Federal Aviation Administration
Air Traffic Organization
(FAA ATO)

Low Altitude Authorization and Notification Capability (LAANC)

USS Performance Rules

Version 5.0

05 February 2021

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Revision History

Version	Description	Date
1.0	First complete release	6/16/2017
1.1	Major update based on internal and external review	9/18/2017
1.2	Update per prototype evaluation feedback	2/26/2018
1.3	Update following first open onboarding period	12/14/2018
1.4	Removed rule deferrals due to combined on-boarding sessions in 2019	2/11/2019
1.5	Update for 2020 1st onboarding session; Changed the name of the document [“Operating” → “Performance”]	12/03/2019
4.0	Rename version number; new rules (incl. DPP/Attachment E), clarifications (3.2.2i link and ex; 3.4.3; auth text operator; 3.7; updates (3.9.5c; Attachment A); re-ordered Section 3.9; editorial changes	2/12/2020
4.1	Section 3.2.2: Correct 3.2.2i hyperlink; Section 3.7: Update filtering rules; Sections 1.3, 3.2.2: grammar corrections	4/17/2020
5.0	Update for 2021 USS implementation and onboarding	2/5/2021

Explanation of Changes

Version 5.0 keeps intact the content and basic framework of the LAANC system and how a LAANC USS will interact with the FAA. However, changes were made including issuing new rules, and clarifying items. USSs are required to comply with all rule provisions contained in these Performance Rules. Therefore, due to the nature of the changes, all USSs should review this document carefully to ensure awareness and understanding of all provisions set forth.

Functional Performance Rule changes between Version 4.1 and 5.0 primarily relate to the following:

- New rule for Further Coordination denial.
- New rule for Part 107 Operations at night.
- Modification to existing rule for Civil Twilight.
- Modification to existing rules and a new rule for Reasonable Filtering.
- New rule for the destruction of LAANC data.

To assist existing USSs and potential applicants, the cross-reference table below shows what rules have been changed, adjusted, issued, or removed from the last version. The following chart is not meant to be dispositive. The LAANC USS Performance Rules v5.0 takes precedence to the extent there are any discrepancies between the below chart and the enumerated rules.

Previous Rule Number or Section	New Rule Number or Section	Change Summary
2	–	Editorial change
3.2.1a	–	Editorial change
3.2.2a	–	Modification
3.2.2	–	New supporting text (for Rule [3.2.2l])
3.3.1	–	Removed obsolete supporting text (for Rule [3.3.1a])
–	**3.4.2g**	New Rule
3.4.3	–	New supporting text (for Rule [3.4.3b])
3.4.4 (Table 2)	–	Editorial change; Modification
–	**3.4.4g**	New Rule
3.4.4g	3.4.4h	Rule Moved; Modification
3.4.4h	3.4.4i	Rule Moved
3.4.4i	3.4.4j	Rule Moved
3.4.4j	3.4.4k	Rule Moved; Modification
3.4.4k	3.4.4l	Rule Moved
3.4.4l	3.4.4m	Rule Moved

Previous Rule Number or Section	New Rule Number or Section	Change Summary
3.4.4m	3.4.4n	Rule Moved
3.4.5	–	New supporting text (for Rule [3.4.5a])
3.4.10d	–	Editorial change; New supporting text
3.5a	–	Modification
3.7b	–	Clarification
3.7c	–	Modification; New supporting text
3.7d	**3.7e**	Rule Moved; New Rule
3.7e	3.7d	Rule Moved; Modification; New supporting text
3.8a	–	Clarification
3.9.3	–	Editorial change
–	**3.10b**	New Rule
Attachment A	–	Modification
Attachment B	–	Modification
Attachment C	–	Clarification
Attachment D	–	Modification

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1 Introduction

1.1 Background

The FAA's challenge is to foster equitable airspace access while ensuring that critical Air Traffic technical and safety requirements are met for operations in the National Airspace System (NAS). In addition, the FAA seeks to foster an environment for providers of Unmanned Aircraft Systems (UAS) and related services. With the fast pace of small UAS (sUAS) operators entering the market, automation is critical to support the growing demand and to ensure safe and efficient NAS operations.

The FAA developed LAANC to provide sUAS operators an automated, streamlined, and efficient solution to receive airspace authorizations from Air Traffic. LAANC provides near real-time processing of airspace authorizations including automatic approval of requests that are below approved altitudes in controlled airspace. LAANC uses a data exchange framework with UAS Service Suppliers (USSs) to provide quick access to controlled airspace for sUAS operators. This quick access is expected to increase and encourage regulatory compliance. From an Air Traffic perspective, the development of LAANC promotes safe and efficient flight services of sUAS in the NAS.

1.2 Purpose

This document identifies performance rules for non-government organizations that participate in LAANC as USSs. USSs enter into an agreement with the FAA to act as an intermediary between sUAS operators (e.g., remote pilots) and the FAA's LAANC system interface. The FAA provides the ability to incorporate LAANC access into USS service offerings, and USSs provide operator access and validation of operational submissions concerning authorization. LAANC supports innovative USS business models to individual operators and understands other services beyond LAANC might be offered. These Performance Rules are directed at the provision and management of sUAS operators' airspace authorization requests to Air Traffic.

1.3 Scope

The scope of this document encompasses current LAANC capabilities, including:

- support for automatically approved authorizations using altitude maps established by the FAA around airport facilities,
- mechanism for "Further Coordination (FC)*" of 14 CFR Part 107 ("Part 107") authorizations that cannot be approved automatically,
- management of which facilities are available via LAANC and their associated airspace boundaries,
- providing sUAS operations information to Air Traffic personnel, and
- operations and maintenance functions (e.g., status and metrics, outages, etc.).

[*] "Further Coordination" are those operations where the operator requests to fly at an altitude that is above the prescribed set limit of the UASFM, but still no higher than 400 feet. For example, if an operator wants to fly up to 250 feet and the prescribed limit is 200 feet, a "Further Coordination" request can be made and sent to Air Traffic for manual approval or denial. Further coordination is only available to 14 CFR Part 107 operations.

Applications for waiver under 14 CFR Part 107, including waivers to permit multiple sUAS with a single controller (swarms), are not currently supported by LAANC.

This document establishes performance rules for USSs. Other aspects of LAANC, such as the technical details of the interface between USSs and the FAA and the design of FAA LAANC systems, are not discussed herein.

The term, “Operator”, is used throughout the LAANC USS Performance Rules. Operator refers to the individual who is responsible for the sUAS flight. Under 14 CFR Part 107, the remote pilot in command is the person responsible for the flight. To avoid duplicative rules that only differ between referring to the remote pilot in command [under 14 CFR Part 107] and operator [under 49 U.S.C. § 44809], the single term operator is used throughout the LAANC USS Performance Rules to refer to the individual who bears responsibility for the UAS flight. Exceptions to this convention may be made in cases where there is a direct link to regulatory language.

2 Referenced Sources

FAA ATO, *Low Altitude Authorization and Notification Capability (LAANC) Concept of Operations*, current version.

FAA ATO, *USS-FAA LAANC API Specification*, current version.

14 CFR Part 107, *Small Unmanned Aircraft Systems*.

14 CFR Part 99.7, *Special Security Instructions*.

FAA Form 7711-1, *UAS COA*.

49 U.S.C. § 44809 (Sec. 349, FAA Reauthorization Act of 2018 (P.L. 115-254)), *Exception for limited recreational operations of unmanned aircraft*.

Advisory Circular (AC) 00-45, *Aviation Weather Services*, current version.

3 LAANC USS Performance Rules

This section documents the performance rules that each USS is required to follow. The rules identified here only minimally define USS behavior. Further processes, features, and capabilities are up to each USS to determine as they develop their unique service offerings. Rules are identified in brackets with a letter appended to the document section number (in bold text), for example **[1.2.3a]**, **[1.2.3b]**, etc.; the Rule identification numbers are prepended to the sentence of each respective Rule statement. Restatements and clarifications of rules are not given a new identifier.

There are several types of sUAS operations that USSs may handle as a participant in LAANC. It is essential that USSs accurately understand what operations comply (without a waiver) with statutory and regulatory requirements, including: operation type, time of day, location, and maximum altitude. Potential sUAS operations handled by USSs fall into two categories:

(1) Require authorization, but can be automatically approved (e.g., based on UAS Facility Maps – UASFMs), or

(2) require authorization through Further Coordination.

The performance rules defined here are designed around corresponding LAANC operation types.

3.1 Operator Access to LAANC

[3.1a] The USS must manage sUAS authorizations as a service to operators. **[3.1b]** The USS must manage users using individual accounts (requiring a login) and reasonably secure identification mechanisms (e.g., usernames/passwords, biometric, etc.).

LAANC is designed for the operator to be the one logging into the USS application, submitting authorization requests, and managing all authorization requests. It is recognized, however, that some entities may have an individual [who is not the operator] responsible for logging into the USS application and who is both submitting and managing authorization requests. Regardless of how an authorization request is submitted and managed, note that:

(a) All authorization data must be correct on submission, including operator name and operator phone number for contact during the flight, and

(b) the operator may be contacted through automated means (e.g., email, etc.) with changes such as rescinded authorizations.

[3.1c] The USS must make the following statement available to users in a manner appropriate to its application designs: "[*USS Name*] is a provider of UAS services within the FAA's Low-Altitude Authorization and Notification Capability (LAANC). LAANC may be used to satisfy compliance with Air Traffic authorization. Information provided here is based on real-time and available projected information on airspace status and airport-specific maps, and that information is subject to change. Planning tools should be checked prior to flight for any changes that could impact the operation."

[3.1d] The USS must provide the operators with the hyperlink to the FAA Privacy Statement notifying them that the FAA has issued a Privacy Statement regarding information collected

within LAANC. The Privacy Statement is located at: https://www.faa.gov/uas/programs_partnerships/uas_data_exchange/privacy_statement/.

3.2 USS Access to FAA Systems and Information

3.2.1 API-Based Interface Between USS and FAA

LAANC incorporates an FAA system and USS system portions, linked by an Application Programming Interface (API). **[3.2.1a]** The USS must conform to the *USS-FAA LAANC API Specification* version in effect. The includes details on connecting to the FAA's LAANC system via the Internet. The FAA provides the *USS-FAA LAANC API Specification* to USSs as part of the LAANC onboarding process. Attachment A– USS-FAA High-Level Exchange Model" provides an overview of the major data items transferred over the APIs. USS-FAA information transmission is bidirectional and secure. As part of *USS-FAA LAANC API Specification* compliance, the USS must implement and maintain the interface capabilities defined by the *USS-FAA LAANC API Specification*, including the ability to receive secure real-time messages from the FAA.

