U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Airports Safety
and Standards

800 Independence Ave., S.W.
Washington, DC 20591

December 30, 2024

Subject: Emerging Entrants Bulletin 25-01, Rocket Engine Testing on Federally Obligated Airports

Dear National Plan of Integrated Airport Systems (NPIAS) Airport Sponsors:

The aerospace industry is experiencing expedited growth in developing and testing new launch vehicles. The Federal Aviation Administration (FAA) anticipates increasing interest in the development of rocket engine testing infrastructure on federally obligated airports. There are currently no industry standards for rocket engine testing on airports. However, like other on-airport development, an airport sponsor must properly plan for the rocket engine testing infrastructure, support equipment, propellant storage (including haul routes), and operations while ensuring compliance with its federal obligations.

An airport sponsor interested in conducting rocket engine testing on its airport needs to submit an updated Airport Layout Plan (ALP) for FAA approval with a narrative report to supplement the ALP update. Rocket engine testing may be associated with commercial space development, may adversely affect the safety of people and property, and may materially impact the safe and efficient operation of aircraft. FAA Office of Commercial Space Transportation (AST) does not license static rocket engine testing operations, but may license or permit tethered or other experimental flights. AST encourages consultation of 14 CFR 400.2. The FAA retains ALP approval authority for any type of rocket engine testing performed on the airport. FAA approval of the ALP is a major federal action that will trigger a National Environmental Policy Act (NEPA) review for the project. The airport sponsor must ensure compliance with NEPA and depiction of the relevant facilities on the FAA-approved ALP prior to any construction or operation.

Items to Consider for ALP update with Narrative Report

The airport sponsor should coordinate with the proposed rocket engine testing operator to obtain the information needed to answer the questions listed below in an ALP update with narrative report.

1. What type of testing will the facility support?
    - **Static Testing:** Rocket engines are fired at partial or full thrust while fixed to a test stand or mount that prevents the rocket or engine from moving while remaining on the ground. These tests can be completed in a vertical or horizontal orientation.
    - **Tethered Testing:** Rocket engines are fired at partial or full thrust and are allowed to move while on a tether to the ground, crane, or other piece of equipment restricting rocket movement within the test area.
    - **Other Testing:** May involve experimental test flight in which the vehicle or parts of the vehicle leave the ground reaching relatively low altitude within a test area with appropriate clear zone(s) and safety controls in-place. An example is a “hop” test where the rocket/engine and associated vehicle parts hop up from one location and land either in the same location or another within the test area.

2. Is the testing considered aeronautical or non-aeronautical and what does the ALP currently reflect as planned use for subject property?
    - Aeronautical and non-aeronautical activities cannot displace or impact existing or planned aeronautical activities at the airport.
    - Generally, rocket engine testing is considered non-aeronautical unless associated with final assembly of an aircraft or commercial space vehicle.[1] Therefore, non-aeronautical testing must occur on airport property identified by the sponsor for non-aeronautical use on the ALP, but an airport sponsor has no obligation to accommodate any non-aeronautical activities. Table 1 below addresses land release or change in use if a proposed testing location is currently designated for aeronautical use on the approved ALP.
    - If the rocket testing is considered aeronautical, the testing facility needs to be designed and integrated with existing aeronautical activities.
3. What is the siting, design, construction, safety, and operational plans for the testing facility?
    - The current versions of National Aeronautics and Space Administration (NASA) STD-8719.12, *Safety Standards for Explosives, Propellants, and Pyrotechnics*; 14 CFR 420.63-70, Explosive Siting; and Department of Defense (DoD) Manual 4145.26, *DOD Contractor's Safety Manual for Ammunition and Explosives,* are commonly referenced for test stand facilities and explosives, but there may be other guidance the responsible design professional determines are applicable. Please explain why a particular standard was chosen.
        - *Note:* The Office of Airports (ARP) may request that a Safety Risk Management Panel (SRMP) be convened in accordance with the current version of FAA Order 5200.11, *FAA Airports (ARP) Safety Management System,* to provide a thorough examination of hazards and risks associated with the specific conditions associated with the proposed testing.
    - Calculated hazard distances/areas such as, but not limited to, engine blast, worse-case fragment distance, and quantity distance based on propellant will be included in the narrative report and reflected on the ALP. Propellant haul routes and storage location(s) must also be considered and shown. Structures, aircraft aprons, auto parking lots, Navigational Aids (NAVAIDs) including critical areas, Runway and Taxiway Object Free Areas, Runway Safety Areas, and runway approach/departure surfaces (see Title 14 Code of Federal Regulations (CFR) §77.19(d) and the latest version of Advisory Circular 150/5300-13, *Airport Design*) must be outside all calculated hazard areas.
4. What type of rocket/propellant/thrust can the facility support and what is the duration/frequency of planned testing (i.e. 10 seconds once per week during daytime hours)? Are any noise or vibration impacts anticipated on nearby structures, NAVAIDs, etc.?
5. What is the maximum exhaust plume? Exhaust plumes can potentially create electromagnetic interference to NAVAIDs and pick up dust/dirt potentially obstructing Airport Traffic Control Tower (ATCT) line of sight. Dust/dirt can also affect certain sensors in weather observation systems.
6. Engine blast can create Foreign Object Debris (FOD) and/or negatively impact existing structures/facilities. Horizontal engine configuration may have the most impact potential. Similar

