

## SECTION I: SE OVERVIEW

### Study Topic Overview Summary

CAST chartered the Runway Excursion (RE) Joint Safety Analysis and Implementation Team (JSAIT) in 2012 to review the findings and recommendations from 15 industry reports by 11 different organizations and authorities on the issue of RE. From those reports, the team identified 155 contributing factors and 274 recommendations that it eventually consolidated into 45 Standard Problem Statements (SPS) and 75 Intervention Strategies (IS). The RE JSAIT grouped, analyzed, and consolidated the ISs into 7 SEs for industry implementation and 1 research and development (R&D) SE. CAST approved the SEs the RE JSAIT recommended in June 2014.

### SE Objective

CAST recommends air carriers improve takeoff safety through revised procedures and training for takeoff planning and rejected takeoff (RTO) decision making.

### Primary Risks Mitigated

Runway Excursion (RE)

Action	Organization(s)	Strategy	Description	Due Date
<a href="#">Action 1</a>	FAA AFS	Guidance	Publish guidance for air carrier standard operating procedures (SOP) to ensure accurate takeoff performance data.	06/30/2016
<i>Comments: CAST closed this action based on the publication of Safety Alert for Operators (SAFO) 16008.</i>				
<a href="#">Action 2</a>	Air Carriers	Procedures, Training	Modify SOPs and training to ensure accurate takeoff performance data based on FAA guidance from Action 1.	07/31/2017
<i>Comments: CAST closed this action based on survey results from air carrier industry associations. CAST encourages air carriers that have not performed the modifications requested in this action to do so.</i>				
<a href="#">Action 3</a>	Air Carriers	Procedures	Define and standardize procedures and training for the RTO decision.	12/31/2018 <sup>1</sup>

*See section II of this SE for detailed action descriptions.*

**References:** The detailed analysis in the Runway Excursion Joint Safety Analysis and Implementation Team (RE JSAIT) Final Report (February 12, 2015) is available through CAST.

<sup>1</sup> CAST is leaving Action 3 open beyond the original due date to gather stakeholder implementation feedback. CAST expects implementers completed this action on the original schedule, so the due date and flow time remains unchanged.



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*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

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*This section provides a history of revisions to this SE.*



## SECTION II: DETAILED ACTION INFORMATION

### Action 1: Publish guidance for air carrier SOPs

Primary Implementer

FAA Flight Standards Service, Safety Standards (AFS)

Action Objective

FAA AFS should publish guidance for air carrier standard operating procedures (SOP) to ensure accurate takeoff performance data

Action Timeline

Flow Time: 24 months to revise guidance material

Due Date: 06/30/2016

Timeline/Flow for Future Adopters

N/A

CAST Lead

FAA AFS

#	Organization(s)	Detailed Steps
1a	FAA AFS	<p>With input from air carriers and air carrier industry associations, publish guidance to include formal processes that ensure accurate takeoff performance data, specifically considering inclusion of the following:</p> <ol style="list-style-type: none"> <li>Emphasize timely (that is, before commencement of taxi) communication and coordination between gate agents, ground crew chiefs, load agents/dispatchers, and flightcrews on accurate takeoff weight and balance information.</li> <li>Encourage development and use of software “flags” to alert all air carrier personnel involved in dispatch of aircraft to gross data entry errors.</li> <li>Emphasize the importance for both flightcrew members to cross-check takeoff performance data and/or calculations.</li> <li>Provide guidance on training for hazards/risks of incorrect data entry into the flight management systems (FMS), electronic flight bags (EFB), or laptops for takeoff performance calculations.</li> <li>Address proper processing and communication of late changes to passenger/cargo loads, weather and runway conditions, departure runway or clearance, etc.</li> <li>Address both “paper” information and electronically transmitted information, such as Aircraft Communication Addressing and Reporting Systems (ACARS) data.</li> </ol>
<p><i>Safety Alert for Operators (SAFO) 16008 published July 26, 2016.</i></p>		
1b	FAA AFS	<p>Track implementation and report progress to JIMDAT and CAST.</p>
<p><i>Reported to JIMDAT and CAST in August 2016.</i></p>		
Notes	Form of guidance to be determined by FAA AFS.	



## SECTION II: DETAILED ACTION INFORMATION

### Action 2: Modify SOPs and training

*Primary Implementer*      **Air Carriers**

*Action Objective*      Air carriers should modify standard operating procedures (SOP) and training to ensure accurate takeoff performance data, in accordance with FAA guidance from Action 1.

*Action Timeline*      Flow Time: 19 months (upon completion of [Action 1](#))  
Due Date: 07/31/2017

*Timeline/Flow for Future Adopters*      TBD

*CAST Lead*      Airlines for America (A4A)

#	Organization(s)	Detailed Steps
2a	Air Carrier Industry Assns.	Communicate with member air carriers, explaining the analysis undertaken by CAST regarding runway excursions and the factors that result takeoff overruns, and request they review and revise their procedures, as necessary, to be in accordance with the revised guidance material developed in Action 1.
<i>Complete.</i>		
2b	Air Carriers	Review and revise procedures and training, as necessary, in accordance with the guidance from Action 1, and respond to air carrier industry associations when this task is complete.
<i>As of August 2017, a significant number of air carriers have reported to their respective industry associations they meet the intent of this action step.</i>		
2c	Air Carrier Industry Assns.	Track implementation and report progress to JIMDAT and CAST.
<i>Reported to JIMDAT and CAST in August 2017.</i>		

*Notes*



## SECTION II: DETAILED ACTION INFORMATION

### Action 3: Define and standardize procedures and training

**Primary Implementer**      **Air Carriers**

**Action Objective**      Air carriers should define and standardize procedures and training for the rejected takeoff (RTO) decision utilizing guidance as recommended in the 2005 revision of the [Takeoff Safety Training Aid](#).

