



Commercial Aviation Safety Team



Flight Standards CAST Safety Portfolio

April 2020

REVISION LOG

Date	Updates
02/04/2016	SE 127 Action 4 completed and closed. SE 212 Action 2 completed and closed.
06/02/2016	SE 193 Action 1 completed and closed. SE 196 Action 2 completed and closed. SE 219 Action 4 completed and closed.
08/04/2016	SE 217 Action 1 completed and closed.
10/06/2016	SE 196 Action 4 completed and closed. SE 227 Action 1, Action 2, and Action 3 added to portfolio. SE 229 Action 2 added to portfolio.
12/01/2016	SE 213 Action 1 completed and closed. SE 215 Action 7 completed and closed.
02/02/2017	SEs 193, 195, 197, and 215 completed and closed.
04/06/2017	SE 196 completed and closed. SE 198 Action 2 completed and closed.
06/01/2017	SE 227 Action 1 completed and closed.
08/03/2017	SE 185 completed and closed. SE 217 Action 2 completed and closed. SE 218 completed and closed. SE 227 Action 3 completed and closed.
10/05/2017	SE 199 Action 2 completed and closed.
12/07/2017	SE 213 Action 3 completed and closed. SE 219 completed and closed.
02/01/2018	No changes. SE decisions at the February 2018 CAST meeting do not affect this portfolio.
04/05/2018	No changes. SE decisions at the April 2018 CAST meeting do not affect this portfolio.
06/07/2018	No changes. SE decisions at the June 2018 CAST meeting do not affect this portfolio.
08/02/2018	No changes. SE decisions at the August 2018 CAST meeting do not affect this portfolio.
10/04/2018	SE 211 completed and closed.
12/06/2018	SE 192 reopened.
02/06/2019	No changes. SE decisions at the February 2019 CAST meeting do not affect this portfolio.
04/04/2019	No changes. SE decisions at the April 2019 CAST meeting do not affect this portfolio.
06/06/2019	No changes. SE decisions at the June 2019 CAST meeting do not affect this portfolio.

08/15/2019	No changes. SE decisions at the August 2019 CAST meeting do not affect this portfolio.
10/03/2019	No changes. SE decisions at the October 2019 CAST meeting do not affect this portfolio.
12/05/2019	SE 183 completed and closed. SE 212 completed and closed.
02/06/2020	No changes. SE decisions at the February 2020 CAST meeting do not affect this portfolio.
04/02/2020	No changes. SE decisions at the April 2020 CAST meeting do not affect this portfolio.

In the wake of several accidents in the 1990s, in 1998 the U.S. Government and key industry stakeholders established the Commercial Aviation Safety Team (CAST) and set a goal to reduce the U.S. commercial aviation fatality rate by 80 percent by 2008.

To accomplish this goal, CAST adopted an integrated, data-driven strategy that targets specific areas for improvement in both operations and airworthiness. Specifically, CAST—

- Identifies top safety areas through the analysis of accident and incident data.
- Charters joint teams of experts to develop methods to understand the chain of events leading to accidents.
- Identifies and implements effective interventions or safety enhancements (SEs) to reduce the fatality rate in these areas.

By implementing the most promising SEs, CAST helped reduce the U.S. commercial air travel fatality rate by 83 percent. As a follow-on goal, CAST now seeks to reduce the U.S. commercial aviation fatality risk by at least 50 percent from 2010 to 2025 and to continue working with international partners to reduce fatality risk in worldwide commercial aviation. CAST continues to evolve its approach to safety management, moving from a forensic approach to a more prognostic approach by using the Aviation Safety Information Analysis and Sharing (ASIAS) program. ASIAS brings together voluntary safety data from across the industry to help monitor known risk, gauge the effectiveness of deployed mitigations, and identify emerging risk.

As of February 2014, CAST has adopted 98 voluntary SEs. This report describes 53 of these activities, focusing on actions that air carriers voluntarily agreed to implement.

That brings me to the purpose of this message. Voluntary safety measures are more important than ever before. The record shows that CAST SEs, when implemented, contribute to our goal of reducing aviation fatalities. The Federal Aviation Administration has the authority and responsibility to ensure that identified risks are mitigated. Members of the aviation community have a statutory obligation to comply with established regulatory standards, and this obligation includes a duty to develop and use processes and procedures that will prevent deviation from regulatory standards and enhance safety. These include voluntary safety measures such as CAST SEs. I therefore ask you to include the appropriate CAST SEs in conversations with your operators and to encourage their participation in applicable measures.

Thank you in advance for your support and, as always, thank you for all that you do.

Best,

John Duncan
March 2014

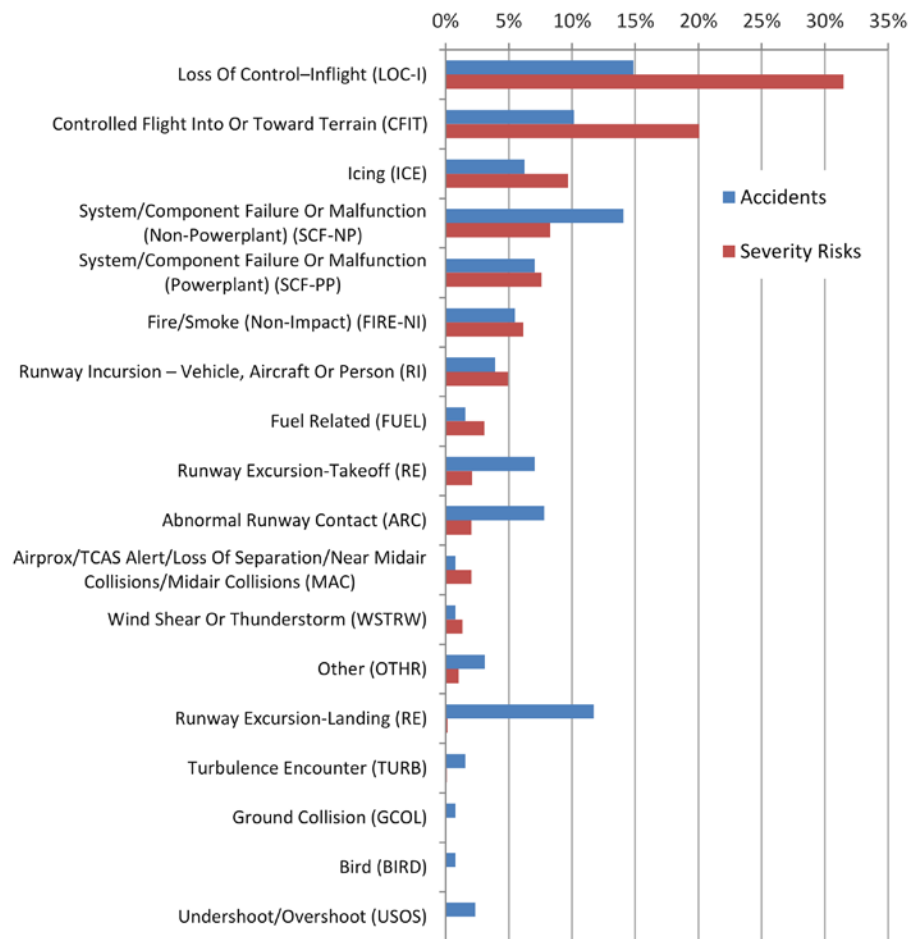


1. INTRODUCTION

CAST OVERVIEW

The Commercial Aviation Safety Team (CAST) is a Government and industry collaboration of major organizations sharing the common aviation safety mission to reduce the commercial aviation accident rate.

CAST uses an integrated, data-driven strategy to reduce the U.S. commercial aviation fatality risk¹ and promote new Government and industry safety initiatives throughout the world. CAST prioritizes its efforts based on historical accident risk. The following bar chart displays 1987–2011 U.S. Hull Loss and Fatal Accidents and the percent of the total for each associated contributing factor.²



¹ Fatality risk is the fatal accident rate computed in terms of equivalent fully fatal airplane loads. It does not include ramp or security-related fatalities. It does include cargo operations. An accident that is fatal to 50 percent of the people on board equates to a 0.50 fatality risk.

² CAST/International Civil Aviation Organization Common Taxonomy Team Aviation Occurrence Category definitions: <http://www.intlaviationstandards.org/Documents/CICTTOccurrenceCategoryDefinitions.pdf>.

As of April 2020, CAST has adopted 101 voluntary safety enhancements (SE), 88 completed and 13 underway. During the CAST studies, some potential mitigations were discussed that were not mature enough to add to the CAST Plan. These research and development (R&D) SEs do not directly reduce accident risk, but were adopted for further research or studies that CAST hopes will lead to opportunities for additional risk reduction. In the future, as the research is conducted, aspects of these R&D SEs may be added to the CAST Plan.

CAST seeks to have industry and Government voluntarily implement the SEs, which can be as effective as rulemaking, but take less time. Safety experts report the fatality risk for commercial aviation in the United States has been reduced by 83 percent from 1998 to 2008 by implementing the voluntary SEs described in this CAST portfolio.

Current CAST goals include—

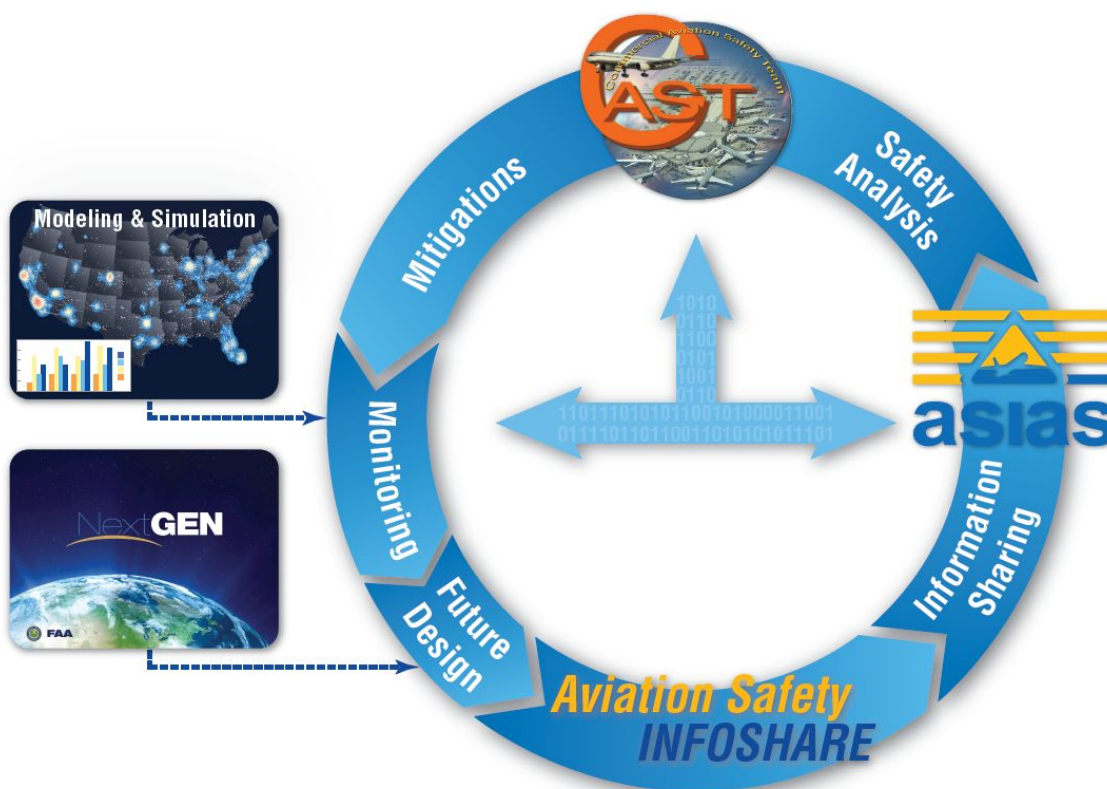
- Reducing the U.S. commercial aviation fatality risk by at least 50 percent from 2010 to 2025.
- Continuing to work with our international partners to reduce fatality risk in worldwide commercial aviation.

ASIAS OVERVIEW

The Federal Aviation Administration (FAA) created Aviation Safety Information Analysis and Sharing (ASIAS) as a means to provide a national resource for data analysis to discover common, systemic safety problems spanning multiple aspects of the global air transportation system. ASIAS uses safety data collected from the public sector and internal FAA databases, and proprietary data from industry stakeholders (air carriers and manufacturers) to assess identified safety issues and monitor multiple data sources for potential high-risk safety vulnerabilities. Proprietary ASIAS data is governed by policies that protect the interests of the supplier(s) while allowing the broader aviation community to benefit from aggregate data analysis. Data from the public sector is available online at <http://www.asias.faa.gov>. Additional data is available on the ASIAS extranet portal after—

- Requesting an individual account through <https://extranet.asias.faa.gov/>,
- Calling ASIAS directly at 1–800–842–8736 extension 34247, or
- Emailing ASIAS directly at ASIAS@faa.gov.

The FAA Office of Accident Investigation and Prevention (AVP) acts as a facilitator and is an available resource. AVP analysts are available to assist with accessing proprietary ASIAS data and information beyond what is publicly available.



Aviation Safety InfoShare (InfoShare) is a semiannual event where air carriers and others come together in an open environment to voluntarily share safety findings and potential issues. InfoShare is a vital part of the aviation safety community. By participating in InfoShare, air carriers can fulfill the Title 14, Code of Federal Regulations (14 CFR) § 13.401³ requirement for disclosing Flight Operational Quality Assurance (FOQA) data. Inspectors should encourage participation from air carriers at InfoShare to reduce the risk of fatality.

CAST, ASIAS, and InfoShare together are part of the global Safety Management System (SMS) process. ASIAS uses all available data to study systemic issues raised at InfoShare and better understand the underlying contributing factors. When appropriate, ASIAS shares its directed studies with CAST for potential mitigation. CAST develops voluntary SEs to mitigate potential fatality risk threats. CAST also monitors implementation and effectiveness of its safety plan to ensure it is adopted in a manner consistent with the agreed-to plan and CAST goals. The ultimate goal is to generate corrective actions before new types of accidents emerge.

Inspectors should work with their air carriers to encourage implementation of the CAST voluntary SEs.

³ Flight Operational Quality Assurance Program: Prohibition against use of data for enforcement purposes.

PORTFOLIO LAYOUT

This portfolio summarizes 62 of the 101 CAST voluntary SEs, and 2 of the 21 R&D SEs. This portfolio will be updated after each CAST meeting (typically every 2 months) to reflect the status of SEs in the CAST Plan. This portfolio is intended to clearly explain each SE as it pertains to air carriers. A complete listing of all CAST SEs, in their original formatting and language, is available at the website:

http://www.skybrary.aero/index.php/Portal:CAST_SE_Plan.

Each SE may involve several actions needed from multiple sources, such as regulators, manufacturers, or air carriers, for successful implementation. This portfolio focuses on all SEs with air carrier actions.

Eleven SEs in this portfolio are considered “underway” (10 CAST voluntary SEs and 1 R&D SE). Specific actions of these SEs may already be complete; however, the SE as a whole is not.

