

SECTION I: SE OVERVIEW

Study Topic Overview Summary

Throughout the National Airspace System (NAS), the risk for approach and landing misalignment (ALM) has been identified. This risk includes aircraft approaching or landing on a surface other than what they were cleared for. These other surfaces include the wrong runway, taxiway, or airport. While these events have typically been caught soon enough to prevent an adverse outcome, there have been high-profile events, including an event involving an approach to a taxiway on July 7, 2017, in San Francisco, California. This ultimately led CAST to charter the ALM Joint Safety Analysis and Implementation Team (JSAIT) to analyze misalignments and determine mitigations based on Aviation Safety Information Analysis and Sharing (ASIAS) data from sources such as Aviation Safety Action Program (ASAP) reports, Air Traffic Safety Action Program (ATSAP) reports, and Mandatory Occurrence Reports (MOR). CAST adopted four SEs as a result of the study, two of which are directed toward aircraft operators and original equipment manufacturers (OEM), while the remaining two are directed toward air traffic control (ATC). CAST also adopted one research and development (R&D) SE, which is directed toward aircraft operators and OEMs.

SE Objective

CAST recommends the industry develop and make available, on new transport category aircraft and major derivatives, enhanced aircraft design features as feasible, that increase flightcrew awareness of runway/taxiway/aerodrome ALMs. Applicable new aircraft programs include—

- New type certificate programs and
- Major derivative, amended type certificate programs involving redesign of flightdeck avionics.

Primary Risks Mitigated

Ground Collision (GCOL) and Runway Incursion (RI)

Action	Organization(s)	Strategy	Description	Due Date
Action 1	OEMs	Design	Manufacturers should develop and make available, on new transport category aircraft, enhanced aircraft design features as feasible, that increase flightcrew awareness of runway/taxiway/aerodrome ALMs.	11/30/2023
<i>Comments: None</i>				

See section II of this SE for detailed action descriptions.

References: The detailed analysis in the ALM JSAIT Final Report is available through CAST.



TABLE OF CONTENTS

SECTION II: DETAILED ACTION INFORMATION

PAGE 3

SE 235 consists of one action, which this section lays out in detail.

- **Action 1 (Aircraft Manufacturers, Aircraft Manufacturer Industry Associations).....PAGE 3**
Develop and make available enhanced aircraft design features

SECTION III: SUPPLEMENTAL INFORMATION

PAGE 4

This section contains the following additional information that may be of interest to implementers:

- Source Study
- Related Initiatives
- Total Cost/Resource Overview

SECTION IV: REVISION LOG

PAGE 5

This section provides a history of revisions to this SE.



SECTION II: DETAILED ACTION INFORMATION

Action 1: Develop and make available enhanced aircraft design features

Primary Implementer

Aircraft Manufacturers

Action Objective

Manufacturers should develop and make available, on new transport category aircraft, enhanced aircraft design features as feasible, that increase flightcrew awareness of runway/taxiway/aerodrome approach and landing misalignments (ALM).

Action Timeline

Flow Time: 24 months

Due Date: 11/30/2023

Timeline/Flow for Future Adopters

N/A

CAST Lead

Aerospace Industries Association (AIA)

#	Organization(s)	Detailed Steps
1a	Original Equipment Manufacturers (OEM)	<p>Establish a working group to develop these—and other—additional aircraft design features, related to—</p> <ul style="list-style-type: none"> a. Situational awareness technologies <ul style="list-style-type: none"> i. The ability to differentiate between open and closed runways. b. Advisory technologies <ul style="list-style-type: none"> i. The consideration of expanding the envelope for which the advisory technologies function. ii. The ability to include the runway of intended landing as instructed by air traffic control (ATC) and as programmed into the flight management computer (FMC). c. Alerting technologies <ul style="list-style-type: none"> i. The ability to include the runway of intended landing as instructed by ATC and as programmed into the flight management computer (FMC).
1b	OEMs	Respond with intentions on providing these additional situational awareness, advisory, and alerting technologies on new type designs and future major derivatives programs and, to the extent practical, incorporate these features on currently in-production aircraft.
1c	OEMs	Report to CAST that OEMs have performed their assessments and made their future implementation decisions.

Notes



SECTION III: SUPPLEMENTAL INFORMATION

Source Study Approach and Landing Misalignment (ALM) Joint Safety Analysis and Implementation Team (JSAIT)

Related Initiatives SE 200, Airplane State Awareness—Virtual Day-VMC Displays

SE 218, Runway Excursion—Overrun Awareness and Alerting Systems

Total Cost **\$50,000** *Note: For labor, 1 Full Time Equivalent (FTE) = \$250,000*

Action 1 \$50,000 0.2 FTE *[add 0.1 FTE for each aircraft manufacturer over one]*

	Organization	Resources Needed
<i>Direct Resource Overview—Government</i>		<ul style="list-style-type: none"> N/A

	Organization	Resources Needed
<i>Direct Resource Overview—Industry</i>	Aerospace Industries Association (AIA)	<ul style="list-style-type: none"> Action 1: 0.1 FTE
	Aircraft Manufacturers	<ul style="list-style-type: none"> Action 1: 0.1 FTE, per manufacturer

Indirect Resource Overview The organizations identified in this section are not expected to incur direct costs associated with implementing this SE, but they may incur indirect costs within their normal line of work.

	Organization	Description
	European Organisation for Civil Aviation Equipment (EUROCAE) Working Group 101	This working group is investigating similar technologies as the ALM JSAIT and looking to mandate such technologies for air carriers operating in Europe.



SECTION IV: REVISION LOG

Major revisions (whole numbers) represent CAST-approved changes to SE language. Minor revisions (decimals) represent minor changes to target dates or completion notes that do not affect implementer actions.

Revision	Date	Description
Original	12/02/2021	Start date based on CAST adoption.

