U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Control of Hazard Areas

Date: 12-21-2022

AC No: 450.161-1

Initiated By: AST-1

This Advisory Circular (AC) provides guidance for an operator to meet the requirements of Title 14 of the Code of Federal Regulations (CFR) § 450.161 to publicize, survey, control, or evacuate each flight hazard area identified under § 450.133 prior to initiating flight of a launch vehicle or the reentry of a reentry vehicle to the extent necessary to ensure compliance with the risk criteria in § 450.101.

This AC describes acceptable means, but not the only means, for demonstrating compliance with the applicable regulations. It is intended to assist prospective applicants in obtaining commercial space authorizations and operating in compliance with commercial space regulations. The contents of this document do not have the force and effect of law and are not meant to bind the public in any way. The document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies.

If you have suggestions for improving this AC, you may use the Advisory Circular Feedback form at the end of this AC.

KELVIN B COLEMAN

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Kelvin B. Coleman
Associate Administrator
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1 PURPOSE.

1.1 This AC provides guidance on meeting the requirements of § 450.161 to publicize, survey, control, or evacuate each flight hazard area identified under § 450.133 prior to initiating flight of a launch vehicle or the reentry of a reentry vehicle to the extent necessary to ensure compliance with the risk criteria in § 450.101. Section 450.161(b) requires an operator to perform surveillance sufficient to verify or update the results of the flight safety analysis. An operator must, in accordance with § 450.161(c), publicize warnings for each flight hazard area except for regions of land, sea, or air under the control of the vehicle operator, site operator, or other controlling authority with which the operator has an agreement.

1.2 **Level of Imperatives.**

This AC presents one, but not the only, acceptable means of compliance with the associated regulatory requirements. The Federal Aviation Administration (FAA) will consider other means of compliance that an applicant may elect to present. In addition, an operator may tailor the provisions of this AC to meet its unique needs, provided the changes are accepted as a means of compliance by the FAA during review of the application for a license. Throughout this document, the word "must" characterizes statements that directly follow from regulatory text and therefore reflect regulatory mandates. The word "should" describes an option that, if used would constitute a means to comply with the regulation; variation from the provisions of this AC is possible but must satisfy the regulation to constitute a means of compliance. The word "may" describes variations or alternatives allowed within the accepted means of compliance set forth in this AC.

2 APPLICABILITY.

2.1 The guidance in this AC is for launch and reentry vehicle applicants and operators required to comply with 14 CFR part 450. The guidance in this AC is for those seeking a launch or reentry vehicle operator license and licensed operators seeking to renew or modify an existing vehicle operator license.

2.2 The material in this AC is advisory in nature and does not constitute a regulation. This guidance is not legally binding in its own right, and the FAA will not rely upon this guidance as a separate basis for affirmative enforcement action or other administrative penalty. Conformity with this guidance document (as distinct from existing statutes and regulations) is voluntary only, and nonconformity will not affect rights and obligations under existing statutes and regulations.

2.3 The material in this AC does not change or create any additional regulatory requirements, nor does it authorize changes to, or deviations from, existing regulatory requirements.

3 APPLICABLE REGULATIONS AND RELATED DOCUMENTS.

3.1 Related United States Code (U.S.C.) Statute.

- 51 U.S.C. Subtitle V, Chapter 509.

3.2 Related FAA Commercial Space Transportation Regulations.

The following regulations from Title 14 of the CFR must be accounted for when showing compliance with 14 CFR § 450.161, *Control of Hazard Areas*. The full text of these regulations can be downloaded from the U.S. Government Printing Office e-CFR. A paper copy can be ordered from the Government Printing Office, Superintendent of Documents, Attn: New Orders, P.O. Box 371954, Pittsburgh, PA, 15250-7954.

- Section 401.7, *Definitions.*
- Section 450.101, *Safety criteria.*
- Section 450.133, *Flight hazard area analysis*.
- Section 450.137, *Far-field overpressure blast effects analysis.*
- Section 450.139, *Toxic hazards for flight*.
- Section 450.147, *Agreements*.
- Section 450.165, *Flight commit criteria*.
- Section 450.187, *Toxic hazards mitigation for ground operations*.

3.3 FAA Documents.

Note: FAA Advisory Circulars (are available through the FAA website, http://www.faa.gov).

- AC 450.109-1, *Flight Hazard Analysis*, dated August 5, 2021.
- AC 450.115-1A, *High Fidelity Flight Safety Analysis*, dated June 24, 2021.
- AC 450.139-1, *Toxic Release Hazard Analysis*, when published.
- *FAA Statement of Policy on Use of Letter of Intent (LOI) Between the United States Coast Guard (USCG) and a Commercial Space Operator to Establish Procedures for Issuance of Notice to Mariners (NOTMAR) and Other Measures Necessary to Protect Public Health and Safety for a Launch or Reentry*.

3.4 Related Technical Reports.

- National Research Council. *Streamlining Space Launch Range Safety*. The National Academies Press, Washington D.C. 2000. http://www.nap.edu/catalog/9790.html.

4 DEFINITION OF TERMS.

For this AC, the following terms and definitions from § 401.7 apply.

4.1 Captain of the Port (COTP)

United States Coast Guard (USCG) official responsible for enforcing, within their respective areas, port safety and security and marine environmental protection regulations. These regulations include, without limitation, the following: the protection and security of vessels, harbors, and waterfront facilities; anchorages; security zones; safety zones; regulated navigation areas; deep water ports; water pollution; and ports and waterways safety.

4.2 Navigable Waters of the United States (navigable waterway)

Navigable Waters refers to the territorial seas of the United States (U.S.); internal waters of the U.S. that are subject to tidal influence; and internal waters of the U.S. not subject to tidal influence that are or have been used as highways for substantial interstate or foreign commerce, or have been determined by a governmental or non-governmental body having expertise in waterway improvement to be capable of improvement to provide highways for substantial interstate or foreign commerce. See 33 C.F.R. § 2.36(a).

4.3 Navigational Telex (NAVTEX)

NAVTEX is the primary means designated by the International Maritime Organization for transmitting coastal urgent marine safety information to ships worldwide. In the U.S., NAVTEX is broadcasted from USCG facilities. NAVTEX is part of the Global Maritime Distress and Safety System, which has been incorporated into the International Convention for the Safety of Life at Sea, 1974, to which the U.S. is a party. All NAVTEX broadcasts are made on 518 kHz, using narrow-band direct printing 7-unit forward error correcting transmission.

4.4 Notice to Mariners (NOTMAR)

Notice published weekly by the National Geospatial Intelligence Agency (NGA) and prepared jointly with the USCG and National Ocean Service. It is intended to advise mariners of new hydrographic discoveries, changes in channels and navigational aids, and information concerning the safety of navigation. It may also contain information to update charts and publications, information from Local Notices to Mariners (LNMs) published by USCG districts, and information compiled from foreign notices to mariners, ship reports, and similar cooperating observer reports.

4.5 Broadcast Notice to Mariners (BNM)

The most expedient method of disseminating important navigation safety information. Two agencies within the U.S., the USCG and the NGA, are responsible for broadcasting navigation information. Each agency has a particular geographic area of responsibility.