[1] Included in Proposed Policy on the Definition of Aeronautical Activities (FR Doc. 2023-25198) (Docket No. FAA-2023-1739)

to jet blast considerations on airfields, is there a need for an earthen berm or blast fence to protect existing structures/facilities (i.e. NAVAIDs, hangars, fences, roadways, etc.)?

7. If applicable at the airport, what is the plan for coordination with the ATCT or responsible air traffic facility?
8. What is the plan and need for firefighting personnel support prior to testing?
9. If located at a 14 CFR Part 139 certificated airport, how will this operation impact the Airport Certification Manual (ACM), Airport Emergency Plan (AEP), Safety Management System (SMS) manual (if applicable), and any other documents required for the airport to maintain Part 139 compliance?
10. Will other airport users be impacted or will flight operations be disrupted in any way during testing?
11. What are the potential environmental impacts?
    - This is intended to be a cursory review of potential impacts.
    - FAA staff will give detailed guidance on what the airport will need to analyze in the NEPA document once the review of the ALP and narrative report are completed.

Next Steps

Prior to construction of a rocket engine testing facility, airports will need to address all items listed in Table 1. This list should not be considered comprehensive as the FAA may request/require other items, terms, or conditions it deems necessary to avoid impacting existing or planned aeronautical activities and ensure an acceptable level of safety.

Your Office of Airports Regional Office (RO) or local Airports District Office (ADO) continues to be the point of contact for ALP updates, Environmental Determinations, and Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) airspace evaluations. Other technical questions about rocket engine testing on airports can be submitted to: 9-ARP-CommercialSpace-OnAirport@faa.gov

Table 1. List of Action Items for Safe Integration of On-Airport Rocket Engine Testing Facilities

Action Items (in recommended order)	Applicability to Planned Testing Type
Coordinate with the FAA Airports Emerging Entrants Division (AAS-200) through ADO/RO (See Note 1)	Applies to all testing
Update ALP with Narrative Report (See Note 2)	Applies to all testing
Conduct Safety Risk Management Panel (SRMP)	See Note 3
Ensure environmental due diligence to satisfy NEPA	Applies to all testing
Consider disposal of land and/or change in land use	See Note 4
Submit on-airport airspace cases in OE/AAA for evaluation (See Note 5)	Applies to all testing
Develop a Construction Safety and Phasing Plan (CSPP) for FAA review and coordination in OE/AAA	See Note 6
Update Airport Certification Manual (ACM) and Airport Emergency Plan (AEP) if a certificated Part 139 airport (See Note 7)	Applies to all testing
Obtain a Certificate of Authorization (CoA)	See Note 8. Does not apply to Static testing.
Increase awareness with training (See Note 9)	Applies to all testing

Table Notes:

1 The airport should first coordinate with its local ADO or RO (if there is no ADO). The ADO/RO will coordinate with AAS-200, which will request FAA Office of Commercial Space Transportation (AST) review of the proposal as appropriate. Again, AST does not license static rocket engine testing operations but may license or permit tethered or other experimental flights. AST encourages consultation of 14 CFR 400.2.