Fifty-three SEs in this portfolio are considered “completed.” Because CAST SEs are voluntary, the classification “completed” does not mean every air carrier implemented the SE as specified.

Inspectors should work with their air carriers to see whether the SEs have been implemented. If the SEs have not been implemented, inspectors should encourage their air carriers to review the SEs and evaluate whether implementing them would improve their safety margin.

The following is a list of the CAST voluntary SEs and R&D SEs included in this portfolio.

Topic	Completed	Underway	Category
<u>SE 1: Terrain Avoidance Warning System (TAWS)</u>	X		<i>Airworthiness</i>
<u>SE 2: Standard Operating Procedures (SOP)</u>	X		<i>Operations</i>
<u>SEs 3–8: Precision-Like Approach Implementation</u>	X		<i>Operations</i>
<u>SE 10: Airline Proactive Safety Programs (FOQA & ASAP)</u>	X		<i>Operations</i>
<u>SE 11: Crew Resource Management (CRM)</u>	X		<i>Operations</i>
<u>SE 12: CFIT Prevention</u>	X		<i>Operations</i>
<u>SEs 14–16: Policies for ALAR (Safety Culture)</u>	X		<i>Operations</i>
<u>SEs 17–20: Maintenance Procedures</u>	X		<i>Airworthiness</i>
<u>SE 21: Flight Deck Equipment Upgrade/Installation To Improve Altitude Awareness and Checklist Completion</u>	X		<i>Operations</i>
<u>SE 23: Flight Crew Training</u>	X		<i>Operations</i>
<u>SE 24: Aircraft Design</u>	X		<i>Airworthiness</i>
<u>SE 26: Standard Operating Procedures (SOP)</u>	X		<i>Operations</i>
<u>SE 27: Risk Assessment and Management</u>	X		<i>Operations</i>
<u>SE 28: Policies</u>	X		<i>Operations</i>

Topic	Completed	Underway	Category
<u>SE 29: Policies</u>	X		Operations
<u>SE 30: Human Factors and Automation</u>	X		Operations
<u>SE 31: Advanced Maneuvers</u>	X		Operations
<u>SE 49: Runway Incursion Prevention</u>	X		Operations
<u>SE 51: SOPs for Tow Tug Operators</u>	X		Operations
<u>SE 60: Pilot Training</u>	X		Operations
<u>SE 78: Cabin Injury Reduction During Turbulence</u>	X		Operations
<u>SE 84: Disk Inspection Initiative</u>	X		Airworthiness
SE 120: TAWS Improved Functionality			
<u>Action 1</u>	X		Operations
<u>Actions 3 and 4</u>			Airworthiness
<u>SE 121: Cargo Loading Training and SOPs</u>	X		Operations
<u>SE 125: HazMat Processing</u>	X		Operations
<u>SE 127: Cargo Fire Management</u>	X		Airworthiness
<u>SE 131: Safety Culture</u>	X		Operations
<u>SE 136: Engine Surge Recovery</u>	X		Operations
SE 165: TCAS Policies and Procedures			
<u>Actions 2 and 3</u>	X		Operations
<u>Action 6</u>			Airworthiness
<u>SE 169: Work Cards/Shift Change/Responsibilities/Manuals</u>	X		Airworthiness
<u>SE 170: OEM Continuous Monitoring of Service History</u>	X		Airworthiness
SE 175: Flight Critical Configurations Changes Made During Maintenance			
<u>Action 1</u>	X		Airworthiness
<u>Action 2</u>			Operations
<u>SE 183: Cockpit Moving Map Display and Runway Awareness System</u>	X		Airworthiness
<u>SE 185: TAWS and RNAV Visual or Other Procedures</u>	X		Airworthiness
<u>SE 186: TCAS-Sensitivity Level Command</u>		X	Operations
<u>SE 192: Low Airspeed Alerting</u>		X	Airworthiness
<u>SE 193: Non-Standard, Non-Revenue Flights</u>	X		Operations
<u>SE 194: SOPs Effectiveness and Adherence</u>		X	Operations
<u>SE 195: Flight Crew Training Verification and Validation</u>	X		Operations
<u>SE 196: Effective Upset Prevention and Recovery Training, Including Approach-to-Stall</u>	X		Operations
<u>SE 197: Policy and Training for Non-Normal Situations</u>	X		Operations

Topic	Completed	Underway	Category
<u>SE 198: Scenario-Based Training for Go-Around Maneuvers</u>		X	Operations
<u>SE 199: Enhanced CRM Training</u>		X	Operations
<u>SE 209: Simulator Fidelity</u>		X	Research
<u>SE 211: Training for Attention Management</u>	X		Research
<u>SE 212: Equipment and Procedures To Improve Route Entry for RNAV Departures</u>	X		Operations
<u>SE 213: Safe Operating and Design Practices for STARs and RNAV Departures</u>		X	Airworthiness
<u>SE 215: Landing Distance Assessment</u>	X		Operations
<u>SE 216: Flight Crew Landing Training</u>		X	Operations
<u>SE 217: Takeoff Procedures and Training</u>		X	Operations
<u>SE 218: Overrun Awareness and Alerting Systems</u>	X		Operations
<u>SE 219: Policies, Procedures, and Training To Prevent Runway Excursions</u>	X		Operations
<u>SE 227: Air Carrier Procedures for Takeoff Configuration</u>		X	Operations
<u>SE 229: Takeoff Configuration Warning System Maintenance and Operational Assurance</u>		X	Airworthiness

Section 2 of this portfolio includes a list and summary of the airworthiness CAST voluntary SEs, with associated air carrier.

Section 3 of this portfolio includes a list and summary of the operations CAST voluntary SEs, with associated air carrier.

Section 4 of this portfolio includes a list and summary of the R&D SEs, with associated air carrier actions.

Section 5 of this portfolio includes a checklist for air carriers to use to determine if they have implemented the 62 voluntary SEs with air carrier actions. In this section, the SEs are categorized by safety topic.

FEEDBACK

If you have questions or suggested changes on the utility of the information, please email your feedback to ASIAS@faa.gov.

2. SAFETY ENHANCEMENTS—AIRWORTHINESS

SE 192: LOW AIRSPEED ALERTING (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed to further improve, throughout the U.S. fleet, early flightcrew awareness of a decreasing energy state.

Action 1

Air carriers should review the available service bulletins, determine applicability of the available bulletins to their specific fleets, and develop an implementation plan for prioritizing incorporation of these bulletins at their earliest convenience.

Completed and closed April 2, 2015.

SE 213: SAFE OPERATING AND DESIGN PRACTICES FOR STARS AND RNAV DEPARTURES (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed to mitigate errors on Standard Terminal Arrival Routes (STAR) and RNAV departures through FAA and industry collaboration to develop and implement safe operating and design practices for these procedures.

Action 1

Inspectors should encourage their air carriers to collaborate with the FAA to develop guidance to align training for flightcrews, training for controllers, and procedure and chart design and implementation.

Completed and closed December 1, 2016.

Action 2

Inspectors should encourage their air carriers to collaborate with FAA Flight Standards Service (AFS) to update ACs containing details of commonly accepted safe operating practices for flightcrews to mitigate errors on STARS and RNAV departures.

Air carrier training organizations should develop, review and amend training syllabi as well as air carrier policies and procedures to be consistent with the guidance in the ACs for conducting STARS and RNAV departures.

Action 3

Inspectors should encourage their air carriers to provide input and assist the FAA Air Traffic Organization (ATO) in developing commonly accepted safe operating practices for air traffic control of STARs and RNAV departures.

Completed and closed December 7, 2017, based on release of FAA ATO training videos.

SE 229: TAKEOFF CONFIGURATION WARNING SYSTEM MAINTENANCE AND OPERATIONAL ASSURANCE (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed to mitigate the risk of flightcrews attempting to take off with flaps in an improper setting by ensuring air carrier maintenance programs include appropriate actions and procedures to ensure proper operation of the takeoff configuration warning system (TCWS).

Action 2

Air carriers should review their maintenance programs related to the TCWS to ensure acceptable in-service reliability:

- Ensure maintenance programs meet the latest manufacturer recommendations for maintenance intervals and procedures on TCWS.
- Review maintenance programs to ensure any circuit breakers pulled during maintenance or troubleshooting that could affect availability of the TCWS are re-engaged before release for flight.
- Review Minimum Equipment List (MEL) to ensure the procedures do not allow flightcrews to disable the TCWS by pulling circuit breakers.

SE 1: TERRAIN AVOIDANCE WARNING SYSTEM (TAWS) (COMPLETED)

This SE is designed to reduce or eliminate controlled flight into terrain (CFIT) accidents by improving pilot situational awareness. It also establishes appropriate procedures for the installation and use of TAWS equipment. Procedures include proper flightcrew reaction in response to TAWS aural and visual warnings.

Action 5

Air carriers should use a comprehensive system to support TAWS. The system should include information on installation, maintenance, training, and use of TAWS equipment.

Although SE 1 was originally written to be a voluntary safety enhancement, 14 CFR §§ 91.223 and 121.354 have required TAWS since 2005 for all turbine-powered airplanes in part 121 air carrier service. Air carriers are encouraged to implement CAST SE 120 for additional TAWS functionality.

AC 20–138D, Airworthiness Approval of Positioning and Navigation Systems, Change 2, issued April 7, 2016, initiated by the FAA Aircraft Certification Service (AIR), Systems and Equipment Standards Branch (AIR–130) is available for guidance:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_20-138D_Chg_2.pdf.

SEs 17–20: MAINTENANCE PROCEDURES (COMPLETED)

The purpose of these SEs is to reduce approach and landing accidents by reemphasizing current maintenance rules, policies, and procedures developed by commercial air carriers and the FAA. The reemphasis should specifically direct—

- Approved maintenance programs related to the servicing of components incorporate all OEM safety related components and procedures;
- Oversight of subcontractor activity is increased by both the air carriers and regulators; and
- MEL policies and procedures are strictly adhered to.

The reemphasis could be acted on almost immediately.

Action 4

Air carrier directors of safety should—

- Determine if quality control procedures have been implemented to ensure those deficiencies are continually addressed.
- Ensure an internal audit is conducted to determine whether rules relating to maintenance deficiencies in the specified bulletins, listed above, are being met through adequate maintenance procedures.
- Establish system safety procedures to ensure continuing conformance with the bulletins listed above.
- Determine whether the maintenance deficiencies described in the following bulletins and policy letters have been remedied:
 - o Flight Standards Information Bulletin for Airworthiness 97–10 dated March 3, 1997: <http://www.skybrary.aero/bookshelf/books/1561.pdf>.
 - o Handbook Bulletin Airworthiness (HBAW) 96–05C dated December 15, 1997: <http://www.skybrary.aero/bookshelf/books/1562.pdf>.
 - o HBAW 98–01 dated February 3, 1998: <http://www.skybrary.aero/bookshelf/books/1563.pdf>.
 - o HBAW 98–09 dated April 28, 1998: <http://www.skybrary.aero/bookshelf/books/1564.pdf>.
 - o Handbook Bulletin Air Transportation (HBAT) 98–18 dated April 28, 1998: <http://www.skybrary.aero/bookshelf/books/1564.pdf>.
 - o MMEL Policy Letter 87 Revision 10 dated August 10, 2010: NAVAID <http://fsims.faa.gov/PICDetail.aspx?docId=237672117617D63C86257784006C2EED>.
 - o National Transportation Safety Board (NTSB) Safety Recommendation A–96–166: <http://www.nts.gov/investigations/AccidentReports/layouts/nts.gov/recsearch/Recommendation.aspx?Rec=A-96-166>.

- o NTSB Safety Recommendation A-97-74 and A-97-57:
<http://www.nts.gov/investigations/AccidentReports/layouts/nts.recsearch/Recommendation.aspx?Rec=A-97-074>.

SE 24: AIRCRAFT DESIGN (COMPLETED)

This SE is designed to incorporate fault-tolerant design principles for flight-critical system components and facilitates critical-point, flight-realistic condition, and certification testing/analysis. Changes to flight-critical system components will be considered a major change unless the applicant can show the change is minor and monitors the continued airworthiness (in-service failures) of these systems using a risk-assessment focused methodology.

Action 3

Manufacturers and air carriers should review SAE Aerospace Standards Aerospace Recommended Practice (ARP) 5150, Safety Assessment of Transport Airplanes in Commercial Service, to ensure their continuing airworthiness processes incorporate risk management techniques to help ensure the original design level of safety is not degraded.

Air carriers should adequately monitor and assess fleet performance to verify that the level of safety intended by the product's original basis of certification remains unchanged by application of safety risk management processes to identify and prioritize safety critical threats/trends and mitigating corrective action.

SE 84: DISK INSPECTION INITIATIVE (COMPLETED)

This SE is designed to eliminate uncontained engine failures (UEF) by mandatory inspections of the disks of turbine engines during shop visits.

Action 1

Air carriers should develop and implement enhanced disk inspection to detect cracks and help prevent UEFs of high-energy rotating parts.

Guidance on disk inspections can be found in U.S. Department of Transportation (DOT)/FAA/AR-04/28, Turbine Engine Fan Disk Crack Detection Test, issued September 2004: <http://www.tc.faa.gov/its/worldpac/techrpt/ar04-28.pdf>.

SE 120: TAWS IMPROVED FUNCTIONALITY (COMPLETED)

This SE is designed to increase the potential safety effect of [SE 1, Terrain Avoidance Warning System \(TAWS\)](#), by developing procedures to include Global Positioning System (GPS) sensors for TAWS, and to ensure updates to terrain databases, alerting algorithms, and new options to TAWS are incorporated as soon as possible.

Action 3

Air carriers should install GPS capability on all airplanes with multisensor RNAV Flight Management Systems (FMS), Electronic Flight Instruments and Electronic Map Displays.

Note: These airplanes may have distance measuring equipment (DME)/DME or triple Inertial Navigation System positioning capability rather than GPS.

As a minimum, air carriers should modify TAWS to GPS TAWS. In addition, all air carriers should enable GPS to the TAWS box at any applicable maintenance opportunities. To minimize CFIT risk, air carriers not installing GPS at this time should implement Standard Operating Procedures (SOP) that advise flightcrews of the possible increased risk of operating into areas with limited ground-based navigation aids (NAVAID) and that help verify the aircraft's actual position relative to displayed ground track when appropriate.

Air carriers that fly standard airplanes, equipped with non-GPS TAWS, into regions with minimal navigation aids, should modify standard TAWS to GPS TAWS or conduct a risk assessment to develop and implement effective risk mitigation (such as no dual DME, or poor ground-based NAVAID reliability).

Action 4

Air carriers should develop and implement procedures to ensure TAWS terrain databases are updated in accordance with the manufacturer's recommendations on all airplanes.

SE 127: CARGO FIRE MANAGEMENT (COMPLETED)

This SE is designed to reduce cargo fires through new or revised standards for the construction of standardized and improved cargo containers including fire-suppression or fire-containment systems.

This SE calls for the development of improved fire containment/suppression systems in Class B or E cargo areas. These systems could include: 1) improved containers/unit load devices (ULD) capable of internally containing or suppressing a fire; 2) fire containment bags/blankets, which would be used to cover palletized cargo or cargo containers; or 3) fire suppression systems external to the pallets/ULDs. These improved containment/suppression systems should be implemented when available.