3.2.2 Required Authoritative Sources of LAANC Geospatial Information

To ensure operators have the most complete and current information, the USS must use the listed source for each geospatial item below. Note that each row is an enumerated rule.

Table 1: Required Sources for Certain LAANC Information Types

Rule	Information Type	Authoritative Source (Permanent Link)
[3.2.2a]	UAS Facility Map (UASFM) Data V5	https://udds-faa.opendata.arcgis.com/datasets/ee469d2965014d978d1973c440119152_0
[3.2.2b]	Full-Time National Security UAS Flight Restrictions (NSUFRs)	https://udds-faa.opendata.arcgis.com/datasets/0270b9d8a5d34217856cc03aaf833309_0
[3.2.2c]	Part-Time NSUFRs	https://udds-faa.opendata.arcgis.com/datasets/3a4a808aec634e4e8e4b0ee0d5366da6_0
[3.2.2d]	Class Airspace	https://adds-faa.opendata.arcgis.com/datasets/c6a62360338e408cb1512366ad61559e_0
[3.2.2e]	Airports	https://adds-faa.opendata.arcgis.com/datasets/e747ab91a11045e8b3f8a3efd093d3b5_0
[3.2.2f]	Stadiums	https://adds-faa.opendata.arcgis.com/datasets/67af16061c014365ae9218c489a321be_0
[3.2.2g]	Washington D.C. FRZ	https://adds-faa.opendata.arcgis.com/datasets/67885972e4e940b2aa6d74024901c561_0
[3.2.2h]	U.S. Special Use Airspace	https://adds-faa.opendata.arcgis.com/datasets/dd0d1b726e504137ab3c41b21835d05b_0
[3.2.2i]	Airspace Schedule	https://adds-faa.opendata.arcgis.com/datasets/811863566da44acf91cb42f82ad0ac99_0

[3.2.2j] For the geospatial information above, the USS must use information that is not more than 24 hours old. **[3.2.2k]** The USS must acquire the data directly from the authoritative source. USSs may not get this data via an intermediary.

Note: The FAA recommends using the GeoJSON publications available from ArcGIS Online. Other formats are available, such as shapefiles, spreadsheets, KML, and a real-time Feature Service – however, these formats and protocols are not as stable and well-structured as the GeoJSON publication.

From the webpages at the permanent links listed in Table 1 above, USSs can find links to download formats and protocols. USSs are not required to download datasets every 24 hours (or less), but are required to ensure the data is not more than 24 hours old. As part of the USS checks for data currency, below is a method for determining the version (date/timestamp) of the dataset. If the date/timestamp has not changed since the last download, USSs are not required to download the dataset for a full check. **[3.2.2l]** If the full dataset is not downloaded in its entirety, the USS must use the following method for checking currency:

1. **Go to the permanent link.**
   Example – Class Airspace:
   https://adds-faa.opendata.arcgis.com/datasets/c6a62360338e408cb1512366ad61559e_0

2. **Go to the "Data Source" link, specifying the JSON version.**
   Example (note "?f=pjson" at the end):
   https://services6.arcgis.com/ssFJjBXIUyZDrSYZ/arcgis/rest/services/Class_Airspace/FeatureServer/0?f=pjson

3. **Extract the "lastEditDate" from the "editingInfo" attribute.**
   Example:
   "editingInfo": {"lastEditDate": 1570714332975}

4. **(Optional) Convert the date/timestamp from epoch milliseconds format to UTC.**
   Example:
   1570714332975 = October 10, 2019 13:32:12.975

To avoid the potential USS/LAANC-AP dataset record mismatch and potential submission rejections, consider implementing automated mechanisms to ensure a complete dataset record download. For example:

- Query the feature service to retrieve the number of records in the dataset;
- Once the dataset retrieval is completed, compare the number of records initially retrieved to the actual number of records.

3.3 UAS Facility Maps (UASFMs)

UASFMs play a vital role in the LAANC concept of operations. UASFMs identify threshold altitudes at or below which Air Traffic has decided operations can be automatically authorized (provided the operations comply with all other legal provisions). This means that the FAA can

authorize operations within the UASFMs automatically, requiring far less time and human effort than manually processed authorizations.

Note: UASFMs are a shared resource within the FAA and not used for LAANC alone. Other FAA processes, such as non-LAANC authorization and waiver request management, also use UASFMs.

3.3.1 UASFM Changes

[3.3.1a] The USS must apply the appropriate UASFM(s) to each operation. Basemap data includes the definition of UASFM grid cells. UASFM values (such as altitude limits and flags) may change on a daily timeframe, especially to expedite map corrections or time-sensitive adjustments.

3.3.2 UASFM and Airspace Boundaries

UASFM grid cell boundaries are rectangular and airspace boundaries are generally curved. If a UASFM extends beyond a controlled airspace boundary, the airspace boundary has precedence. For example, in the area outside a controlled airspace boundary but covered by a UASFM grid, the UASFM threshold does not apply.

In graphically presenting limits to operators, USSs are encouraged to round off or clip UASFMs to match airspace boundaries where this accurately represents the precedence described above. USSs may also aggregate adjacent grids having the same altitude threshold and/or annotate grids (for example, with authorizing facility association) as deemed effective in their graphical interface designs.

3.3.3 Subdividing Operations

In some cases, USSs and/or operators may wish to or need to geographically subdivide a single operational volume in controlled airspace into two or more adjacent operational volumes for submission to LAANC. Valid reasons to subdivide a single operational volume in controlled airspace are as follows:

1. **Crossing authorization boundaries.**
    - For more information, see Section 3.3.4 and Figure 4.

2. **Part of the operation can be auto-approved, part must be a Further Coordination request.**

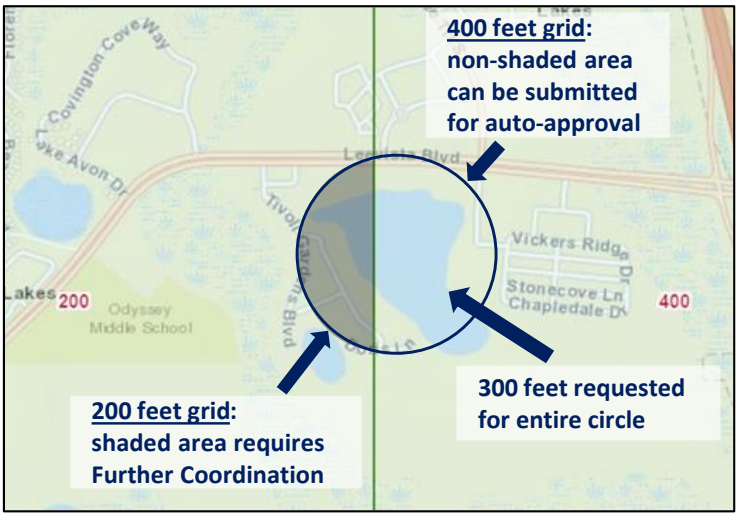

Figure 1: Further Coordination Subdivision

3. **Portions of the operation that are different maximum altitudes.**

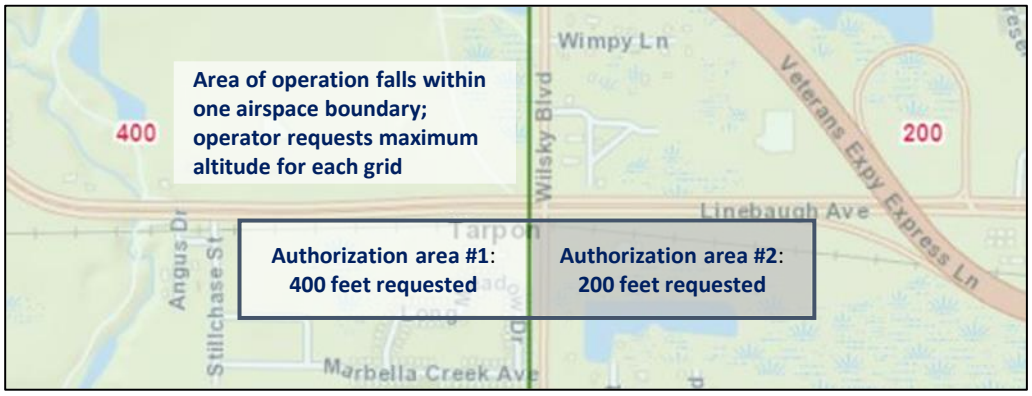

Figure 2: Different Maximum Altitude Subdivision

Note: Adjacent UASFM grid cells may have different thresholds and operators may wish to take advantage of this by planning to fly to a higher threshold in one grid than the other. Currently in LAANC, each authorization can only have a single boundary with a single maximum altitude. Planned operations of this type with multiple maximum altitudes must be submitted as two (or more, as necessary) adjacent authorizations.

[3.3.3a] The USS must only subdivide a single operational volume in controlled airspace into multiple authorization submissions for the enumerated reasons listed above. For example, the USS may not submit separate adjacent authorizations at the same maximum altitude just because they fall within different UASFM grids (see Figure 3).

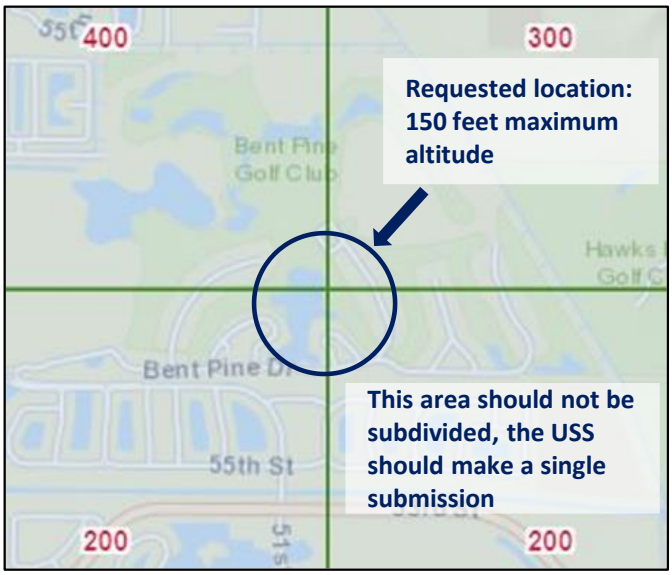

Figure 3: Non-divided Operations

Note: This section is not referring to multiple non-contiguous operational volumes in controlled airspace. This situation may arise when an operation passes into and out of controlled airspace at more than one location. "Subdivision" refers only to how a single volume may be split into two or more contiguous volumes. For more on associating multiple volumes (multiple authorizations) with a single operation, see Section 3.4.6.

Where operational subdivisions coincide with UASFM grid or airspace boundaries, geometric uncertainties can arise. **[3.3.3b]** USSs must use a tolerance to fall cleanly on one side or the other of the relevant boundary and this tolerance may not exceed 10 feet.