4.6 Local Notice to Mariners (LNM)

The USCG's primary means for disseminating navigation safety information concerning aids to navigation, hazards to navigation, and other items of interest to mariners navigating the waters of the U.S., its territories, and possessions. Each District Commander is responsible for issuing an LNM each week containing information that contributes to navigation safety and maritime security within the boundaries of the District.

5 ACRONYMS.

AC – Advisory Circular

ADS-B – Automatic Dependent Surveillance – Broadcast

AIS – Automatic Identification System

ALTRV – Altitude Reservation

ANSP – Air Navigation Service Provider

AST – Office of Commercial Space Transportation

ATC – Air Traffic Control

ATCSCC – Air Traffic Control System Command Center

ATO – Air Traffic Organization

BMN – Broadcast Notice to Mariners

CARF – Central Altitude Reservation Function

CFR – Code of Federal Regulations

COTP – USCG Captain of the Port

DOD – Department of Defense

FAA – Federal Aviation Administration

FSA – Flight Safety Analysis

GMT – Greenwich Mean Time

HF – High Frequency

LOI – Letter of Intent

LNM – Local Notice to Mariners

MF – Medium Frequency

MLAT – Multilateration

NAVTEX – Navigational Telex

NGA – National Geospatial Intelligence Agency

NOTAM – Notices to Air Missions

NOTMAR – Notice to Mariners

NTM – Notice to Mariners

OMB – Office of Management and Budget

P_C – Probability of Casualty

RADAR – Radio Detection and Ranging

RCC – Range Commanders Council

U.S. – United States

USCG – United States Coast Guard

U.S.C. – United States Code

VHF – Very High Frequency

6 CONTROL OF HAZARD AREAS – GENERAL.

The publicizing, surveying, controlling, and evacuating of hazard areas allow for the mitigation of risk to the public and potential damage to property. For this reason, the FAA requires in § 450.133 that operators include in their flight safety analysis (FSA) a flight hazard area analysis that identifies each region of land, sea, or air that must be surveyed, publicized, controlled, or evacuated in order to control the risk to the public in accordance with § 450.101. Under § 450.161, an operator must implement hazard area controls for each identified flight hazard area prior to initiating flight of a launch vehicle or the reentry of a reentry vehicle to the extent necessary to ensure compliance with the risk criteria found in § 450.101.

6.1 **Guidance on Launch from a Federal Range**.

Note that in some cases, applicants may meet the requirements of § 450.45(b), in which the FAA accepts any safety-related launch or reentry service or property provided by a Federal launch or reentry site or other Federal entity by contract, as long as the FAA determines that the launch or reentry services or property provided satisfy part 450. In the cases where § 450.45(b) applies and the FAA has determined that a Federal site's publicizing, surveillance, control, and evacuation of hazard areas satisfy § 450.161, the applicant could benefit from reduced uncertainty, a faster review time by the FAA, and a reduced need for detailed descriptions under § 450.161(d)(1) and (d)(2).

6.2 **Guidance on Flight Safety Analysis**.

As noted above, the requirements of § 450.161 are based on the results of a flight hazard area analysis conducted in accordance with § 450.133 as part of an FSA. Guidance on how to identify hazard areas of concern is available in AC 450.115-1A, *High Fidelity Flight Safety Analysis.* Section 450.133 specifies the factors that must be taken into account in preparing a flight hazard area analysis, including requirements for identifying any waterborne vessel hazard area(s), land hazard area(s), and airspace hazard volume(s) that must be surveyed, publicized, controlled, or evacuated in order to control the risk to the public.

7 PUBLISHING WARNINGS FOR EACH HAZARD AREA.

In accordance with § 450.161(c), an operator must publicize warnings for each flight hazard area. The warnings should include land hazard areas, waterborne vessel hazard areas, and airspace hazard volumes. An operator is not required, per § 450.161(c), to publicize warnings for regions of land, sea, or air that are under the control of the vehicle operator, site operator, or other controlling authority with which the operator has an agreement. An operator may enter into an agreement with another entity who will publish warnings on its behalf. In accordance with § 450.161(c)(1) and (2), if an operator relies on another entity to publicize these warnings, the operator must determine whether the warnings have been issued, and notify the FAA if the warnings have not been issued so that the FAA can determine if the launch or reentry can be conducted in a manner that sufficiently protects the public.

7.1 **Clarity of Warnings**.

Before publishing warnings, an operator should ensure that the warnings contain the necessary information to accurately describe the location, time, and nature of the hazard. Warnings should be provided in a format that is clear to the receiving entity and to the public. Operators should follow the procedures established in their agreements with all entities providing warning services, as required by § 450.147.

7.2 **Methods of Publicizing Warnings for Land Hazard Areas**.

An operator should coordinate with appropriate local entities, such as launch site operators, local government officials, and law enforcement to publicize warnings for land hazard areas. Warnings may be published via local newspapers, city event calendars, alert messaging services, news releases, signs/placards, or by other means. Social media is best used as a supplementary notification, rather than a primary means of publicizing hazard areas. If an operator utilizes an entity to provide land hazard area warnings required by § 450.161, then it must have a written agreement specifying roles and responsibilities, as required by § 450.147(b). Physical methods for publicizing land hazard areas may include the use of signs, notices, placards, flags, or other visual warnings, that can be publicly displayed. On day of launch, a public address system, if available, may be used to restate warnings aurally at or near the launch or reentry site (e.g. loudspeakers or telephone paging).

7.3 **Methods of Publicizing Warnings for Waterborne Vessel Hazard Areas**.

Operators should coordinate with appropriate entities, including the USCG, other launch site operators, other applicable maritime authorities, or service providers to publicize warnings for waterborne vessel hazard areas in accordance with § 450.147(a)(2). The primary method is to coordinate with the USCG to publicize these warnings in the form of NOTMARs. Flags, buoys, and other visual warnings can be publicly displayed on and around docks and harbors to warn mariners. Written notices for the hazard area may be handed out around affected docks and harbors. On day of launch, marine very high frequency (VHF) radio transmissions may be used to restate warnings aurally. VHF-FM voice broadcasts generally contain all information that applies to inland waters and seaward to 20 nautical miles. Medium frequency (MF)

broadcasts (out to 100 nautical miles) and high frequency (HF) broadcasts (out to 200 nautical miles), delivered via NAVTEX, duplicate the VHF-FM broadcasts.

7.4 **Methods of Publicizing Warnings for Airspace Hazard Volumes**.

Operators must establish agreements for Notices to Air Missions (NOTAM) as required by § 450.147(a)(3) that define procedures for the issuance of NOTAMs. The following sub-paragraphs identify organizations responsible for the issuance of warnings for airspace hazard volumes. If the applicant has difficulty contacting those organizations, it may contact the FAA's Office of Commercial Space Transportation (AST) for additional guidance.

7.4.1 Notices to Air Missions.

Operators should coordinate directly with the FAA's Air Traffic Organization (ATO), applicable air navigation service provider (ANSP), or site operator to issue a NOTAM. An operator may use another entity to issue a NOTAM on its behalf if it has an agreement with that entity, pursuant to § 450.147(a). NOTAM information may be communicated via web portal, email, telephone, or by other appropriate communications method. A NOTAM should be issued prior to a launch or reentry, for closing of air routes during the respective launch and reentry windows, and for other measures necessary to protect public health and safety and safety of property. For example, notification measures necessary to protect the public, including any minimum times for notification, should be determined as part of the agreement development process with the FAA ATO, foreign ANSP, site operator, or service provider.