Action 4

SAE International published Aerospace Specification AS6453 on August 6, 2013. Portions of the SAE standard were adopted by reference in FAA TSO-C203, effective July 1, 2014.

Cargo operators should use fire containment covers conforming with TSO-C203 on palletized cargo.

Completed and closed February 4, 2016.

Action 8

Product development and testing activities are underway for ULDs made of more fire-resistant materials, as well as ULDs with internal fire suppression systems. If the testing shows such products to be viable, standards for these types of ULDs will be developed. Cargo operators should install and use these new ULDs if they become available.

Completed and closed April 2, 2020, based on xxxxxxxxxx.

SE 165: TCAS POLICIES AND PROCEDURES (COMPLETED)

This SE is designed to prevent midair collisions by requiring flightcrew to follow Traffic Collision Avoidance System (TCAS) resolution advisories (RA), even in the presence of contravening air traffic control (ATC) instructions. It also establishes procedures for TCAS range setting, and recommends TCAS-capable simulators and flight training devices be used for training TCAS responses and maneuvers.

Action 6

TCAS DO-185, Version 7.1 includes TCAS reversal logic as well as a change from “Adjust Vertical Speed Adjust” to “Level off-Level off.”

Air carriers should consider the benefits associated with TCAS DO-185, Version 7.1. If air carriers are conducting maintenance on their TCAS units, they should consider upgrading to TCAS DO-185, Version 7.1.

For more information on TCAS DO-185, Version 7.1, see Introduction to TCAS II Version 7.1: <http://www.skybrary.aero/bookshelf/books/1927.pdf>.

SE 169: WORK CARDS/SHIFT CHANGE/RESPONSIBILITIES/MANUALS (COMPLETED)

This SE is designed to reduce accidents related to improper or incomplete maintenance by ensuring—

- Work cards or other written instructions are used at the start of each task, with written and oral status reports at every shift change;
- Procedures are written to include clear responsibility and authority for work assignments; and
- Necessary manuals (operational and maintenance) are complete, accurate, available, and appropriately used.

Action 2

Air carriers should audit their compliance with AC 120-16F, Air Carrier Maintenance Programs, and implement changes where needed, including both procedural content and procedural use. AC 120-16F, issued November 15, 2012, is available for guidance: http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC%20120-16F.pdf.

Successful implementation of procedural enhancements may additionally require changes to associated company policies and philosophy, and a sound organizational commitment to safety culture. See [SE 17, Maintenance Procedures](#).

Air carriers should review their guidance material in an appropriate and timely manner to establish their level of alignment with the material.

SE 170: OEM CONTINUOUS MONITORING OF SERVICE HISTORY (COMPLETED)

This SE is designed to reduce accidents caused by improper maintenance. It is designed to ensure maintenance task difficulty data is collected and reported to the OEM and proper maintenance is being performed to ensure aircraft systems continue to function as designed.

Action 2

Air carriers and maintenance organizations should develop processes to follow the intent of and incorporate best practices into their reporting processes for maintenance task difficulties.

(See ATA⁴ Spec 119, Continuous Monitoring of Maintenance Instructions, January 2014, <http://www.skybrary.aero/bookshelf/books/2866.pdf>)

SE 175: FLIGHT CRITICAL CONFIGURATIONS CHANGES MADE DURING MAINTENANCE (COMPLETED)

This SE is designed to reduce accidents, caused by loss of pitot static systems, by providing visible tagging any time ports of the pitot static system are covered during maintenance or servicing. This SE is also designed to enhance preflight walkaround procedures to include specific verification that pitot static ports are uncovered.

Action 1

OEMs and air carriers should review, and amend, procedures to ensure multiple levels of alerting, including visible tagging, are used anytime the pitot static system is covered. Such levels should include visible tagging, or similar readily visible alerting, a work card, and logbook entry.

Air carrier directors of safety, in conjunction with directors of maintenance, should ensure appropriate procedures are covered in maintenance information, including work cards.

Air carriers should include adherence to the process within the internal audit process of their SMS (or equivalent).

⁴ Airlines for America, formerly known as Air Transport Association of America (ATA). The specifications are still known as “ATA specs.”

SE 183: COCKPIT MOVING MAP DISPLAY AND RUNWAY AWARENESS SYSTEM (COMPLETED)

This SE is designed to reduce wrong runway departures and runway incursions by encouraging the installation of ownship moving map display and/or runway awareness systems.

Action 1

Air carriers should—

- Review the latest version of Advisory Circular (AC) 120–76, Guidelines for the Certification, Airworthiness, and Operational Use of Electronic Flight Bags, and other applicable ACs that enable use of moving map displays in conjunction with company implementation of electronic flight bags (EFB).
- Evaluate all available runway awareness systems for forward fit and retroactive implementation, and consult with original equipment manufacturers (OEM) and third-party suppliers for detailed costs and technical capabilities of any system that provides airport position and/or aural warnings and alerts for airport runways.
- Install and implement moving map displays and/or runway awareness systems and activate the software to provide crews with knowledge of airplane position during taxi operations.

Completed and closed December 5, 2019, based on the 2019 MITRE avionics survey indicating 92 percent of the U.S. part 121 fleet is capable of displaying own-ship position on the ground.

SE 185: TAWS AND RNAV VISUAL OR OTHER PROCEDURES (COMPLETED)

This SE is designed to reduce terrain awareness warning system (TAWS) alerts and provide better separation from terrain by providing Area Navigation (RNAV) Visual, or other procedures, that mitigate known TAWS and terrain issues.

Action 3

Airlines for America (A4A) should identify a lead air carrier for each prioritized location identified for RNAV Visual procedures mitigation.

- | | | |
|--|--|--|
| 1. Eagle County Regional Airport (EGE) | 7. Spokane International (GEG) | 13. O'Hare International Airport (ORD) |
| 2. Crested Butte Regional Airport (GUC) | 8. Denver International (DEN) | 14. Portland International (PDX) |
| 3. Yampa Valley Airport (HDN) | 9. John Wayne-Orange County Airport (SNA) | 15. San Diego International Airport (SAN) |
| 4. Gallatin Airport (BZN) | 10. Metropolitan Oakland International Airport (OAK) | 16. Luis Munoz Marin International Airport (SJU) |
| 5. Albuquerque International Sunport Airport (ABQ) | 11. McCarran International Airport (LAS) | 17. Bob Hope Airport (BUR) |
| 6. Burlington International Airport (BTV) | 12. Bradley International Airport (BDL) | 18. Dallas-Ft Worth International Airport (DFW) |

19. Washington Dulles International Airport (IAD)	24. Guam International Airport (GUM)	29. Los Angeles International Airport (LAX)
20. Manchester Airport (MHT)	25. Jackson Hole Airport (JAC)	30. Phoenix Sky Harbor International Airport (PHX)
21. Miami International Airport (MIA)	26. San Francisco International Airport (SFO)	31. Midway International Airport (MDW)
22. Reno/Tahoe International Airport (RNO)	27. Long Beach Daugherty Airport (LGB)	32. Ontario International Airport (ONT)
23. Boise Air Terminal/Gowen Field (BOI)	28. Dallas Love Airport (DAL)	

The lead air carrier will start approval process in accordance with FAA Order 8260.55, Special Area Navigation Visual Flight Procedures, issued March 8, 2010:
<http://www.faa.gov/documentLibrary/media/Order/8260.55.pdf>.

FAA Order 8260.55 provides:

- Reference document/publications,
- Design considerations,
- Equipment requirements,
- Weather requirements, and
- Charting requirements.

Once procedures are developed, A4A should advise other air carriers of the availability of the approved procedure.

Completed and closed December 31, 2014.

Action 4

Air carriers will share the historical analysis of TAWS alerts among ASIAs carrier participants. The analysis will identify specific hotspot areas within the highest TAWS warning airports. For each of these airports, the arrival procedures that help mitigate or reduce TAWS alerts will be shared on a common public server. RNAV Visual flight procedures will be initiated by a lead air carrier for those facilities not scheduled to update instrument approach procedures (IAP) within the next 15 months.

This action supersedes previously described Actions 1–3.

- A4A, the Regional Airline Association (RAA), and the National Air Carrier Association (NACA) should perform a preliminary analysis of the airports for trends and potential terrain issues based on groupings or clusters of TAWS events in close proximity to actual terrain for each runway. This analysis can be conducted using current analysis tools or other three-dimensional analysis programs (available through Google Earth or other commercial or proprietary sources) of the current TAWS hotspots.
- A4A, RAA, and NACA should identify airports that are: 1) candidates for new procedures, 2) candidates for validating existing procedures, and 3) those showing no

clear terrain-related history from the preliminary analysis. Air carrier associations should conduct detailed analysis of candidate airports for new improvements. When a detailed analysis shows an opportunity for RNAV Visual operations, a lead air carrier should be identified for development based on the current proportion of operations and future schedule plans. Air carriers should identify any RNAV Visual approaches already developed but not yet shared. Once an existing RNAV Visual approach is identified or an air carrier has developed a new RNAV Visual approach, the procedure should be posted on an A4A server for other 14 CFR part 121 air carriers and approved 14 CFR part 135 and approved 14 CFR part 91 operators to access.

- Action items should be considered flexible because this process is repeated biannually and as improvements in technology or methodology are identified.

Completed and closed August 3, 2017, because TAWS warnings have decreased at all airports being monitored under this SE; JIMDAT will continue to monitor TAWS alerts and will work with air carriers to develop RVFP as needed.

3. SAFETY ENHANCEMENTS—OPERATIONS

SE 186: TCAS SENSITIVITY LEVEL COMMAND (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed to reduce the rate of unnecessary TCAS alerts at high altitude airports. Based on site-specific analysis, a determination will be made whether a change to TCAS sensitivity, operational practices, or additional guidance will contribute to improved awareness by ATC and aircrews.

Action 4

Develop changes in operating practices at Denver International Airport (DEN) to reduce TCAS RAs. These changes should consider altitudes, merge points, distance between aircraft, and the potential operational impact on the traffic flow.

Air carriers should coordinate implementation of these changes with Denver TRACON representatives and other air traffic representatives.

SE 194: SOPs EFFECTIVENESS AND ADHERENCE (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed for air carriers to develop and implement improved SOPs to increase flightcrew adherence to SOPs most relevant to issues leading to fatality risk in 14 CFR part 121 air travel.

Action 1

Air carrier industry associations should communicate with their air carrier members, explaining the analysis undertaken by CAST regarding loss of ASA, the role of that non-adherence to SOPs played in the accidents, and the purpose of the CAST SE.

Air carriers should—

- Review SOPs for consistency with the CAST Plan, focusing on completeness for all phases of flight and improved awareness and response during operations that are more prone to reduced ASA.
- Consult with manufacturers to check that SOPs are consistent with current manufacturer recommendations.
- Review SOPs for compatibility with the most current ATC procedures, paying attention to airports where data show higher rates of unstabilized approach or excessive bank angles.

- Validate and update SOPs as needed based on above review, ensuring that procedures are clear, logical, prioritized, and incorporate human factors best practices.

Action 2

Air carriers should—

- Prioritize SOPs for monitoring and evaluation based on relevance of the SOPs to the highest areas of fatality risk in part 121 air carrier operations.
- Determine level of adherence to current SOPs through data and operational monitoring programs, prioritizing assessment and evaluation based on the results of Action 1.
- Determine which of the prioritized SOPs have lower adherence rates and identify possible reasons.
- Communicate with their industry associations when they have completed this assessment.

Completed and closed February 2, 2017, based on air carrier industry association member implementation surveys.

Action 3

Air carriers should—

- Based on the results of Action 2, improve or clarify SOPs that have high correlation to ASA issues and low adherence rates, and develop suitable training to address causes for noncompliance.
- Implement training and revise syllabuses as appropriate.
- Revise SOPs and other policies as needed, and incorporate processes to periodically review and update SOPs, other policies, and training based on results of monitoring programs developed in Action 2 for SOP adherence.
- Periodically review and reprioritize SOPs that have high correlation to the highest areas of fatality risk in part 121 air travel, and review additional CAST or manufacturer recommendations as they become available.

SE 198: SCENARIO-BASED TRAINING FOR GO-AROUND MANEUVERS (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed for air carriers to incorporate scenario-based go-around training (both initial and recurrent) that matches realistic situations. In addition, air carriers should perform an assessment to identify additional improvements to go-around procedures and training. This assessment would include a review of ongoing go-around initiatives, research planning, review of ASIAs metrics and data, and review of ATC go-around procedures.

Action 2

Air carriers should—

- Review their current go-around policies, SOPs, manuals, and training programs for consistency with the recommendations in the FAA guidance material addressing scenario-based go-around training.
- Consult with airplane manufacturers to develop airplane-specific procedures for those scenarios not already covered in their training.
- Update their go-around policies, SOPs, manuals, and training programs to incorporate the proposed scenarios.
- Coordinate with their pilot labor organizations to communicate these revisions and the rationale behind them to the line pilot community.
- Conduct the scenario-based training for the line pilots in initial and recurrent training.

Completed and closed April 6, 2017, based on air carrier association reports of operator implementation. CAST will continue to monitor the metrics.

SE 199: ENHANCED CRM TRAINING (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed to reduce accidents and incidents because of loss of ASA.

Action 2

Air carriers should review their crew resource management (CRM) policies in light of the revised FAA guidance in AC 120–51E, Crew Resource Management Training, and revise as necessary.

Completed and closed October 5, 2017, based on air carrier survey responses.

Action 3

Air carriers should develop, in cooperation with the pilot labor organizations, revised CRM training programs based on guidance of the FAA-revised AC 120–51E and the air carrier policies developed from Action 2. These programs will include simulator scenarios, classroom instruction and case studies in accordance with the latest version of AC 120–51E.

Air carriers should implement the revised training in initial and recurrent training programs.

(See AC 120–51E, Crew Resource Management Training, January 22, 2004, [http://rgl.faa.gov/Regulatory and Guidance Library/rgAdvisoryCircular.nsf/list/AC%20120-51E/\\$FILE/AC120-51e.pdf](http://rgl.faa.gov/Regulatory%20and%20Guidance%20Library/rgAdvisoryCircular.nsf/list/AC%20120-51E/$FILE/AC120-51e.pdf))

Action 4

Air carriers should develop a process to solicit ongoing feedback from line pilots, flight standards organizations, and training department instructors and revise CRM training accordingly.

SE 216: FLIGHT CREW LANDING TRAINING (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed to reduce runway excursion (RE) accidents by air carriers defining, publishing, and training proper techniques for stabilized approach, flare, touchdown, and use of available airplane stopping devices.

Action 1

Air carrier industry associations should communicate with their member air carriers, explaining the analysis undertaken by CAST regarding REs and the factors that result in reduced or minimal landing margins.

Air carriers should consult airplane manufacturer guidance to ensure consistency with their policies and operating procedures as related to the proper use of available airplane stopping devices.

