



**INTERNATIONAL ASSOCIATION
FOR THE ADVANCEMENT OF
SPACE SAFETY**

IAASS Professional Training Course

***AIRCRAFT PROTECTION
REGULATIONS AND STANDARDS
FOR US LAUNCH AND REENTRY
OPERATIONS***

9 November 2023

Paris (France)

Course Description

Aircraft Protection Regulations and Standards for US Launch and Reentry Operations



The Challenges

Safety regulators are facing unprecedented challenges due to major innovations in the form of new vehicles, new sites, and new development and testing approaches where failures are embraced as a learning tool, not shunned as a sign of poor engineering. The largest launch and reentry vehicles ever flown, the fully reusable Super-Heavy and Starship, are developed and operated with the only safety requirements set in the form of FAA regulations that apply equally to an increasingly diverse set of operational concepts, launch sites, and vehicle and propellant types. In addition, regulators in the US are dealing with a dramatic increase in the pace of launch operations, while aircraft operations also reach record levels.

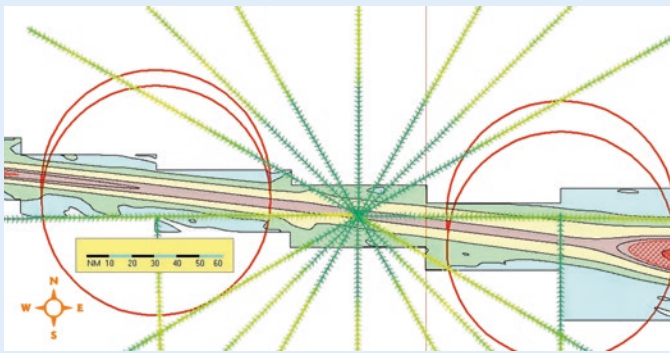
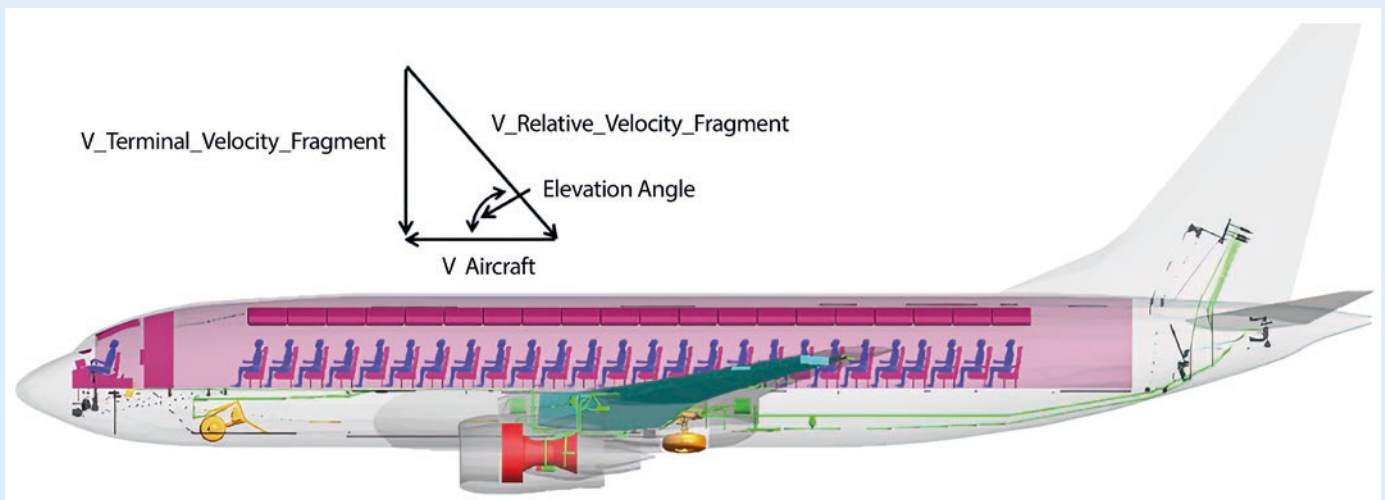
On 4 November 2023, hundreds of airline flights were affected when Spain totally restricted flights from 0938-1018 GMT in Catalonia due to risks from the passage of a Long March 5B upper-stage.

Scope of the course

This course is designed to provide the participant with an understanding of the technical underpinnings and evolution of regulations and standards designed to protect aircraft during launch and reentry operations authorized by the US. The course will explain the FAA's safety requirements and analysis standards to protect aircraft, with a focus on aircraft hazard areas and the new performance-based regulations that apply to all types of commercial space transportation operations. Special attention will be given to the development and implementation of aircraft vulnerability models. The participants will gain an understanding of aircraft protection requirements, standards, and analysis methods that address:

1. acceptable analysis methods that span from relatively low to high-fidelity,
2. probability of casualty and catastrophe producing impacts,
3. parameter sensitivities and analysis uncertainties, and
4. various types and sizes of aircraft.





The instructor will identify challenges where collaboration/research would be beneficial (such as the increasing use of composite materials in aircraft), introduce efforts designed to address these challenges, and present previously unpublished test and analysis results.

Target Audience

The course will be technical in nature because aircraft protection requirements, standards, and analysis methods contain quantitative and qualitative criteria, concepts, metrics, and terminology. However, the instructor will make every effort to describe the requirements and required safety analyses in the simplest terms possible. The target audience are safety professionals engaged in regulation development, compliance evaluation, and anyone seeking to understand the technical underpinnings and evolution of aircraft protection regulations, standards, and analysis methods applied to US launch and reentry operations.

Prerequisites

There are no specific prerequisites for this course, although participants should have a technical background such as a degree in engineering or a physical science. Some background in launch and reentry safety, including especially flight safety analysis, as described in the book co-edited by the instructor, *Safety Design for Space Operations*, will help students get the most benefit.

What You Will Learn

- I'd like to hear
- What others think are
- The top five things that
- The target audience most wants
- Covered in this course

How You Will Learn It

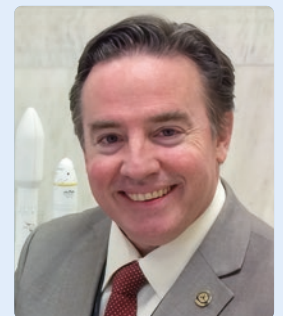
- Verbal instruction with multimedia aids to learning
- Hypothetical and de-identified examples from past operations

Duration

1 Day

Instructor

Paul D. Wilde, Ph.D., P.E. is a founding fellow and the current President of the IAASS with ~30 years of experience in safety standards development, launch and reentry safety evaluations, explosive safety analysis, and operations safety. Dr. Wilde currently serves as the Senior Technical Specialist at the FAA Office of Commercial Space Transportation, where he develops innovative concepts and approaches to resolve technical and policy issues, guides research and development efforts, facilitates educational outreach and training internal and external the FAA. As tri-chair for the Common Standards Working group, he directs the coordination between USG agencies to establish and maintain common public safety requirements and compliance evaluation standards for space transportation at Federal and non-Federal launch sites. He has performed leading roles for multi-organization projects in high-profile situations, such as investigations of the Columbia and SpaceShipTwo accidents as well as flight safety evaluations for the maiden flights of the many launch and reentry vehicles.



Paul D. Wilde