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 flightcrews assess landing performance based on conditions actually existing at time of arrival (not conditions presumed at dispatch), including weather, runway conditions (using standardized terminology), aircraft weight, braking systems, and performance assumptions.

Primary Risks Mitigated

Runway Excursion (RE)

Action	Organization(s)	Strategy	Description	Due Date
Action 1	FAA AFS	Policy, Guidance	Develop guidance material incorporating TALPA ARC recommendations addressing procedures for conducting a landing distance assessment using actual conditions existing at the time of arrival.	12/31/2015
	Comments: CAST closed this action based on the publication of Advisory Circular (AC) 91–79A Chg 1, Safety Alert for Operators (SAFO) 16009, FAA Notice N8900.374, and FAA Notice N8900.375.			
Action 2	FAA ARP	Guidance	Revise guidance material to incorporate TALPA ARC recommendations addressing procedures for measuring and reporting runway conditions.	04/30/2016
	Comments: CAST closed this action based on the publication of AC 150/5200–30D and AC 150/5200–28F.			
Action 3	FAA AIR	Guidance	Develop guidance material incorporating TALPA ARC recommendations addressing standards for manufacturers to provide landing distance data.	03/31/2015
	Comments: CAST closed this action based on the publication of AC 25–31 and AC 25–32.			
Action 4	FAA ATO	Policy	Modify procedures, training, and reporting to implement TALPA ARC recommendations.	10/31/2016
	Comments: CAST closed this action based on the publication of FAA Notices JO 7110.720, JO 7110.721, and JO 7210.898, and the 2016 revisions of the Aeronautical Information Manual, Aeronautical Information Publication, and Pilot/Controller Glossary.			
Action 5	Airport Operators	Procedures	Incorporate new/revised guidance material into runway assessment procedures and report the runway conditions using the new terminology.	10/31/2016
	Comments: CAST closed this action based on the FAA Office of Airport Safety receiving updated Snow and Ice Control Plans from all part 139 airports indicating TALPA compliance.			

CAST Safety Enhancement (SE)

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AIR CARRIER OPERATIONS AND TRAINING – LANDING DISTANCE ASSESSMENT

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SECTION I: SE OVERVIEW

Action	Organization(s)	Strategy	Description	Due Date
Action 6	Aircraft Manufacturers	Performance Data	Provide landing distance data to operators to support the landing distance assessment described by the guidance material developed in Action 3.	03/31/2016
	Comments: CAST closed this action based on manufacturers providing TALPA data for the newest type designs. *CAST encourages manufacturers to expand TALPA data to all fleets as feasible.*			
Action 7	Air Carriers	Procedures, Training	Incorporate new/revised guidance material and manufacturers' landing standardized assessment data into flightcrews' approach and landing planning.	10/31/2016
	Comments: CAST closed this action based on air carriers reporting TALPA implementation. *CAST encourages air carriers that have not incorporated the guidance material and data requested in this action to do so.*			

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.

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CAST Safety Enhancement (SE)

AIR CARRIER OPERATIONS AND TRAINING – LANDING DISTANCE ASSESSMENT

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Action 1: Develop guidance material for air carriers/operators to enable TALPA

Primary Implementer	**FAA Flight Standards Service, Safety Standards (AFS)**
Action Objective	FAA AFS should develop guidance material incorporating Takeoff and Landing Performance Assessment (TALPA) Aviation Rulemaking Committee (ARC) recommendations addressing procedures for conducting a landing distance assessment using actual conditions existing at the time of arrival (including standardizing terms used to report conditions and make landing distance assessments).
Action Timeline	Flow Time: 24 months
	Due Date: 12/31/2015
Timeline/Flow for Future Adopters	N/A
CAST Lead	FAA AFS