Air carriers should develop/revise their operational procedures for landing on runways with reduced or minimal landing distance margin, including processes to identify runways within their sphere of operations having a higher risk of REs. These processes should use feedback from operational data-monitoring programs such as Aviation Safety Action Programs (ASAP), FOQA, and ASIAs to measure risk based on industry-developed and accepted RE metrics. Data from the monitoring programs should be fed back into flightcrew training and procedures.

Air carriers should develop and implement procedures for stabilized approach, flare, and landing and train to these procedures. These procedures and associated training should be driven from operational data-monitoring programs such as ASAP, FOQA, and ASIAs. The related risk assessment should include all key risk issues that are recognized in contributing to REs. The results of that risk assessment should be used to establish training to include any or all of the following:

- Emphasis on flying a stable approach in accordance with the air carrier's SOPs, and on executing a go-around when the approach becomes unstable.
- Emphasis on transitioning from a stable approach to a stable flare and touchdown within -250 feet to +500 feet of the aiming point markings or, where there are no runway aiming point markings, 750 feet to 1500 feet from the approach threshold of the runway (as consistent with the current FAA Airline Transport Pilot Practical Test Standards). Training should reinforce that the crew should consider a go-around if the airplane does not touch down in the defined touchdown zone.

- Emphasis on early deployment of available stopping devices (such as speedbrakes/ground spoilers, reverse thrust to at least the flight idle position) for all landings, and the early use of appropriate levels of wheel braking on the first half of the runway, where friction levels tend to be higher in contaminated conditions.
- Specific instruction for the pilot monitoring to verify and call out deployment of stopping devices after touchdown.
- Simulator-based practice for airplane-specific handling guidelines in gusty tailwind conditions (within approved airplane-specific limits), to be performed in full flight simulators with capability to support the training.
- Simulator-based practice for landing and stopping on wet/contaminated runways, to be performed in full flight simulators with capability to support the training.
- Simulator-based practice for operation into runways with higher risk of RE, as identified by the processes developed to identify runways within the air carrier's sphere of operations having a higher risk of REs.
- Potential effects of MEL conditions on airplane stopping performance.
- Promotion of awareness and use of the Flight Safety Foundation's Runway Excursion Risk Awareness Tool.

Action 2

Air carrier industry associations should communicate with their member air carriers, explaining the analysis undertaken by CAST regarding REs and the factors that result in directional control issues.

Air carriers should consult airplane manufacturer guidance to ensure consistency with their policies and operating procedures as related to airplane performance in crosswinds, including—

- Maximum demonstrated crosswind values;
- Airplane-specific flight handling characteristics in gusty crosswind conditions;
- Airplane-specific ground handling characteristics on wet/contaminated runways when operating in gusty crosswind conditions;
- Emphasis on proper use of tiller during ground rollout, including the risk of nose gear steering malfunctions or over control if the tiller is used at high speeds; and
- Potential effects of MEL conditions on directional control (such as single reverser inoperative).

Air carriers should develop and implement procedures concerning proper techniques for maintaining directional control in crosswind conditions or in response to an airplane system failure resulting in a directional asymmetry and train to those procedures. These procedures and associated training should use feedback from operational data-monitoring programs such as ASAP, FOQA, and ASIAs and should include simulator practice (in full flight simulators with capability to support the training) of the following:

- Landing and rollout in gusty crosswinds on a contaminated runway, within air carrier crosswind landing guidelines for contaminated runways; and
- Recognition and control of asymmetric thrust reverser deployment.

SE 217: TAKEOFF PROCEDURES AND TRAINING (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed to reduce RE accidents by air carriers improving takeoff safety.

Action 1

FAA AFS will publish guidance that includes formal processes that ensure accurate takeoff performance data.

During the development and publishing of the guidance, air carriers and air carrier industry associations should give input to FAA AFS.

Completed and closed August 4, 2016.

Action 2

Once complete, air carrier industry associations should communicate with their member air carriers, explaining the analysis CAST has undertaken regarding REs and the factors that result in 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.

Air carriers should review and revise their procedures and training, as necessary, in accordance with the guidance from Action 1, and respond to their air carrier organizations when this task is complete.

Completed and closed August 3, 2017, based on air carrier survey responses.

Action 3

Air carrier industry associations should communicate with the air carrier members, explaining the analysis undertaken by CAST regarding REs and the specific risk that rejected takeoff (RTO) scenarios pose in contributing to REs.

Air carriers should define and update SOPs related to the RTO decision, utilizing guidance as recommended in the 2005 revision of the Pilot Guide to Takeoff Safety, 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:

- Utilize good CRM in briefing for a possible RTO and crew responsibilities during an RTO.

- Awareness of and adherence to SOPs regarding the RTO decision, including emphasis on the startle effect.
- Emphasis in training scenarios on RTO decision making on non-engine-failure-related events that occur during the takeoff roll, such as—
 - Airspeed discrepancies;
 - Takeoff configuration warnings;
 - Cargo/door warning lights;
 - Mechanical issues;
 - Tire failures;
 - ATC comments, “instruction” to reject, or canceled clearance;
 - Birdstrike; and
 - Scenarios (other than engine failure) that, according to air carrier SOPs, should instigate an RTO.
- Reinforce in training the underlying rationale for the RTO procedures, based on airplane stopping characteristics.

The Pilot Guide to Takeoff Safety, Takeoff Safety Training Aid, is available for guidance: http://www.faa.gov/other_visit/aviation_industry/airline_operators/training/media/takeoff_safety.pdf.

SE 227: AIR CARRIER PROCEDURES FOR TAKEOFF CONFIGURATION (UNDERWAY)

This SE is underway. Aspects of this SE are being worked on and will be altered from this draft version once they are complete.

This SE is designed to mitigate the risk of flightcrews attempting to take off with flaps in an improper setting by recommending air carriers to review and/or amend their SOPs relating to setting proper flap/slat configuration for takeoff.

Action 1

Air carriers should review and assess current policies and procedures for takeoff configuration and evaluate them against recommended best practices derived from analysis of flight operational data and pilot reports for takeoff flap misconfiguration events.

Completed and closed June 1, 2017, based on industry association survey results.

Action 2

Air carriers should revise their procedures as necessary in accordance with the results of Action 1.

Action 3

FAA AFS should assess the increased risk of takeoff misconfiguration (particularly attempted takeoff with flaps up) if the annual anti-icing holdover time tables allow longer holdover times for operators anti-icing and taxiing with flaps up instead of the aircraft remaining in the takeoff flap configuration.

Completed and closed August 3, 2017, based on the amended language in the Winter 2017–2018 FAA Holdover Time Guidelines (issued August 9, 2017).

SE 2: STANDARD OPERATING PROCEDURES (SOP) (COMPLETED)

This SE is designed to improve aviation safety by ensuring air carriers establish flightcrew SOPs that fit each air carrier's particular operation. It will also improve safety by ensuring all air carriers train their SOPs and encourage the use of all SOPs in all normal operations.

All air carriers should have SOPs that address all projected normal situations crew/company personnel will encounter. SOP manuals should address—

1. Use of checklists,
2. Personnel responsibilities,
3. Use of available equipment, and
4. Expected procedures to be used during—
 - a. Preflight,
 - b. Taxi,
 - c. Takeoff,
 - d. Climb,
 - e. Cruise,
 - f. Descent,
 - g. Approach,
 - h. Missed approach,
 - i. Landing,
 - j. Taxi, and
 - k. Parking.

Air carriers should involve flightcrew in SOP development activities to increase acceptance and understanding of new procedures. Air carriers should develop, publish, and train SOPs for any new equipment before any new equipment is used or installed. Air carriers should train proficiency in their SOPs and crews should use published company SOPs.

Action 4

Air carriers should adopt SOPs and revise their training manuals and programs to incorporate the proposed SOP template for the technology of the equipment in the aircraft.

SOP template items can be found in appendix 1 of AC 120–71A, Standard Operating Procedures for Flight Deck Crewmembers.

AC 120–71A, issued February 27, 2003, is available for guidance:

[http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-71A/\\$FILE/AC120-71A.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-71A/$FILE/AC120-71A.pdf).

AC 120–71B was issued January 10, 2017. The SOP template is no longer published in the AC, but the revised AC contains additional information on SOP policy, checklist development, and Pilot Monitoring (PM) duties:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-71B.pdf.

SEs 3–8: PRECISION-LIKE APPROACH IMPLEMENTATION (COMPLETED)

These SEs were designed to reduce the possibility of CFIT accidents by identifying the means by which all flightcrew can fly an appropriate stabilized vertical path to the runway end, for all instrument approach procedures. These SEs will direct or encourage the aviation community to—

1. Identify criteria for the development of appropriate stabilized continuous descent approach procedures to the runway end for all instrument approaches and air carrier aircraft types.
2. Address any changes necessary to ensure adequate training and certification of flightcrews.
3. Address any changes necessary for certification and authorization of aircraft and procedures.
4. Take advantage of existing aircraft capabilities to improve approach and landing safety to the maximum extent practical.
5. Transition to use of new and evolving aircraft capabilities which can further improve approach and landing safety at the earliest practical time.

The potential technologies for precision-like approach implementation include Non-Precision Approach with Vertical Angles, Visual Glide Slope Indicator (VGSI), DME, RNAV 3D, Required Navigation Performance (RNP)–RNAV, and laterally and vertically guided approach path (xLS), instrument landing system (ILS), Microwave Landing System (MLS), and Global Navigation Satellite System Landing System (GLS). The following actions apply to all of these technologies:

Action 3

Air carriers should update all appropriate pilot documentation to explain the revised instrument procedures as detailed in SEs 3 through 8.

Action 6

Air carriers should develop crew procedures and update their training program to promote new instrument procedures as specified in SEs 3 through 8.

Action 11

Air carriers should develop crew procedures/techniques to fly stabilized approach procedures that replace “dive and drive” procedures. Air carriers should tailor existing crew procedures and techniques to individual operational requirements.

SE 10: AIRLINE PROACTIVE SAFETY PROGRAMS (FOQA & ASAP) (COMPLETED)

This SE is designed for air carriers to develop and implement a mutually agreed upon methodology to use deidentified FOQA and ASAP information to proactively identify safety-related issues and corrective actions.

Action 1

FAA AFS and the Office of the Chief Counsel (AGC) worked with industry groups to draft and issue a notice of proposed rulemaking (NPRM) preventing use of data collected under FOQA and ASAP programs in certificate actions against the airlines or their employees. This NPRM resulted in 14 CFR § 13.401, Flight Operational Quality Assurance Program: Prohibition against use of data for enforcement purposes, on May 9, 2002.

Employee groups should work with operators to draft contractual language to prevent the use of FOQA or ASAP information as a basis for disciplinary actions.

Operators worked with employee groups to develop legislative language to exempt FOQA and ASAP information from disclosure under the Freedom of Information Act of 1966 § 552 of Title 5 of the United States Code (U.S.C.) and prevent misuse of FOQA and ASAP information. This legislative language resulted in 49 U.S.C. § 44735, Limitation on disclosure of safety information.

Action 2

A FOQA steering committee and ASAP policy subcommittee comprised of Government and industry representatives, endorsed by FAA, provided guidance to operators regarding the implementation of FOQA and ASAP programs (mentoring). Each steering committee was responsible for the development and establishment of standards for FOQA and ASAP programs. In addition, each steering committee documented standards for FOQA and ASAP programs.

The FAA convened a group to draft and coordinate ASAP AC 120–66B and FOQA AC 120–82. A re-draft of the ASAP AC is in production.

(See AC 120–66B, Aviation Safety Action Program (ASAP), November 15, 2002, http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC120-66B.pdf)

(See AC 120–82, Flight Operational Quality Assurance, April 12, 2004, [http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-82/\\$FILE/AC120-82.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-82/$FILE/AC120-82.pdf))

Action 3

The FAA convened a group of the referenced organizations to draft HBAT guidance regarding the approval of FOQA and ASAP programs. FAA AFS was the lead organization for HBAT development.

Action 4

Air carriers and manufacturers developed a process to identify and communicate “Hot Topic” items of focus or review that could be monitored for a specific period.

Currently, ASIAs handles the sharing of trend information and corrective actions from FOQA and ASAP programs.

Action 5

The Flight Safety Foundation promoted and advertised FOQA overview documentation.

Air carriers, through the FOQA Task Force, drafted and coordinated documentation outlining suggested methods and procedures regarding key components of analysis and trend identification programs and suggested items to monitor in FOQA and ASAP programs.

The FAA and the National Aeronautics and Space Administration (NASA) published results of studies reviewing existing FOQA and ASAP programs and the analysis tools those programs employ.

NASA undertook studies to develop analytical tools and methods that both large and small operators could apply to FOQA and ASAP information.

SE 11: CREW RESOURCE MANAGEMENT (CRM) (COMPLETED)

This SE is designed to reduce CFIT accidents by promoting comprehensive SOPs as a key element of air carrier CRM training programs. Under [SE 2, Standard Operating Procedures \(SOP\)](#), a template for a comprehensive SOP has been developed, including an SOP which specifically addresses CFIT accident prevention.

Action 3

Air carriers should incorporate CFIT prevention and training in their approved CRM training program.

Guidance regarding this training is available in AC 120–71B, issued January 10, 2017: http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-71B.pdf.

SEs 14–16: POLICIES FOR ALAR (SAFETY CULTURE) (COMPLETED)

The purpose of these SEs is to develop a strategy to promote a safety culture at each air carrier specifically targeting approach and landing accident reduction (ALAR). They are designed to ensure essential safety information generated by airplane manufacturers and the FAA is included in company operating manuals and in training programs for pilots and other appropriate employee groups.

Teams within each air carrier should jointly develop manuals and training programs striving for the highest safety goals. They should further ensure the content of those manuals is rigorously followed in training programs and in day-to-day operations. It is recognized that rulemaking may be necessary to clarify existing requirements specifying the content and use of company operating manuals.

Action 1

Air carrier chief executive officers (CEO) and other key officers should be made more visible and more effective in promoting safety culture.

Safety culture guidance material can be found in the following documents:

- Operator's Aviation Safety Handbook: http://flightsafety.org/files/OFSH_english.pdf;
- FAA Audit Tool; or
- Other similar guidance, endorsed by CAST.

Actions 2 and 3

Air carrier directors of safety should be made more visible and more effective in promoting safety culture.

Air carrier directors of safety should also ensure the establishment of a process to identify, review, analyze and include appropriate safety information in training programs and in manuals used by flightcrews and maintenance staff.

Air carrier directors of safety should accomplish the above in the following ways:

- Promote HBAAT 99–19 endorsed by CAST as good guidance material.
- Working through senior management, should implement guidance contained in HBAAT 99–19.

HBAAT 99–19, 14 CFR part 121 and 135 Air Carrier Safety Departments, Programs, and the Director of Safety, is available for guidance:
<http://www.skybrary.aero/bookshelf/books/1556.pdf>.

