

Commercial Aviation Safety Team (CAST)

Supplemental Implementation Plan (SIP) for
CAST Safety Enhancement 60

Commonly Used Safe Operating Practices for Taxi Safety

Purpose: This package provides supplemental information to further encourage the ongoing implementation of CAST SE 60, “Develop policies, procedures, and implementation guidelines for Pilot Training programs to prevent runway incursions” and specifically Output 1, “*Runway Safety Program Office should identify and compile runway safety materials currently available from Government, Industry, Academia, and DOD and make that material available for education, training, and awareness of pilots.*” The information contained in this package was developed by the Air Transportation Association (ATA) Safety Council and approved by the Commercial Aviation Safety Team (CAST).

Background: The Air Transport Association Safety Council, comprising 17 major U.S. airlines, played a significant role in the FAA Administrator’s Runway Safety “Call to Action” announced in August 2008. ATA considers runway incursions the most significant threat that exists in the flight environment. Much has been done to improve airport physical layout, signage, markings, pilot awareness training, and standardized communications terminology. However, following the presentation of a serious runway incursion incident to the ATA Safety Council by the FAA’s Director of Runway Safety in July 2008, it became apparent that not nearly enough has been done to adopt common operating strategies during taxi operations between terminal gate and runway. Advisory Circular 12–74A provides guidelines for the development and implementation of standard operating procedures for conducting safe aircraft operations during taxiing. However, there are many more “effective taxi strategies” commonly used by commercial air carriers than are mentioned in the AC. Therefore, the ATA Safety Council developed the attached “Commonly Used Safe Operation Practices for Taxi Safety.”

Output 1

Operators are encouraged to use the attached “*Commonly Used Safe Operating Practices for Taxi Safety*” in their training programs and SOP to increase the awareness of threats and error management involved in taxi operations.

LOOC: ATA, RAA, NACA, JIMDAT

Timeframe: 3 months from CAST approval

Action:

1. ATA in coordination with RAA and NACA will ensure distribution of this SIP to all Part 121 carriers.
2. JIMDAT will ensure that the “*Commonly Used Safe Operating Practices for Taxi Safety*” is placed on the CAST Web site and is included in the next version of the CAST CD.
3. JIMDAT will provide a copy of this SIP to the Runway Safety Office for consideration of use within Air Traffic.
4. JIMDAT will provide a copy of this SIP to the Joint Safety Council (JSC) for consideration within the General Aviation community.

CAST SE 60 Supplemental Implementation Plan

Commonly Used Safe Operating Practices for Taxi Safety

Factors for consideration regarding Air Carrier Threat and Error Management Response
December 1, 2009

AIR CARRIER THREAT AND ERROR MANAGEMENT RESPONSE FACTORS

Situational Awareness	Properly comprehend taxi clearance and trap inherent errors, and know their position on the airport surface.
See and Be Seen	Adopt techniques to enhance the likelihood of being seen by traffic on final when moving on the airport surface.
Expectation Bias	Resist temptation to expect a certain clearance based on past experience with commonly used movement patterns.
Distraction	Avoid unnecessary distractions that could divert attention from safe taxi.
Haste	Avoid errors and undesired aircraft state resulting from time compression.
Fatigue	Address vulnerability to this ever-present human physiological factor.

PRE-TAXI	
Situational Awareness	<ul style="list-style-type: none"> • All aircraft performance data required for takeoff and departure should be received before commencing taxi. • Flightcrews should— <ul style="list-style-type: none"> ○ Verify the correct flight management system (FMS) takeoff runway entries. ○ Discuss the taxi-out route, including runway incursion hot spots and any crossing runways on the appropriate taxi diagram. • The pilot monitoring (PM) should— <ul style="list-style-type: none"> ○ Write down and read back the air traffic control (ATC) clearance before pushback. If the clearance is received as filed, ensure any standard instrument departures (SIDs), transitions, or crossing altitude restrictions are clearly understood. If there is a change in the flight plan, do not accept an abbreviated departure clearance. ○ Obtain taxi clearance from clearance delivery and ground control. • The pilot flying (PF) should verbalize the taxi clearance back to the PM after receipt. The PM should verify that the PF comprehends the route and clearance limit.
Expectation Bias	<ul style="list-style-type: none"> • Flightcrews must agree on the runway assigned, the taxi route, and any restrictions. • As part of the taxi brief, the flightcrew should include a plan for handling changes to the briefed departure runway and taxi route, including performance data.
Distraction	The taxi checklist should be eliminated, or vastly reduced through incorporating required actions into the after start checklist performed at the gate.
Fatigue	Flightcrews should recognize that a lack of alertness on a multiple leg domestic schedule can easily lead to a breakdown in prioritization, and errors during task saturation.