3.3.4 Operations that Cross FAA Authorization Boundaries

FAA authorization boundaries for the purposes of LAANC are expressed by the airspace boundaries. UASFM grids also identify the authorizing facility associated with each maximum auto-approval altitude. All airports that are participating in LAANC have UASFM grids for which they are listed as the LAANC Air Traffic authority. As the grids are geodetically rectangular, some grids cross boundaries and list two (or more) authorities.

[3.3.4a] USSs must subdivide operations as necessary so that each authorization has a single authority. This is critical for Air Traffic since a single operation may need authorizations from different facilities. **[3.3.4b]** Additionally, if any subdivision of the operation falls outside of controlled airspace, the USS must not submit that portion of the operation. (The FAA is prohibited from collecting information through LAANC concerning operations in uncontrolled airspace.) For example, if a proposed operation crosses the airspace boundary between Airport A and Airport B, the USS must subdivide the operation along the airspace boundary and make separate LAANC submissions, to each authority, without transmitting any uncontrolled airspace. An example is shown in Figure 4.

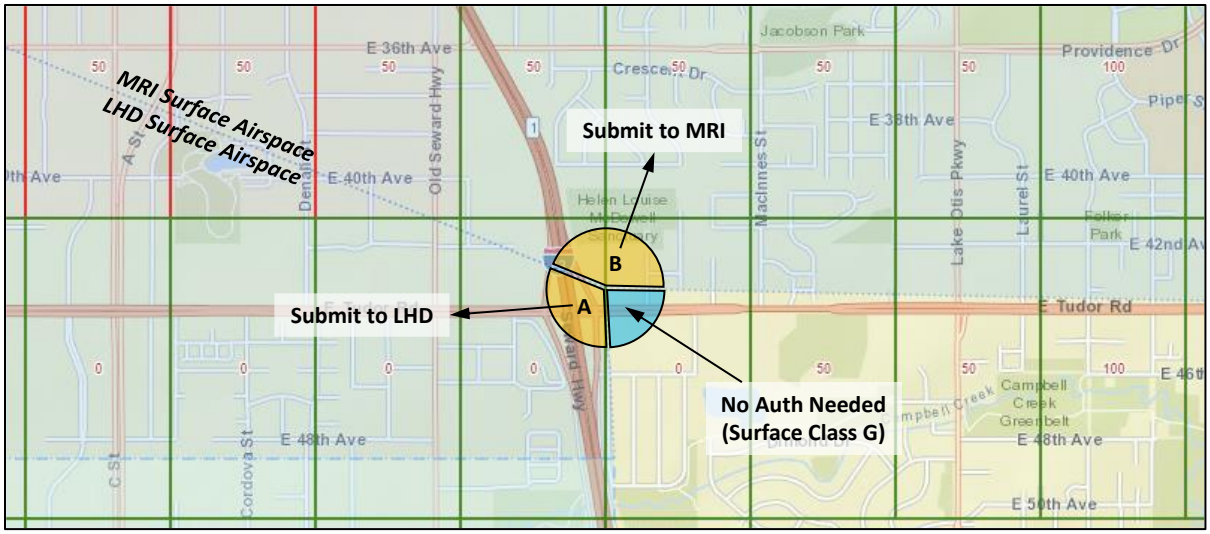

Figure 4: Example Operation Crossing Authorization Boundaries

In this example, the desired operation (whole circle) needs to be subdivided into three regions corresponding to the different airspace authorities defined by the surface airspace boundaries. The auto-approval maximum altitudes (red numbers) indicate that most of the operation must be submitted under Further Coordination (0' equates to no auto-approval). The Class G (uncontrolled) region needs no authorization and therefore no LAANC submission. The MRI region of the operation could be further subdivided along the grid boundary to auto-approve the uppermost portion (up to 50').

[3.3.4c] If an airspace identifies an authority that does not correlate to UASFM grids covering the operation, the USS must not submit that portion of the operation to LAANC and clearly indicate to the operator that information on that portion of the flight will not be submitted to the FAA. Section 3.4.3 describes the method for determining the correct airspace volume. **[3.3.4d]** The USS must not make LAANC submissions to facilities/airspace authorities that do not have a UASFM covering the operation in question.

For example, if a proposed operation is partly in Airport A's airspace and partly in Facility B's airspace, it must be subdivided accordingly. If Airport A has a corresponding UASFM and Facility B does not, only the portion in Airport A's airspace may be submitted to LAANC. The portion in Facility B's airspace cannot be authorized via LAANC.

3.3.5 UASFM Data Flags Indicating Enabled LAANC Operations

Data associated with each UASFM grid includes a "LAANC Ready" flag corresponding to each facility touched by that grid. LAANC Ready flags are either "true" or "false". A "true" flag means that LAANC is active (accepting authorization submissions) for the associated UASFM grid and facility. A "false" flag means that LAANC is not active and cannot accept authorization submissions for the associated UASFM grid and facility. The **[3.3.5a]** USS must not submit any operations to a given facility that includes a grid with a LAANC Ready flag of "false" for that facility.

Data associated with each UASFM grid also includes an "Enabled" text field, which contains a set of enumerators. An "Enabled" enumerated string indicates the types of authorizations enabled in LAANC for a given facility with airspace touched by that grid. The following values are currently defined:

- "107-AA" = Part 107 authorizations approved automatically
- "107-FC" = Part 107 authorizations processed through Further Coordination
- "44809-AA" = § 44809 authorizations approved automatically
- "44809-FC" = § 44809 authorizations processed through Further Coordination

  Note: "44809-FC" is defined, but is currently not available anywhere through LAANC.

Note: The current nominal value for the "Enabled" field is "107-AA,107-FC,44809-AA". Other enumerated values may be defined in the future.

[3.3.5b] The USS must only submit an operation to a given facility if the "Enabled" field indicates that the operation type is available for that facility through LAANC. For example, an "Enabled" string of "107-AA,44809-AA" indicates that the given facility is accepting the common automatic authorization types but (by omission) is *not* accepting Further Coordination submissions. In this example, USSs should not make any Further Coordination submissions to that facility in that grid.

3.4 Air Traffic Authorizations: General Provisions

Controlled airspace boundaries (Classes B, C, D, and areas within the lateral boundaries of the surface area of Class E airspace designated for an airport[†]) are a determining factor in authorization requirements. To be eligible for automatic approval, the planned operation must fall entirely at or below UASFM maximum altitudes. Planned operations between set UASFM maximum altitudes and 400' are eligible for Further Coordination. **[3.4a]** The USS must clearly advise the operator if a planned operation is eligible for automatic authorization or if a planned operation is eligible for Further Coordination.

3.4.1 Automatic Approved Authorizations

LAANC processes automatically approved authorizations at participating facilities and for certain classes of sUAS operations. **[3.4.1a]** The auto-approved authorization process must not be considered complete until a confirming digital response is received from the FAA as described in the *USS-FAA LAANC API Specification*.

USSs may submit auto-approved authorizations up to the start time of the operation. **[3.4.1b]** The USS must not make submissions more than 90 days in advance of the planned start of the operation. Note that the FAA prefers that submissions be made with as much lead time as practical.

[†] Separately from LAANC, the FAA ATO has determined that the only subtype of Class E that applies to UAS authorizations is Class E2.

3.4.2 Further Coordination Authorizations

LAANC processes Further Coordination authorizations at participating facilities and for certain classes of sUAS operations. **[3.4.2a]** A Further Coordination request must not be considered approved or denied until a definitive response has been received from the FAA as described in the *USS-FAA LAANC API Specification*.

Note: Further Coordination requests may contain a short description of the operator's intentions, known as a safety justification, which may aid the FAA in its response. The safety justification field is required, but submitting a blank field is acceptable.

[3.4.2b] Further Coordination requests must be submitted no later than 24 hours prior to the start time of the requested authorization. **[3.4.2c]** Furthermore, the USS must automatically cancel any pending requests for Further Coordination 24 hours before the proposed start time if the FAA has not approved or denied the request. Cancellation must be indicated by the corresponding message to the FAA.

Note: Unlike other cancellations, this automatic request cancellation is initiated by the USS, rather than the operator.

[3.4.2d] The USS must not make submissions more than 90 days in advance. Note that the FAA prefers that submissions be made with as much lead time as practical.

[3.4.2e] The USS must inform operators that Further Coordination is a manual process with commensurate timelines. The FAA's goal is to respond to Further Coordination requests in less than 30 days, but it may take up to 90 days to either approve or deny and, in some cases, requests may expire without resolution. **[3.4.2f]** After submission, the USS must inform the operator that the request is "pending" and discourage following up with Air Traffic by phone as this may result in the request being denied by FAA.

[3.4.2g] If a Further Coordination request is denied, the USS must advise the operator not to submit an operation with the same input parameters as the one that was denied. The USS may suggest that the operator submit the operation to FAADroneZone in an effort to create an operation that can be approved.

<u>The following is a suggested message to the Operator:</u>
"*[Name of operator], the request for Further Coordination was denied by the controlling facility. The operation was denied for reasons that may include any of the following: altitude, date, time, or duration of the requested operation. Re-submitting the same request through LAANC will result in a denial. To continue pursuit of an authorization for the operation, consider altering part, or all, of the request and re-submitting either through LAANC or through FAADroneZone. Re-submission through LAANC and/or FAADroneZone does not guarantee the operation request will be approved.*"

3.4.3 LAANC Airspace Transition and Facility Determination

Certain airspace volumes located around airports change class depending on time of day, month of the year, etc. The important transitions for LAANC are when airspaces switch from controlled

to uncontrolled or vice versa. These transitions generally occur when the control tower at the airport is a part-time tower and the associated airspace transitions to Class G (uncontrolled) when the tower is closed. The airspace schedule data source (see Section 3.2.2) indicates controlled/uncontrolled transitions. **[3.4.3a]** The USS must apply the published airspace schedule for each operation. The airspace schedule defines the start time and end time for which the airspace volume is active (controlled). If no airspace volume is active, the airspace is Class G (uncontrolled) and thereby authorizations are not required. If no corresponding airspace schedule is found for a given airspace volume, that volume is assumed to be active at all times.

[3.4.3b] The USS must determine the correct facility to which to submit authorization-related messages. The correct algorithm for doing this is described by the enumerated steps below. USSs may implement these steps or an equivalent, alternative process that produces the same result. This algorithm is to be used for the Facility Determination for all authorization-related messages.

1. At any given point of operation, find the encompassing surface-level controlled airspace volume (using the Class Airspace and Airspace Schedule source datasets identified in Section 3.2.2). If more than one active airspace volume is found, use the highest class (for example, Class B supersedes Class C) and disregard lower class(es).