2 The ALP should reflect these items:

- The location and size/dimensions of the test stand/test cell/structure and other supporting improvements,
- The pad (if pad only with no vertical improvements), should be reflected on the ALP.
- Anticipated engine blast contours (show blast fence if needed),
- Fragment distance based on worse-case engine explosion during testing,
- Safe distance based on worse-case propellant storage explosion,
- Dimensions to other structures or NAVAIDs on the airport, and
- Propellant storage and disposal/venting areas with haul routes to/from these areas (if applicable)

3 Depending on the circumstances (type of vehicle, test activity, airport geometry, safety processes or lack thereof, OE/AAA review comments, etc.) and in addition to, or as part of, its existing processes, the FAA may require an SRMP as part of its review and approval process. The FAA may consider an airport/proponent's safety management submissions as part of the proposal and may request such assessment at any point in the process.

4 Depending on site-specific details including whether the land will be leased or sold; how land was purchased (federally conveyed or with federal funds) and for what purpose (if for noise abatement, rocket engine testing may be challenging); whether the land use is aeronautical, airport purpose, non-aeronautical, or mixed use; etc. If the airport sponsor is selling federally acquired or conveyed land, then they should coordinate with the local RO/ADO and follow Chapter 22 of the current FAA Order 5190.6, *Airport Compliance Manual*, for actions to request release from federal obligations. If the airport sponsor is leasing federally acquired or conveyed land, then they should coordinate with the local RO/ADO and follow the FAA's policy for land use changes (88 Fed. Reg. 85474, December 8, 2023) as updated. If the airport sponsor plans to enter into a non-aeronautical lease agreement with the rocket engine testing entity, the FAA strongly recommends the airport sponsor submit the lease agreement for review by an FAA compliance specialist.

5 Any permanent structures planned to support the testing, including any construction equipment, need to be evaluated for potential impacts to air navigation in OE/AAA. See current AC 150/5300-20, *Submission of On-Airport Proposals for Aeronautical Study,* for guidance on submitting on-airport airspace cases.

6 The FAA recommends developing and submitting a CSPP for FAA review to help an airport maintain operational safety during construction, but CSPP development and FAA review are not required for non-federally funded projects (i.e. those using airport revenue or Passenger Facility Charge (PFC) funds). At Part 139 certificated airports, preparation of a CSPP represents an acceptable method to meet Part 139 requirements during airfield construction for non-federally funded projects. See current AC 150/5370-2, *Operational Safety on Airports During Construction,* for CSPP related guidance.

7 In addition to completing updates to the ACM and AEP, the airport sponsor should coordinate with their assigned Part 139 inspector to update any other applicable documents to maintain Part 139 certification compliance such as but not limited to the Safety Management System Manual, if applicable.

8 If tethered testing is planned, it is unlikely a Certificate of Authorization (CoA) will be required. If experimental flight or "hop" testing is planned to operate under 14 CFR Part 101, Moored Balloons, Kites, Amateur Rockets, and Unmanned Free Balloons, as a Class 2 or 3 rocket, the airport should notify the rocket engine operator they need to obtain a fully executed CoA (FAA Form 7711-1) from the appropriate FAA Air Traffic Organization (ATO) Service Center. Note: CoA only addresses waiver of the 14 CFR 101 regulation. Other airport-specific regulations must be met prior to the start of any testing operations.

9 Develop and provide rocket engine testing training to increase awareness for people with an operational need to be in or near the testing area (e.g. airport operations/maintenance staff, ARFF personnel, construction contractors, etc.).

Sincerely,

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