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SAFO

Safety Alert for Operators

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Subject: Runway Incursions (RI) on Parallel Runways When Exiting via Acute-Angled Taxiways.

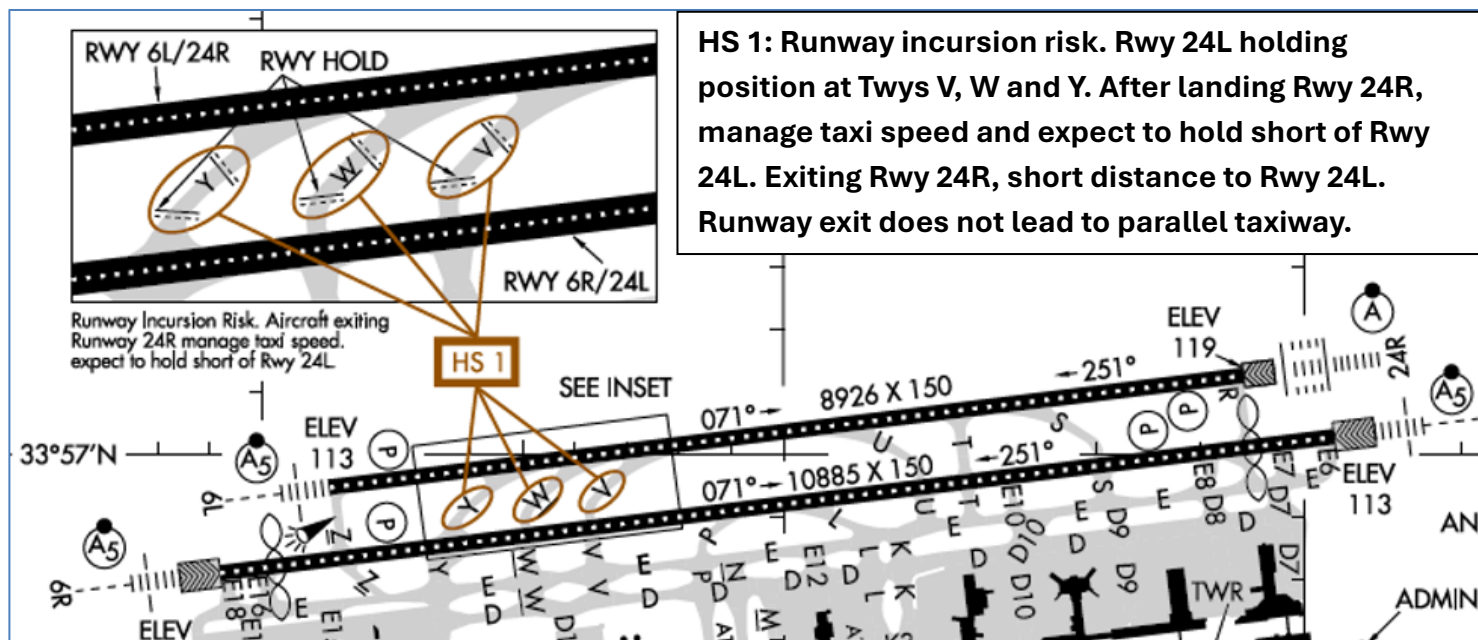
Purpose: This SAFO warns operators and flightcrews of the critical need for enhanced situational awareness and energy management when exiting a runway via an acute-angled (less than 90 degrees from runway centerline) taxiway with minimal stopping distance before reaching the holding position markings of a parallel runway. This SAFO also complements the foundational safety practices of SAFO 11004, Runway Incursion Prevention Actions, by providing targeted mitigations for unique geometric risks and human performance limitations.

Background: Following the July 2024 commissioning of taxiways V and W and the renaming of taxiways AA to Y in the North Complex at Los Angeles International Airport (KLAX), a significant spike in RIs occurred on Runway 24L. Analysis of 15 distinct RIs revealed a recurring operational pattern: flightcrews landed on Runway 24R, received and correctly read back Air Traffic Control (ATC) instructions to hold short of the parallel runway (24L), but subsequently crossed the Runway 24L holding position markings into its protected Runway Safety Area.

While the Federal Aviation Administration (FAA) modified the Hot Spot 1 (HS1) description and added a graphical inset to the airport diagram in August 2025, which reduced occurrences, systemic risks remain. The root cause analysis of these RIs revealed that the primary causal factors stem from human performance limitations, compromised situational awareness, high workload during the landing rollout, information processing challenges, and confusing taxiway configurations. See Diagram 1 below.

Diagram 1

Los Angeles Intl (KLAX), North Complex



Note: See References section below for links to the current full chart and airport information.

Discussion: The physical separation between the centerlines of KLAX Runways 24R and 24L is approximately 700 feet. Unlike airport layouts featuring a center taxiway between parallel runways, this configuration results in an unexpectedly short distance of approximately 300 feet between the holding position markings for Runway 24R and Runway 24L. This environment creates two immediate, conflicting operational challenges during a high-workload phase of flight:

1. The flightcrew must stop the aircraft before encroaching on the parallel runway's holding position markings.
2. The flightcrew must ensure the aircraft tail completely clears the runway safety area of the runway it landed on (behind the aircraft).