**Action Timeline**

Flow Time: 54 months

- 18 months to revise procedures and training scenarios.
- 36 months for flightcrew to receive training.

Due Date: 12/31/2018

**Timeline/Flow for Future Adopters**      TBD when CAST closes this action.

**CAST Lead**      Airlines for America (A4A)

#	Organization(s)	Detailed Steps
3a	Air Carrier Industry Assns.	Communicate with the air carrier members, explaining the analysis undertaken by CAST regarding runway excursions and the specific risk that RTO scenarios pose in contributing to runway excursions.
3b	Air Carriers	Define and update standard operating procedures (SOP) related to the RTO decision, utilizing guidance as recommended in the 2005 revision of the Takeoff Safety Training Aid, and train to the procedures. Procedures and associated training for the RTO decision should address the following points as a minimum— <ul style="list-style-type: none"> <li>a. Utilize good crew resource management (CRM) in briefing for a possible RTO and flightcrew responsibilities during an RTO.</li> <li>b. Awareness of and adherence to SOPs regarding the RTO decision, including emphasis on startle effect.</li> <li>c. Emphasis in training scenarios on RTO decision making on “non-engine-failure” related events that occur during the takeoff roll, such as—                             <ul style="list-style-type: none"> <li>i. Airspeed discrepancies;</li> <li>ii. Takeoff configuration warnings;</li> <li>iii. Cargo/door warning lights;</li> <li>iv. Mechanical issues;</li> <li>v. Tire failures;</li> <li>vi. Air traffic control (ATC) comments, “instruction” to reject, or canceled clearance;</li> <li>vii. Birdstrikes; and</li> <li>viii. Scenarios (other than engine failure) that, per air carrier SOPs, should instigate an RTO.</li> </ul> </li> <li>d. Reinforce in training the underlying rationale for the RTO procedures, based on aircraft stopping characteristics.</li> </ul>
3c	Air Carrier Industry Assns.	Track implementation and report progress to JIMDAT and CAST.

**Notes**

- CAST is leaving this action open beyond the original due date to gather stakeholder implementation feedback. CAST expects implementers completed this action on the original schedule, so the due date and flow time remains unchanged.

SECTION II

Note: See Section III for detailed costs and resources.



## SECTION II: DETAILED ACTION INFORMATION

- Assumes no increase in training footprint; only changes to existing scenarios.
- Assumes all scenarios are covered in initial training and then specific scenarios are varied in recurrent training, with the goal of training each scenario at least once every 3 years.



### SECTION III: SUPPLEMENTAL INFORMATION

**Source Study** Runway Excursion Joint Safety Analysis and Implementation Team (RE JSAIT) Final Report (February 12, 2015)

- Related Initiatives**
- CAST SE 215, Air Carrier Operations and Training – Landing Distance Assessment
  - CAST SE 216, Air Carrier Operations and Training – Flightcrew Landing Training
  - Industry Takeoff Safety Training Aid

**Total Cost** **\$1,925,000** Note: For labor, 1 Full Time Equivalent (FTE) = \$250,000

**Action 1** \$125,000 0.5 FTE

**Action 2** \$900,000 3.6 FTE

**Action 3** \$900,000 3.6 FTE

	Organization	Resources Needed
<i>Direct Resource Overview – Government</i>	FAA AFS	<ul style="list-style-type: none"> <li>• Action 1: 0.5 FTE to update guidance.</li> </ul>

	Organization	Resources Needed
<i>Direct Resource Overview – Industry</i>	Air Carriers	<ul style="list-style-type: none"> <li>• Action 2: 3.3 FTE (0.06 FTE per carrier to revise procedures and training, as needed).</li> <li>• Action 3: 3.3 FTE (assumes 0.06 FTE at each carrier to revise SOPs and training scenarios).</li> </ul>
	Air Carrier Industry Assns.	<ul style="list-style-type: none"> <li>• Action 2: 0.3 FTE (0.1 FTE per association for communication and coordination).</li> <li>• Action 3: 0.3 FTE (assumes 0.1 FTE at each association for communication and tracking).</li> </ul> <p><i>Note: 55 air carriers are represented by three CAST-member air carrier industry associations:</i></p> <ul style="list-style-type: none"> <li>○ Airlines for America (A4A),</li> <li>○ Regional Airline Association (RAA), and</li> <li>○ National Air Carrier Association (NACA).</li> </ul>

**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
FAA AFS	Inspector resources required for normal review and acceptance or approval, as applicable, of air carrier manuals and programs.



## 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
1.3	08/15/2019	Administrative revision to Action 3 due date; flow time not affected.
1.2	06/06/2019	Action 3 due date extended.
1.1	02/06/2019	Action 3 due date extended.
1.0	09/17/2018	New SE format. Content reorganized and terminology updated. No substantive changes.
0.4	08/03/2017	Action 2 closed.
0.3	12/01/2016	Action 2 due date extended from 12/31/2016 to 07/31/2017.
0.2	08/04/2016	Action 1 closed.
0.1	12/03/2015	Action 1 due date extended from 12/31/2015 to 06/30/2016.
Original	06/05/2014	CAST adopted SE 217.