7.4.2 Altitude Reservation.

Some airspace hazard volumes that affect oceanic airspace may be implemented by the FAA as an Altitude Reservation (ALTRV). Operators should coordinate with the Central Altitude Reservation Function (CARF) at the FAA Air Traffic Control System Command Center (ATCSCC), or the local FAA Air Traffic Control facility, as appropriate, for ALTRV requests.

7.4.3 Department of Defense.

An operator should coordinate airspace hazard volumes affecting Department of Defense (DoD) airspace (e.g. Restricted Areas, Warning Areas, etc.) with the responsible DoD entity. An entity, such as a Federal launch range or site operator, may coordinate warnings for airspace hazard volumes on the operator's behalf in accordance with an agreement that meets the requirements of § 450.147.

7.4.4 Notification to Foreign Entities.

To publicize warnings for aircraft hazard areas outside the U.S. National Airspace System and oceanic airspace not under the control of FAA ATO, an operator should enter into a Letter of Intent (LOI) with the FAA ATO for the coordination of issuance of NOTAMs with foreign ANSPs. Regardless of how the operator chooses to coordinate issuance of NOTAMs, the operator is ultimately responsible for meeting the requirements of §§ 450.147 and 450.161.

7.5 Determining Warnings Have Been Issued in the U.S.

To comply with § 450.161(c)(1), an operator should either (1) coordinate directly with the issuing government authority, such as the FAA for NOTAMs or the USCG for Notice to Mariners (NTMs or NOTMARs), to confirm that the warning has been issued, or (2) confirm that the warning has been issued using publically available information. If an operator relies on another entity to publish warnings, their agreement with the entity should specify the procedures for coordinating and confirming government acceptance of the warnings.

7.6 Determining Whether Warnings Have Been Issued to Foreign Entities.

To comply with § 450.161(c), when it is necessary to publish warnings for regions of land, sea, or air that are controlled by a foreign entity, operators should obtain confirmation that the warning has been issued from either (1) the responsible foreign government entity, or (2) publically available information. If an operator relies on another entity to publish warnings for foreign jurisdictions, their agreement with the entity should specify the procedures for coordinating and determining whether warnings have been issued. The FAA recognizes an operator may be unable to ensure publication of warnings by foreign Air Navigation Service Providers (ANSPs). In accordance with § 450.161(c)(2), if the warnings have not been issued, the operator must notify the FAA so that the FAA can determine if the launch or reentry can be conducted in a manner that sufficiently protects the public. This notification must provide sufficient information to enable the FAA to issue warnings to U.S. aircraft.

8 PERFORMING SURVEILLANCE OF HAZARD AREAS.

Surveillance must be performed for two reasons:

1. As required by § 450.161(a), an operator must publicize, survey, control, or evacuate each flight hazard area to the extent necessary to ensure compliance with § 450.101.
2. As required by § 450.161(b), an operator must perform surveillance sufficient to verify or update the assumptions, input data, and results of the flight safety analyses.

8.1 **External Entities**.

An operator may perform the necessary surveillance or have an entity conduct the surveillance on its behalf. This may be a Federal Entity, as authorized under § 450.45(b), or another entity. If an operator utilizes an entity to provide land surveillance services, it must have a written agreement specifying roles and responsibilities, as required by § 450.147(b).

8.2 **Sufficiency**.

To determine whether surveillance is "to the extent necessary" and "sufficient to verify or update assumptions," the effectiveness of the surveillance approach should be commensurate with the individual and collective risks posed by the operation. Any method or combination of methods for surveillance has some amount of effectiveness.

8.2.1 For example, extremely high effectiveness might be obtained by a high-density set of visual and infrared cameras that are monitored with both automated motion detection and humans monitoring feeds. A much lower effective surveillance method might be a request via radio to provide position updates. A measure of effectiveness is the probability of detecting a person in a particular environment.

8.2.2 No surveillance method is perfect, but there should be a much lower likelihood of an undetected person in a region where the risk to the person is well above the individual risk criterion. For example, if a location has an individual risk, also known as probability of casualty (P_C), of 1×10^{-4}, it is a factor of 100 above the safety criteria, so there should be less than a 1 in 100 chance of failing to detect a person being present. For surveillance systems where quantitative effectiveness is not known, a qualitative justification for a quantitative estimate should be used.

8.3 **Methods for Day-of-Flight Surveillance**.

There are multiple methods for conducting day-of-flight surveillance of hazard areas. An operator may use a combination of methods, if appropriate.

8.3.1 Land Hazard Areas.

Observers and/or security personnel may be used to monitor access points or hazard areas using electronic, video, or direct visual surveillance. Piloted or remotely-piloted aircraft may also be used for surveillance of land hazard areas. An operator may use its own personnel to survey land hazard areas, or it may enter into agreements with local law enforcement, launch site operators, or other entities to conduct surveillance.

8.3.2 Waterborne Vessel Hazard Areas.

An operator may monitor marine traffic using information received from Automatic Identification System (AIS) transmissions from waterborne vessels, which is an automated tracking system that displays vessels in the vicinity. An operator may utilize service providers to obtain real-time AIS surveillance data or use direct surveillance methods, such as marine radar or sonar to detect waterborne vessels. Visual observers (launch operator personnel or contractors) on land may be used to survey waterborne vessel hazard areas within visual range. Waterborne vessels may be used to assist in surveying hazard areas at sea. Piloted or remotely-piloted aircraft may also be used to survey areas of sea from above. An operator may use its own personnel to survey waterborne vessel hazard areas, or it may enter into agreements with the USCG, launch site operators, or other entities to conduct surveillance.

8.3.3 Airspace Hazard Volumes.

Surveillance methods may include data from Automatic Dependent Surveillance – Broadcast (ADS-B), Radio Detection and Ranging (RADAR), Multilateration (MLAT), visual observers, or other methods. An operator may use web or mobile-application-based ADS-B flight tracking applications to access real-time ADS-B data to survey aircraft hazard areas. Since not all aircraft may have operating ADS-B equipment,[1] additional methods may be used to supplement ADS-B surveillance. An operator may also use visual observers, either on land, airborne, or both to survey for aircraft. Additionally, an operator may utilize service providers to obtain real-time airspace surveillance data. It may also choose to survey airspace hazard volumes using its own personnel and resources.

[1] See 14 CFR § 91.225.

8.4 **Surveillance Plans to Submit with an Application**.

Pursuant to § 450.161(d)(1), an operator must provide in its application a description of how the applicant will provide for day-of-flight surveillance and control of flight hazard areas, if necessary, to ensure that the presence of any member of the public in or near a flight hazard area is consistent with flight commit criteria developed for each launch or reentry as required by § 450.165(b) to meet the risk criteria in § 450.101. Paragraphs 8.4.1 and 8.4.2 of this AC address day-of-flight surveillance while chapter 9 of this AC addresses control of flight hazard areas.