2. Read the "ADHP_ID" property of the identified airspace volume and use it as an index into the Airports dataset (see Section 3.2.2), matching the "GLOBAL_ID" property.

3. The corresponding Airports source dataset entry has "IDENT" and "ICAO_ID" fields that identify the facility to which LAANC authorizations may potentially be sent (see Figure 5 below).

4. The point of operation must also be within a UASFM grid that identifies the same Airports from Step 3 (possibly among several) with the LAANC Ready Flag[‡] set to true. If a matching LAANC-ready facility is not found in the UASFM data, the authorization cannot be provided via LAANC.

[‡] The LAANC Ready Flag in conjunction with the Enabled text will determine if the operation is eligible for authorization for the facility.

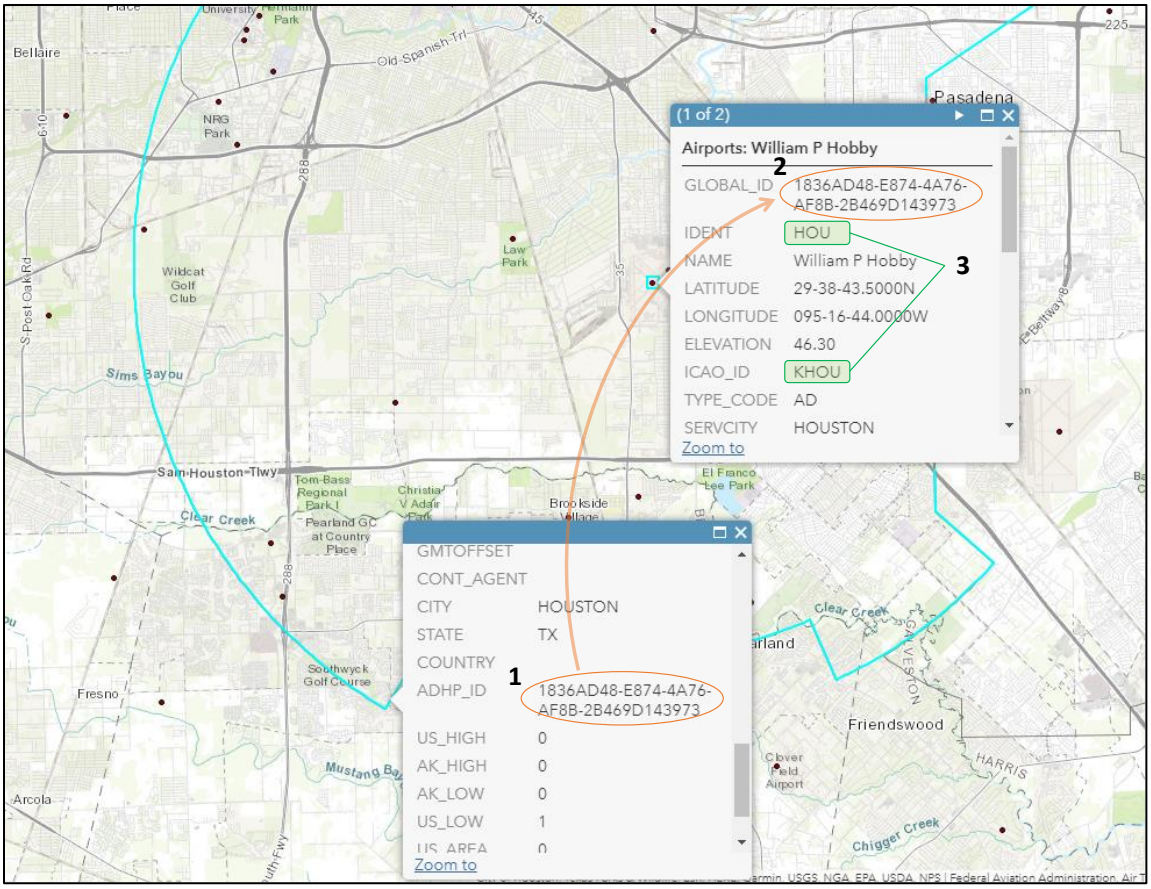

Figure 5: Example Determination of Submission Facility

Note: The airspace volume also has facility identifier fields, but these do not always match the correct submission facility – for example, in Figure 5, the airspace identifies IAH (which is incorrect). Use the algorithm provided above.

3.4.4 Compliance Checks

Operators are required to comply with applicable aeronautical information, including restrictions, published by the FAA and other airspace authorities. At a minimum, USSs are *required* to check for certain applicable restrictions (see Table 3 below) and *may* check for others (see Table 2 below) as part of their service offering to inform operators and prevent unsafe, unauthorized flights.

Potential aeronautical data items include Notices to Airmen (NOTAMs), including Temporary Flight Restrictions (TFRs). Special Use Airspace (SUA) schedule data may also be used. FAA sources for these data items are listed below.

Table 2: Specific FAA Sources of Certain LAANC Information Types

Information Type	FAA Source(s)
NOTAMs (including TFRs)	(1) https://notams.aim.faa.gov/notamSearch/ (2) FAA Flight Service
TFRs	(1) https://tfr.faa.gov/ (2) FAA Flight Service
SUA Schedule (for geometry, see Table 1)	https://sua.faa.gov/

[3.4.4a] If used, the USS must use aeronautical data that is not more than 24 hours old. **[3.4.4b]** If used, the USS must either acquire the aeronautical data items listed above directly from an FAA source; or, the USS may utilize a non-FAA intermediary ***provided*** documentation from the non-FAA intermediary is provided demonstrating the aeronautical data is obtained from an official FAA source. **[3.4.4c]** Additionally, if a non-FAA intermediary is used, the USS must prominently display the following text to the operator, *"This graphical representation* [if displayed] / *aeronautical data* [if text] *is for informational purposes only. The operator is responsible for referring to an FAA official source for NOTAM information relevant to this operation."*

NOTAMs, including TFRs, convey many relevant sUAS restrictions. SUAs may also apply to sUAS. "Prohibited" and "Restricted" are important SUA types that generally *do* apply to sUAS. (Note that Restricted SUAs also have associated schedules documenting when they are active or "hot" – these schedules are published on sua.faa.gov and are partially included in the SUA ArcGIS dataset.) The FAA wants to ensure that operators using LAANC are aware of these potential restrictions. These performance rules offer several ways for USSs to address these concerns.

[3.4.4d] Unless all applicable NOTAMs (including TFRs and manually readable NOTAMs) and Prohibited/Restricted SUAs are completely processed by the USS from an FAA source as a service to operators and presented to them, USSs must provide a hyperlink to FAA sources of information for these restrictions. The notams.aim.faa.gov, tfr.faa.gov, and sua.faa.gov sources listed above are recommended.

Note: Certain restrictions sources are known to be difficult to process, such as manually readable NOTAMs (some with complex references to other sources of regulatory text). USSs are advised that the links associated with [3.4.4d] above are a good way to ensure compliance with these rules, even if only as a safety net after processing that is done automatically for operators.

USSs may process NOTAMs (including TFRs) and SUAs, either in part or in whole, as part of their service offering to operators. Some processing of SUAs is necessary to comply with rules documented below. In addition to required geospatial data (see Section 3.2.2), the USS will also need to employ daylight calculations and other algorithms.

The USS must block certain types of operations within LAANC and advise the operator concerning other types of operations. **[3.4.4e]** The USS must provide a clear indication that a blocked operation does not have a valid authorization to fly through LAANC. Table 3 below identifies each operation type and the associated USS responsibilities. Note that each row is an enumerated rule.

Table 3: USS Responsibilities for Certain Flight Restrictions

Rule	Operation Type	USS Responsibility	Notes
[3.4.4f]	Operations exceeding 400 feet (§107.51b)	Block	This request type is not supported by LAANC.
[3.4.4g]	Part 107 Operations at night (§107.29)	Advise	USSs must alert operators that at night, operating a sUAS is only permitted if: (1) the operator has completed the required FAA training/testing, and (2) the sUAS is lighted with anti-collision lighting visible for at least 3 statute miles that has a flash rate sufficient to avoid a collision.
[3.4.4h]	44809 Operations at night	Block	USSs must employ a reasonable algorithm for periods of nighttime excluding civil twilight.
[3.4.4i]	Operations in an NSUFR or the DC FRZ (§107.47)	Block	This request type is not supported by LAANC. NSUFRs may be full-time or part-time (see respective datasets). The DC FRZ is full-time.
[3.4.4j]	Operations in a Prohibited or active Restricted SUA (§107.45)	Block	This request type is not supported by LAANC. USS may use active times from an FAA source (see [3.4.4b]). In order to meet this rule without the burden of processing active times, USSs may block all Prohibited and Restricted SUAs all the time.
[3.4.4k]	Operations at civil twilight (§107.29)	Advise	USSs must alert operators that during civil twilight periods, operating a sUAS is only permitted if the sUAS is lighted with anti-collision lighting visible for at least 3 statute miles that has a flash rate sufficient to avoid a collision.
[3.4.4l]	Operations in a TFR (§107.47)	Advise	Providing FAA link(s) per [3.4.4d] minimally satisfies this rule. USSs may read digital TFR's and display them. Blocking is permissible but not required.

Rule	Operation Type	USS Responsibility	Notes
[3.4.4m]	Operations in another type of SUA (MOA, CFA, Warning, Alert, etc.) (§107.49)	Advise	Providing FAA link(s) per [3.4.4d] minimally satisfies this rule. USSs may read digital SUAs for these other types and display them. Blocking is permissible but not required.
[3.4.4n]	Operations within 3NM of a stadium (§107.47)	Advise	At a minimum, USSs must alert users when their operation is within 3NM of an FAA-designated stadium and that operations are not permitted within 1-hr before/after the event time start/end. USSs are not required to determine event times. USSs may offer additional guidance (e.g., event times) on a best-effort basis. Blocking is permissible but not required.

3.4.5 Class E Surface Area Weather Ceiling Caveat

Due to the relatively lower minimums for Special VFR traffic in Class E airspace, additional situational risks limit the validity of automatically approved authorizations provided via LAANC. Specifically, automatic approvals obtained via LAANC are not valid in Class E Surface Area airspace when the weather ceiling is less than 1,000 feet. (This is a situational limitation of the authorization which cannot be known in advance of the actual operation.)
[3.4.5a] The USS must inform operators of the Class E limitation when it applies to their planned operation. The authorization caveat is necessary to alert the operator of the spacing rules in Class E airspace which allows for low flying aircraft when a low weather ceiling exists. The USS should also assist in informing the operator about relevant, reliable weather information to include; current and forecast sky condition that describes cloud cover, vertical visibility, or clear skies and the height of the layer indicated in feet Above Ground Level (AGL). Providing a link to an aviation weather source that includes Meteorological Aerodrome Report (METAR) and Terminal Aerodrome Forecasts (TAF) reports is strongly recommended. The USS may also refer to the *Aviation Weather Services* Advisory Circular for detailed information about sky condition reporting criteria (AC 00-45, Section 3.1.5.9).