During the landing rollout on Runway 24R, exiting via the acute-angled taxiways (V, W, Y) at an excessive speed creates a risk of overrunning the Runway 24L holding position markings. High aircraft momentum requires greater stopping distance, which is further exacerbated if the runway surface is contaminated. The holding position markings and signage on Taxiway V, W, and Y are configured at a non-perpendicular angle relative to the aircraft's taxi path. Furthermore, acute-angled exits may distort a flightcrew's visual perspective. Because the flight deck points away from the parallel runway's approach/departure path, the flightcrew's field of view of the parallel environment is restricted, severely limiting their ability to see an aircraft on its departure roll on the parallel runway. The upcoming holding position marking is configured at an angle other than perpendicular to the taxi path. This configuration

can cause pilots to misjudge their proximity to the holding position marking, possibly leading to a runway incursion.

Systemic Risk Profile at Other Airfields: This risk profile is not isolated to KLAX; flightcrews face similar geometric constraints and intense task compression at several other major airfields across the National Airspace System. These airports have narrow parallel runway spacing, which precludes a center taxiway buffer. This hazard is further compounded at locations featuring acute-angled exit taxiways within the parallel system. Additional airports with similar geometric configurations include, but are not limited to:

- Burke Lakefront Airport (KBKL)
- Fresno Yosemite International Airport (KFAT)
- Ontario International Airport (KONT)
- Reno/Tahoe International Airport (KRNO)
- San Francisco International Airport (KSFO)
- Seattle-Tacoma International Airport (KSEA)
- Ted Stevens Anchorage International Airport (PANC).

The FAA recognizes that runway incursions rarely result from a single causal factor. Rather, they typically arise from the interaction of airport geometry, operational procedures, human performance limitations, and environmental conditions. Effective mitigations, therefore, require a systems-based approach that incorporates pilot training, controller awareness, airport design, and standardized operational practices.

Recommended Action: Directors of Operations, training managers, and flightcrews should implement the following safety mitigations into their standard operating procedures (SOP):

- 1. Enhanced Arrival Briefings:** Flightcrews should explicitly brief the physical runway layout during the descent phase if parallel runways are present. It is imperative they remain vigilant that an acute-angled exit taxiway can closely mimic a high-speed exit taxiway, but without the geometry necessary to deliver its operational efficiency, higher exit speed margins (up to 60 knots), or adequate stopping distance. Briefings should include, at a minimum, a review of:
 - The absence of a middle/center taxiway buffer;
 - The proximity of the parallel runway holding position markings after exiting;
 - Target speeds for exiting the runway safely based on available stopping distance;
 - Awareness of flightcrews' restricted field of view toward the full parallel runway while exiting; and
 - Contingency plans for a late runway change to a parallel runway.
- 2. Strict Energy Management:** Rollout speeds should be carefully managed. Flightcrews should not exit the landing runway onto an acute-angled taxiway until the aircraft has decelerated to a controllable speed to ensure a complete stop before the adjacent runway holding position markings.

3. **Proactive Crew Resource Management (CRM):** Post-landing non-essential checklist items should be delayed until the aircraft has come to a complete stop or cleared all parallel runway environments. The Pilot Monitoring (PM) should actively assist the Pilot Flying (PF) by tracking progressive taxi positions, visually scanning for runway holding position markings and signs, and verbally confirming proximity to the parallel runway.
4. **Training Program Integration:** Title 14 of the Code of Federal Regulations (14 CFR) parts 91K, 121, 125, and 135 operators should integrate scenarios emphasizing parallel runway operations, the visual perceptions of runway/taxiway geometry with acute-angled exit taxiways, runway holding position markings or signs, and task compression into regular flight training and simulator curricula.

References: For additional references, please see the following:

1. **Aeronautical Information Manual**
2. **AC 120-74**, Parts 91, 121, 125, and 135 Flightcrew Procedures during Taxi Operations
3. **AC 91-73**, Part 91 and Part 135 Single-Pilot Procedures during Taxi Operations
4. **SAFO 11004**, Runway Incursion Prevention Actions
5. **Office of Runway Safety at:** [Runway Safety | Federal Aviation Administration](#)
6. **Video Resource:** [Surface Safety Spotlight – Los Angeles International Airport, CA \(LAX\) – From the Flight Deck](#)
7. **Airport Information:**
 - **KLAX.** <https://adip.faa.gov/agis/public/#/airportCharts/LAX>
 - **Airport Diagram.** [Link](#).
 - **Airport Hotspots.** [Link](#).
 - **KBKL.** <https://adip.faa.gov/agis/public/#/airportCharts/BKL>
 - **KFAT.** <https://adip.faa.gov/agis/public/#/airportCharts/FAT>
 - **KONT.** <https://adip.faa.gov/agis/public/#/airportCharts/ONT>
 - **KRNO.** <https://adip.faa.gov/agis/public/#/airportCharts/RNO>
 - **KSFO.** <https://adip.faa.gov/agis/public/#/airportCharts/SFO>
 - **KSEA.** <https://adip.faa.gov/agis/public/#/airportCharts/SEA>
 - **PANC.** <https://adip.faa.gov/agis/public/#/airportCharts/ANC>

Contact: Direct questions or comments regarding this SAFO to the Air Transportation Division's Air Carrier Operations branch at 9-AFS-200-Correspondence@faa.gov.