8.4.1 Description for providing Day-of-Flight Surveillance.

The description should cover methods used for surveillance of all hazard areas identified in compliance with § 450.133. Day-of-flight surveillance should ensure that the presence of any member of the public in or near any flight hazard area is consistent with the assumptions and inputs to the operator's flight safety analysis.

8.4.2 Surveillance of Land, Sea, and Air.

If the presence of any member of the public in or near any flight hazard area is not consistent with the flight commit criteria developed under § 450.165(b), an operator must not commence launch or reentry until such time that any public presence is consistent with those criteria required by § 450.165(a)(1). If surveillance is stopped prior to launch, latency should be taken into account. The launch decision should be based on surveillance that shows no public, including ship or aircraft, will transition into the hazard area during flight. For instance, the time it takes for a ship to traverse from the edge of the surveyed area to the waterborne vessel hazard area should be taken into account when deciding when to end surveillance prior to launch. It is recommended that the surveillance assets account for a buffer between the recommended clearance area and an area encompassing the distance a vessel could travel in this time. An operator's surveillance plan should also include atmospheric limitations of sensors or observers, if applicable. For example, if observers will be used to determine if aircraft are in the airspace hazard volume below 5,000 feet, then a minimum 5,000 feet visibility requirement should be in the surveillance plan during the time when these observations take place.

9 CONTROLLING FLIGHT HAZARD AREAS.

As required by § 450.161(a), an operator must publicize, survey, control, or evacuate each flight hazard area identified in accordance with § 450.133 prior to initiating flight of a launch vehicle or reentry of a reentry vehicle to the extent necessary to ensure compliance with § 450.101. While surveillance may help an operator detect or identify the presence of members of the public, control includes actions or methods of actively preventing access or facilitating exit of members of the public from flight hazard areas. The entities providing surveillance services may also provide control services if they have the legal authority to control access to those hazard areas. For example, security guards may both survey an area and control an area by preventing members of the public from entering a flight hazard area, or by escorting persons out of the area. The USCG may provide similar control measures for waterborne vessels at its discretion, provided that the requisite assets are available and the area under control is within U.S. territorial waters. As noted above, operators are required under § 450.147 to execute an agreement with the USCG establishing procedures for NOTMAR issuance, to be included with their application. The USCG and the FAA have developed a template Letter of Intent (LOI) that the FAA will accept as a means of compliance with § 450.147(b) when submitted with an application, provided the LOI follows the template (including any mission details) and is signed by the applicant and relevant USCG office. If an operator utilizes an entity to provide flight hazard area control services, it must have a written agreement specifying roles and responsibilities, as required by § 450.147.

9.1 **Methods for Day-of-Launch Control of Land Hazard Areas**.

Security checkpoints, roadblocks, fences, barriers, or other physical controls may be used to control access to an area of land. An operator should determine appropriate locations for any physical controls, as necessary, to prevent access to the defined hazard areas. Appropriate locations may include highways, walkways, trails, beaches, or other areas that would enable access by persons on foot or in vehicles. It may be helpful to develop a map of the hazard area depicting locations of access points, checkpoints, roadblocks, and other physical controls. Security guards may also be employed to escort unauthorized persons out of an area or prevent persons from entering an area. For areas with speaker systems coverage throughout, aural warnings and directions may be used to direct people out of the area. In the event that a hazard area is breached, the applicant should have a communications plan to address how to communicate to individuals responsible for the launch commit criteria. Real time calculations may be accomplished to determine if the members of the public who are present cause the risk to exceed the flight commit threshold criteria. If the risk criteria threshold is exceeded, an operator must not commence flight of a launch vehicle or reentry of a reentry vehicle until such time that any public presence is consistent with those criteria, in accordance with § 450.165(a)(1).

9.2 **Methods for Day-of-Launch Control of Airspace Hazard Volumes**.

An operator should coordinate with FAA air traffic control (ATC) to manage or reroute aircraft so that they avoid any active airspace hazard volume(s). An operator's agreement with the FAA ATO should include roles, responsibilities, and procedures for managing airspace hazard volumes. Operators should have a communications plan to address how to communicate any breach of an airspace hazard volume to the individual responsible for launch commit criteria. If an aircraft breaches the area, an operator may coordinate with the local FAA ATC facility to monitor the aircraft's progress and, if possible, direct the aircraft out of the hazard area. If the presence of any member of the public on an aircraft in the flight hazard area is not consistent with the flight commit criteria developed under § 450.165, an operator must not commence launch or reentry until such time that any public presence is consistent with those criteria in accordance with § 450.165(a)(1).

10 CONTROLLING WATERBORNE VESSEL HAZARD AREAS.

10.1 Commercial Space Operator Requirements for Waterborne Vessel Hazard Areas.

Unless otherwise addressed in agreements with a launch or reentry site operator, for overflight of navigable water, § 450.147(a)(2) requires an operator to establish a written agreement with the USCG or other applicable maritime authority to establish procedures for the issuance of a NOTMAR prior to a launch or reentry and other measures necessary to protect public health and safety. To satisfy this requirement an operator should submit an LOI using the template LOI in appendix B as provided in the FAA's *Statement of Policy on Use of Letter of Intent (LOI) Between the United States Coast Guard (USCG) and a Commercial Space Operator* in Appendix A.

11 EVACUATION AREAS.

11.1 Evacuation Area Procedures.

In order to manage risks to the public, there are often areas that are evacuated where people are normally present. These often include public recreation areas and on-site non-mission personnel, and may include other areas as well. The approach to effecting the notification and enforcement of evacuations should be described. In some cases, not everyone would need to be evacuated from the area, either because the evacuation is to reduce collective risk or there are people who are not the public that are allowed in the area. Evacuation areas should become controlled areas, where there are active measures to prevent entry of unauthorized personnel, or surveillance areas to the extent necessary to ensure compliance with the risk criteria found in § 450.101.

11.2 Evacuating the Public from Flight Hazard Areas Having Toxic Risk.

An operator must provide a description of how it will establish flight commit criteria based on the results of its toxic release hazard analysis, toxic containment analysis, or toxic risk assessment for any necessary evacuation of the public from any toxic hazard area, as required by § 450.161(d)(3). The FAA recommends that an operator anticipating toxic hazards on its vehicle or payload reference AC 450.139-1*, Toxic Release Hazard Analysis* for means of compliance on determining sizes of hazard areas, flight commit criteria, as well as mitigations and controls for toxics.

Appendix A. Statement of Policy on Use of Letter of Intent

A.1 STATEMENT OF POLICY ON USE OF LETTER OF INTENT

The following is a copy of the Statement of Policy on the use of a Letter of Intent between the United State Coast Guard (USCG) and a Commercial Space Operator to issue a Notice to Mariners (NOTMAR) and the measures necessary to protect public health and safety.

The updated version of the USCG Letter of Intent (LOI) Policy Statement is located here:

https://www.faa.gov/space/legislation_regulation_guidance

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 417,420,431,433,435,437, and 450

Statement of Policy on Use of Letter of Intent (LOI) Between United States Coast Guard (USCG) and a Commercial Space Operator[2] to Establish Procedures for Issuance of Notice to Mariners (NOTMAR) and Other Measures Necessary to Protect Public Health and Safety for a Launch or Reentry.