3.4.6 LAANC Reference Codes

Every authorization referenced by the LAANC API has a reference code. The full reference code is 12 characters long. The first 11 characters make up the base operation reference code and the final character identifies one or more authorizations associated with the operation (for a total of 12 characters). LAANC codes consist of digits (0-9) or letters (A-Z, not case-sensitive, represented as capitals). The first three characters of a LAANC code identify the USS (these codes are assigned by the FAA during onboarding). The next eight characters identify the operation. The last character identifies an authorization or requested authorization within the operation, of which there could be more than one. The code format is illustrated below.

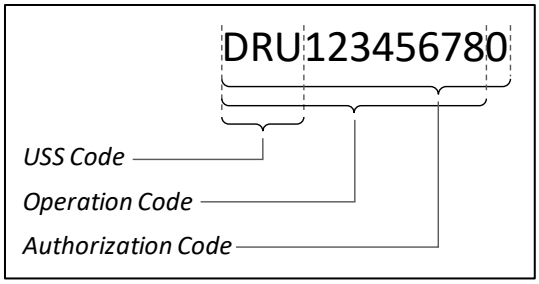

Figure 6: LAANC Code Format

Authorization codes correspond to portions of an operation that are part of the same planned flight but must be subdivided for various reasons (see Section 3.3.3). For example, part of the operation might correspond to one facility and part to another. These require separate authorizations and, therefore, at least two reference codes. With a way to track authorizations as a subset of operations, LAANC can comprehend when different authorizations are part of the same operation, which is beneficial for tracking and managing whole operations.

[3.4.6a] The USS must assign unique reference codes for every applicable submission (see *USS-FAA LAANC API Specification* for details). **[3.4.6b]** The USS must make the reference code available to the operator. Reference codes will be used in the event there is a need to communicate directly with the operator or if the USS needs to interact with the FAA in any capacity.

[3.4.6c] A submitted operation with multiple associated authorizations (or authorization requests) must correspond to submissions that sequentially end in “0”, “1”, …, “A”, “B”, and so on through “Z”. In the exceedingly rare case that an operation has more than 36 authorizations, a new operation code should be started (which is not required to be sequential).

Note: As each submission must use a unique reference code, codes can never be reused. A code associated with an authorization does not necessarily mean that the authorization is approved or valid. A LAANC reference code may refer to an authorization that is requested, cancelled, invalid, submitted but not confirmed, etc.

3.4.7 Operator Changes

[3.4.7a] The USS must offer the capability to modify the details of a planned operation if such change does not invalidate the authorization or require Air Traffic Further Coordination. For example, extending the duration of an automatically approved authorization is an acceptable modification. **[3.4.7b]** The USS must submit such changes to the FAA using the appropriate interface mechanism (see *USS-FAA LAANC API Specification* for details).

Note: It is minimally acceptable for a USS to offer change capabilities by the operator cancelling a previously approved authorization and constructing a new one to replace it.

*Note: The USS-FAA LAANC API Specification describes a more advanced method which preserves the operation Reference Code. When a USS processes an operator request to delete their LAANC data (see **[3.10b]**), the USS should retain knowledge of the reference codes used – to ensure the reference codes are not reused.*

3.4.8 Operator Cancelled or Closed Authorizations

[3.4.8a] The USS must incorporate the capability for any previously submitted requests or authorizations to be "cancelled" by the operator, indicating the operation is no longer planned. Since cancellation indicates that an operation will not be flown (in the future), it can occur only prior to the operation start time.

The USS may offer the capability for the operator to close an operation indicating the operation is complete prior to the submitted end time of the authorization.

3.4.9 Air Traffic Rescinded Authorizations

FAA personnel may rescind any previously approved authorization. "Rescind" means that an authorization is nullified before it begins. Since an authorization can be rescinded only before it begins, rescind can occur only prior to the operation start time.

Messages indicating rescinded authorizations will be initiated by the FAA and communicated to the USS via mechanisms described in the *USS-FAA LAANC API Specification*. Air Traffic cannot be sure that the operator is aware of and responding to a rescinded authorization unless there is acknowledgement from the operator. This acknowledgement is operationally vital to let Air Traffic know that the operator is aware of the change in authorization status and does not intend to fly. **[3.4.9a]** Once a rescind message is received, the USS must initiate resolution with the operator upon receipt that the authorization is rescinded by informing the operator via a standard communication method (e.g., Email or SMS are currently acceptable methods). **[3.4.9b]** USSs must design their messaging and applications to prompt operators in the application to acknowledge authorizations that are rescinded by Air Traffic. **[3.4.9c]** Furthermore, the USS must provide the operator with a means to acknowledge the rescinded authorization. The rescind acknowledgement should occur as soon as possible, but may occur any time prior to the operation end time.

Note: Air Traffic may opt to call the operator directly (Air Traffic contacts the operator at the phone number included in the authorization), whether or not they rescind an authorization through LAANC. Should a difference arise, any authorization information provided verbally by Air Traffic supersedes prior authorization information conveyed via LAANC.

3.4.10 Previous Submissions Becomes Invalid

[3.4.10a] When changes occur that could impact the approval status of previous submissions (e.g., change to UASFM, new NSUFR, etc.), the USS must review previous submissions (regardless of approval status) that have not commenced and could be affected by the change. This review should happen whenever an updated dataset is downloaded or accessed.

[3.4.10b] For previous submissions that are no longer valid, the USS must initiate resolution with the operator upon detection that the authorization is invalid by informing the operator via a standard communication method (e.g., Email or SMS are currently acceptable methods). **[3.4.10c]** USSs must design their messaging and applications to prompt operators in the application to cancel authorizations that are no longer valid whenever they exist. **[3.4.10d]** Furthermore, the USS must provide the operator with a means to cancel each invalid submission.

The “invalid cancel” message will alert Air Traffic of the cancellation of each invalid submission.

Note: The FAA may or may not detect the invalid status of an authorization before the USS and may or may not send a “rescind” message. The USS is required to handle invalid authorizations proactively and direct operators to cancel them so that they are not flown regardless of actions that may be taken by Air Traffic or FAA systems.

3.5 14 CFR Part 107 Authorizations: Specific Provisions

14 CFR Part 107 authorizations are provided via LAANC in accordance with 14 CFR Part 107.41. LAANC supports both auto-approved and Further Coordination types for commercial authorizations. USSs may opt to include one and/or the other type in their service offerings.

[3.5a] When Part 107 authorizations are provided, the USS must generate, display, and store the following text (including the context-dependent information shown in brackets):

“[*LAANC Reference Code* / *FAA Facility Code*, *Start Date & Time – End Date & Time*, Max Alt *num*ft]: In accordance with Title 14 CFR Part 107.41, your operation is authorized within the designated airspace and timeframe constraints. Altitude limits are absolute values above ground level which shall not be added to the height of any structures. This Authorization is subject to cancellation at any time upon notice by the FAA Administrator or his/her authorized representative. This Authorization does not constitute a waiver of any State law or local ordinance. [*Name of operator*] is the person designated as responsible for the overall safety of UAS operations under this Authorization. During UAS operations for on-site communication/recall, [*name of operator*] shall be continuously available for direct contact at [*contact phone number*] by Air Traffic. Remote pilots are responsible to check the airspace they are operating in and comply with all restrictions that may be present in accordance with 14 CFR 107.45 and 107.49 (a)(2), such as restricted and Prohibited Airspace, Temporary Flight Restrictions, etc. Remote pilots are also responsible for complying with the operating requirements in 14 CFR 107.29(a) when operating at night. Operations are not authorized in Class E airspace when there is a weather ceiling less than 1,000 feet AGL. If the UAS loses communications or loses its GPS signal, it must return to a predetermined location within the operating area and land. The remote pilot in command must abort the flight in the event of unpredicted obstacles or emergencies.”

Note: The “name of operator” is the name and contact information for the remote pilot in command who is responsible for the operation during the planned operation period as specified in 14 CFR Part 107.

[3.5b] “Start Date & Time” and “End Date & Time” must unambiguously include the year, month, day, hour, minute, and time zone (or UTC).

Along with the text above, the USS is encouraged to include a graphical depiction of the authorization boundary. This graphical depiction ensures that the operator knows the scope of the authorization granted and can distinguish between related individual authorizations. In some

cases, the graphical depiction will also clarify that the authorization does not apply to uncontrolled airspace.

[3.5c] The USS must provide a method for quick access to the operation-specific authorization information (including text above) in a form that could be produced by the operator to authorities if necessary.

3.6 49 U.S.C. § 44809 Authorizations: Specific Provisions

49 U.S.C. § 44809 authorizations are provided via LAANC in accordance with 49 U.S.C. § 44809. LAANC supports only the auto-approved type for limited recreational authorizations. USSs may opt to include this type in their service offerings.

[3.6a] When limited recreational authorizations in accordance with 49 U.S.C. § 44809 are provided, the USS must generate, display, and store the following text (including the context-dependent information shown in brackets):

"[*LAANC Reference Code* / *FAA Facility Code*, *Start Date & Time – End Date & Time*, Max Alt *num*ft]: In accordance with 49 U.S.C. § 44809(a)(5), your operation is authorized within the designated airspace and timeframe constraints. Altitude limits are absolute values above ground level which shall not be added to the height of any structures. This Authorization is subject to cancellation at any time upon notice by the FAA Administrator or his/her authorized representative. This Authorization does not constitute a waiver of any State law or local ordinance. [*Name of operator*] is the person designated as responsible for the overall safety of UAS operations under this Authorization. During UAS operations for on-site communication/recall, [*name of operator*] shall be continuously available for direct contact at [*contact phone number*] by Air Traffic. [*Name of operator*] is responsible to check the airspace in which the UAS will be operated and comply with all restrictions that may be present in accordance with § 44809(a)(5), such as restricted and prohibited airspace, temporary flight restrictions, etc. This authorization is subject to the following conditions: (1) operations are not authorized in Class E surface area airspace when there is a weather ceiling less than 1,000 feet AGL; (2) if the UAS loses communications or loses its GPS signal, it must return to a predetermined location within the operating area and land; and (3) the person manipulating the controls of the UAS must abort the flight in the event of unpredicted obstacles or emergencies."

Note: The "name of operator" is the name and contact information for the person who is responsible for the operation during the planned operation period as specified in 49 U.S.C. § 44809.

