



Commercial Space Transportation Advisory Committee (COMSTAC) Meeting

June 14, 2018



Federal Aviation
Administration

Today's Discussion Topics

- 1. Necessary facilities covered by a site operator's license.**
- 2. Reporting safety-related anomalies.**
- 3. Streamlining internal AST processes.**
- 4. Acceptable Level of Risk (ALR) briefing.**
- 5. Outer Space Treaty compliance.**

NECESSARY FACILITIES COVERED BY A SITE LICENSE

What are the necessary facilities that should be covered by a site operator's license i.e. how much regulatory authority should AST have over facilities and operations within the boundaries of a launch or reentry site that are unrelated to preparing a launch or reentry vehicle for space flight? If none, how should these situations be handled?

REPORTING SAFETY-RELATED ANOMALIES

Should criteria exist requiring industry to report safety-related anomalies? If so, how would proprietary data be protected?

STREAMLINING INTERNAL AST PROCESSES

What are industry best practices that AST may consider adopting in order to complement the ongoing regulatory reform efforts? What industry processes might AST want to tie-in to its own internal processes in order to streamline licensing activities?

ACCEPTABLE LEVEL OF RISK (ALR) BRIEFING

FAA established the Acceptable Level of Risk (ALR) approach to bridge between the established aviation and space risk-calculation frameworks and to safely accommodate the growth of commercial space launches in the NAS.

OUTER SPACE TREATY COMPLIANCE

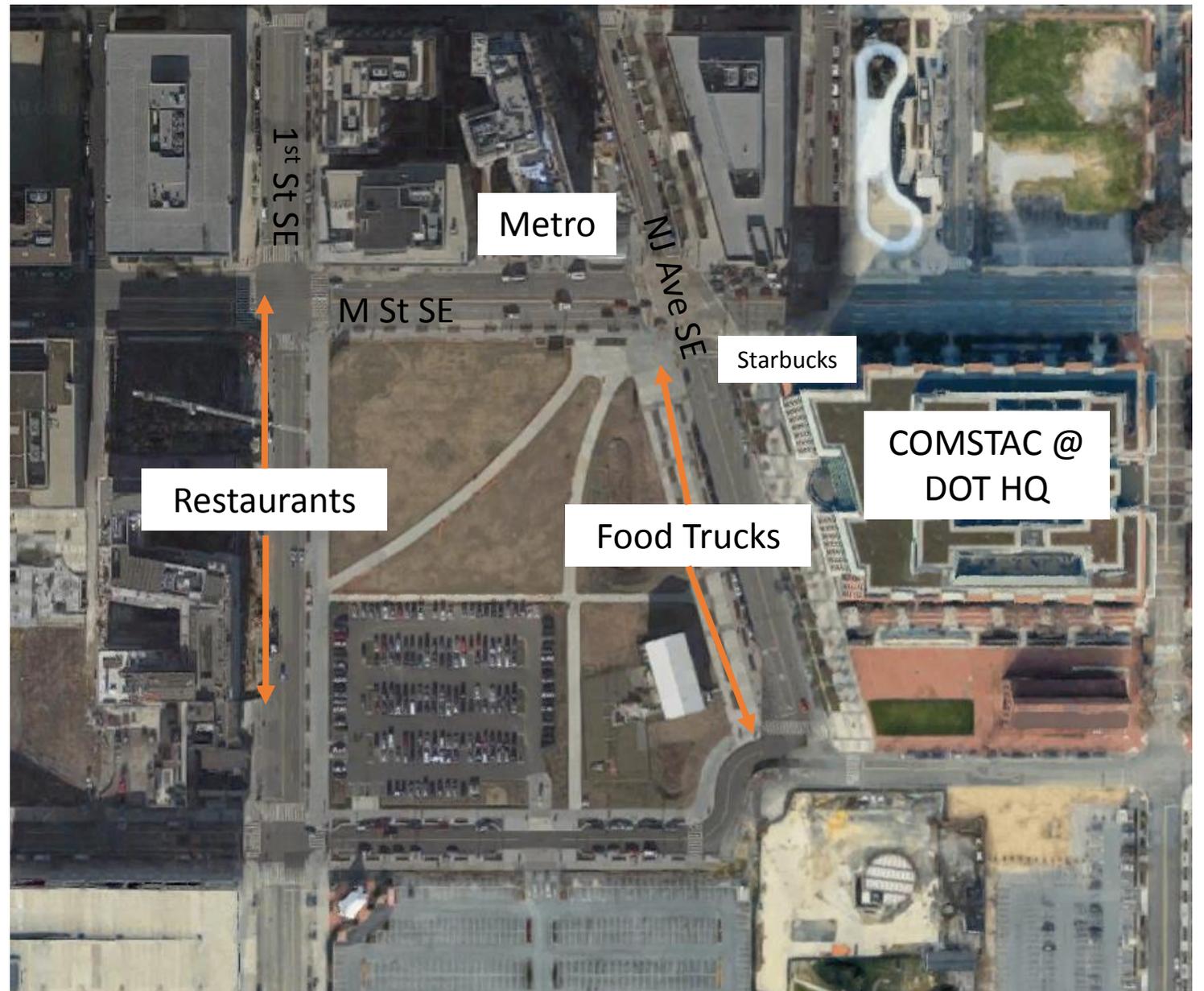
How can the United States best meet its Article VI Outer Space Treaty obligations as it regulates the commercial space transportation industry? What does implementing 'continuing supervision' mean to the industry? How will Article VI compliance work in practice?