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT)

ACTION: Policy Statement

SUMMARY: This action establishes the FAA's policy for accepting the attached LOI as a means of compliance with FAA regulations that require a written agreement between the operator and the USCG establishing procedures for the issuance of a NOTMAR prior to a launch or reentry. If additional measures beyond NOTMAR issuance are necessary to protect public health and safety, as specified in FAA regulations, the FAA will accept an LOI including those additional measures as an equivalent level of safety.

DATES: The policy described herein will be effective 19 October 2022.

FOR FURTHER INFORMATION CONTACT: For additional information concerning this action, contact Daniel Murray, Executive Director, Office of Operational Safety, via letter: 800 Independence Ave, SW, Washington, DC 20591; via email: 9-AST-Inquiries@faa.gov; via phone: (202) 267-7793.

[2] An operator is a holder of a license or permit under 51 U.S.C. Subtitle V, chapter 509, but in this document it may also refer to an applicant applying for a license or permit.

SUPPLEMENTARY INFORMATION: The Commercial Space Launch Act of 1984, as amended and codified at 51 U.S.C. §§ 50901-50923, authorizes the Department of Transportation, and the FAA through delegation, to oversee, license, and regulate commercial launch and reentry activities, and the operation of launch and reentry sites as carried out by U.S. citizens or within the United States. The FAA, through regulations, exercises this responsibility consistent with public health and safety, safety of property, and the national security and foreign policy interests of the United States. 51 U.S.C. 50905. To satisfy the FAA regulations, operators may use a means of compliance that has already been accepted by the FAA or propose an alternate approach. For flexibility, the FAA regulations[3] allow an operator to demonstrate that an alternative approach provides an equivalent level of safety to a regulatory requirement.

I. **Background**.

Unless otherwise addressed in agreements with the site operator, for overflight of navigable water, 14 CFR § 450.147(a)(2) requires an operator to provide a written agreement with the USCG or other applicable maritime authority establishing procedures for the issuance of a NOTMAR prior to a launch or reentry and other measures necessary to protect public health and safety. Section 450.147(b) requires the agreement to clearly delineate the roles and responsibilities of each party to support a safe launch or reentry. The FAA requires a similar agreement between the applicant and USCG in §§ 420.31(a), 431.75(b)(l), and 437.63(b)(l) that establishes procedures for the issuance of a NOTMAR.[4] Furthermore, under part 417, which sets forth the safety requirements for launch of an expendable launch vehicle, § 417.111(i)(5) requires an operator to describe its procedures to provide hazard information and communicate with the local USCG office to ensure that a NOTMAR is issued.

In the past, operators complied with this requirement by entering into a Memorandum of Agreement (MOA) with the USCG for the issuance of a NOTMAR. The USCG recently advised the FAA that it will no longer enter into MOAs with commercial entities due to restrictions on its legal authority. In order to ensure that operators can continue to meet the requirement for an agreement with the USCG regarding procedures for NOTMAR issuance, the FAA and USCG have developed an LOI template that will serve as a means of compliance with the FAA regulations requiring such an agreement between the applicant and USCG.

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[3] Sections 417.1, 420.1, 431.1, 435.1, 437.1, and 450.37 of title 14 of the Code of Federal Regulations provide applicants an option to demonstrate an equivalent level of safety to the requirements in parts 417 (Launch Safety), 420 (License to Operate a Launch Site), 431 (Launch And Reentry Of A Reusable Launch Vehicle), 435 (Reentry Of A Reentry Vehicle Other Than A Reusable Launch Vehicle), 437 (Experimental Permits), and 450 (Launch and Reentry License Requirements). An applicant for a license or permit to conduct a launch or reentry or to operate a launch or reentry site must demonstrate compliance with the requirements of the aforementioned parts of 14 CFR unless the applicant clearly and convincingly demonstrates that an alternative approach provides an equivalent level of safety to the requirement.

[4] Section 43l.75(b)(l) also applies to a reentry per§ 435.51. In addition to the requirements of part 433, per § 413.13, the FAA identified additional information necessary (similar to § 420.31(a)) for a determination that public health and safety, safety of property, and national security and foreign policy interests of the United States are protected during operation of a reentry site.

II. **Discussion of the Policy**.

The FAA's policy with respect to use of the template LOI to satisfy the requirement for an agreement with the USCG for NOTMAR issuance is as follows:

1. The LOI is a means of compliance with FAA regulations requiring a written agreement for issuance of a NOTMAR[5] because it expressly provides for NOTMAR issuance by the USCG and contains the same information and coordination requirements previously required of operators under MOAs. The LOI template delineates the roles and responsibilities of the operator and USCG to support safe launch or reentry to the same extent as the MOAs previously used to meet this requirement.
2. If additional measures beyond NOTMAR issuance are deemed necessary to protect public health and safety under 14 CFR § 450.147(a)(2), § 420.31(a), or § 431.75(b)(l), the FAA may accept a version of this LOI specifying all such additional measures as a separate means of compliance or make an equivalent level of safety determination as necessary. The template also contains the language embodied in past MOAs regarding the USCG's intent to conduct a risk assessment to determine what, if any, assets are appropriate to ensure public safety during a launch or reentry.

An applicant may submit an LOI that follows the attached template to demonstrate compliance with the following regulations requiring a written agreement with the USCG that establishes procedures for NOTMAR issuance: 14 CPR § 417.111(i)(S), § 420.3l(a), § 43l.75(b)(l), § 437.63(b)(l), and § 450.147(a)(2). If additional measures beyond NOTMAR issuance are necessary to protect public health and safety under 14 CFR § 450.147(a)(2), § 420.3l(a), or § 43l.75(b)(l), the FAA may accept an LOI that follows the attached LOI template and includes such additional measures as an alternate means of compliance or as an equivalent level of safety to those regulations as appropriate.

The contents of this document do not have the force and effect of law and are not meant to bind the public in any way. It is intended only to provide clarity to the public regarding existing requirements under the law and agency policies.

[5] 14 CFR § 417.ll l{i)(5), § 420.3l{a), § 431.75(b){l), § 437.63(b)(l}, and§ 450.147(a)(2).

Appendix B. Letter of Intent

B.1 LETTER OF INTENT (LOI) TEMPLATE

The following is a copy of the Letter of Intent template for a commercial space operator's use in providing information regarding their intent to conduct launch and reentry operations to the appropriate Coast Guard District to ensure the safety of the Maritime Domain.