[3.6b] "Start Date & Time" and "End Date & Time" must unambiguously include the year, month, day, hour, minute, and time zone (or UTC).

Along with the text above, the USS is encouraged to include a graphical depiction of the authorization boundary. This graphical depiction ensures that the operator knows the scope of the authorization granted and can distinguish between related individual authorizations. In some cases, the graphical depiction will also clarify that the authorization does not apply to uncontrolled airspace.

[3.6c] The USS must provide a method for quick access to the operation-specific authorization information (including text above) in a form that could be produced by the operator to authorities if necessary.

3.7 Reasonable Filtering

[3.7a] LAANC must be reasonably protected from spurious submissions that do not align with the intent of LAANC capabilities and associated legal requirements. Attempts should be made to block illegitimate submissions (e.g., excessive or malicious).

USSs are encouraged to develop innovative means of protecting LAANC from being misused. At a minimum, USSs must implement the following filtering:

- **[3.7b]** Block submissions with an operation area larger, in maximum linear extent, than 10 nautical miles.

  Note: "Maximum linear extent" is the diameter for a circular area or the maximum distance between any two points for a polygon area.
- **[3.7c]** Block any submissions associated with a new operation if there are already five (or more) non-pending operations for the same operator (name and phone number) occurring with an overlapping time period. A message should be generated to inform the user of the reason for the block.

  Note: A non-pending operation is an operation that does not contain any pending authorization submissions. If an operation contains at least one pending FC request, then the operation is considered a "pending operation".
- **[3.7d]** Block submissions (automatic or Further Coordination) that are more than 100 nautical miles from an existing non-pending operation for the same operator (name and phone number) for an overlapping time period. Specifically, two operation volumes are more than 100 nautical miles apart if the nearest points between the two volumes are a distance greater than 100 nautical miles from each other. A message should be generated to inform the user of the reason for the block.

  Note: This rule relates to non-pending operations. If an operator does not have a prior authorization for an overlapping time period, they may make multiple simultaneous FC requests at larger distances from each other (usually days in advance), allowing for alternatives in case some are not approved.

[3.7e] If a new submission is made when there is one (or more) non-pending operations for the same operator (name and phone number) occurring with an overlapping time period, the USS must display a message to user that there are one or more operations for this operator and time period and unused operations should be cancelled before the operation start time.

<u>The following is a suggested message to the User:</u>
"*There are one or more operations for this operator and time period. The operator should cancel all operations that will not be used before the operation start time.*"

Note: Minimum and maximum operational durations are constrained per the USS-FAA LAANC API Specification.

3.8 Contingency Operations

[3.8a] If the FAA's LAANC system is down or inaccessible for any reason, all submissions must be considered temporarily incomplete. Authorization requests cannot be considered successfully submitted until their receipt is indicated by a positive acknowledgement from FAA systems. This approach ensures that the FAA has the opportunity to check that submissions are valid and correct before they are used operationally, as well as ensuring Air Traffic situational awareness.

However, during such outages, the USS can continue planning functions with operators pending final completion once the FAA's LAANC system is available. Many authorization situations provide ample time for later resubmission prior to the start time of the operation. For example, given a desired automatically approved authorization that starts in 24 hours, there are many opportunities for digital resubmission before the flight commences. The USS could inform the operator that the FAA's LAANC system interface is temporarily unavailable, and they will be notified when the process is complete (or should check back before flying).

In the event of protracted unavailability of the FAA's LAANC system, USSs may inform operators of other compliant mechanisms (such as requesting authorizations via non-LAANC processes accessible from the FAA's website).

3.9 Operations and Maintenance

Accurate responses to operations and maintenance queries are important. However, perfect alignment in certain cases is not expected, for example due to message transit times or typical processing delays.

3.9.1 System Health and Version(s) Check

To facilitate awareness, the FAA makes a health status and version(s) API endpoint available to USSs, which report the FAA's operational status and system version(s) in effect. **[3.9.1a]** A USS must not automatically call this endpoint with a period less than one minute. (Endpoint calls that are individually, manually triggered are acceptable without a rate limit, with the expectation that these constitute a much smaller load than once per minute on average.)

[3.9.1b] The USS must make specified health and version(s) API endpoints available to the FAA. The FAA will not automatically call this with a period less than one minute. (Endpoint calls that are individually, manually triggered may occur without a rate limit, with the expectation that these constitute a much smaller load than once per minute on average.)

<u>Fields include (see Attachment A for more detail):</u>

- System status (up or down)
- Software / API version(s)
- Critical datasets and version(s)

Health and version information communicated to the LAANC Enterprise Control Center (ECC) will not be shared outside the FAA. A lack of response may be interpreted as a USS system outage.

Note: If USS endpoints do not respond in less than 30 seconds with one or more retries, the FAA may not consider the endpoint available and interpret it as a system outage.

3.9.2 Operational Statistics

The FAA makes an operational statistics API endpoint available to USSs supporting queries about the numbers of previously submitted operations. **[3.9.2a]** A USS must not query the operational statistics endpoint with less than one minute between queries with the exception that anytime the FAA returns an error code, a USS may submit a follow-up query without concern for rate.

[3.9.2b] The USS must make a specified operational statistics API endpoint available to the FAA. The FAA will not submit associated queries with less than one minute between queries with the exception that anytime the USS returns an error code, the FAA may submit a follow-up query without concern for rate.

See Attachment A for a detailed list of Operational statistics.

Note: When calling the USS endpoint, the FAA will not include a start date of more than 30 days in the past.

3.9.3 Open Authorizations Queries

The FAA makes an open authorizations API endpoint available to USSs supporting queries about what currently active and/or open authorizations fall into specified categories. **[3.9.3a]** A USS must not query the open authorizations endpoint with less than one minute between queries with the exception that anytime the FAA returns an error code, a USS may submit a follow-up query without concern for rate.

[3.9.3b] The USS must make a specified open authorizations API endpoint available to the FAA. The FAA will not submit associated queries with less than one minute between queries with the exception that anytime the USS returns an error code, the FAA may submit a follow-up query without concern for rate.

<u>Open authorization lists include (see Attachment A for more detail):</u>

- Reference codes of Part 107 auto-approved authorizations that are active (issued and termination state has not been reached)
- Reference codes of Section 44809 auto-approved authorizations that are active (issued and termination state has not been reached)
- Reference codes of Part 107 Further Coordination requests that are:
    - Authorized and active
    - Pending
    - Rescinded awaiting acknowledgement

3.9.4 Operation History Queries

The FAA makes an operation history API endpoint available to USSs supporting queries about the past transitions of a specific operation. **[3.9.4a]** A USS must not query the operation history

endpoint with less than one minute between queries with the exception that anytime the FAA returns an error code, a USS may submit a follow-up query without concern for rate.

[3.9.4b] The USS must make a specified operation history API endpoint available to the FAA. The FAA will not submit associated queries with less than one minute between queries with the exception that anytime the USS returns an error code, the FAA may submit a follow-up query without concern for rate.

Operation history includes (see Attachment A for more detail):

- Submission type, category, and status
- Date and Time of submission, approval, denial, and/or rescind (as applicable)
- Date and Time of change, close, and/or cancel (as applicable)

Note: When calling the USS endpoint, the FAA will not request operation history for an operation that is more than 30 days past its termination state.

3.9.5 Manual Reporting and Auditing

The FAA reports LAANC outages, both scheduled and unscheduled, to the USSs and Air Traffic users through the ECC. Outage information is a critical resource for the FAA to manage incidents and inquiries concerning LAANC capability functionality. **[3.9.5a]** The USS must notify the ECC of scheduled outages at least 24 hours in advance. **[3.9.5b]** The USS must notify the ECC of unscheduled outages within one hour of detection. The USS will be given contact information (i.e., email address and phone number) of the ECC as part of the onboarding process. Outage status communicated to the ECC will not be shared outside the FAA.

Note: The ECC outage notification can be manual or automated. The notification preference is email, but a phone call is acceptable as well. The ECC will monitor USS system status (see Section 3.9.1) and often will contact the USS directly upon identifying a potential outage.

[3.9.5c] The USS must provide FAA user accounts to the FAA for the following purposes:

1. **Production Environment**: Monitoring of service functionality on a periodic basis for quality assurance.
2. **Non-Production Environment**: Conduct onboarding testing as applicable.

The FAA user accounts should be provided at no cost to the FAA. The FAA production user account should be the same in nature as a normal operator account. The FAA understands that USS models vary widely – “accounts” may be secured (not accessible to the public), USS systems may be installed on site or on equipment, and different user groups may be differentiated by location or customer base. Regardless of these variations, the FAA must have access to user accounts. The FAA and USS will define appropriate FAA user accounts as part of onboarding. Manual checks will be used to confirm compliance with the USS rules and/or identify a need for re-onboarding in some cases (for example, if service has changed significantly).

[3.9.5d] Additionally, the USS must make available LAANC data records to the FAA. Examples of LAANC data records include, but not limited to, logging interactions of users for operations submissions, operations (i.e., type, time of submission, geometry, submission details including type, time of submission and any subsequent updates, etc.).

[3.9.5e] The USS must respond to the FAA request of the LAANC data records within 1 business day acknowledging the receipt of the request. Upon acknowledgement of receipt of the FAA request, the FAA will work with the USS to determine a reasonable response period for the USS to deliver the LAANC data records.

3.10 Data Protection Plan

[3.10a] In accordance with Article 22, Data Procedural Protections, of the LAANC Memorandum of Agreement, the USS must develop and implement a Data Protection Plan that is available to the FAA upon request *(*see Attachment E*)*.

[3.10b] When processing an operator request for destruction of LAANC Data, the USS must ensure the operation is in a termination state and also call the Delete Endpoint. The Termination States are a subset of the statuses defined in the *USS-FAA LAANC API Specification* (also reflected in Attachment B). Delete requests cannot be considered successfully submitted until their receipt is indicated by a positive acknowledgement from FAA systems. However, the lack of a positive acknowledgement does not impede the USS from fulfilling the operator's request to destroy the user data. The USS can delete the operator's information and call the Delete Endpoint until a positive acknowledgement is received from the FAA system. Calling the Delete Endpoint will impact the Operational Statistics by incrementing the "**countLaancCallSuccess**" field. This behavior is similar to the update endpoint calls since the other counts are not increased/decreased.

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Attachment A – USS-FAA High-Level Exchange Model

The reference material below is intended to assist stakeholders in understanding, planning, and scoping LAANC-related systems and services. Information items listed are high-level and not technically exhaustive (additional data may be required). This material is intended to be synchronized with the relevant *USS-FAA LAANC API Specification*, but in any cases of perceived or actual conflict, the *USS-FAA LAANC API Specification* has precedence.

