

Airspace Management

Space Activity Coordination

Presented to: APIRG/26 & RASG-AFI/9

By: United States of America

Date: November 6-10, 2023



**Federal Aviation
Administration**

Outline

- **Introduction**
- **Discussion**
- **Action by the Meeting**



Introduction

Objective:

- Address hazard to airspace users posed by under-coordinated integration of space launch and re-entry of operations

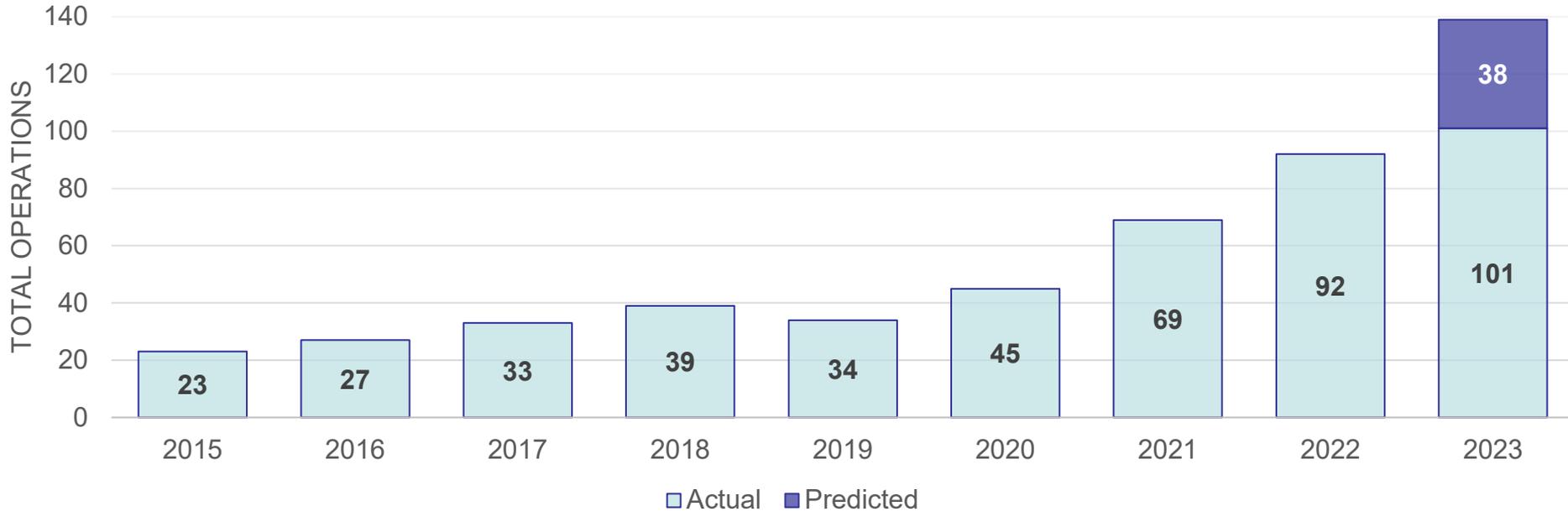
How:

- Ensure process for the timely coordination of space launch and re-entry activities



Industry Growth

U.S. SPACE OPERATIONS PER CALENDAR YEAR



Safe and Efficient Integration

- Evaluation, identification, and clearance of risk areas
- Tolerance determined by space launch authority
- Acceptable level of risk for airspace determined by Air Navigation Service Provider (ANSP)



Aircraft Hazard Areas (AHAs)

- Characterizes geographic areas subject to higher risk during space operations
 - Based on 1×10^{-6} probability of individual casualty (fatality or serious injury) per aircraft per launch
- Defined by a series of points, associated dates, times, and duration
- Dissemination to airspace users occurs via NOTAMs as Danger Areas



Affected Areas

- AHAs for missions coordinated by the U.S. during the year 2022
- Extensive outreach during the development of space NOTAM coordination procedures, particularly with regions affected most frequently