The updated version of the LOI template is located here:

https://www.faa.gov/space/legislation_regulation_guidance

LETTER OF INTENT FOR *COMMERCIAL SPACE ENTITY* TO PROVIDE INFORMATION RELATED TO [LAUNCH AND REENTRY OPERATIONS] [AND] [LAUNCH AND REENTRY SITE OPERATIONS] TO THE UNITED STATES COAST GUARD *RELEVANT AREA* AND *APPROPRIATE COAST GUARD DISTRICT* TO ENSURE SAFETY OF THE MARITIME DOMAIN

1. **BACKGROUND**.
   a. 14 C.F.R. Chapter III requires Commercial Space Operators to coordinate with the U.S. Coast Guard to establish procedures for the issuance of a Notice to Mariners and any other measures the Coast Guard deems necessary to protect public health and safety, prior to any launch or reentry activity licensed by the FAA that overflies or affects Navigable Waters. The U.S. Coast Guard's authority to regulate Navigation and Navigable Waters is implemented in 33 C.F.R. Chapter I.
   b. [Commercial Space Entity] has applied for a [license/permit] from the FAA to [conduct a launch / reentry or operate a launch / reentry site] at [location] under 14 CFR [insert applicable part]. *Briefly describe operations, nexus with USCG, and USCG Districts affected*.
2. **PURPOSE.** This Letter of Intent is in response to a request made to the U.S. Coast Guard *Relevant Area* from *Commercial Space Entity* to establish procedures for issuance of Notices to Mariners [Optional: and provide resources in support of its operations [currently planned for] [on or about] [date] from [location],] including launch, reentry, and recovery efforts involving a [rocket type] that may affect the safety and security of the maritime domain]. The U.S. Coast Guard intends to exercise its statutory authorities and responsibilities to safeguard the maritime transportation system, public safety, and marine environment with regard to these activities, and consistent with its statutory authority, will issue Notices to Mariners in its discretion. This Letter of Intent does not address Air Traffic Control procedures, nor does it cover other notifications required for launch operations.

3. **SCOPE.** The information contained herein establishes Coast Guard *Relevant Area's* intent to issue Notices to Mariners in its discretion and monitor *Commercial Space Entity's launch/reentry* operations activity within the *Relevant Area's* area of responsibility to ensure safety and security of the maritime domain. The U.S. Coast Guard's intent is specific to the locations and proposed operations of the subject *launch/reentry* areas and is designed to establish Coast Guard conditions and coordination procedures for *launch/reentry* operations.

4. ABBREVIATIONS & DEFINITIONS.

a. Abbreviations:

i. AST Office of Commercial Space Transportation

ii. BNM Broadcast Notice to Mariners

iii. COTP Coast Guard Captain of the Port

iv. FAA Federal Aviation Administration

v. GMT Greenwich Mean Time

vi. LAA Limited Access Area

vii. LNM Local Notice to Mariners

viii. NAVTEX NAVigation TEleX

ix. NGA National Geospatial-Intelligence Agency

x. NSRA Navigation Safety Risk Assessment

xi. RLV Reusable Launch Vehicle

b. Definitions:

i. Captain of the Port (COTP): Captains of the Port and their representatives enforce, within their respective areas, port safety and security and marine environmental protection regulations. These regulations include, without limitation, the following: the protection and security of vessels, harbors, and waterfront facilities; anchorages; security zones; safety zones; regulated navigation areas; deep water ports; water pollution; and ports and waterways safety.

ii. Limited Access Area (LAA): Tool used to control movement of marine traffic and limit access to all or a portion of the waterway to provide safety and security for mariners, vessels, and maritime critical infrastructure, and manage the use of navigable waterways for commerce and environmental protection. LAAs could be a tool used to mitigate risks identified through a Navigation Safety Risk Assessment (NSRA).

iii. U.S. Coast Guard District: A Coast Guard District Commander is in command of a Coast Guard District and the District Commander's office may be referred to as a Coast Guard District Office. For the purposes of this letter of intent, the "Local U.S. Coast Guard District" refers to the *Relevant USCG District(s) and location (City, State)*.

iv. Navigation Safety Risk Assessment (NSRA): Tool used by the COTP when preparing input for the permitting agency regarding port or waterway safety issues associated with a project located on, over, or near the navigable waters of the United States. The assessment helps the COTP identify potential navigation risks and is the basis of any recommendation to the permitting agency.

v. Navigable Waters of the United States (navigable waterway): Navigable Waters refers to the territorial seas of the United States (all waters seaward of the baseline to 12 nautical miles (NM)); internal waters of the United States that are subject to tidal influence; internal waters of the United States not subject to tidal influence, but that are or have been used, are or have been susceptible for use, as highways for substantial interstate or foreign commerce, have been determined by a governmental or non-governmental body, having expertise in waterway improvement, that they are capable of improvement to constitute highways for substantial interstate or foreign commerce; and other waters over which the Federal Government may exercise Constitutional authority. See 33 C.F.R. § 2.36(a).

vi. NAVTEX: The International Maritime Organization has designated NAVTEX as the primary means for transmitting coastal urgent marine safety information to ships worldwide. In the United States, NAVTEX is broadcasted from Coast Guard facilities. NAVTEX is part of the Global Maritime Distress and Safety System, which has been incorporated into the International Convention for the Safety of Life at Sea, 1974, to which the United States is a party. All NAVTEX broadcasts are made on 518 kHz, using narrow-band direct printing 7- unit forward error correcting transmission.

vii. Notice to Mariners:

a. Broadcast Notice to Mariners (BNM): Broadcast Notice to Mariners is the method by which important navigation safety information is disseminated in the most expedient manner. Two agencies within the United States, the U.S. Coast Guard and the National Geospatial-Intelligence Agency (NGA), are responsible for broadcasting navigation information. Each agency has a particular geographic area of responsibility.

i. USCG: Broadcast Notice to Mariners are issued via voice and NAVTEX. As a general rule, VHF-FM voice broadcasts will contain all information that applies to inland waters and seaward to 20 nautical miles. Medium frequency (MF) broadcasts (out to 100 nautical miles) and high frequency (HF) broadcasts (out to 200 nautical miles), delivered via NAVTEX, duplicate the VHF-FM broadcasts.

ii. NGA: In support of the Global Maritime Distress and Safety System (GMDSS), NGA Broadcast Warnings are promulgated by the Worldwide Navigational Warnings Service (WWNWS) to provide rapid dissemination of information critical to navigation and the safety of life at sea. Navigational Warnings are issued regularly and contain information about persons in distress, or objects and events that pose an immediate hazard to navigation. NGA broadcasts contain information that concerns ocean waters beyond approximately 150 nautical miles from shore.

b. Local Notice to Mariners: The Local Notice to Mariners is the Coast Guard's primary means for disseminating navigation safety information concerning aids to navigation, hazards to navigation, and other items of interest to mariners navigating the waters of the United States, its territories, and possessions. Each District Commander is responsible for issuing a Local Notice to Mariners each week containing information that contributes to navigation safety and maritime security within the boundaries of the District.

c. Notice to Mariners: The Notice to Mariners is published weekly by the NGA and prepared jointly by the USCG, National Ocean Service, and the NGA. It is intended to advise mariners of new hydrographic discoveries, changes in channels and navigational aids, and information concerning the safety of navigation. It also contains information to update charts and publications, information from Local Notices to Mariners published by USCG districts, and information compiled from foreign notices to mariners, ship reports, and similar cooperating observer reports.

viii. [Reusable Launch Vehicles: Reusable Launch Vehicle (RLV) means a launch vehicle that is designed to return to Earth substantially intact and therefore, may be launched more than one time or that contains vehicle stages that may be recovered by a launch operator for future use in the operation of a substantially similar launch vehicle.] [Launch vehicle means a vehicle built to operate in, or place a payload in, outer space or a suborbital rocket.] [Reentry vehicle means a vehicle designed to return from Earth orbit or outer space to Earth substantially intact. A reusable launch vehicle that is designed to return from Earth orbit or outer space to Earth substantially intact is a reentry vehicle.] [Expendable launch vehicle means a launch vehicle whose propulsive stages are flown only once.]

ix. *USCG Relevant Area*: Refers to the Commander of the Relevant Area and responsible for determining when operational matters require the coordination of forces and facilities of more than one Coast Guard District. The geographic boundary for the *Relevant Area* is available at 33 C.F.R. Subpart 3.04. The Relevant Area Commander provides operational oversight of USCG Districts XX, XX, XX, XX, and XX for the purposes of this LOI.