#	Organization(s)	Detailed Steps
1a	FAA AFS	Develop or revise guidance material to incorporate TALPA ARC recommendations for flightcrew performance of a landing distance assessment using reported conditions existing at the time of arrival. The guidance material should provide— a. Recommendations for air carrier procedures for the use of aircraft performance data by flightcrews when making the landing distance assessment, including when the assessment should be performed. b. Background information on manufacturer-provided landing distance data, including description of content and accuracy required for factors that affect the landing distance and standards for reporting runway conditions.
		Advisory Circular (AC) 91–79A Chg 1 published April 28, 2016. Safety Alert for Operators (SAFO) 16009 published August 15, 2016.
1b	FAA AFS	Provide guidance material to aviation safety inspectors on the landing distance assessment procedures.
		FAA Notice N8900.374 and FAA Notice N8900.375 published August 1, 2016. These notices apply to the year 2016–2017; revised versions are issued each year.
1c	FAA AFS	Communicate completion of the guidance material to JIMDAT and CAST.
		Reported to JIMDAT and CAST in October 2016.
Notes		This work was performed as part of the FAA's TALPA Implementation Plan.

SECTION II

Note: See Section III for detailed costs and resources.

SECTION II: DETAILED ACTION INFORMATION

Action 2: Revise guidance material for airport operators to enable TALPA

Primary Implementer	**FAA Office of the Associate Administrator for Airports (ARP)**
Action Objective	FAA ARP should revise guidance material to incorporate Takeoff and Landing Performance Assessment (TALPA) Aviation Rulemaking Committee (ARC) recommendations addressing procedures for measuring and reporting runway conditions.
Action Timeline	Flow Time: 27 months
	Due Date: 04/30/2016
Timeline/Flow for Future Adopters	N/A
CAST Lead	FAA ARP

#	Organization(s)	Detailed Steps
2a	FAA ARP	Revise Advisory Circular (AC) 150/5200–30C, Airport Winter Safety and Operations, and AC 150/5200–28D, Notices to Airmen (NOTAMs) for Airport Operators, regarding airport measurement and reporting of runway surface conditions consistent with the recommendations of the TALPA ARC for description and terminology.
	AC 150/5200–30D published March 8, 2017. AC 150/5200–28F published December 30, 2016.	
2b	FAA ARP	Review and revise (as applicable) the criteria in AC 150/5200–30C for closing a runway to be consistent with TALPA ARC recommendations for runway condition descriptions and reported friction levels. Runway closure criteria should include consideration of "rapidly deteriorating weather/runway surface conditions" that can result in runway friction levels degrading faster than the airport can correct or clear.
	AC 150/5200–30D published March 8, 2017.	
2c	FAA ARP	Train airport certification safety inspector (ACSI) workforce on the revised guidance for airport runway condition assessment and reporting.
	Training complete.	
2d	FAA ARP	Develop and provide web-based training for airport operators.
	Narrated PowerPoint training products published.	
2e	FAA ARP	Communicate completion of the guidance material to JIMDAT and CAST.
	Reported to JIMDAT and CAST in October 2016.	
Notes		This work was performed as part of the FAA's TALPA Implementation Plan.

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Action 3: Develop guidance material for aircraft manufacturers to enable TALPA

Primary Implementer	**FAA Aircraft Certification Service (AIR)**
Action Objective	FAA AIR should develop guidance material incorporating Takeoff and Landing Performance Assessment (TALPA) Aviation Rulemaking Committee (ARC) recommendations addressing standards for manufacturers to provide landing distance data.
Action Timeline	Flow Time: 15 months
	Due Date: 03/31/2015
Timeline/Flow for Future Adopters	N/A
CAST Lead	FAA AIR

#	Organization(s)	Detailed Steps
3a	FAA AIR	Develop two new advisory circulars (AC) containing— a. Standards for manufacturer-provided landing distance data, including description of content and accuracy required for factors that affect the landing distance. b. Standards for assignment of a braking coefficient to reported braking conditions.
		AC 25–31 and AC 25–32 published December 22, 2015.
3b	FAA AIR	Communicate completion of the guidance material to JIMDAT, CAST, air carrier industry associations, and manufacturers.
		Reported to JIMDAT, CAST, air carrier industry associations, and manufacturers in April 2016.
Notes		This work was performed as part of the FAA's TALPA Implementation Plan.