Create Auto Authorization (USS → FAA)
▪ Operator Name (first and last) ▪ Operator Phone Number (during operation) ▪ Reference Code ▪ Start Date/Time (UTC) ▪ Duration ▪ Maximum Altitude (AGL) ▪ Boundary Geometry (polygon or point/radius) ▪ Authorizing Airport ▪ UASFM Grids Touched (IDs and last edit dates) ▪ Airspace Classes Touched ▪ Registration Number (Optional)

Request Authorization [Further Coordination] (USS → FAA)
▪ Operator Name (first and last) ▪ Operator Phone Number (during operation) ▪ Reference Code ▪ Start Date/Time (UTC) ▪ Duration ▪ Maximum Altitude (AGL) ▪ Boundary Geometry (polygon or point/radius) ▪ Authorizing Airport ▪ UASFM Grids Touched (IDs and last edit dates) ▪ Airspace Classes Touched ▪ Safety Justification (text) ▪ Registration Number (Optional)

Auto Authorization Update (USS → FAA)
▪ Operator Name (first and last) ▪ Operator Phone Number (during operation) ▪ Reference Code ▪ Start Date/Time (UTC) ▪ Duration ▪ Maximum Altitude (AGL) ▪ Boundary Geometry (polygon or point/radius) ▪ Authorizing Airport ▪ UASFM Grids Touched (IDs and last edit dates) ▪ Airspace Classes Touched ▪ Registration Number (Optional)

Operation Action Response (FAA → USS)
▪ Type of Operation ▪ Reference Code ▪ Approved or Denied ▪ Status Date Time

Operation Cancelled by Operator (USS → FAA)
▪ Reference Code

Operation Closed by Operator (USS → FAA)
▪ Reference Code

Operation Deleted by Operator (USS → FAA)
▪ Reference Code

Operation Automatically Cancelled (USS → FAA)
▪ Reference Code

Operation Invalidated (Invalid Cancel) (USS → FAA)
▪ Reference Code

Authorization Rescinded (FAA → USS)
▪ Reference Code

Authorization Rescind Acknowledgement (USS → FAA)
▪ Reference Code

Delete Operation (USS → FAA)
▪ Reference Code

No Operation (USS → FAA)
▪ Reference Code

System Health and Versions (USS → FAA) or (FAA → USS)
▪ System Status (UP or DOWN) ▪ Codes (FAA only) ▪ System Version ▪ API Version ▪ UASFM Dataset URL and Last Edit Date ▪ Airspace Dataset URL and Last Edit Date ▪ Airports Dataset URL and Last Edit Date ▪ FT NSUFR Dataset URL and Last Edit Date ▪ PT NSUFR Dataset URL and Last Edit Date ▪ Stadiums Dataset URL and Last Edit Date ▪ FRZ Dataset URL and Last Edit Date ▪ SUA Dataset URL and Last Edit Date ▪ Airspace Schedule Dataset URL and Last Edit Date

Operation Statistics (USS → FAA) or (FAA → USS)
▪ Count of 107 Operations Submitted ▪ Count of 107 Auto-Approved Submitted ▪ Count of 107 Further Coordination Submitted ▪ Count of 107 Further Coordination Approved ▪ Count of 107 Further Coordination Denied ▪ Count of Automatically Cancelled ▪ Count of 107 Further Coordination Expired ▪ Count of 107 Rescinded ▪ Count of 107 Rescind Acknowledged ▪ Count of 107 Cancelled ▪ Count of 107 Invalid Cancel ▪ Count of 107 Close ▪ Count of 44809 Operations Submitted ▪ Count of 44809 Auto-Approved Submitted ▪ Count of 44809 Rescinded ▪ Count of 44809 Rescind Acknowledged ▪ Count of 44809 Cancelled ▪ Count of 44809 Invalid Cancel ▪ Count of 44809 Close ▪ Count of Successful API Calls

Open Authorizations (USS → FAA) or (FAA → USS)
▪ List of open authorizations including: ▪ Reference Code ▪ Submission Type (AA, FC) ▪ Submission Category (107, 44809) ▪ State (Authorized, Pending, Rescinded_Awaiting)

Operation History (USS → FAA) or (FAA → USS)
▪ Submission Type (AA, FC) ▪ Submission Category (107, 44809) ▪ Submission Date and Time ▪ Status (Authorized, Complete, Pending, Never Authorized, De-Authorized, Rescinded_Awaiting) ▪ Approval Date and Time (if applicable) ▪ Denial Date and Time (if applicable) ▪ Change Date and Time (if applicable) ▪ Rescind Date and Time (if applicable) ▪ Cancel Date and Time (if applicable) ▪ Rescind Acknowledgement Date and Time (if applicable) ▪ Close Date and Time (if applicable)

Attachment B – LAANC States and Transitions

The reference material below is intended to assist stakeholders in understanding LAANC-related terminology concerning authorization processes. The information provided here is high-level and may not be technically exhaustive. For example, unsuccessful transitions are not shown and do not count (such as API rejections).

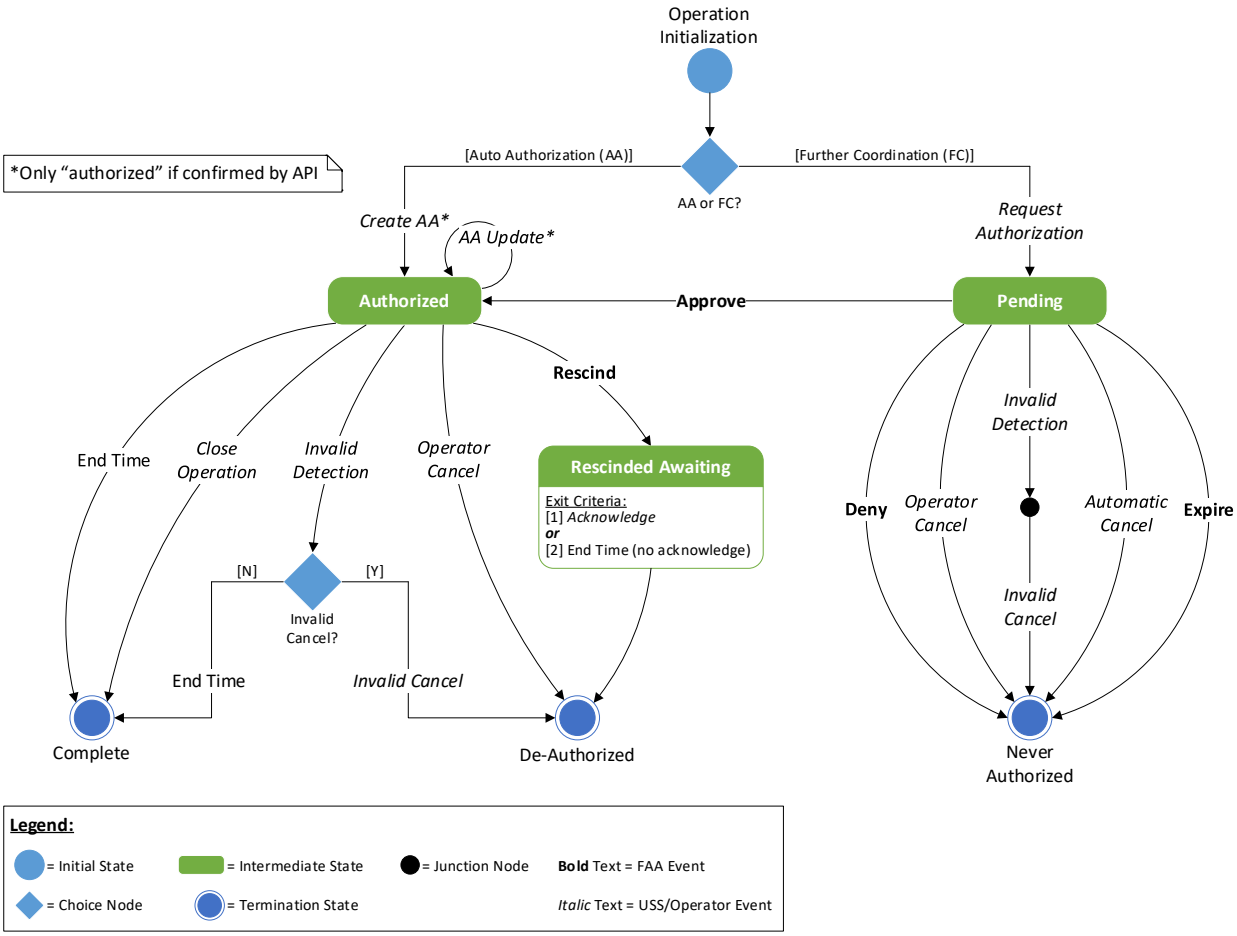

Figure 7: LAANC State-Transition Diagram

State Definitions

Table 4: LAANC State Definitions

State	Definition
Authorized	Approved authorization that has not been Completed or De-Authorized.
Complete	Approved authorization that has finished at its submitted end time, or by an operator action indicating the authorization is closed. Note: Includes authorizations detected as invalid that have not been invalid cancelled by the operator, but have reached its submitted end time.
Pending	Active authorization request that has not yet been approved or denied.
Never Authorized	Pending authorization request that was denied, expired, or cancelled (i.e., automatic, invalid, or operator).
De-Authorized	Authorization was cancelled (i.e., operator, invalid), or rescinded. Notes: (1) Operator cancel and invalid cancel can only occur prior to the submitted start time. (2) Rescind acknowledgement can occur any time after the authorization is rescinded, but prior to the submitted end time. (3) Includes rescinded authorizations ***not*** acknowledged by the submitted end time.
Rescinded Awaiting	Authorization rescinded and awaiting operator acknowledgement.

Event Responsibility Matrix

Table 5: LAANC Event Responsibility Matrix

Event	Operator	USS	LAANC	ATM
Create Auto Authorization (AA)	✓	✓		
Auto Authorization (AA) Update	✓	✓		
Request Authorization (FC)	✓	✓		
Reject			✓	
Approve			✓	✓
Deny			✓	✓
Expire			✓	
Operator Cancel	✓	✓		
Automatic Cancel		✓		
Rescind			✓	✓
Rescind Acknowledgement	✓	✓		
Close Operation	✓	✓		
Invalid Detection		✓		
Invalid Cancel	✓	✓		
Delete Operation	✓	✓		

Attachment C – Onboarding Information

Approved LAANC USSs are required to demonstrate the capability to provide LAANC services on all available product configurations (i.e., 107-AA, 107-FC, 44809-AA) and platforms (e.g., Web-Based application, Android/iOS application, etc.) to verify compliance of all USS Performance Rules. Prospective LAANC USSs must complete the LAANC USS New Applicant Onboarding Process to demonstrate compliance and become approved LAANC USSs, while approved LAANC USSs must participate in annual Upgrade Onboarding.