5. **Commercial Space Entity Requirements.** *Commercial Space Entity* will:

   a. Operations Plans: *Commercial Space Entity* will provide current copies of the following plans to the Coast Guard:

      i. Ship Hazard Area or Restricted Hazard Area, as defined through Range Commanders Council, Common Risk Criteria Standards for National Test Ranges 321, section 3.4. This includes a Ship Hazard Area/Restricted Hazard Area diagram describing the projected impact area of debris fragments (shown in Appendix *list appendices*);

      ii. Mishap Plan that includes all information to facilitate the immediate notification of primary points of contact listed in Section 7 and Appendix A, in the event of a launch or reentry site accident over or adjacent to navigable waters, and/or within the Coast Guard District areas of responsibility.

   b. Response Plans: *Commercial Space Entity* will provide current copies of a Response Plan to *Coast Guard Relevant Area* Prevention Operations Planning Branch, and *list Relevant USCG Districts Waterways Management Branches*. This Response Plan will include the procedures necessary to contain, minimize the adverse effects of, and respond to the foreseeable consequences of a mishap, as such term is defined in 14 C.F.R. § 401.7, occurring in the conduct of the [launch and/or reentry] reentry accident, reentry incident, or other mishap, as such terms are defined in 14 C.F.R. § 401.5, occurring in the conduct of an FAA-licensed activity, and at a minimum, will include procedures to mitigate hazards to public health and safety, and the contamination of waterways and adjacent coastline.

   c. Scheduling and Notification Activities:

      i. *Commercial Space Entity* will annually provide the *Relevant Area Commander* a launch and reentry schedule forecast for the fiscal year, as it is known at the time, by 30 September.

      ii. *Commercial Space Entity* will provide, to the extent reasonably practicable, not less than 10 business days of advance notice of the launch and reentry schedule.

      iii. (R-30 days) *Commercial Space Entity* will submit reentry information, where applicable, at least 30 days prior to scheduled reentry or as soon as practicable for contingency reentry.

         a. *Commercial Space Entity* will provide this reentry information to:

            i. *Relevant Area* Prevention Operations Planning Branch;

            ii. *Relevant District* Waterways Management Branch(es), who will request an LNM article via *list Relevant Districts' LNM email addresses*; and

            iii. *Relevant Sector* Waterways Management Division(s).

         b. Reentry information should include the following:

i. Mission Designator;

ii. Vehicle type and reentry description;

iii. Primary, secondary, and contingency reentry dates and times in GMT;

iv. Restricted Hazard Area perimeter coordinates in degrees, minutes, and seconds to three decimal places, if applicable.

v. Recovery Officer contact information.

iv. (NLT T-72 hours) *Commercial Space Entity* will contact the following:

a. Relevant Sector Level: *Relevant Sector* Waterways Management Divisions and Sector Command Centers, to request issuance of a Broadcast Notice to Mariners (BNM) to provide [launch] [reentry] information and any other specific information needed by mariners. This communication is important because it will, subject to the discretion of the Coast Guard Captain of the Port, result in the Coast Guard issuing a NAVTEX broadcast;

b. Relevant District Level:

i. *Relevant District* Waterways Management Branch(es) to confirm reentry information for the LNM;

ii. District Command Center(s), to ensure general awareness and monitoring and to trigger LNM issuance, at the discretion of the District Commander, for [launch] [reentry] activities occurring within 150 miles from shore;

c. NGA may issue Navigation Area XII or HYDROPAC warning notifications for launch/reentry activities occurring over water seaward of 150 nautical miles offshore. Reentry information should be sent to navsafety@nga.mil and may also be relayed via voice at (571) 557-5455.

d. *Chain of communications*: *Commercial Space Entity* will inform the *Relevant Area's* Prevention Operations Planning Branch of all communications with an engaged District (dpw) and will inform the relevant District of all communications with an engaged Sector.

d. Limited Access Area (LAA) activation, coordination and enforcement: *Describe LAA activation, coordination and enforcement. If no LAAs are required, input "The Coast Guard Operational Commander has determined that no LAAs are required for safe operation* for this event."

6. Coast Guard Intent.

a. Upon receipt of the information relating to any launch, reentry, or recovery operation from *Commercial Space Entity*, Coast Guard *Relevant Area* intends to:

i. Assess the information received for potential effects in or to the maritime domain;

ii. Discuss the information received with relevant Districts and Sectors to allow local Coast Guard leaders to make a risk-based assessment of the need for resources;

iii. Conduct a risk assessment to determine what, if any, assets are appropriate to ensure public safety and that commerce is not adversely affected by the launch, reentry, or recovery;

iv. Issue appropriate public advisories, such as Notices to Mariners (e.g. LNM and BNM), for *Commercial Space Entity* launches, reentries, and recoveries; and

v. Communicate Coast Guard actions in response to *Commercial Space Entity's* planned recovery operations to *Commercial Space Entity* and other stakeholders, as appropriate.

vi. Limitations: The Coast Guard cannot commit a specific number or type of asset(s) because of the dynamic nature of Coast Guard operations, the potential for competing missions, and vessel or personnel limitations. Upon notification of an imminent [launch] [reentry], the Coast Guard will determine asset availability based on factors that include, but are not limited to, the following: whether the spacecraft is crewed and by whom, weather and sea state at the splashdown location, competing or ongoing missions, potential hazards to Coast Guard personnel and the public, anticipated public presence at the splashdown location, and the presence of private resources arranged for the operation.

b. Coast Guard District(s) *list relevant USCG Districts* Waterways Management Branches intend to engage in the following scheduling and notification activities:

i. Receive and review annual forecast of scheduled [launches] [reentries] provided by *Commercial Space Entity*;

ii. Endeavor to publish [launch] [reentry] information at least 15 days prior to [launch] [reentry] in the Local Notice to Mariners, at the discretion of the operational commander and subject to operational limitations;

iii. Fulfill any other statutory responsibility pertaining to USCG jurisdiction and authorities, subject to the discretion of the *Relevant District Commander*;

iv. Consult with *Commercial Space Entity* on all matters related to navigation safety pertaining to space transportation, as appropriate.

c. Nothing in this letter prevents Coast Guard Area, District, Sector, or local unit commanders from exercising their discretion to take necessary action, consistent with law and regulation, to protect the safety and security of lives and property in areas and aboard vessels in which the Coast Guard may exert jurisdiction.