Note: See Section III for detailed costs and resources.

SECTION II: DETAILED ACTION INFORMATION

Action 4: Modify procedures, training, and reporting for air traffic controllers to enable TALPA

Primary Implementer	**FAA Air Traffic Organization (ATO)**
Action Objective	FAA ATO should modify procedures, training, and reporting to implement recommendations of the Takeoff and Landing Performance Assessment (TALPA) Aviation Rulemaking Committee (ARC).
Action Timeline	Flow Time: 28 months
	Due Date: 10/31/2016
Timeline/Flow for Future Adopters	N/A
CAST Lead	FAA ATO

#	Organization(s)	Detailed Steps
4a	FAA ATO Mission Support Services (AJV)	Modify air traffic control (ATC) procedures and training to implement standardized braking action terminology in accordance with the recommendations of the TALPA ARC and in coordination with the FAA Flight Standards Service, Safety Standards (AFS) guidance material from Action 1.
		FAA Notices JO 7110.720, JO 7110.721, and JO 7210.898 published in 2016.
4b	FAA ATO AJV	Modify appropriate guidance, such as the Aeronautical Information Manual (AIM) and Pilot/Controller Glossary (PCG), to include TALPA ARC recommendations.
		AIM, PCG, and Aeronautical Information Publication revised in 2016.
4c	FAA ATO	Consider available means to convey the latest runway conditions to pilots in such a manner that it is available to aircrews to complete a landing assessment near top of descent, and if applicable, implement the process.
		Complete.
4d	FAA ATO	Track implementation and report to JIMDAT and CAST when complete.
		Reported to JIMDAT and CAST in October 2016.

Notes	• This work was performed as part of the FAA's TALPA Implementation Plan. • Content, format, type, and frequency of training subject to change by FAA ATO based on internal scoping of requirements and resource availability and do not include additional costs incurred if facility simulation development is required.

Note: See Section III for detailed costs and resources.

SECTION II: DETAILED ACTION INFORMATION

Action 5: Incorporate guidance material into airport operator procedures for TALPA reporting

Primary Implementer	**Airport Operators**
Action Objective	Airport operators should incorporate the guidance material into their runway assessment procedures and report the runway conditions using the new terminology.
Action Timeline	Flow Time: 6 months (upon completion of Action 2)
	Due Date: 10/31/2016
Timeline/Flow for Future Adopters	TBD
CAST Lead	Airports Council International-North America (ACI–NA)

#	Organization(s)	Detailed Steps
5a	ACI–NA	Communicate with membership, especially part 139 airports, explaining the background for the guidance in Action 2.
	Complete.	
5b	Airport Operators	Update procedures, Airport Certification Manuals, and Snow and Ice Control Plans, as appropriate, to incorporate the changes in guidance from Action 2.
	The FAA Office of Airport Safety and Standards (AAS) received updated Snow and Ice Control Plans from all part 139 airports indicating TALPA compliance.	
5c	Airport Operators	Train workforce on changes to procedures for assessing and reporting runway conditions, and closing runways when appropriate, using training materials developed in Action 2.
	As of February 2017, a significant number of air carriers have reported to their respective industry associations they meet the intent of this subaction.	
5d	ACI–NA	Track implementation and report completion to JIMDAT and CAST.
	Reported to JIMDAT and CAST in February 2017.	
Notes		This work was performed as part of the FAA's TALPA Implementation Plan.