PUBLIC COMMENT SESSION

Background Slides

Map of Nearby Eateries

Note: You will have to pass through security to reenter the building.





Background on

**The Commercial Space
Transportation Advisory
Committee
(COMSTAC)**

Work Plan and Taskers

Prepared for:
COMSTAC

June 14, 2018



**Federal Aviation
Administration**

Overview

FAA/AST has a need for industry feedback on a number of topics.

Hence, in addition to the Committee's items, FAA/AST suggested a number of questions for COMSTAC.

This presentation discusses the most pressing, near-term requests for feedback. Medium and long-term taskers are described at the end of this packet.

Near-term Work Plan for COMSTAC

Responses are needed on these questions before end of 2018

1. Necessary facilities covered by a site operator's license?
2. Automating/streamlining licensing and inspection?
3. Criteria to report safety-related anomalies beyond what regulations require?
4. Acceptable Level of Risk (ALR) briefing.
5. Outer Space Treaty compliance feedback.

Necessary Facilities

What are the necessary facilities that should be covered by a site operator's license i.e. how much regulatory authority should AST have over facilities and operations within the boundaries of a launch or reentry site that are unrelated to preparing a launch or reentry vehicle for space flight? If none, how should these situations be handled?

Some licensed launch/reentry sites have facilities within the site boundaries that may not be related to spaceflight.

Should a launch or reentry site operator be responsible for:

- Conducting an analysis of the environmental impacts associated with unrelated facilities and operations;
- Following quantity-distance criteria or providing an explosive site plan for locations on the launch or reentry site with only unrelated facilities and where only unrelated operations take place;
- Preventing unauthorized access to locations on the launch or reentry site with only unrelated facilities and where only unrelated operations take place;
- Notifying safety rules and emergency and evacuation procedures to anyone entering locations on the launch or reentry site with only unrelated facilities and where only unrelated operations take place;
- Scheduling unrelated operations, unless they impact the safe preparation of a launch or reentry vehicle for flight, or the return of a launch or reentry vehicle to a safe condition on the ground after landing; and
- Reporting, responding to, or investigating unplanned events occurring during unrelated activities resulting in a fatality or serious injury to any person who is not associated with the activity, or any damage estimated to exceed \$25,000 to property not associated with the activity.

Automating Licensing & Inspection

Is industry aware of any turn-key, commercially-available products that AST can use to quickly automate or streamline portions of the licensing and/or inspection process?

With the exception of some portions of the flight safety analysis, most of an AST license or permit evaluation is done manually. That is, each document is read by a human being and analyzed on a case-by-case basis via extensive discussions with the company. This is a very resource and time intensive process that will become untenable as AST's licensing workload increases. While AST is actively exploring ways to expedite both licensing and inspection we seek industry's ideas, best practices and other suggestions on how to facilitate its internal processes.