SE 21: FLIGHT DECK EQUIPMENT UPGRADE/INSTALLATION TO IMPROVE ALTITUDE AWARENESS AND CHECKLIST COMPLETION (COMPLETED)

This SE is designed to ensure altitude awareness and accomplishment of checklist items. Air carriers should develop guidelines and procedures for a flightdeck smart-alerting system. Air carriers should incorporate procedures and operational training based on—

1. The installation of automated checklist devices to provide a positive means for checklist completion (described in Human Performance Considerations in the Use and Design of Aircraft Checklists, issued January 1995:
<http://www.skybrary.aero/bookshelf/books/1566.pdf>;
2. Research and assessment of existing technology in flightdeck smart-alerting system design; and
3. The installation of equipment to provide automatic aural altitude alert callouts on final approach or other such altitude alerting systems.

Actions 1 and 3

Air carriers should develop training syllabuses and procedures for interactive checklists and smart-alerting system use.

(AC 25.1322–1, Flightcrew Alerting, is available for guidance:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_25.1322-1.pdf

SE 23: FLIGHT CREW TRAINING (COMPLETED)

This SE is designed to ensure air carriers implement syllabuses that train and evaluate flightcrews on stabilized approaches, unusual attitudes, and upset recoveries.

Action 3

Air carriers should assist their assigned principal operations inspectors and director of safety, or equivalent, in conducting a review using the ALAR JSIT Training Guide, to ensure the following topics are included in their approved training programs:

- Stabilized approaches;
- Go-around gates and missed approach criteria;
- Approach procedures and briefings;
- Non-normal aircraft conditions;
- CRM courses and training;
- Basic airmanship skills;
- Specific turbojet, high speed, versus propeller, low speed aircraft characteristics for transitioning pilots if appropriate;
- Basic instrument and visual airmanship;

- Transfer of aircraft control; and
- Upset recoveries, unusual attitudes, mountain flying, heavy aircraft operations.

Information for Operators (InFO) 08029, Supportive Information, contains guidance on the above topics in appendix 1, ALAR JSIT Team Training Guide:

<http://www.skybrary.aero/bookshelf/books/1573.pdf>.

SE 26: STANDARD OPERATING PROCEDURES (SOP) (COMPLETED)

This SE is designed to ensure all air carriers publish and enforce clear, concise, and accurate flightcrew SOPs. Air carrier instructors and check airmen should ensure these SOPs are trained and enforced in their flightcrew proficiency and standardization programs. Flightcrew SOPs should include—

- Expected procedures during pre/post flight and all phases of flight checklists;
- Simulator training;
- Pilot-flying/pilot-not-flying duties;
- Transfer of control, automation operation;
- Rushed and/or unstabilized approaches;
- Rejected landings and missed approaches;
- In-flight pilot icing reporting; and
- Flightcrew coordination.

Action 4

Air carriers should adopt the revised SOP information from AC 120–71A (the current version is AC 120–71B) and revise their training programs and manuals to incorporate the proposed revisions.

Air carriers should revise their company training programs and manuals to incorporate as many SOP item revisions as appropriate.

AC 120–71B, issued January 10, 2017, is available for guidance:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-71B.pdf.

SE 27: RISK ASSESSMENT AND MANAGEMENT (COMPLETED)

This SE is designed to identify, or develop and implement, methods for air carriers to prioritize safety-related decisions. This SE will improve methods of risk assessment for operational issues related to service bulletins, aircraft accident/incident analysis, flight-critical safety information, and recurring intermittent failures related to dispatch.

Action 3

Air carrier directors of safety or their equivalents should ensure all appropriate managers implement and use risk assessment tools to prioritize safety related decisions. Guidance materials on risk assessment and risk management tools to prioritize safety-related decisions for operational issues are in Guide to Methods and Tools for Airline Flight Safety Analysis, second edition, issued June 2003: <http://www.skybrary.aero/bookshelf/books/237.pdf>.

Air carrier directors of safety or their equivalents, working through senior management, should apply the principles contained in AC 120–92B, Safety Management Systems for Aviation Service Providers, to training programs and manuals used by operations and maintenance staff.

AC 120–92B, is available for guidance:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-92B.pdf.

SE 28: POLICIES (COMPLETED)

This SE is designed to ensure essential safety information and operational procedures generated by airplane manufacturers are included in operating manuals and training programs for pilots, and other appropriate employee groups. Air carriers should develop a means to improve the performance of those flightcrew members who meet the minimum criteria, but have shown a limited proficiency.

Action 1

Air carriers should develop reliable processes to ensure flight operations and maintenance personnel are made aware of and incorporate essential operating information in a timely manner.

- Air carriers should distribute essential operating information identified by the manufacturers to flightcrews and maintenance staff in an appropriate and timely manner.
- Air carrier directors of safety or their equivalents should ensure the establishment of a process to identify, review, analyze and include essential operating information in training programs and in manuals used by flightcrews and maintenance staff.
- Air carriers should revise the company flight manual(s) in a timely manner as essential operating information is amended or added.

SE 29: POLICIES (COMPLETED)

This SE is designed to ensure air carriers have a process to enhance pilot proficiency.

Action 2

Air carriers, in collaboration with pilot associations, should ensure their training and qualification processes use information from programs such as FOQA, Advanced Qualification Program (AQP), and ASAP to assist in assuring pilot proficiency.

- Pilot associations and air carriers should review existing programs and collaborate to develop a mechanism to continuously improve pilot performance and proficiency.

- Improved overall flightcrew performance and proficiency should be paramount in program design.
- The program should be a joint effort among pilot associations and air carriers, with safeguards designed to protect confidentiality of individuals and information.
- The program shall be nonpunitive, voluntary, and managed by the individual air carriers. Entry into the program can either be by voluntary self-disclosure or through encouragement by the pilot associations Professional Standards or Standardization and Training committees.

SE 30: HUMAN FACTORS AND AUTOMATION (COMPLETED)

This SE is designed to reduce loss of control accidents by encouraging air carriers to adopt consensus policies and procedures relating to mode awareness and energy-state management.

Action 4

Air carriers should review the generic automation policies as published and implement them as appropriate.

Guidance can be found in SE 30, Mode Awareness and Energy State Management Aspects of Flight Deck Automation, final report:

http://www.cast-safety.org/pdf/cast_automation_aug08.pdf.

SE 31: ADVANCED MANEUVERS (COMPLETED)

This SE is designed to implement training for the prevention and recovery from loss of control events.

Action 3

Air carriers should implement loss of control flight training via ground and simulator instruction within the certified flight envelope, with emphasis on recognition, prevention, and recovery techniques. A check airman should administer this flight training.

Guidance can be found on the FAA website under Airline Operator Training:

http://www.faa.gov/other_visit/aviation_industry/airline_operators/training/.

SE 49: RUNWAY INCURSION PREVENTION (COMPLETED)

This SE is designed to reduce the risk of runway incursions and surface incidents by recommending all 14 CFR part 121 and 14 CFR part 135 operators establish, document, train, and follow SOPs for ground operations.

Action 4

All part 121 and part 135 operators should revise their company training programs and policy manuals to incorporate as many SOP template items in AC 120–71A, as appropriate, for the scope of the operation.

AC 120–71A, issued February 27, 2003, is available for guidance:

[http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-71A/\\$FILE/AC120-71A.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-71A/$FILE/AC120-71A.pdf).

AC 120–71B was issued January 10, 2017:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-71B.pdf

SE 51: SOPs FOR TOW TUG OPERATORS (COMPLETED)

This SE is designed for the development and use of recommended best practices, for ground operations for use by mechanics and others who tow or otherwise move aircraft within the airport movement area, and will improve aviation safety by reducing the frequency and severity of runway incursions.

Action 1

AFS developed a template for best practices to prevent runway incursions and other surface incidents. Air carriers should train mechanics and others who tow or otherwise move aircraft within the airport movement area on the recommended best practices.

SE 60: PILOT TRAINING (COMPLETED)

This SE is designed to substantially reduce or eliminate the risk of runway incursions. It is designed to incorporate runway incursion training into approved flightcrew qualification training and other pilot training programs. This training should increase the pilot's ability to recognize and avoid situations leading to runway incursions.

Action 7

Air carriers should use the guidance in AC 120–51E, Crew Resource Management Training, to implement scenario-based flight simulator training in ground taxi operations that emphasize flightcrew vigilance in avoiding runway incursions.

AC 120–51E, issued January 22, 2004, is available for guidance:

[http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-51E/\\$FILE/AC120-51e.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-51E/$FILE/AC120-51e.pdf).

SE 78: CABIN INJURY REDUCTION DURING TURBULENCE (COMPLETED)

This SE is designed to reduce turbulence injuries to flight attendants and passengers through improved situational awareness, turbulence encounter management procedures—before, during

and after encounter—and enhanced communication methodologies standardized across air carriers.

Data has consistently shown most turbulence-related injuries occur to flight attendants and passengers who are not properly secured. Over the years, Government and industry efforts have addressed this issue in an attempt to reduce turbulence injuries to flight attendants and passengers. These efforts have lacked overall coordination and consequently have not been effective, as indicated by the increasing trends in flight attendant injuries.

Action 3

Air carriers should revise flight attendant, pilot, and dispatcher SOPs and training programs to incorporate the recommendations and best practices contained in the published AC 120–88A, Preventing Injuries Caused by Turbulence.

AC 120–88A, issued January 19, 2006, is available for guidance:

[http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-88A/\\$FILE/AC120-88A.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-88A/$FILE/AC120-88A.pdf).

Air carriers should conduct the upgraded training during annual recurrent training for flight attendants and pilots to implement the recommendations and best practices contained in the AC.

SE 120: TAWS IMPROVED FUNCTIONALITY (COMPLETED)

This SE is designed to increase the potential safety impact of [SE 1, Terrain Avoidance Warning System](#), by developing procedures to include GPS sensors for TAWS, and to ensure updates to terrain databases, alerting algorithms, and new options to TAWS are incorporated as soon as possible.

Action 1

Air carriers should—

- Establish, as appropriate, SOPs that communicate to flightcrews the rationale behind the necessity for these TAWS procedures.
- Advise flightcrews of the possible increased risk of operating into areas with limited ground-based NAVAID which help verify the aircraft’s actual position relative to displayed ground track when appropriate.
- Reference events involving map shifts and/or ground navigation equipment failures.
- Develop policies that match aircraft capability to the NAVAID environment at the expected arrival location.

SE 121: CARGO LOADING TRAINING AND SOPs (COMPLETED)

This SE is designed to reduce cargo-related accidents and incidents by—

- Publishing and enforcing clear, concise, and accurate SOPs.

- Teaching the rationale behind those procedures.
- Ensuring company training programs are approved and monitored.
- Ensuring adequacy of contractor training.

Action 1

Cargo operators should conduct/improve the surveillance of contractor cargo loading training. Cargo operators should ensure an audit/surveillance of their cargo loading program is being conducted with an emphasis on contracted work. Cargo operators should improve audit/surveillance programs as necessary.

AC 120–59A, Air Carrier Internal Evaluation Program, issued April 17, 2006, is available for guidance:

[http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-59A/\\$FILE/AC%20120-59a.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-59A/$FILE/AC%20120-59a.pdf).

Action 4

Operators should incorporate AC 120–85, Air Cargo Operations, into their SOPs, and train those procedures including emphasis of the rationale behind them.

Operators should develop and obtain approval, from their principal operations inspector, of SOPs that adopt best practices.

AC 120–85A, issued June 25, 2015, is available for guidance:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-85A.pdf.

SE 125: HAZMAT PROCESSING (COMPLETED)

This SE is designed to reduce cargo-related accidents and incidents by preventing undeclared hazardous material from entering the shipping system.

This SE is designed to encourage cargo operators (air and ground) to develop and implement a multitier system to identify and process undeclared hazardous material. This system should include education, identification, inspection, regulation, and oversight.

Action 2

Cargo operators should incorporate best practices, or a comprehensive system including education, identification, and inspection to prevent shipping undeclared hazardous materials.

Resource Material for Air Carriers and Passengers from the Office of Hazardous Materials Safety is available for guidance:

http://www.faa.gov/about/office_org/headquarters_offices/ash/ash_programs/hazmat/

SE 131: SAFETY CULTURE (COMPLETED)

This SE is designed to reduce cargo-related accidents and incidents by encouraging a safety culture, which includes the following actions.

Action 2

Air carriers should implement a self-audit process as part of the Safety Management System (SMS) program to further enhance safety.

Information on SMS is available for guidance:

<http://www.faa.gov/about/initiatives/sms/explained/>.

Action 3

Air carriers should implement an operational risk management program.

See CAST [SE 27, Risk Assessment and Management](#).

Action 5

Air carriers should implement a safety reporting system and develop a quality assurance program appropriate for their operations.

SE 136: ENGINE SURGE RECOVERY (COMPLETED)

This SE is designed to reduce the risk of accidents from engine surge caused by ice ingestion. This SE includes engine failure recognition and response training materials in air carrier training programs.

Action 1

Air carriers should include engine malfunction recognition and response training materials in training programs.

Information on engine malfunction recognition and response is available on the CAST website:

http://www.cast-safety.org/apex/f?p=180:1:13916167188449::NO::P1_X:engine

SE 165: TCAS POLICIES AND PROCEDURES (COMPLETED)

This SE is designed to prevent midair collisions by encouraging air carriers to require flightcrews to follow TCAS RAs, even in the presence of contravening ATC instructions. It also establishes recommended procedures for TCAS range setting, and recommends that TCAS-capable simulators and flight training devices be used for training TCAS responses and maneuvers.

Action 2

Air carriers should establish SOPs, and standardized ground school and simulator training, on pilot response to TCAS RAs for aircraft equipped with TCAS II. The training should ensure pilots follow the RA promptly and accurately even in the presence of contravening ATC instructions. Simulator training should include a scenario(s) involving contravening ATC instructions.

AC 120–55C, Air Carrier Operational Approval and Use of TCAS II, Change 2, issued March 18, 2013, is available for guidance:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-55C_CHG_1.pdf.

Action 3

Air carriers should establish procedures for TCAS range setting, appropriate to traffic situations (such as using maximum range in low-traffic situations).

AC 120–55C, paragraph 12d, TCAS Good Operating Practices, is available for guidance:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-55C_CHG_1.pdf.

SE 175: FLIGHT CRITICAL CONFIGURATIONS CHANGES MADE DURING MAINTENANCE (COMPLETED)

This SE is designed to reduce accidents, caused by loss of pitot static systems, by providing visible tagging any time ports of the pitot static system are covered during maintenance or servicing. This SE is designed to enhance preflight walk-around procedures to include specific verification that pitot static ports are uncovered.

Action 2

OEMs and air carriers should confirm pilots performing preflight walk-around procedures ensure pitot/static ports are uncovered.

Air carrier directors of safety, in conjunction with their directors of operations, should ensure the appropriate preflight walk-around procedures are covered in the Flight Operations Manual.

Air carriers should include adherence to the process within the internal audit process of their SMS (or equivalent).

SE 193: NON-STANDARD, NON-REVENUE FLIGHTS (COMPLETED)

This SE is designed to reduce accidents and incidents because of loss of airplane state awareness (ASA) during high-risk maneuvers in functional check flights, as well as in other non-standard, non-revenue flight operations.

Action 1

AFS published InFO 16006, identifying risks and summarizing recommendations while conducting non-revenue flights.

