

Operational Observations

A thorough review of contributing factors identified in the 75 airports, 1184-report Airport Surface Movement Event Transgressions data set provides the following observations:

- Unpredictable task distractions (e.g. calls from cabin personnel; changes to ATC clearances, weight and balance numbers, FMC reprogramming, etc.) appear to cause more incursions than predictable distractions such as going through the checklist.
- Checklist and FMC programming distractions are particularly problematic when the distance from the ramp to the active runway is short.
- Schedule pressure and a short taxi route are frequent runway transgression causal factors.
- “Heads-Down” preoccupation by both pilots that occur during rushed checklist situations results in transgressions.
- The potential for incorrect readbacks to be missed are likely to occur during high traffic periods.
- A significant number of Aircraft Surface Movement Event Transgressions occur at locations already depicted on airport charts as “Hotspots.”
- Runway transgressions and hold line penetrations appear to be related to the distance between parallel runways. A majority of parallel runway transgressions took place on runways that were close together (600-1200 feet).
- Arrivals that are exiting a high speed taxiway, between closely spaced parallel runways, are prone to hold line transgressions.
- Preoccupation with reconfiguring the aircraft for the next trip contributes to transgressions while taxiing in and during “close parallel runway” operations.
- With one pilot “out of the loop” (e.g. running a checklist, FMC programming, radio communication), the other pilot appears to fixate more on “looking ahead” to find (or stay on) the correct route than on watching for hold short lines.
- The First Officer is frequently left out of monitoring ATC communications during critical phases of taxiing due to ancillary company duties.
- Last-minute runway changes and takeoff data recalculations are factors that take the pilot-not-flying “out of the loop” for taxi monitoring.
- ATC issuance of multiple runway crossings at the same time can result in other aircraft assuming that they too, have been cleared to cross the runway.
- Controllers fail to challenge incomplete or partially blocked readbacks, thus missing a wrong aircraft response.
- Pilots fail to request progressive taxi instructions when unsure of their taxiing route.
- Controller phraseology that is unique to a particular airport causes confusion for transient pilots who do not use the airport on a regular basis.
- Pilots enter active runways without realizing that the markings and width of the runway do not resemble a typical taxiway.
- Although they may be in doubt regarding their clearance, less experienced First Officers are often reluctant to question or challenge a more experienced Captain’s assurance that they were cleared to enter an active runway.
- Controllers at busy airports tend to issue minimal taxi instructions, leaving it to the pilots to make their way.

- Controllers at busy major airports do not always spontaneously provide progressive taxi instructions to itinerant aircraft. Conversely, pilots are reluctant to ask busy ground controllers for progressive taxi instructions.
- ATC use of instructions to “follow (type aircraft) to Runway __” can result in hazardous runway transgression incidents when the succeeding aircraft has lost sight of the preceding aircraft.
- Familiarity with an airport layout can induce pilot complacency and result in “how did it happen” transgressions.
- Some flight crews fail to confirm their taxi routing or monitor their taxi progress by using the airport chart.
- Complacency develops when flight crews fly into the same airport daily and receive the same routing to the gate or runway. Transgressions result when a different taxi route is assigned due to construction or the use of seasonal runway configurations.
- Hold short lines are more likely to be missed when encountered on a runway that is being used as part of the taxi route, particularly at intersections greater than 90 degrees.
- Flight crews tend to miss hold lines that are placed farther back from the runway than expected.
- Failure to de-combine Local and Ground Control or dual Ground Control positions in a timely manner contributes to runway transgression errors.
- A breakdown in CRM is more likely when one pilot is out of the ATC communications loop and assumptions develop when approaching an active runway.
- Pilots tend to accept a non-response from ATC as confirmation of their clearance readbacks.
- Being “primed” for the next in line for takeoff contributes to erroneous runway incursions and takeoffs without a clearance.
- Pilots, when in doubt about their taxiing clearance, tend to reassure each other that they were cleared to cross or enter an active runway. There seems to be a tendency to rely on each other’s confirmation rather than checking with ATC.
- Where the approach to the runway ends and intersects at a large taxiway/run-up area, transgressions appear to be more prevalent, i.e., all the paved areas appear to blend together, making it more difficult to identify hold lines.
- A significant number of incursions appear to be due to the non-standard angle or placement of hold lines on intersecting runways or at the ends of converging runways.
- Pilots who are very familiar with operations at a particular airport tend to hear the clearance they expect to hear even when a non-standard taxi route is issued.
- Controllers at busy airports tend to issue minimal taxi instructions, leaving it to the pilots to make their way.
- ATC grouping of clearances without adequate “readback” contributes to “assumed” understanding of the clearances.
- Checklist and FMC programming distractions are particularly problematic when the ramp to runway distance is short.
- Unpredictable task distractions (e.g. calls from cabin personnel; changes to clearance, weight and balance numbers, etc.) appear to cause more incursions than predictable distractions such as checklists.
- A significant number of incursions appear to be due to the non-standard angle or placement of hold lines on intersecting runways or at the ends of converging runways.