TAXI OUT

Situational Awareness	<ul style="list-style-type: none"> • The PM should monitor the progress of the taxi. • Flightcrews should be heads up and confirm all clearances to cross or hold short of any runway. • Flightcrews should be aware hold-short lines can be as far as 260 feet laterally from a runway. Because of Precision Obstacle Free Zones (POFZs) or when a taxiway is not perpendicular to the runway, the hold-short line may be reached sooner than expected. • Flightcrews should not accept position-and-hold clearances until the aircraft is ready for departure. • Upon taking the runway, the PF should call out “cleared on runway XX, heading XXX checked.”
See and Be Seen	<ul style="list-style-type: none"> • Before crossing any runway while taxiing to the assigned runway— <ul style="list-style-type: none"> ○ Both pilots should scan the full length of the crossing runway for potential conflicts and report “clear left” or “clear right,” as appropriate. The PM verifies the clearance and states “clear to cross.” The PF acknowledges “clear to cross.” ○ Turn all exterior lights on (leave the landing lights off if they will adversely affect other pilots’ vision). <ul style="list-style-type: none"> ▪ Upon clearing the runway, return to the previous exterior light configuration. • During position-and-hold— <ul style="list-style-type: none"> ○ Align the aircraft off centerline during low visibility and night operations to contrast with runway lighting and markings. ○ Monitor traffic alert and collision avoidance system (TCAS) display (if equipped) for traffic approaching the runway. ○ Contact ATC if holding in position for more than 90 seconds or upon determination that a potential conflict exists. ○ Turn on all lights at night (except landing lights) to highlight the aircraft silhouette. • When cleared for takeoff or commencing takeoff roll, turn landing lights and appropriate exterior lights on.
Expectation Bias	<ul style="list-style-type: none"> • If the departure runway is changed, flightcrews should visually verify the correct FMS takeoff runway entry as part of the taxi and takeoff clearance process. • A clearance to follow another aircraft does not include a clearance to cross any runway.
Distraction	<p>The PF should delay duties that may cause distraction (for example, engine starts, FMS programming, Airborne Communications Addressing and Reporting System (ACARS), and company radio calls) between active runways, crossing active runways, or in runway incursion hot spots.</p>
Haste	<p>The captain should stop the aircraft for the second engine start unless on a long, straightaway taxiway.</p>
Fatigue	<p>Flightcrews should plan ahead in managing cockpit workload levels and prioritizing tasks.</p>

TAXI IN	
Situational Awareness	<ul style="list-style-type: none"> • Flightcrews should brief the taxi plan and/or taxi and runway exit strategy in top of descent brief, emphasizing any runways that the aircraft is expected to cross after clearing the landing runway. • After landing, do not change from tower frequency to ground control until directed to do so.
See and Be Seen	<ul style="list-style-type: none"> • Before crossing any runways en route to an assigned gate— <ul style="list-style-type: none"> ○ Both pilots should scan the full length of the runway for potential conflicts; report “clear left” or “clear right,” as appropriate. The PM verifies the clearance and states “clear to cross.” The PF acknowledges “clear to cross.” ○ Turn all exterior lights on (leave the landing lights off if they will adversely affect other pilots’ vision). <ul style="list-style-type: none"> ▪ Upon clearing the runway, return to the previous exterior light configuration. • Ensure the aircraft is completely clear of the runway (including the aircraft tail) immediately after landing.
Expectation Bias	<ul style="list-style-type: none"> • Expect that early automatic terminal information service (ATIS) and arrival/departure information may be updated or changed. <ul style="list-style-type: none"> ○ Properly pre-brief well in advance, but... ○ Expect and be prepared for changes (load alternate arrival procedure, if possible).
Distraction	<ul style="list-style-type: none"> • When the first officer (FO) makes the landing as the PF (recognize possible threat, which can include role reversal conflicts with normal cockpit duty orientation)— <ul style="list-style-type: none"> ○ The flightcrew should adhere to an established formal transfer of control procedure. <ul style="list-style-type: none"> ▪ Ensure the PF and PM verbalize a positive transfer of control. ▪ The captain announces “I have the aircraft.” The FO replies “you have the aircraft.” ▪ There is no minimum speed for change of control on the runway. Directional control and braking effectiveness under existing meteorological conditions and aircraft configuration are primary concerns. ○ The FO should maintain runway centerline. <ul style="list-style-type: none"> ▪ The FO should not, under normal conditions, attempt to steer the aircraft toward the turnoff taxiway or high speed taxiway unless the captain so directs (based on a perceived need for consistent crosswind control in deceleration, or another significant concern). • The flightcrew should refrain from acknowledging and accepting a clearance during high workload phases of the landing rollout, except for runway exiting instructions. • The PM should not acknowledge ATC radio transmissions until reaching taxi speed and should not contact the company until all runways have been crossed en route to ramp.
Haste	<ul style="list-style-type: none"> • The captain should delay directing after landing flows and engine shutdowns when between two active runways unless stopped, with the parking brake set. • The PF should not exceed normal braking to comply with an ATC request for an early or expedited turn-off. • Taxi speed should depend on existing conditions, but should be a maximum of 30 knots on straight taxiways.
Fatigue	<ul style="list-style-type: none"> • Flightcrews should— <ul style="list-style-type: none"> ○ Use defensive fatigue management practices whenever circumstances can produce cumulative fatigue. ○ Assign utmost priority to verifying and adhering to a taxi clearance over nonessential communications and clean-up flows. ○ Use threat and error management to avoid fatigue-induced haste, which often results in critical omissions or inappropriate decisions.