(See InFO 16006, Non-Revenue Flight Procedures, https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info/all_infos/media/2016/InFO16006.pdf, and the Flight Safety Foundation Functional Check Flight Compendium, <http://flightsafety.org/current-safety-initiatives/functional-check-flights>.)

Completed and closed June 2, 2016.

Action 2

Air carriers should implement the guidance developed from Action 1 to create operational risk assessment guidelines and training standards that mitigate risk associated with non-standard, non-revenue flights.

Air carriers should incorporate these practices into their SOPs, policies, training, and SMS.

Completed and closed February 2, 2017, based on air carrier industry association member implementation surveys.

SE 195: FLIGHT CREW TRAINING VERIFICATION AND VALIDATION (COMPLETED)

This SE is designed to improve flightcrew proficiency in handling issues that can lead to loss of ASA.

Action 1

Air carriers should—

- Implement a process to ensure their aircrew training program, including any contractor training, is consistent with current air carrier and manufacturer policy and procedures.
- Implement a process to validate the qualification and currency of trainers, including contractor trainers.
- Validate contractor training by periodically observing training and/or checking events and auditing records to ensure consistency of aircrew training and pilot proficiency.

Completed and closed February 2, 2017, based on air carrier industry association member implementation surveys.

SE 196: EFFECTIVE UPSET PREVENTION AND RECOVERY TRAINING, INCLUDING APPROACH-TO-STALL (COMPLETED)

This SE is designed for air carriers to review, incorporate, and adopt the best practices recognized by the aeronautical community concerning upset prevention and recovery training (UPRT).

Action 2

Air carriers should review AC 120–109, Stall and Stick Pusher Training, and revise their training programs as necessary to ensure the following components are included in recurrent and initial training approach-to-stall and stall recovery training:

1. The key concept that reduction of angle of attack is the most important response when confronted with a stall event. The training should emphasize treating an approach to stall the same as a full stall, executing the stall recovery at the first indication of the stall and emphasizing that reduction of angle of attack is the most important response.
2. Airline Transport Pilot and Aircraft Type Rating Practical Test Standards, recently revised, as they relate to checking approach to stall recognition and recovery, including evaluation criteria for a recovery from a stall or approach-to-stall that does not mandate a predetermined value for altitude loss and should consider the multitude of external and internal variables which affect the recovery altitude.
3. Academic training on specific aircraft characteristics that identify a stalled condition, the characteristics that can predict an imminent stall departure, and the role air data system failures can play in contributing to a stall and the proper diagnosis and response to these failures.
4. Realistic scenarios that could be encountered in operational conditions.

Air carriers should coordinate with their pilot labor organizations to communicate these revisions and the rationale supporting them to the line pilot community.

Air carriers should conduct approach-to-stall recovery training for their line pilots in initial and recurrent training, including in accordance with these revisions, in appropriately validated flight simulator devices. Air carriers should undertake simulator qualification through their normal procedures in coordination with the FAA National Simulator Program (NSP), using available guidance bulletins for approach-to-stall and stall recovery maneuvers.

(See AC 120–109A, Stall and Stick Pusher Training, November 24, 2015, https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-109A.pdf)

Completed and closed June 2, 2016.

Action 4

Air carrier recurrent and initial UPRT procedures should be revised to be conducted using realistic scenarios based on industry best practices and FAA guidance material.

Air carriers should—

- Assess their training programs to ensure their recurrent and initial training include the principles in the guidance and revise their training programs as necessary.
- Conduct revised UPRT for their line pilots in initial and recurrent training in appropriately qualified flight simulator devices. Air carriers should undertake simulator qualification through their normal procedures in coordination with the FAA NSP, using available guidance bulletins for upset prevention and recovery.

- Coordinate with their pilot labor organizations to communicate these revisions and the rationale behind them to the line pilot community.

Completed and closed October 6, 2016.

Action 5

Air carriers should implement the changes, as necessary, made by airplane and simulator manufacturers to update training devices to satisfactorily represent airplane characteristics for additional proposed training scenarios.

Air carriers should make additional revisions to their training programs to support the additional scenarios and communicate these actions to the industry associations.

Completed and closed April 6, 2017, based on the requirements being satisfied in 14 CFR part 60.

SE 197: POLICY AND TRAINING FOR NON-NORMAL SITUATIONS (COMPLETED)

This SE is designed to improve flightcrew proficiency during upsets or non-normal situations.

Action 1

Air carriers should review their policies and procedures for handling non-normal situations to ensure they clearly include the following concepts:

1. Fly the airplane first (establish controlled and stabilized flight).
2. Practice crew coordination (such as determining who will fly the aircraft, who will read the checklist, and who will communicate with ATC).
3. Identify the non-normal situation and correct checklist.
4. Identify the appropriate time to complete the non-normal checklist (for example, if on takeoff, complete the after takeoff checklist first if the situation does not require immediate attention).
5. Complete the appropriate checklist.

Based on the review, air carriers should revise their manuals, as necessary, to include the above information.

Air carriers should coordinate with pilot labor organizations to communicate the policies, ensure they are understood by the line pilot community, and gather feedback.

Action 2

Air carrier training organizations should review and amend, as necessary, their ground and flight training syllabuses to emphasize the air carrier's policy relating to the handling of non-normal situations as stated in Action 1.

Completed and closed February 2, 2017, based on air carrier industry association member implementation surveys.

SE 212: EQUIPMENT AND PROCEDURES TO IMPROVE ROUTE ENTRY FOR RNAV DEPARTURES (COMPLETED)

This SE is designed to reduce the frequency of crew errors during initial flight management system (FMS) programming of departure routes. Air carriers should take steps to address issues concerning pre-departure clearances (PDC) and pre-departure route changes.

Action 1

To improve the likelihood that air carrier dispatch should file routes that are not changed in the cleared route of flight by ATC, air carrier dispatch organizations should review and update procedures to coordinate with FAA ATO.

Completed and closed June 2, 2015.

Action 2

Air carriers should modify and standardize PDC format and update as appropriate to clearly communicate PDC to pilots and reduce crew errors.

Completed and closed February 4, 2016.

Action 3

Air carriers are encouraged to deploy the capability to autoload pre-departure route clearances, with crew acknowledgement, into the FMS.

Completed and closed December 5, 2019, based on implementation at 65 airports as of 2019. CAST will continue to monitor airport and operator implementation.

SE 215: LANDING DISTANCE ASSESSMENT (COMPLETED)

This SE is designed to improve flightcrew awareness of their landing distance margin and the factors and variables that can affect those margins. Flightcrews should 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.

Action 7

Once complete, air carrier industry associations should communicate with their air carriers explaining the background for the guidance material developed by FAA AFS and the manufacturer landing distance data.

Air carriers should implement the guidance material and the manufacturer landing distance data to develop air carrier-specific landing distance assessment procedures and associated performance tools.

Air carriers should develop and implement training based on the developed landing distance assessment procedures for flightcrews to perform the landing distance assessment and use associated tools.

Completed and closed December 1, 2016.

SE 218: OVERRUN AWARENESS AND ALERTING SYSTEMS (COMPLETED)

This SE is designed to reduce landing overrun accidents through the development by manufacturers and the implementation by manufacturers and operators of onboard technologies to reduce or prevent landing overruns on new and existing airplanes and airplane designs, as applicable and as feasible.

Action 3

Air carrier industry associations should communicate with their air carrier members, explaining the analysis undertaken by CAST regarding REs and the potential benefits of onboard technologies that reduce or prevent landing overruns.

Air carriers should study the feasibility of incorporating these technologies into their specific fleet (both existing airplanes and new purchases) and operations. Studies should take into account current and potential future availability of systems from manufacturers. Air carriers should consider results from manufacturer-developed onboard technology that reduces or prevents landing overruns on new, current production and out-of-production transport category airplane programs.

Air carriers should develop an implementation plan based on results of their feasibility assessments, where applicable, and report to air carrier industry associations whether they intend to incorporate systems in their fleet.

Completed and closed August 3, 2017, based on air carrier survey responses.

SE 219: POLICIES, PROCEDURES, AND TRAINING TO PREVENT RUNWAY EXCURSIONS (COMPLETED)

This SE is designed to reduce the risk of RE accidents through the development or modification by FAA ATO of policies, procedures, and training related factors that contribute to the risk of REs.

Action 3

Air carriers and FAA AFS will assist FAA ATO Safety and Technical Training (AJI), in the development and implementation of training for air traffic controllers on significant factors that that can contribute to the risk of REs.

Completed and closed April 7, 2016.

Action 4

Air carrier industry associations should communicate with their air carrier members, asking them to review and revise policies to reinforce a culture for flightcrews to declare “unable” to ATC clearances that, in the opinion of the flightcrew, could lead to an unstable approach.

Air carriers, ATO, and labor organizations should encourage reporting by both flightcrews and air traffic controllers of approach procedures where flightcrews often refuse clearances, and periodically review the resulting data to identify and correct potential systemic issues with those approaches.

Completed and closed June 2, 2016.

4. SAFETY ENHANCEMENTS—RESEARCH

SE 209: SIMULATOR FIDELITY (UNDERWAY)

This SE is designed to improve pilot performance during recovery from a full stall and to determine the benefits of using various levels of prototype advanced aerodynamic modeling of full stall characteristics to perform full stall recovery training.

Action 1

Air carrier training organizations and pilot labor organizations should assist FAA AFS in developing learning objectives related to recovery from full aerodynamic stall.

Action 4

Air carriers should provide pilots to assist FAA AFS with a study that uses an in-flight simulator to confirm the model characteristics used to train upset prevention and recovery techniques will transfer to flight.

SE 211: TRAINING FOR ATTENTION MANAGEMENT (COMPLETED)

This SE is designed for the aviation community (Government, industry, and academia) to perform research and develop and assess training methods and realistic scenarios that can address the attention-related human performance limitations observed in the ASA event data, including channelized attention, confirmation bias, startle/surprise, and diverted attention, with accompanying performance measures.

Action 1

Air carriers should provide research organizations access to operational expertise that can help improve effectiveness and feasibility of detection methods.

Completed and closed October 4, 2018, based on completed NASA research.

Action 2

Air carriers should assist NASA in developing methods for creating realistic, high workload scenarios that can incite human performance limitations, including channelized attention, confirmation bias, startle/surprise, and diverted attention. These methods should use the technologies developed in Action 1 for measuring human attention issues.

Air carrier training organizations, in conjunction with research organizations, should use these methods to develop scenarios and training-based mitigations, including but not limited to—

- Improved instrument-scanning behaviors in both nominal and off-nominal conditions, with emphasis on scan patterns for glass cockpits;
- Recognition of channelized or diverted attention in one flightcrew member by the other flightcrew member, and appropriate methods of intervention and correction;

- Self-diagnosis methods for flightcrew members to recognize and recover from channelized attention, confirmation bias, startle/surprise, and diverted attention; and
- Reinforcement of proper air carrier procedures regarding recognition of and response to flight deck alerts.

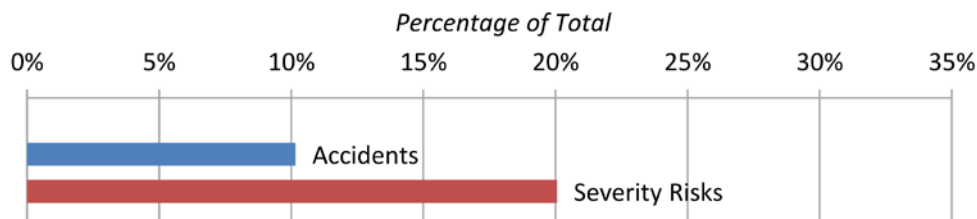
Air carriers and research organizations should assess the effectiveness of these scenarios and mitigations and report results to JIMDAT and CAST for review and reference.

Completed and closed October 4, 2018, based on completed NASA research.

5. AIR CARRIER ACTION SAFETY ENHANCEMENT CHECKLIST

CONTROLLED FLIGHT INTO TERRAIN (CFIT)

Controlled Flight Into or Toward Terrain (CFIT)



SE 1: TERRAIN AVOIDANCE WARNING SYSTEM (TAWS)

Action 5

- ☐ Is your air carrier using a comprehensive system to support TAWS that includes information on installation, maintenance, training, and the use of TAWS equipment?

SE 2: STANDARD OPERATING PROCEDURES (SOP)

Action 4

- ☐ Has your air carrier developed SOPs that incorporate the proposed SOP template items as appropriate for the technology of the equipment in the aircraft?
- ☐ Has your air carrier revised training manuals and programs to incorporate the SOP items above as appropriate for the technology of the equipment in the aircraft?

SE 3-8: PRECISION-LIKE APPROACH IMPLEMENTATION

Action 3

- ☐ Has your air carrier updated all appropriate pilot documentation to explain the revised instrument procedures including VGSI, DME, RNAV 3D, RNP-RNAV, xLS, MLS, and GLS?

Action 6

- ☐ Has your air carrier developed crew procedures and updated their training program to promote new instrument procedures including VGSI, DME, RNAV 3D, RNP-RNAV, xLS, MLS, and GLS?

Action 11

- ☐ Has your air carrier developed crew procedures/techniques to fly stabilized approach procedures that replace “dive and drive” procedures?
- ☐ Has your air carrier tailored existing crew procedures and techniques to your operational requirements?

SE 10: AIRLINE PROACTIVE SAFETY PROGRAMS (FOQA & ASAP)

Action 1

- ☐ Have your air carrier’s employee groups worked with operators (A4A, RAA) to draft contractual language to prevent the use of FOQA or ASAP information as a basis for disciplinary actions?

SE 11: CREW RESOURCE MANAGEMENT (CRM)

Action 3

- ☐ Does your air carrier have CFIT training incorporated in your approved CRM training program?

SE 12: CFIT PREVENTION

Action 5

- ☐ Does your air carrier have a CFIT education and training aid, or similar training, in your approved training program?
- ☐ Has your air carrier submitted your revised training program to your principal operations inspector for approval?