SECTION II: DETAILED ACTION INFORMATION

Action 6: Provide landing distance data to operators

Primary Implementer	**Aircraft Manufacturers**
Action Objective	Aircraft manufacturers should provide landing distance data to support the landing distance assessment described by the guidance material developed in Action 3.
Action Timeline	Flow Time: 12 months (upon completion of Action 3)
	Due Date: 03/31/2016
Timeline/Flow for Future Adopters	TBD
CAST Lead	Aerospace Industries Association (AIA)

#	Organization(s)	Detailed Steps
6a	AIA	Communicate with CAST-represented manufacturers that are currently producing or are expected to produce aircraft for use in U.S. part 121 operations, explaining the background for the guidance in Action 3.
		Complete.
6b	Aircraft Manufacturers	Develop and provide operators with landing performance data for each of their aircraft types consistent with the standards in the FAA guidance from Action 3.
		Manufacturers provided Takeoff and Landing Performance Assessment (TALPA) data for recent fleets .
6c	AIA	Track implementation and report to JIMDAT and CAST when complete.
		Reported to JIMDAT and CAST in April 2016.
Notes		

Note: See Section III for detailed costs and resources.

SECTION II: DETAILED ACTION INFORMATION

Action 7: Incorporate guidance material and data into procedures and training

Primary Implementer	**Air Carriers**
Action Objective	Air carriers should incorporate the guidance material and manufacturers' landing standardized assessment data into procedures and training to implement landing assessment at time of arrival.
Action Timeline	Flow Time: 6 months (upon completion of Action 6)
	Due Date: 10/31/2016
Timeline/Flow for Future Adopters	TBD
CAST Lead	Airlines for America (A4A)

#	Organization(s)	Detailed Steps
7a	Air Carrier Industry Assns.	Communicate with member air carriers explaining the background for the guidance in Action 1 and manufacturer data provided in Action 3.
		Complete.
7b	Air Carriers	Implement the FAA guidance from Action 1 and the manufacturer data from Action 6 to develop air carrier-specific landing distance assessment procedures and associated performance tools.
		As of December 2016, a significant number of air carriers have reported to their respective industry associations they meet the intent of this subaction.
7c	Air Carriers	Develop and implement training based on the procedures in Subaction 7b for flightcrews to perform the landing distance assessment and use associated tools.
		As of December 2016, a significant number of air carriers have reported to their respective industry associations they meet the intent of this subaction.
7d	Air Carriers	Air carrier actions are complete when the air carrier has updated its procedures to include a landing distance assessment consistent with the guidance in Action 1 and trained all pilots in the use of the landing distance assessment and performance tools.
		Air carriers reported TALPA implementation.
7e	Air Carrier Industry Assns.	Track implementation and report completion to the JIMDAT and CAST.
		Reported to JIMDAT and CAST in December 2016.
Notes		Assumes flightcrew training will initially be through bulletin and then reinforced in normal simulator recurrent training.

Note: See Section III for detailed costs and resources.

SECTION III: SUPPLEMENTAL INFORMATION

Source Study	Runway Excursion Joint Safety Analysis and Implementation Team (RE JSAIT) Final Report (February 12, 2015)
Related Initiatives	• TALPA ARC recommendations • FAA AFS TALPA Implementation activity • FAA SAFO 08003, Guidance Material for Contaminated Runway Landing Operations • FAA SAFO 06012, Landing Performance Assessments at Time of Arrival (Turbojets) • FAA AC 121.195(d)–1A, Operational Landing Distance for Wet Runways; Transport Category Aircraft • FAA AC 91–79, Runway Overrun Protection • FAA AC 150/5200–30C, Airport Winter Safety and Operations • FAA AC 150/5200–28D, NOTAMS for Airport Operators • FAA AC 150/5320–12C, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces • FAA AC 150/5325–4B, Runway Length Requirements for Airport Design

Total Cost	$11,165,000	Note: For labor, 1 Full Time Equivalent (FTE) = $250,000
Action 1	$500,000	2.00 FTE
Action 2	$215,000	0.85 FTE
Action 3	$100,000	0.40 FTE
Action 4	$450,000	0.85 FTE
Action 5	$2,100,000	8.40 FTE
Action 6	$800,000	3.20 FTE
Action 7	$7,000,000	28.1 FTE

	Organization	Resources Needed
Direct Resource Overview – Government	FAA AFS	• Action 1: 2.0 FTE to complete and publish revised guidance material.