Upgrade Onboarding verifies that approved LAANC USSs adhere to the most recent FAA approved version of the Performance Rules. Per MOA Section 2.3.1.8, USSs are given the opportunity to review new rules and raise objections and/or concerns about the changes. Once objections and/or concerns, if any are made, are adjudicated by the FAA, the new rules are automatically incorporated as an attachment and the upgrade process begins. The USS Upgrade Onboarding timeline is shown in Figure 8 below.

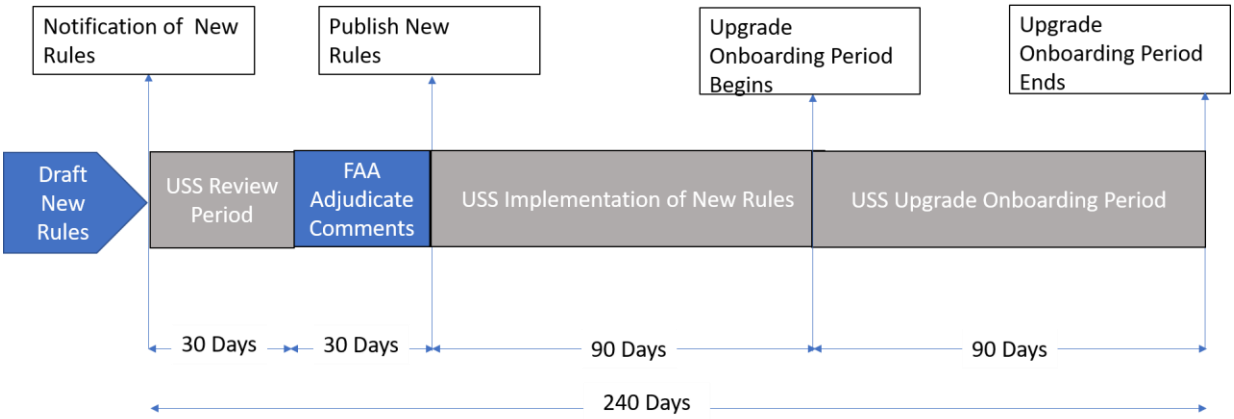

Figure 8: USS Upgrade Onboarding Timeline

In the event that a USS seeks to launch a new product outside of the established annual Upgrade Onboarding Timelines, a request for Off-Cycle Onboarding can be made during a specified time period. To participate in the Off-Cycle Onboarding, a USS must submit a written request to the Contracting Officer with details. As a reminder, all new product configurations must be reviewed by FAA PMO. All products and configurations tested in Off-Cycle Onboarding will be tested in all subsequent Upgrade Onboarding cycles.

Failure to successfully complete Upgrade Onboarding and demonstrate compliance to the USS Performance Rules will result in suspension of the USS to provide LAANC services. Figure 9 below provides a nominal timeline in the event a USS is unable to demonstrate compliance to the USS Performance Rules.

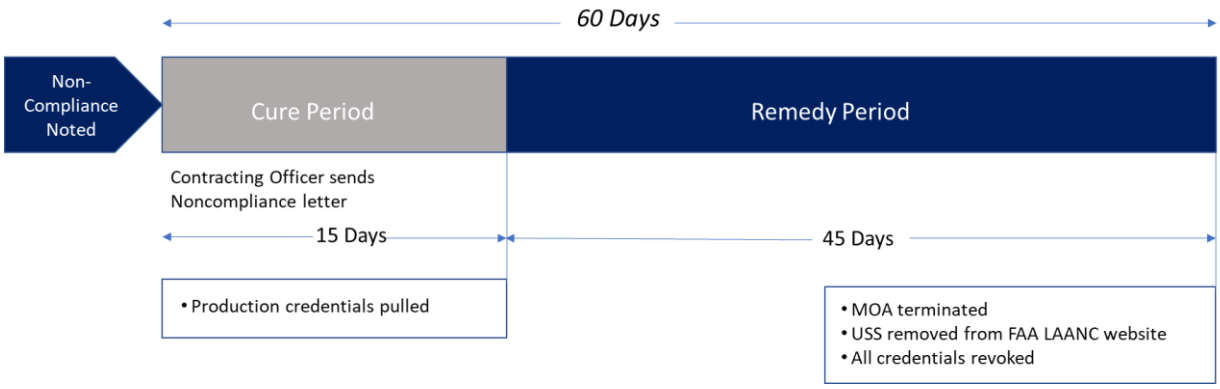

Figure 9: USS Upgrade Onboarding Non-Compliance Timeline

Attachment D – FAA Quality Assurance Process

The FAA has initiated a LAANC Quality Assurance (QA) and Quality of Service with UAS Service Suppliers, with a goal of a shared participation in and awareness of whether the end-to-end service being provided by the FAA-USS partnership is functioning in the manner in which it is intended. The FAA will perform Quality of Service and QA checks on a periodic basis to enable identification of any product delta since the last onboarding checkout that may affect compliance with the Performance Rules. A listing of core Rules is available upon request.

FAA Quality Assurance – Overview

Figure 10 below provides a high-level overview of the FAA Quality Assurance process. The intent of the process is to identify any product deltas since the last onboarding checkout that may affect compliance with the USS Performance Rules.

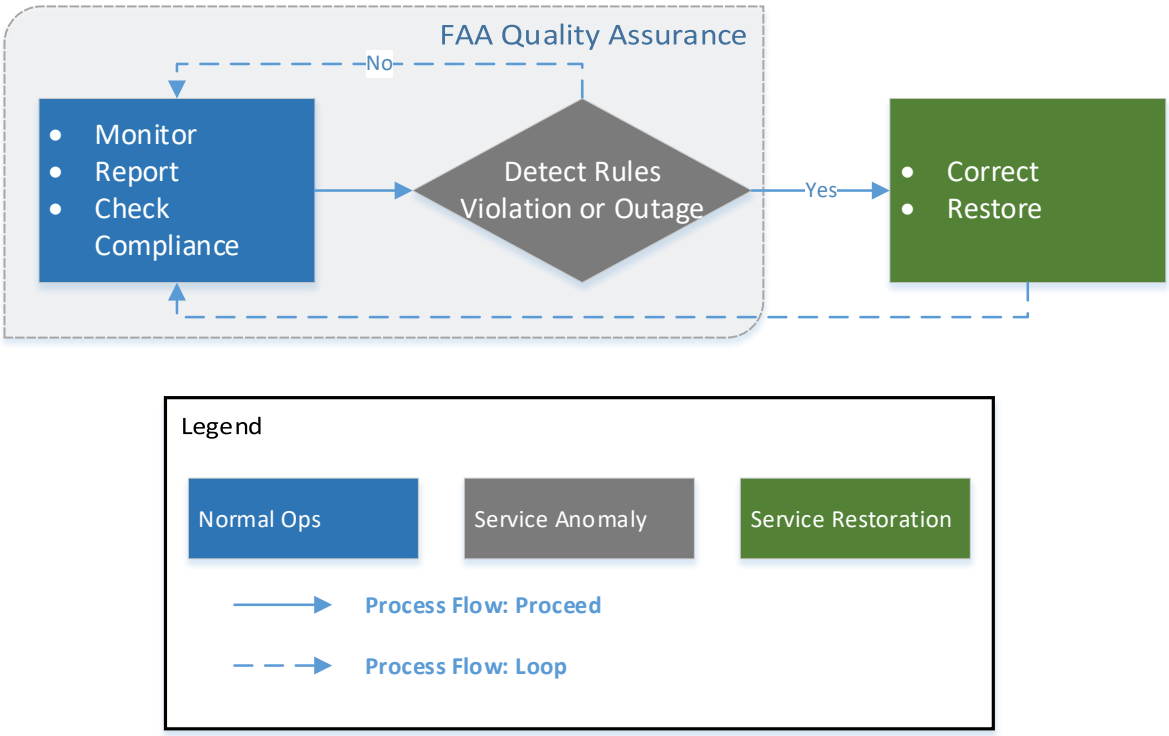

Figure 10: FAA Quality Assurance Process

Approach to Rules Violations

USSs must comply with the current USS Performance Rules, including LAANC MOA Article 2.3.1.8. USSs are encouraged to proactively self-report detected violations to avoid potential FAA action. The FAA will act if a Rules violation is identified and confirmed. Table 6 below identifies guidelines the FAA has defined for severity and actions taken.

Table 6: USS Rules Violation Guidelines

Violation Severity	Rationale	Examples	FAA Action	USS Action
High	Potential Safety Impact	• Violation of core authorization rules	• Contact USS • Suspend service	• Correct • Re-onboard
Medium	Operational Non-Safety Impact	• Violation of non-core rules • Introduction of new product w/o onboarding • Output of misleading information to operators	• Issue warning to USS • Suspend service*	• Correct • Re-onboard*
Low	Minimal Impact	• Incorrect number of API calls • Incorrect spelling of authorization text • Service outage	• Contact USS • Report internally	• Correct*
***If necessary**				

Attachment E – Data Protection Plan Description

The Data Protection Plan provides a detailed description as to how the USS implements the following required LAANC Data procedural protections for UAS operators, recognizing rights UAS operators have in their LAANC Data:

1. Identify to the UAS operator and to FAA, in plain language and in a conspicuous location:
    a. all LAANC Data the USS is collecting from the UAS operator;
    b. for how long the LAANC Data will be retained;
    c. with whom the USS shares LAANC Data for UAS operators who opt-in to such LAANC Data sharing pursuant to paragraph 2 below;
    d. all intended uses of the LAANC Data; and
    e. any intellectual property rights the USS claims in the LAANC Data created by the UAS operator or derived from UAS operator-created LAANC Data.
2. Provide a mechanism that informs the UAS operator of USS's data usage and security policies related to the sharing of LAANC Data, and allow for the UAS operator to affirmatively agree to the sharing of LAANC Data through the UAS operator's decision to use the services offered by the USS:
    a. The Data Protection Plan must provide that the USS may share LAANC Data with the FAA pursuant to law, federal regulation, the LAANC Memorandum of Agreement, or these Performance Rules. This includes, without limitation, the information described in the *USS-FAA LAANC API Specification* version in effect.
3. Allow UAS operators a method to access or request a copy of their LAANC Data collected by the USS, and to request its destruction. Upon receipt of the request from the operator, the USS must destroy the LAANC Data as requested.
4. Identify internal operating documents that implement procedures or policies in compliance with Articles 19, 20, and 21.

The Data Protection Plan will cover all LAANC Data as defined in Article 1, Parties & Definitions, of the LAANC Memorandum of Agreement.