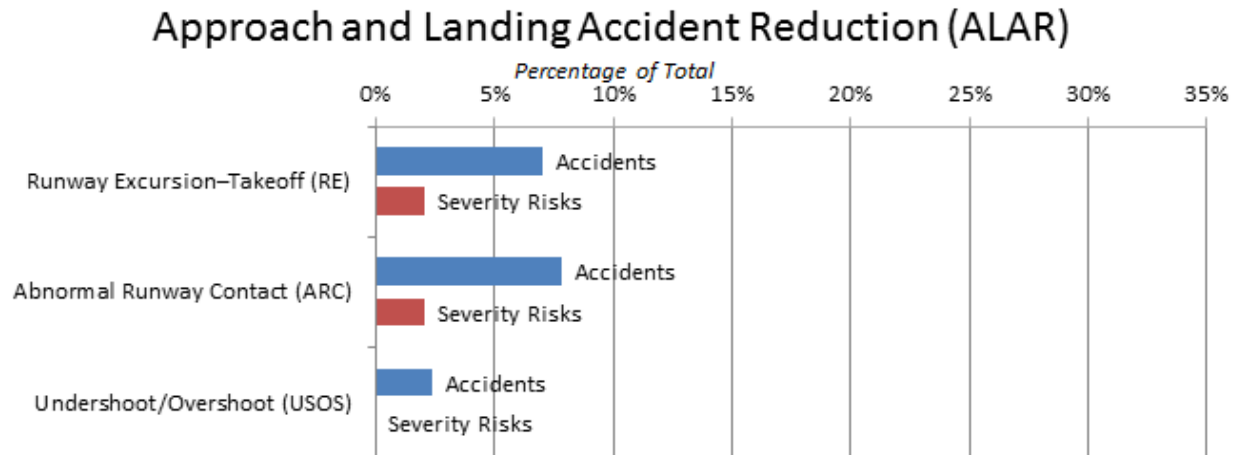
SE 120: TAWS IMPROVED FUNCTIONALITY

Action 1

- ☐ Has your air carrier established SOPs that communicates to flightcrews the rationale behind the necessity for these SOPs?
- ☐ Has your air carrier advised flightcrews of the possible increased risk of operating into areas with limited ground-based NAVAID that help verify the aircraft’s actual position relative to displayed ground track when appropriate?
- ☐ Has your air carrier referenced events involving map shifts and/or ground navigation equipment failures?

- ☐ Has your air carrier developed policies that match aircraft capability to the NAVAID environment at the expected arrival location?

APPROACH AND LANDING ACCIDENT REDUCTION (ALAR)



SE 14–16: POLICIES FOR ALAR (SAFETY CULTURE)

Action 1

- ☐ Is your air carrier's chief executive officer visible and effective in promoting safety culture?

Actions 2 and 3

- ☐ Is your air carrier's director of safety visible and effective in promoting safety culture?
- ☐ Does your air carrier's director of safety ensure the establishment of a process to identify, review, analyze and include appropriate safety information in training programs and in manuals used by flightcrews and maintenance staff?

SE 17–20: MAINTENANCE PROCEDURES

Action 4

- ☐ Has your air carrier's director of safety determined that the maintenance deficiencies, described in the bulletins and policy letters listed in this document, have been remedied?
- ☐ Has your air carrier's director of safety determined that quality control procedures have been implemented to ensure that those deficiencies are continually addressed?
- ☐ Has your air carrier's director of safety ensured an internal audit has been conducted to determine that rules relating to the maintenance deficiencies described in the specified bulletins are being met through adequate maintenance procedures?

- ☐ Has your air carrier’s director of safety established system safety procedures to ensure continuing conformance with the bulletins?

SE 21: FLIGHT DECK EQUIPMENT UPGRADE/INSTALLATION TO IMPROVE ALTITUDE AWARENESS AND CHECKLIST COMPLETION

Actions 1 and 3

- ☐ Has your air carrier developed training syllabuses and procedures for interactive checklists and smart-alerting system use?

SE 23: FLIGHT CREW TRAINING

Action 3

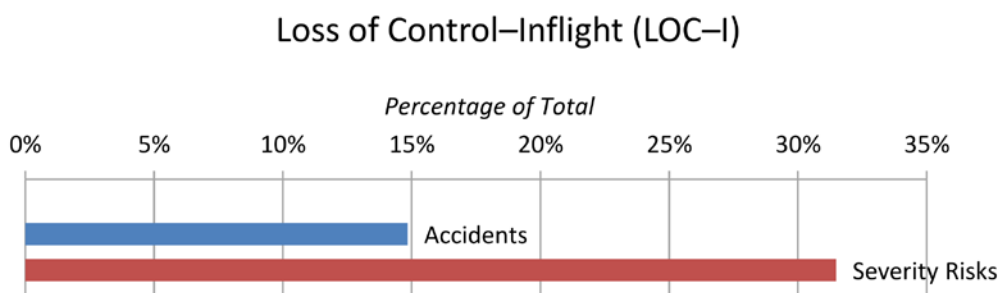
- ☐ Has your air carrier assisted your principal operations inspector and director of safety (or designees) in conducting a review to determine if your air carrier addresses the topics, listed in this document, under your flightcrew qualifications program?

SE 24: AIRCRAFT DESIGN

Action 3

- ☐ Has your air carrier reviewed SAE ARP 5150, Safety Assessment of Transport Airplanes in Commercial Service, to ensure your continuing airworthiness processes incorporate risk management techniques that help ensure that the original design level of safety is not degraded?

LOSS OF CONTROL (LOC)



SE 26: STANDARD OPERATING PROCEDURES (SOP)

Action 4

- ☐ Has your air carrier adopted the revised SOP information from AC 120–71B and revised your training programs and manuals to incorporate the proposed revisions?

- ☐ Has your air carrier revised the company training programs and manuals to incorporate as many SOP item revisions as appropriate?

SE 27: RISK ASSESSMENT AND MANAGEMENT

Action 3

- ☐ Has your air carrier established a risk management program that—
 - a) Prioritizes safety related decisions?
 - b) Implements risk-management methods in operations and maintenance departments?

SE 28: POLICIES

Action 1

- ☐ Has your air carrier distributed essential operating information identified by the manufacturers to flightcrews and maintenance staff?
- ☐ Has your air carrier's director of safety or equivalent ensured the establishment of a process to identify, review, analyze and include essential operating information in training programs and in manuals used by flightcrews and maintenance staff?
- ☐ Has your air carrier revised the company flight manual(s) as essential operating information is amended or added?

SE 29: POLICIES

Action 2

- ☐ Has your air carrier ensured the training and qualification processes use information from programs such as FOQA, AQP, and ASAP to assist in assuring pilot proficiency?

SE 30: HUMAN FACTORS AND AUTOMATION

Action 4

- ☐ Has your air carrier reviewed the generic automation policies as published and implemented them as appropriate?

SE 31: ADVANCED MANEUVERS

Action 3

- ☐ Has your air carrier developed and implemented maneuvers and procedures for the prevention and recovery from loss of control events in ground and flight training?

- ☐ If so, does it include—
 - a) Stall onset recognition and recovery?
 - b) Unusual attitudes?
 - c) Upset recovery?
 - d) Effects of icing?
 - e) Energy awareness and management?
 - f) Causal factors that lead to loss of control?

SE 192: LOW AIRSPEED ALERTING

Action 1

- ☐ Do your air carrier's applicable airplanes have the available manufacturer service bulletins regarding low airspeed alerting functionality installed?

SE 193: NON-STANDARD, NON-REVENUE FLIGHTS

Action 1

- ☐ Has your air carrier reviewed the FAA guidance material providing best practices on the conduct of non-standard, non-revenue flights?

Action 2

- ☐ Has your air carrier revised its SOPs and policies, as applicable, regarding conduct of non-standard, non-revenue flight operations to reflect the guidance?

SE 194: SOPs EFFECTIVENESS AND ADHERENCE

Action 1

- ☐ Has your air carrier reviewed its existing SOPs for consistency with the latest versions of the CAST Plan, manufacturer recommendations, and ATC procedures?
- ☐ Has your air carrier updated its SOPs, as necessary, to become consistent with the latest version of the CAST Plan, manufacturer recommendations, and ATC procedures?

Action 2

- ☐ Has your air carrier completed an assessment to determine the level of adherence to current SOPs and identified possible reasons for insufficient adherence?

Action 3

- ☐ Has your air carrier revised its training program, as necessary, based on the first round of SOP reviews and revisions?
- ☐ Have all pilots employed by your air carrier received the first round of training?

SE 195: FLIGHT CREW TRAINING VERIFICATION AND VALIDATION

Action 1

- ☐ Has your air carrier completed a review of its air crew training to ensure the quality is verified and validated, with emphasis on contractor provided training?
- ☐ Has your air carrier implemented processes to assess trainer currency and qualification?
- ☐ Has your air carrier made an initial observation/validation visit to any contracted training organizations it uses, as applicable?

SE 196: EFFECTIVE UPSET PREVENTION AND RECOVERY TRAINING, INCLUDING APPROACH-TO-STALL

Action 2

- ☐ Has your air carrier revised its approach-to-stall training, as necessary, to reflect the guidance material and industry best practices?
- ☐ Have all pilots employed by your air carrier received approach-to-stall training?

Action 4

- ☐ Has your air carrier revised its UPRT, as necessary, to reflect the guidance material and industry best practices?
- ☐ Have all pilots employed by your air carrier received the UPRT?

Action 5

- ☐ Has your air carrier implemented the changes, as necessary, made by airplane and simulator manufacturers to update training devices to satisfactorily represent airplane characteristics for additional proposed training scenarios?
- ☐ Has your air carrier made additional revisions to its training programs to support the additional scenarios and communicate these actions to the industry associations?

SE 197: POLICY AND TRAINING FOR NON-NORMAL SITUATIONS

Action 1

- ☐ Has your air carrier reviewed and revised its policies and manuals emphasizing the importance of flying the aircraft and crew coordination in non-normal situations?

Action 2

- ☐ Has your air carrier revised training to emphasize the importance of flying the aircraft and crew coordination in non-normal situations, as necessary?
- ☐ Have all pilots employed by your air carrier received the training emphasizing the importance of flying the aircraft and crew coordination in non-normal situations?

SE 198: SCENARIO-BASED TRAINING FOR GO-AROUND MANEUVERS

Action 2

- ☐ Has your air carrier revised its go-around training, as necessary, to reflect the published guidance material addressing scenario-based go-around training?
- ☐ Have all pilots employed by your air carrier received the scenario-based go-around training?

SE 199: ENHANCED CRM TRAINING

Action 2

- ☐ Has your air carrier revised its CRM policies to align the FAA-revised guidance in AC 120–51?

Action 3

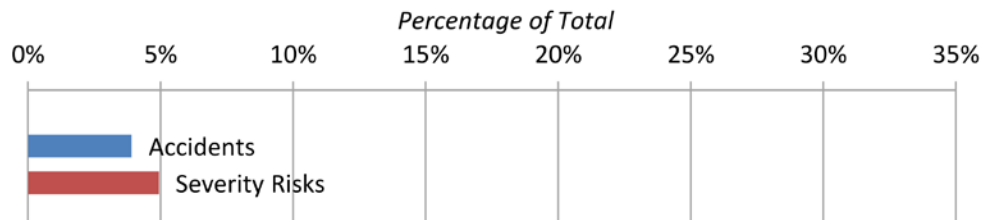
- ☐ Has your air carrier revised training in accordance with the recommendations of the FAA-revised AC 120–51 and air carrier policies regarding CRM training, as necessary?
- ☐ Have all pilots employed by your air carrier received training with the recommendations of the FAA-revised AC 120–51 and air carrier policies regarding CRM?

Action 4

- ☐ Has your air carrier implemented a process for soliciting feedback and revising training, as necessary?

RUNWAY INCURSION

Runway Incursion—Vehicle, Aircraft Or Person (RI)



SE 49: RUNWAY INCURSION PREVENTION

Action 4

- ☐ Has your air carrier incorporated the proposed SOP template items in AC 120–71A into policy manuals and training programs as appropriate?
- ☐ Has your air carrier revised the company training programs and policy manuals to incorporate as many SOP template items as appropriate?

SE 51: SOPs FOR TOW TUG OPERATORS

Action 1

- ☐ Has your air carrier trained its mechanics and others who tow or otherwise move aircraft within the airport movement area on the recommended best practices developed to prevent runway incursions and other surface incidents?

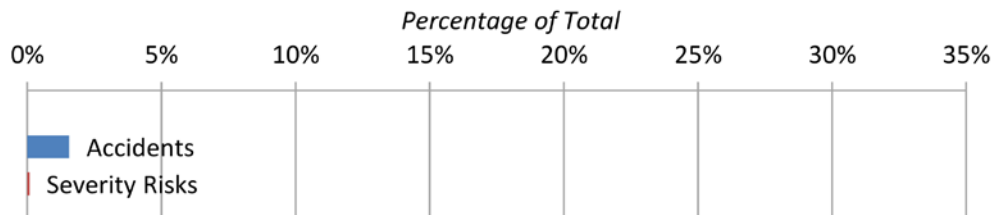
SE 60: PILOT TRAINING

Action 7

- ☐ Has your air carrier used the guidance modified within AC 120–51E to provide clear delineation of captain command oversight training and first officer monitoring responsibilities during surface movements?

TURBULENCE

Turbulence Encounter (TURB)



SE 78: CABIN INJURY REDUCTION DURING TURBULENCE

Action 3

- ☐ Does your air carrier have a safety culture to promote the reduction of cabin injuries?
- ☐ Has your air carrier revised procedures and training programs to address this issue in consideration of concepts in AC 120–88A?
 - a) Has it implemented them in annual recurrent training for flight and cabin crews?
 - b) Has it implemented recommendations and best practices from AC 120–88A?

CARGO

SE 121: CARGO LOADING TRAINING AND SOPs

Action 1

- ☐ Has your air carrier conducted/improved the surveillance of contractor cargo loading training?

Action 4

- ☐ Has your air carrier incorporated AC 120–85 into the SOP?
- ☐ Does your air carrier train those procedures including emphasis of the rationale behind them?
- ☐ Has your air carrier developed and obtained approval/acceptance of SOPs that adopt best practices?

SE 125: HAZMAT PROCESSING

Action 2

- ☐ Has your cargo air carrier incorporated best practices, as shared on the FAA Office of Hazardous Materials Safety website:
http://www.faa.gov/about/office_org/headquarters_offices/ash/ash_programs/hazmat/?

SE 127: CARGO FIRE MANAGEMENT

Action 4

- ☐ Has your cargo air carrier incorporated the new fire suppression and/or containment systems developed by manufacturers?

Action 8

- ☐ If they are available, does your cargo air carrier have the new ULD installed?

SE 131: SAFETY CULTURE

Action 2

- ☐ Has your air carrier implemented a self-audit process to further enhance safety?

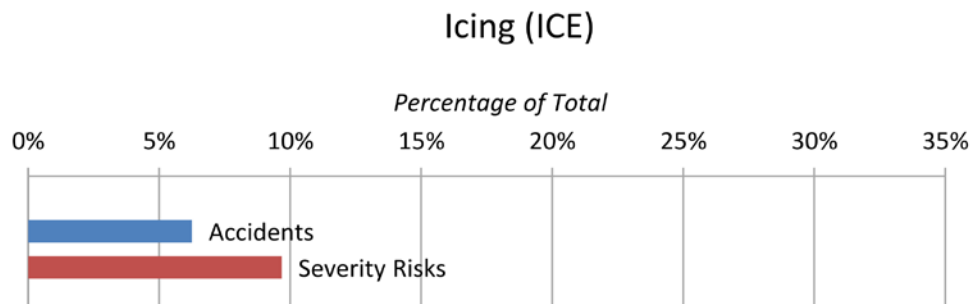
Action 3

- ☐ Has your air carrier implemented an operational risk management program?

Action 5

- ☐ Has a safety reporting system been implemented? Has a quality assurance program appropriate for your operations been developed?