ANY TIME

Situational Awareness	<ul style="list-style-type: none"> • Flightcrews should ensure the airport diagram, appropriate company guidance material, and hot spot charts are out and available for immediate reference. • Before crossing any runway during taxi, both pilots should make a visual check to ensure there is no conflicting traffic on the crossing runway. Each pilot states “clear left” or “clear right,” as appropriate. The PM verifies clearance and states “clear to cross.” The PF acknowledges “clear to cross.” • Taxi clearances should be reconfirmed with ATC before crossing a runway if any uncertainty exists that the runway is not clear, particularly during low visibility. • If low visibility taxi procedures are in effect, any flight deck-intensive tasks by either pilot should be performed with the aircraft stopped, with the parking brake set. • Flightcrews should be aware of the absence of hold-short stop bars or signage on runways used as taxiways.
See and Be Seen	<p>Illuminate the taxi light during night and low visibility operations. When position uncertainty exists in extremely low visibility, turn on all lights to be seen.</p>
Expectation Bias	<ul style="list-style-type: none"> • Exercise vigilance for threats inherent in external communications. <ul style="list-style-type: none"> ○ Be alert to the threat of similar call signs. Never accept a clearance that has errors (for example, incorrect call sign and wrong runway). ○ Recognize that monitoring clearances issued to other aircraft, while useful for situation awareness, can lead to an expectation of the identical clearance. ○ Be wary of ATC phraseology “follow [<i>a specified aircraft</i>],” particularly if it involves a runway crossing. Runway crossings are not included in a follow clearance, unless specifically stated. ○ The PF should stop the aircraft and the PM should request ATC clarification if there is confusion regarding aircraft position or the ATC taxi clearance. • Treat every clearance on its own merits and detail, and do not assume anything that is not specified in the clearance. Always ask for clarification, if necessary.
Distraction	<ul style="list-style-type: none"> • Flightcrews should— <ul style="list-style-type: none"> ○ Remain focused on the primary task: safely taxiing the aircraft. ○ Insist on and comply with sterile cockpit procedures.
Haste	<ul style="list-style-type: none"> • The captain should manage the operational tempo and suspend non-monitoring tasks unrelated to the safe operation of the flight when necessary. • Do not accept complex taxi clearances during change of control or during high workload phases of ground operations. • Flightcrews should expect increased risk historically associated with— <ul style="list-style-type: none"> ○ High speed taxiways. ○ Expedite clearances. • The PF should not advance thrust to expedite exiting the runway or the taxiway because of the risk of skidding, tire blowout, runway/taxiway excursion, and brake overheating.
Fatigue	<ul style="list-style-type: none"> • Recognize that alertness can be enhanced through defensive fatigue management. • Make active listening a priority; communicate freely regarding perceived problems; resolve ambiguities; and trap errors. • Flightcrews should consider approved stimulus (caffeine) intake. • The PF should stop taxiing when either pilot expresses confusion.