Coordination Considerations

- Multiple stakeholders in planning and execution of space operations
 - State sponsored vs. commercial activity
- Restructured coordination process in 2022 for U.S. Government sponsored facilities
 - Distinct pathways for State and commercial operations
- Identified need for streamlined coordination between space operators, the FAA, and other impacted ANSPs



Streamlining Coordination

- FAA leads and/or assists in coordinating required international NOTAMs
- Develop NOTAM requests for each affected Flight Information Region (FIR)
- Use Aeronautical Message Handling System (AMHS) to deliver requests
 - Email notification for added situational awareness and follow-up
 - Briefed through weekly telcons on Civil Air Navigation Services Organisation (CANSO) ATFM Data Exchange Network for the Americas (CADENA) conferences



Regional Example

Informal South Pacific Air Traffic Services Coordinating Group (ISPACG) and Informal Pacific ATC Coordinating Group (IPACG) Guidelines

- Single email coordination within a State
- AMHS usage
- Lead times of 10 days for planning and three days for publication
- AHAs defined by blocks of four, but up to six points within an FIR
- AHAs crossing FIR boundaries defined by separate areas wholly contained within each FIR
- Minimize events times to meet mission needs and limit traffic disruption with a primary and up to six back up times
- AHAs avoid dense traffic areas and times
- Updates (mission success or postponed) via email and AMHS should occur within one (1) hour
- Launch proponents and affected FIR stakeholders to provide timely feedback during, and after the event to improve future activities



Coordination Example

SUBJ: NOTAM REENTRY REQUEST for SPACEX STARLINK 6-24 STAGE 2 REENTRY

****THIS REQUEST IS FOR UPPER STAGE REENTRY**HAZARDOUS AREA SOUTHEAST OF MAURITIUS****

Request NOTAM for MAURITIUS FIR (FIMM):

➤ **DANGEROUS AREA FOR FALLING DEBRIS OF STARLINK 6-24 ROCKET.**

1. SpaceX will be conducting hazardous operations surface to unlimited for atmospheric re-entry and splashdown of launch vehicle upper stage within the following area:

AREA: 3210S 05700E
3012S 06109E
2033S 07500E
2422S 07500E
3216S 06310E
3515S 05700E to [beginning](#)

2. Hazard periods for [Starlink](#) 6-24 Second Stage REENTRY:

Primary REENTRY day :	22 Oct 23 / 0406Z	thru	22 Oct 23 / 0900Z
Backup REENTRY day (1):	23 Oct 23 / 0341Z	thru	23 Oct 23 / 0835Z
Backup REENTRY day (2):	24 Oct 23 / 0316Z	thru	24 Oct 23 / 0810Z
Backup REENTRY day (3):	25 Oct 23 / 0250Z	thru	25 Oct 23 / 0744Z
Backup REENTRY day (4):	26 Oct 23 / 0225Z	thru	26 Oct 23 / 0719Z
Backup REENTRY day (5):	27 Oct 23 / 0200Z	thru	27 Oct 23 / 0654Z
Backup REENTRY day (6):	28 Oct 23 / 0135Z	thru	28 Oct 23 / 0629Z

3. Please advise of scheduling conflicts ASAP to POC.

4. Please confirm receipt to both sender and POC.

5. POC is ATO Space Operations email at 9-AJO-AJR-SpaceOps-Intl@faa.gov



Conclusion

Streamlined process has increased efficiency and reduced overall workload, while utilizing existing infrastructure at no additional cost

The meeting is invited to:

- a) note the information contained in this paper;
- b) discuss any relevant matters as appropriate;
- c) offer feedback to further refine and improve the process;
- d) consider for States routinely affected by space activity to establish a single email distribution list to assure all concerned parties are aware of impending space activities affecting the airspace;
- e) recommend that States conducting or supporting space launches consider coordination using direct email and AMHS in addition to diplomatic notifications; and
- f) recommend ICAO include Space Coordination contact information into the current regional experts list.



Thank you