ICING

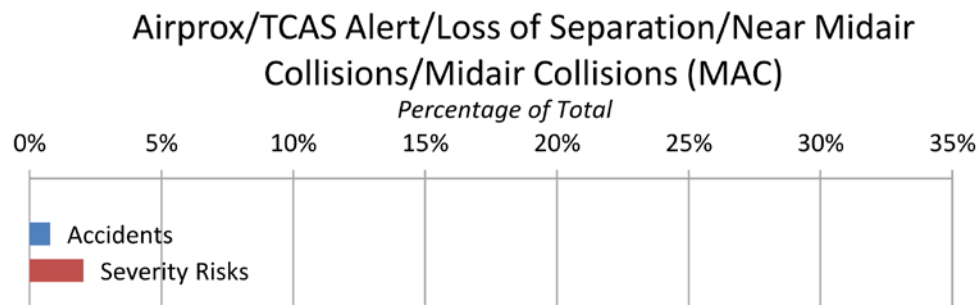


SE 136: ENGINE SURGE RECOVERY

Action 1

- ☐ Does your air carrier include the engine malfunction recognition and response training materials in the training program?

MIDAIR



SE 165: TCAS POLICIES AND PROCEDURES

Action 2

- ☐ For aircraft equipped with TCAS II, has your air carrier established SOPs and standardized training on pilot response to TCAS RAs?

Action 3

- ☐ Has your air carrier established procedures for TCAS range setting appropriate to the traffic situation?

SE 186: TCAS SENSITIVITY LEVEL COMMAND

Action 4

- ☐ Has your air carrier developed changes in operating practices at Denver International Airport (DEN) to reduce TCAS RAs?

SE 212: EQUIPMENT AND PROCEDURES TO IMPROVE ROUTE ENTRY FOR RNAV DEPARTURES

Action 1

- ☐ Has your air carrier's dispatch organization reviewed and updated procedures to coordinate with FAA ATO to improve the likelihood that dispatchers will file routes that are not changed in the cleared route?

Action 2

- ☐ Has your air carrier modified and standardized its PDC format and updated as appropriate to clearly communicate PDC to pilots and reduce crew errors?

Action 3

- ☐ Has your air carrier deployed the capability to autoload pre-departure route clearances, with crew acknowledgement, into the FMS?

SE 213: SAFE OPERATING AND DESIGN PRACTICES FOR STARS AND RNAV DEPARTURES

Action 1

- ☐ Has your air carrier collaborated with the FAA to develop guidance to align training for flightcrews, training for controllers, and procedure and chart design and implementation?

Action 2

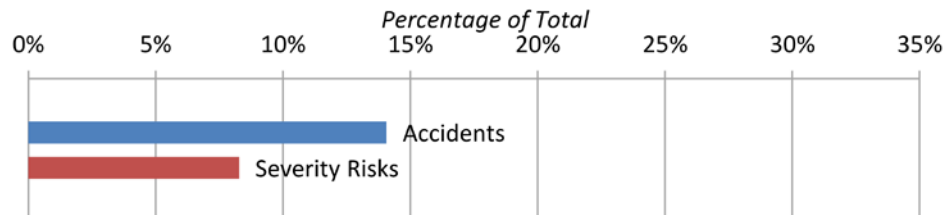
- ☐ Has your air carrier collaborated with FAA AFS to update ACs containing details of commonly accepted safe operating practices for flightcrews to mitigate errors on STARS and RNAV departures?
- ☐ Has your air carrier's training organization developed, reviewed and amended its training syllabi and air carrier policies and procedures to be consistent with the guidance in the ACs for conducting STARS and RNAV departures?

Action 3

- ☐ Has your air carrier provided input to assist the FAA in developing commonly accepted safe operating practices for air traffic control of STARS and RNAV departures?

MAINTENANCE

Maintenance



SE 169: WORK CARDS/SHIFT CHANGE/RESPONSIBILITIES/MANUALS

Action 2

- ☐ Has your air carrier audited your compliance with AC 120–16F?

SE 170: OEM CONTINUOUS MONITORING OF SERVICE HISTORY

Action 2

- ☐ Has your air carrier developed processes to follow the intent of the guidance material?
- ☐ Has your air carrier incorporated the best practices into your reporting processes for maintenance task difficulties?

SE 175: FLIGHT CRITICAL CONFIGURATIONS CHANGES MADE DURING MAINTENANCE

Action 1

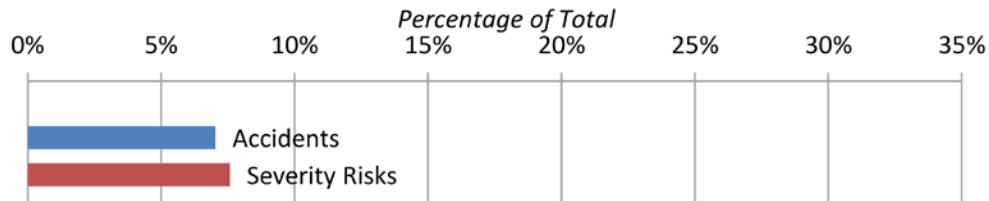
- ☐ Has your air carrier reviewed, and amended, procedures as appropriate to ensure that multiple levels of alerting, including visible tagging, are used anytime the pitot static system is covered?
- ☐ Has your air carrier ensured that maintenance procedures include multiple levels of protection to ensure timely removal of covering?
- ☐ Has your air carrier's director of safety, in conjunction with its director of maintenance, ensured the appropriate procedures are covered in maintenance information, including work cards?
- ☐ Does your air carrier include adherence to the process within the internal audit process of its SMS?

Action 2

- ☐ Has your air carrier ensured that preflight walk around procedures ensure that pitot/static ports are uncovered?

UNCONTAINED ENGINE FAILURES

Uncontained Engine Failures



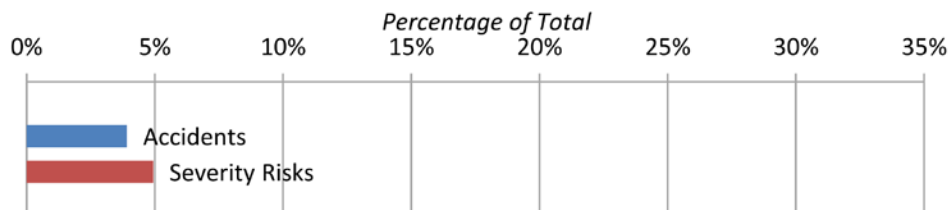
SE 84: DISK INSPECTION INITIATIVE

Action 1

- ☐ Has your air carrier developed and implemented enhanced disk inspection to detect cracks and help prevent UEF of high energy rotating parts?

WRONG RUNWAY DEPARTURES

Wrong Runway Departures



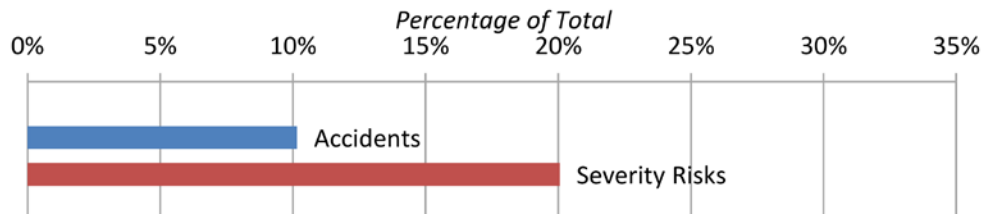
SE 183: COCKPIT MOVING MAP DISPLAY AND RUNWAY AWARENESS SYSTEM

Action 1

- ☐ Has your air carrier installed ownship moving map display and/or runway awareness systems?

TERRAIN AWARENESS WARNING SYSTEM

Terrain Awareness Warning System (TAWS)



SE 120: TAWS IMPROVED FUNCTIONALITY

Action 3

- ☐ Has your air carrier installed GPS capability on all airplanes with multisensor RNAV FMS, electronic flight instruments and electronic map displays?
- ☐ If your air carrier flies standard airplanes equipped with non-GPS TAWS into regions with minimal NAVAID, have you modified standard TAWS to GPS TAWS, or conducted a risk assessment to develop and implement effective risk mitigation?

Action 4

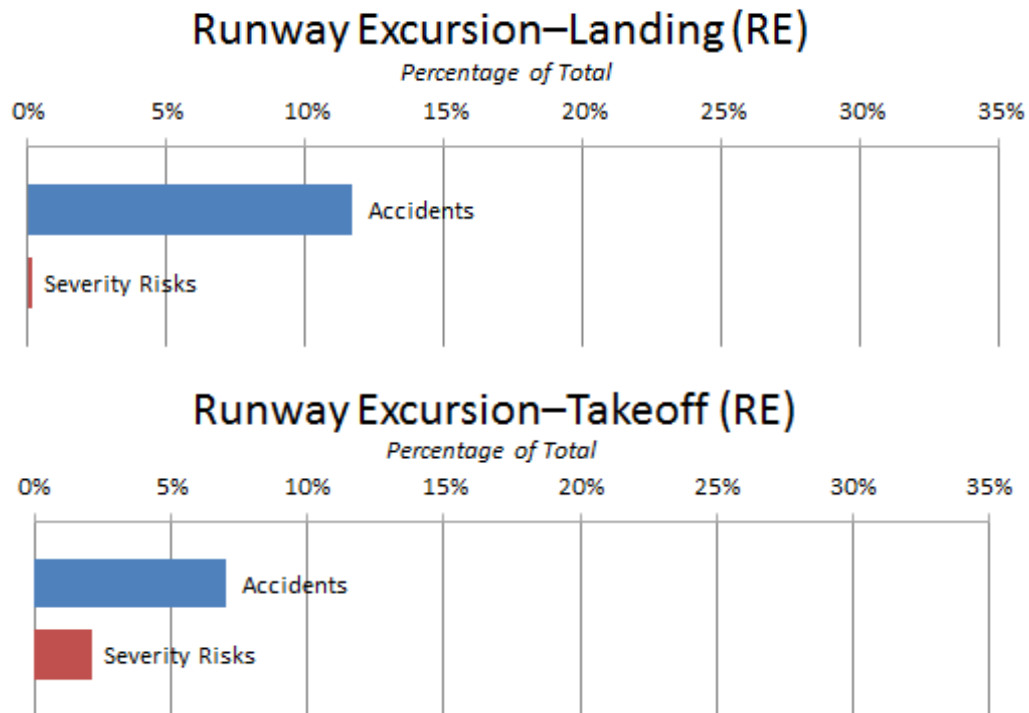
- ☐ Has your air carrier developed and implemented procedures to ensure that TAWS terrain databases are updated in accordance with the manufacturer's recommendations on all airplanes?

SE 185: TAWS AND RNAV VISUAL OR OTHER PROCEDURES

Action 4

- ☐ Has your air carrier shared a historical analysis of TAWS alerts among ASIAS air carrier participants?
- ☐ Has your air carrier been identified as a lead air carrier for RNAV Visual approach development at an airport?

RUNWAY EXCURSION



SE 215: LANDING DISTANCE ASSESSMENT

Action 7

- ☐ Has your air carrier updated its procedures to include a landing distance assessment consistent with the new FAA guidance material incorporating the TALPA ARC recommendations addressing procedures for conducting a landing distance assessment?
- ☐ Have all your air carrier's pilots received training in the use of the landing distance assessment and performance tools?

SE 216: FLIGHT CREW LANDING TRAINING

Action 1

- ☐ Has your air carrier revised its policies, procedures, and training as related to the proper use of available airplane stopping devices?
- ☐ Have all of your air carrier's pilots received stabilized approach, flare, and landing training, during initial or recurrent training?
- ☐ Has your air carrier developed/revised its operational procedures for landing on runways with reduced or minimal landing distance margin?

- ☐ Have all your air carrier's pilots received training for landing on runways with reduced or minimal landing distance margin, during initial or recurrent training?

Action 2

- ☐ Has your air carrier consulted with manufacturers to ensure consistency with their policies and operating procedures as related to airplane performance in crosswinds?
- ☐ Has your air carrier developed and implemented procedures concerning proper techniques for maintaining directional control in crosswind conditions or in response to an airplane system failure resulting in a directional asymmetry?
- ☐ Have all your air carrier's pilots received training concerning proper techniques for maintaining directional control in crosswind conditions or in response to an airplane system failure resulting in a directional asymmetry?

SE 217: TAKEOFF PROCEDURES AND TRAINING

Action 1

- ☐ Has your air carrier assisted FAA AFS and air carrier industry associations with publishing guidance to include formal processes that ensure accurate takeoff performance data?

Action 2

- ☐ Has your air carrier reviewed and revised its procedures and training, as necessary, in accordance with the guidance from Action 1?
- ☐ Has your air carrier responded to its industry associations after its procedures and training revisions were complete?

Action 3

- ☐ Has your air carrier defined and updated its SOPs related to the RTO decision?

SE 218: OVERRUN AWARENESS AND ALERTING SYSTEMS

Action 3

- ☐ Has your air carrier developed an implementation plan, based on the results of its feasibility assessments, for incorporating into its specific fleet (both existing airplanes and new purchases) and operations onboard technologies that reduce or prevent landing overruns?
- ☐ Has your air carrier reported to industry associations whether it intends to incorporate systems in its fleet?

SE 219: POLICIES, PROCEDURES, AND TRAINING TO PREVENT RUNWAY EXCURSIONS

Action 3

- ☐ Has your air carrier assisted FAA ATO Safety and AJI in the development and implementation of training for air traffic controllers on significant factors that can contribute to the risk of REs?

Action 4

- ☐ Has your air carrier encouraged reporting of instances where flightcrews refuse clearances they believe could lead to an unstable approach?
- ☐ Does your air carrier periodically review the resulting metrics to identify and correct potential systemic issues with those approaches?

TAKEOFF MISCONFIGURATION

SE 227: AIR CARRIER PROCEDURES FOR TAKEOFF CONFIGURATION

Action 1

- ☐ Has your air carrier reviewed and assessed its operational data and pilot safety reports to determine its exposure to the risk of improper flap settings on takeoff?
- ☐ Has your air carrier evaluated its SOPs relating to setting takeoff flaps/slats against recommended best practices?
- ☐ If applicable, has your air carrier performed a risk assessment for revising SOPs relating to setting takeoff flaps/slats?

Action 2

- ☐ Do the results of the risk exposure analysis and risk assessment in Action 1 justify revising your air carrier's SOPs relating to setting takeoff flaps/slats?
- ☐ If applicable, has your air carrier updated its SOPs relating to setting takeoff flaps/slats to align with recommended best practices?

SE 229: TAKEOFF CONFIGURATION WARNING SYSTEM MAINTENANCE AND OPERATIONAL ASSURANCE

Action 2

- ☐ Has your air carrier reviewed its maintenance programs related to TCWS to ensure they meet the latest manufacturer recommendations for maintenance intervals and procedures?

- ☐ Has your air carrier reviewed its maintenance procedures to ensure circuit breakers pulled during maintenance or troubleshooting that could affect TCWS availability are re-engaged before releasing the aircraft for flight?
- ☐ Has your air carrier reviewed its MEL procedures to ensure approved procedures do not allow the TCWS to be disabled by pulling circuit breakers, including circuit breakers for integrated/related systems?
- ☐ Does your air carrier periodically review its maintenance programs related to the TCWS to ensure acceptable in-service reliability?