COMSTAC Human Space Flight Working Group
Report to Congress: U.S. Department of Transportation Evaluation of Commercial Human Space Flight Activities Most Appropriate for New Safety Framework

July 11, 2023

Background

The Commercial Space Transportation Advisory Committee (COMSTAC) was tasked with reviewing and providing comment to the Federal Aviation Administration's draft "Report to Congress: U.S. Department of Transportation Evaluation of Commercial Human Space Flight Activities Most Appropriate for New Safety Framework." This report was drafted to fulfill the Secretary of Transportation's requirement under 51 U.S.C. § 50905(c)(7) to submit a report to Congress by March 31, 2022, that identifies the commercial human space flight (HSF) activities described in 51 USC § 50905(c) and (d) most appropriate for a new safety framework. Included in the statute is a requirement that the Secretary coordinate and consult with the commercial space sector, including COMSTAC.

Through enactment of the Commercial Space Launch Amendments Act of 2004, Congress established a "learning period" for commercial human space flight activities which prohibited the Secretary, absent death, serious injury, or an unplanned event during launch or reentry that posed a high risk of causing a serious or fatal injury, from promulgating any regulations governing the design or operation of a launch vehicle intended to protect the health and safety of crew and space flight participants until the year 2012. Congress has extended the learning period twice, with it currently set to expire on October 1, 2023, absent additional Congressional action. Notably, the Secretary of Transportation is not required to promulgate regulations upon the expiration of the learning period or make any deviations from the current safety framework.

The FAA tasked COMSTAC with reviewing and providing comment to the FAA's draft "Report to Congress: U.S. Department of Transportation Evaluation of Commercial Human Space Flight Activities Most Appropriate for New Safety Framework." This document provides COMSTAC's observations on the report as well as formal recommendations adopted unanimously by COMSTAC members.

Observations

The following comments reflect the observations from various COMSTAC members on the draft "Report to Congress: U.S. Department of Transportation Evaluation of Commercial Human Space Flight Activities Most Appropriate for New Safety Framework."

1. COMSTAC does not have consensus agreement on the draft report as written.

The report characterizes the FAA and industry as "ready to develop and transition a new safety framework," but does not provide the metrics or methodologies used by the FAA to make

that determination. Though the commercial human space flight (HSF) industry continues to grow in maturity and consistency, only three commercial operators have conducted HSF operations and HSF missions remain infrequent. Each of the three commercial operators have vehicle designs which are dissimilar to the others. As a result, FAA and industry data on HSF missions remains limited and based on few and dissimilar vehicle designs operated at an infrequent and irregular cadence. The commercial HSF operators serving on COMSTAC, which comprise the totality of current U.S. commercial HSF operators, unanimously agree that the learning period is crucial to supporting a robust and safe HSF industry.

COMSTAC members unanimously agree that operating HSF missions under a safety framework built around informed consent for space flight participants has enabled rapid growth and innovation in the industry. Until commercial HSF missions are routine and the flight rates become substantial, which could take decades, informed consent remains a critical aspect of the regulatory regime for commercial human spaceflight, and one of industry's top priorities for a HSF safety framework.

2. **The report should clarify which metrics and indicators are being used to determine the readiness levels of the FAA and industry.**

The report provides a discussion on which indicators are used by the FAA to determine the readiness of the agency and the commercial space transportation industry to develop and transition to a new framework for the safety of human space flight. As noted in the draft, the indicators are not associated with specific and measurable metrics but are intended to act as guides to "indicate when a framework should be established." It is unclear as to how these indicators are understood and measured by the FAA, or which milestones must be achieved to indicate higher readiness levels. As such, the FAA should better define these elements. The report describes a small, low-volume industry that features a range of dissimilar architectures and serves primarily commercial astronauts. Industry standards continue to be developed. Without clarity on how these indicators are measured and assessed, it is impossible to verify the FAA's assertions of the readiness levels of the agency and industry to develop and transition to a new safety framework.

3. **The U.S. Department of Transportation (DOT) should continue to collaborate with industry and COMSTAC in determining its next steps.**

The report lists multiple activities relating to human space flight safety frameworks that are either planned or underway, including:

a. Ongoing development of industry voluntary standards;
b. Updating and publishing the 2014 *Recommended Practices for Human Space Flight Occupant Safety* document; and
c. Chartering a Human Space Flight Aerospace Rulemaking Committee (SpARC).

The DOT and FAA should coordinate with COMSTAC and industry partners to establish the scope and intent of each of these activities.

COMSTAC supports the ongoing development of industry consensus standards and encourages participation in those efforts. The FAA should consider incentives for operators to participate in industry voluntary standards and ensure that the agency devotes sufficient resources to enable such activities, while ensuring that sufficient resources remain available for its primary launch and reentry licensing functions. Further discussion of how the FAA can assist in developing voluntary consensus standards is needed. Additional activities should be informed by those efforts.

The report implies that the update of the *Recommended Practices for Human Space Flight Occupant Safety* document is expected in 2023. The FAA should provide a draft of the updated document for review and comment by COMSTAC prior to the document being published to ensure that industry feedback is incorporated into the final document. Similarly, the FAA should collaborate with COMSTAC and industry in scoping the activities of an HSF SpARC, determining who will participate in the SpARC, and setting the timeline for the SpARC's activities.

4. **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.**

COMSTAC understands that the FAA is currently operating in a limited resource environment with regards to both funding and personnel. Under current resource levels, the FAA has experienced a backlog of launch and reentry licensing applications requiring agency approval, and that situation will likely worsen as demand for licensing increases in the coming years. The FAA must prioritize an efficient and consistent throughput of licensing determinations to minimize impact to commercial space launch and reentry operations.

The FAA should seek additional resources to the agency's current activities as well as any future activities relating to HSF. Any FAA HSF activities should not negatively impact the agency's licensing duties or other current statutorily-authorized activities. The FAA should instead ensure that it maintains adequate resourcing for its current obligations and seek additional funding for any future activities relating to HSF.

Recommendations

The following recommendations are provided to FAA AST by the members of the COMSTAC. They were unanimously approved by voice vote during the May 15, 2023, COMSTAC meeting.

1. The FAA should detail how it analyzes the readiness indicators outlined in the report and provide more thorough substantiation of the agency's findings regarding the industry's readiness to implement.
2. The FAA should continue to encourage current efforts to develop industry consensus standards through the devotion of resources and incentives for operators to participate.

3. The FAA should prioritize updating the 2014 *Recommended Practices for Human Space Flight Occupant Safety* document, including COMSTAC review, prior to taking further action.
4. The FAA should continue collaboration with COMSTAC and industry partners to determine the HSF SpARC's scope, participants, and pace.
5. Should additional activity be required with respect to HSF, the FAA should seek additional resources.
6. 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.