVSED and recruiting efforts.

Recommendation and Response

Recommendation	Response
Establish a mechanism for industry inputs into the DOT-related tasks of the Interagency Roadmap to Support Space-Related STEM Education and Workforce. Establish workforce development officers to build STEM workforce pipelines including regional postsecondary STEM internship programs.	FAA/AST will work through COMSTAC and direct industry outreach to get input into DOT-related tasks of the Interagency roadmap to Support Space Related Stem work. AST's Space Policy Division will establish more options to support tasks as they are established. FAA/AST leverages the FAA's STEM Aviation and Space Education program including involvement of multiple outreach representatives from AST to provide strong local and regional STEM outreach activities. AST is currently hosting multiple interns through the OPM Pathways program.

Recommendation and Response

Recommendation	Response
Highlight space industry jobs available and identify academic and extracurricular points of engagement within FAA AST.	FAA/AST participates in many STEM activities every year at middle and high schools and universities to raise awareness of the various career opportunities in the aerospace industry.
Extend the Department of Labor's Space-focused Apprenticeship Accelerator model to not only promote areas of research interest to FAA AST, but to also support the space industry's workforce pipeline directly, emphasizing the employment of historically excluded communities in commercial space transportation.	Due to limited personnel resources, FAA/AST has not implemented this recommendation. AST will work with the STEM AVSED office to determine how we could implement this program.

Recommendation and Response

Recommendation	Response
FAA should conduct a voluntary, non-attributable survey to assess the implementation of developed voluntary consensus standards.	FAA/AST will evaluate conducting this type of survey after additional standards are developed and published by Standards Development Organizations.
The FAA should continue to encourage current efforts to develop industry consensus standards and increase participation in the ASTM F47 Committee to guide, develop, and assess standards development efforts. The FAA should also continue to provide technical feedback on standards that have been developed or are currently under development and participate in the balloting	FAA/AST is working closely with ASTM F47A and NFPA as they develop standards. AST has briefed ASTM F47A that we will provide feedback if requested, on a draft scope for a standard, on the development of standards (including AST employees work with the workgroups as time permits) and review the final standard. We also have a member who participates on the ASTM F47A Executive Committee.

Recommendation and Response

Recommendation (Safety Working Group)	Response
The FAA should assess the completeness of standards to serve as a means of compliance and provide guidance on how it will review and accept standards as a means of compliance.	FAA/AST has established a process to review standards as requested to determine if they can be used as a means of compliance. FAA/AST has a website that lists acceptable means of compliance.
In addition to industry standards, means of compliance for future performance-based requirements should include government standards and other unique means of compliance developed by an individual applicant.	Approved unique means of compliance (unless a unique means of compliance contains proprietary information) are posted on ASTs Means of Compliance website. Most unique means of compliance that are submitted are marked as proprietary.

Recommendation and Response

Recommendation	Response
FAA/AST provide update on efforts to streamline licensing, range safety approvals and other processes.	FAA/AST is reviewing rulemaking to include how to most effectively and efficiently update/revise sections of part 450. FAA/AST is working with the ranges to clarify procedures and processes.
FAA/AST brief results from National Spaceport Interagency Working Group and solicit state and private spaceports' participation and feedback.	The Office of Spaceports (OOS) is finalizing these recommendations and is obtaining executive review of the outcomes. OOS is working with the National Space Council (NSpC) on the recommendations being put forward.
FAA/AST brief National Space Council on launch infrastructure and facility construction delays and commodity shortages and proposed initiatives to address space-related infrastructure shortfalls.	OOS will brief the NSpC as delays and shortages are identified.

Recommendation and Response

Recommendation (Regulatory Working Group)	Response
Ensure that Advisory Circulars are accurate and accommodate variations in vehicle complexity and prevent regulatory burdens with no public safety benefit.	Advisory Circulars (AC) are put through a very rigorous review process to include interagency review and multiple levels of FAA review to ensure accuracy. FAA/AST accepts and reviews all feedback received on ACs and is currently revising several published ACs based on feedback.
ACs should make distinctions between launch and reentry when differences exist. ACs should distinguish between launch vs. reentry license requirements or at least include distinct sections discussing the difference in applicability of many of the regulations.	FAA/AST will ensure the ACs more clearly delineate between launch and reentry requirements.

Recommendation and Response

Recommendation (Regulatory Working Group)	Response
The FAA should provide more transparency into the software and analysis tools that have been accepted for use.	FAA/AST is reviewing the how best to provide this support to the industry
The FAA should clarify and as needed amend Part 450 to address challenges with requirements that are distinct to launch or reentry. The FAA should prioritize Part 450 clarification through guidance and policy balanced with reforms.	FAA/AST is reviewing options for revising and updating part 450 including a potential rulemaking committee to garner detailed industry feedback on changes and updates that are needed to provide a better steam-lined licensing process while maintaining the focus on public safety. As of 30 October, there are a total of 18 ACs published on the FAA/AST website with 2 more in the final review process before publication. ASZ-200 has established an AC Tiger Team to prioritize development of ACs and published them in a timely manner.