We specifically seek turn-key, commercial off-the-shelf products or services that might be quickly integrated into the licensing and inspection processes. We do not seek consulting services to analyze our processes.

Reporting Safety Anomalies

Should criteria exist requiring industry to publicly report safety-related anomalies? If so, how would proprietary data be protected?

Currently, AST-regulated companies are not required to disclose safety-related anomalies if they do not reach the threshold of an incident or a mishap. A company that experiences and corrects a safety-related anomaly will learn a valuable lesson but, under the current framework, that lesson is unlikely to be shared across the industry.

AST seeks COMSTAC's feedback on if safety-related lessons should be shared industry-wide. If so, how that can be done: through regulation? Through a type of [voluntary safety reporting program](#) that has proven so effective in the aviation industry?

Challenges on next slide...

Reporting Safety Anomalies

Several challenges will need to be addressed in order to implement such a program:

- i.** De-identification and protection of proprietary data. While the numbers of commercial space operators and operations conducted in the nascent space transportation industry remain low, it will be difficult to implement a data-sharing program that adequately preserves the anonymity of reporting operators;
- ii.** Creating a non-punitive environment for voluntary disclosure of safety information. As was the case with commercial aviation, legislative protections may be required to fully implement the non-punitive environment needed to support this type of program and the sharing of this type of information with the FAA and others in the industry; and
- iii.** Ensuring the availability of data mining and analysis tools to proactively identify emerging safety issues and lessons learned.

Acceptable Level of Risk (ALR)

The increasing frequency and complexity of commercial space operations, including flying back first stage boosters to barges and land, has prompted the FAA to review how it protects aircraft and passengers in the vicinity of space operations.

Because of the differences in terminology and the underlying assumptions for safety risk calculations, it is not possible or appropriate to directly compare the numerical risk values from the FAA's air traffic and commercial space standards.

The FAA conducted extensive work to “translate” between the two schemes. While the work showed that the two sets of standards are not as different as they may appear numerically, it was not possible to fully reconcile the differences.

Instead the FAA developed the Acceptable Level of Risk (ALR) approach to bridge between the established aviation and space frameworks and to safely accommodate the growth of commercial space launches in the NAS.

Acceptable Level of Risk (ALR)

ALR uses a time-tested collective risk approach that limits overall aircraft exposure on a rolling 12-month basis.

The FAA completed its evaluation of ALR and its application to launches with “flybacks” to barges and land and has adopted its use for these missions. With the successful conclusion of that work, the FAA is currently evaluating the application of ALR to the full range of known launch and reentry operations.

The FAA anticipates that it will need to apply ALR to launch and reentry operations until NAS infrastructure, policies, and procedures are modified to integrate such missions. This infrastructure includes technologies such as the Space Data Integrator and the Hazard Risk Assessment Management capabilities that support more automated and dynamic airspace management.

In the meantime, the FAA will actively monitor conditions to ensure that the public safety risk limits associated with ALR are met and remain applicable given the increasing frequency and complexity of commercial space operations.

FAA/AST seeks to inform the commercial space transportation industry of ALR as it is rolled out across the NAS.

Outer Space Treaty Compliance

How can the United States best meet its Article VI Outer Space Treaty obligations as it regulates the commercial space transportation industry? What does implementing 'continuing supervision' mean to the industry? How will Article VI compliance work in practice?

The United States, as a signatory to the Outer Space Treaty, is required to provide authorization and continuing supervision of space activities that launch from its territory. Continuing supervision is not defined by the Treaty or by the US Congress. Furthermore, clarifications are required to permanently assign continuing supervision responsibility for non-traditional commercial space activities.

This lack of clarity in regard to Article VI increases uncertainty and dampens investment opportunities for companies seeking to establish new businesses in outer space. Indeed, plans for new commercial activities in space (e.g. satellite servicing, resource utilization, tourism, manufacturing, etc.) are proliferating. AST seeks COMSTAC feedback on industry's ideal situation for ensuring their activities are in compliance with US treaty obligations.

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?