7. **POINTS OF CONTACT.** The primary points of contact for this Letter of Intent will be the Chief, Prevention Operations Planning Branch (PAC/LANT-54) of *Coast Guard Relevant Area*, *list relevant USCG Districts* Waterways Management Branches, Coast Guard Sectors *list relevant USCG Sectors* Waterways Management Branches, and *Commercial Space Entity's primary contact*. Contact details are in Appendix A.

8. **OTHER PROVISIONS**.

a. *Commercial Space Entity* will immediately notify the Coast Guard in the event it is unable to fulfill any of the requirements covered by this Letter.

b. This Letter represents the entire intent of the Coast Guard and supersedes any prior letters, arrangements, or agreements between the Coast Guard and *Commercial Space Entity* with respect to the subject matters referenced in this Letter.

c. No provision of this Letter of Intent should be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. § 1341. Furthermore, no provision of this Letter of Intent is intended to conflict with current law or regulation or the directives of the U. S. Coast Guard or Department of Homeland Security. If a term of this Letter is inconsistent with such authority, then that term shall be invalid, and is severable from the rest of this Letter.

ISSUED BY:

VADM Date

Commander, Coast Guard Relevant Area

ACKNOWLEDGED BY:

Commercial Space Entity's Signature Authority Date
Title, Commercial Space Entity

Appendix (A) Specific Points of Contact
Appendix (B) Restricted Hazard Areas
Appendix (C) Coast Guard District/COTP Zones
Appendix (D) Composite Restricted Hazard Area Maps

LETTER OF INTENT

Appendix A – Primary Points of Contact (**include all relevant Sector, District, and Area contacts**)

OFFICE	NUMBER	RESPONSIBILITY
Commercial Space Entity's Primary Contact Office/Department Email address	**xxx-xxx-xxxx**	Input responsibility
Commercial Space Entity's Recovery Officer Email address	**xxx-xxx-xxxx**	Input responsibility
Coast Guard Relevant Area Prevention Operations Planning Branch Shared Email@uscg.mil	**xxx-xxx-xxxx**	Chief, Prevention Ops Planning Branch
Coast Guard District XXXX Waterways Management Shared Email@uscg.mil	**xxx-xxx-xxxx**	Chief, Waterways Management
Coast Guard District XXXX LNM Editor Shared Email@uscg.mil	**xxx-xxx-xxxx**	Publication of Local Notice to Mariners

LETTER OF INTENT

Appendix B –Restricted Hazard Areas

The following is the *restricted hazard area name* restricted hazard area associated with a *terrestrial landing site name* landing:

INSERT GRAPHICS/IMAGES HERE

INSERT RESTRICTED HAZARD AREA LATITUDE/LONGITUDE COORDINATES HERE (INCLUDE DEGREES/MINUTES/SECONDS AND DECIMAL DEGREES FORMAT)

LETTER OF INTENT

Appendix C – Coast Guard Relevant Area and Restricted Hazard Areas

INSERT GRAPHICS/IMAGES HERE

1. See 33 C.F.R. 3.55 through 33 C.F.R. 3.85 for Coast Guard *Relevant Area/District* boundaries.

LETTER OF INTENT

Appendix D – Composite Restricted Hazard Area Maps

(THIS SECTION MAY NOT BE NEEDED IF ONLY ONE RESTRICTED HAZARD AREA EXISTS)

INSERT GRAPHICS/IMAGES HERE

Appendix C. Section 3.4 of RCC 321-16 Common Risk Criteria Standards for National Test Ranges

C.1 REFERENCE SECTION FROM RCC 321-16

The following is Paragraph 3.4 Ship Protection from the Range Commanders Council Range Safety Group Standard 321-16, *Common Risk Standards for National Test Ranges*, dated August 2016. Operators should ensure they are referencing the most recent issue of this standard before notifying the FAA and U.S.C.G of an intent to conduct launch and reentry operations.

3.4 Ship Protection

The term "ship" includes boats and watercraft of all sizes.

3.4.1 Non-Mission Ship Criteria

a. Ship Warning Areas. Notices to Mariners (NOTMARS) shall be issued to warn non-mission ships of regions defined by one of the following approaches.

1. where the probability of debris capable of causing a casualty impacting on or near a vessel exceeds 10E-6 (1E-5), accounting for all relevant hazards; or
2. the union of the areas where the individual probability of casualty for any person onboard exceeds the criteria in a of Subsection 3.2.1, the collective casualty expectation for an individual ship would exceed the criterion in b of Subsection 3.2.1, and the catastrophic risk for an individual ship would exceed the provisional criteria outlined in Section 3.6.

In some situations, warnings may be optional when expected ship traffic in the affected area is low and adequate observation will be performed.

b. Non-Mission Ship Risk Criteria. People on observed non-mission ships shall be included in the determination of compliance with collective risk criteria in b of Subsection 3.2.1 and provisional catastrophic criteria in c of Subsection 3.2.1. Observation to locate non-mission ships is an acceptable method to ensure compliance, provided that suitable observation techniques are used to include the region(s):

1. where the individual probability of casualty exceeds the criteria in a of Subsection 3.2.1; and
2. where the collective casualty expectation or provisional catastrophic risk criteria (b or c of Subsection 3.2.1, respectively) would be exceeded given a conservative estimate of typical ship traffic.

3.4.2 Mission-Essential Ship Criteria.

a. Mission-Essential Ship Hazard Areas. Mission-essential ships will be restricted from hazard areas defined by either:

1. the region where the probability of debris capable of causing a casualty impacting on or near vessel exceeds 100E-6 (1E4, accounting for all relevant hazards; or

2. The union of the areas where the individual probability of casualty for an exposed person onboard exceeds the criteria of Subsection 3.2.2, the collective risk criteria in b of Subsection 3.2.2, or the catastrophic risk criteria in c of Subsection 3.2.2.

b. Mission-Essential Ship Risk Criteria. Ship-board MEP shall be included in the assessment of compliance with the collective risk criteria in b of Subsection 3.2.2 and catastrophic risk criteria in c of Subsection 3.2.2.

3.4.3 Ship Hazard Areas for Debris Releases

The range must confirm that NOTMARs are issued for each planned debris release event that encompasses the areas and durations necessary to satisfy the risks as described in a of Subsection 3.4.1 or contain, with 99% probability of containment, all resulting debris impacts capable of causing a casualty.

3.4.4 Mishap Response

The range must coordinate with the United States Coast Guard or other appropriate authorities to ensure timely notification of any ship traffic hazard associated with range activities. In the event of a mishap, the range must promptly inform the appropriate authority(s) of the area and duration of navigable waters where a ship hazard is predicted.

OMB Control Number: 2120-0746
Expiration Date: 11/30/2024

Advisory Circular Feedback Form

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) emailing this form to ASTApplications@faa.gov, or (2) faxing it to (202) 267-5450.

Subject: (insert AC title/number here) Date: Click here to enter text.

Please check all appropriate line items:

- o An error (procedural or typographical) has been noted in paragraph Click here to enter text. on page Click here to enter text..
- o Recommend paragraph Click here to enter text. on page Click here to enter text. be changed as follows:

  Click here to enter text.
- o In a future change to this AC, please cover the following subject: *(Briefly describe what you want added.)*

  Click here to enter text.
- o Other comments:

  Click here to enter text.
- o I would like to discuss the above. Please contact me.

Submitted by: _____ Date: _____