Future Rulemaking

- Rulemaking
  - Two Aerospace Rulemaking Committees are underway
    - FAA/AST will evaluate the results and decide if rulemaking is necessary
    - Part 440 – Financial Responsibility
      - Caryn Schenewerk and James Hatt co-chairs
    - Part 460 – Space Flight Occupancy Safety
      - Mary Lynn Dittmar and Minh Nguyen co-chairs
  - Part 450
    - ASZ-200 establishing a team to identify and document issues and the most expedient means to correct the deficiencies

Published Advisory Circulars

1. AC: 450.101-1A High Consequence Event Protection
2. AC: 450.103-1 Safety System Program
3. AC: 450.107-1 Hazard Control Strategies
4. AC: 450.108-1 Flight Abort Rule Development
5. AC: 450.109-1 Flight Hazard Analysis
6. AC: 450.110-1 Physical Containment as a Hazard Control Strategy
7. AC: 450.115-1A High Fidelity Flight Safety Analysis
8. AC: 450.117-1 Trajectory Analysis for Normal Flight
9. AC: 450.123-1 Population Exposure Analysis
10. AC: 450.141-1A Computing Systems and Software
11. AC: 450.161-1 Control of Hazard Areas
12. AC: 450.167-1 Tracking for Launch and Reentry Safety Analysis
13. AC 450.169-1 Launch and Reentry Collision Avoidance Analysis
14. AC: 450.173-1 Mishap Plan – Reporting, Response, and Investigation Requirements
15. AC: 450.179-1 Ground Safety
16. AC: 450.3-1 Definition of Launch and Scope of a Vehicle Operator License
17. AC 450.31-1 Applying for FAA Determination on Policy or Payload Reviews
18. AC: 450-45-1 Launch and Reentry of Space Nuclear Systems

Upcoming Advisory Circulars

1.	450-45-1	Launch and Reentry of Space Nuclear Systems
2.	413.15-1	Tolling and Denial
3.	450.139-1	De Minimus Toxic Hazard
4.	450.137-2	De Minimus FFBO Hazard
5.	450.143-2	Safety Critical Systems non-FSS
6.	450.121-1	Causes of Breakup
7.	460.45-1	Informed Consent (Human Space Flight)
8.	R 450.117-1A	Normal Trajectory Analysis (REVISION)
9.	450.115-2	FSA Methodology Rigor
10.	413.5-1	Pre-Application Consultation
11.	460.15-1	Human Factors HSF
12.	R 450.161-1A	Control of Hazard Areas (REVISION)
13.	450.133-1	Airspace and Waterborne Vessel Hazard Areas
14.	450.131-1	Probability of Failure
15.	450.135-1	Debris Risk Metrics

Upcoming Advisory Circulars

Projected Additional Advisory Circulars

1.	450.137-1	FFBO Analysis
2.	450.121-1	Inert Debris
3.	450-119-1	Malfunction Trajectory Analysis
4.	450.121-1	Yield from Propellant/Tank Impacts
5.	450.113-1	Flight Safety Analysis: Levels of Fidelity
6.	TBD	Hybrid Vehicles
7.	450.135-2	Consequence Modeling
8.	450.121-2	Debris Risk Propagation
9.	450.110-1	Physical Containment as a Hazard Control Strategy
10.	450.139-1	Toxic Hazards Analysis and Thresholds
11.	R 450.123-1A	Population Exposure
12.	450-121-1	Structural Analysis for High Fidelity Flight Safety Analysis
13.	R 450.115-1A	High Fidelity Flight Safety Analysis
14.	450.115-TBD	Medium Fidelity Flight Safety Analysis
15.	450.143-1	Safety Critical Systems
16.	R 450.107-1	Hazard Control Strategies Determination

Task #2

Provide FAA a list of COMSTAC challenges and their priorities based on FAA status of COMSTAC recommendations.

The intent of Task 2 is to provide a foundation for future recommendations to be delivered to FAA during the April 2024 meeting. After the FAA briefing on status of COMSTAC recommendations, COMSTAC reviews and discusses economic, technological, and institutional developments relating to commercial space transportation and operations. Part of this discussion should include what COMSTAC believes are key future commercial space transportation industry challenges and assign each a priority by working group.

COMSTAC Response to Task #2

Proposed Spring 2024 Taskers

Regulatory Working Group:
Space nuclear power and propulsion is critical to maintaining a future space presence. FAA AST will license vehicles carrying payloads with nuclear material. What recommendations can the COMSTAC provide to the FAA to ensure FAA AST is able to contribute to Space Policy Directive 6 (SPD-6)? Additionally, given the AC on nuclear payload approvals, provide any observations, findings, and recommendations.

Safety Working Group:
Review the 2023 Recommended Practices for Space Flight Participant Occupant Safety and provide any observations, finding, or recommendations to this document.

Research possible frameworks that use industry consensus standards as a means of compliance for performance-based safety requirements and provide recommendations on how the commercial space industry might use similar frameworks.

Proposed Spring 2024 Taskers

Research & Development Working Group:
Research options on Commercial Space Transportation standing up a Research Alliance made up of government, industry, and academia, to foster R&D. This would be a follow up to the Commercial Space Transportation Center of Excellence and provide a recommended path to implement that includes potential funding, structure, and governance.

Innovation & Infrastructure Working Group:
Evaluate space transportation infrastructure funding options and assist in the implementation of the most promising approach. Background: in its report to Congress in December 2020 (GAO-21-154), the GAO encouraged the FAA to examine a range of potential options to support space transportation infrastructure, noting that the FAA had focused on only two existing programs, rather than a range of options, because of limited time and resources.

Public Comment

Closing Remarks