	FAA AIR	• Action 3: 0.4 FTE to complete two new ACs:
		  o Producing Data for Before Landing Assessments.
		  o Producing Takeoff Performance Data for Contaminated Runways.

	FAA ARP	• Action 2:
		  o 0.75 FTE to modify AC 150/5200–30C and AC 150/5200–28D for TALPA ARC terminology, review the document, and develop web-based training for airport operators.
		  o 0.10 FTE for ACSI training (assumes 40 inspectors @ 5 hours per inspector) = 200 hours.

SECTION III

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	Organization	Resources Needed

	FAA ATO	• Action 4:
		  o 0.2 FTE for Safety Risk Management Panel (~10 people full time for 40 hours each).
		  o 0.15 FTE for Safety Risk Management Document (~2 people full time for ~120 hours each).
		  o 0.5 FTE for Document Change Proposal.
		  o $210,000 in training costs for terminal controllers.
		  o $25,000 in travel expenses for Safety Risk Management (SRM) Panel (SRMP).
		
		Notes:
		  o *Training costs assume only terminal controllers require training on the procedural change via verbal brief that would require 30 minutes (8,415 terminal controllers x $49.87 Median Hourly Wage / 2 = $209,828).*
		  o *Costs for Subaction 4c are not included as they would vary based on the potential means chosen to convey the information, if applicable.*

	Organization	Resources Needed
Direct Resource Overview – Industry	ACI–NA	• Action 5: 0.25 FTE for communication and tracking.
	AIA	• Action 6: 0.2 FTE.
	Air Carriers	• Action 7: 27.5 FTE (assumes 0.5 FTE at each carrier to perform review and make revisions to standard operating procedures (SOP) and training curricula and advisory data tables).
	Airport Operators	• Action 5: 8.15 FTE (assumes 3 hours for training, for on average 10 people per airport, at 543 part 139 airports = 3 x 10 x 543 = 16,290 hours / 2,000 hours per FTE = 8.15 FTE).

	Air Carrier Industry Assns.	• Action 7: 0.6 FTE (assumes 0.2 FTE at each association for coordination).
		
		Note: 55 air carriers are represented by three CAST-member air carrier industry associations:
		  o *Airlines for America (A4A),*
		  o *Regional Airline Association (RAA), and*
		  o *National Air Carrier Association (NACA).*

	Aircraft Manufacturers	• Action 6: 3.0 FTE (1.0 FTE per manufacturer to review and update advisory landing data and change manuals).
		
		Note: Costs for only three manufacturers, as Airbus has already developed data per TALPA ARC recommendations:
		  o *Boeing (CAST member),*
		  o *Bombardier (represented by AIA), and*
		  o *Embraer (represented by AIA).*

SECTION III

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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.
FAA AIR	Certification specialist resources required to approve manual changes as part of normal duties.

SECTION III

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
1.0	09/17/2018	New SE format. Content reorganized and terminology updated. No substantive changes.
0.8	02/02/2017	Action 5 closed.
0.7	12/01/2016	Action 7 closed.
0.6	10/06/2016	Actions 1, 2, and 4 closed.
0.5	08/04/2016	Action 2 due date extended from 07/31/2016 to 09/30/2016.
0.4	06/02/2016	Action 1 due date extended from 06/30/2016 to 09/30/2016. Action 2 due date extended from 04/30/2016 to 07/31/2016. Actions 3 and 6 closed
0.3	12/03/2015	Action 1 due date extended from 12/31/2015 to 06/30/2016.
0.2	10/01/2015	Action 3 due date extended from 09/30/2015 to 12/31/2015.
0.1	02/12/2015	Action 3 due date extended from 03/31/2015 to 09/30/2015.
Original	06/05/2014	CAST adopted SE 215.