**Converging Runway Operations**
**At Minneapolis St. Paul International Airport**
**July 1, 2019**

Background

On January 27, 2006, a near midair collision occurred at the Las Vegas-McCarran International Airport when a landing Airbus executed a "go around", as directed by the Federal Aviation Administration (FAA) Air Traffic Control (ATC), to avoid a conflict with another aircraft that was crossing the runway in front of it. The go around took the Airbus directly into the flight path of a Boeing 757 that had just taken off from a crossing runway. While the two aircraft did not collide, the subsequent investigation by the National Traffic Safety Administration (NTSB) revealed that the near collision due to converging runway operations (CRO) was not an isolated incident. The NTSB conducted a broader investigation of existing ATC procedures, and in July 2013, the NTSB made a safety recommendation to the FAA urging a change to existing procedures and standards covering these types of events in ATC's rulebook (FAA Order 7110.65), which it determined were inadequate..

In January and July 2014, the FAA issued changes to the ATC rulebook establishing new separation standards and procedures where airport geometry presents the possibility of CRO, to ensure that a landing aircraft executing a last minute go-around does not conflict with a departing aircraft climbing away from a non-intersecting, but converging runway. As part of the new CRO mitigation requirements, the FAA identified a limited number of tools that could assist in developing local procedures to meet the new requirements.

In December 2015, the NTSB accepted the FAA's actions and closed the safety recommendation as acceptable.

CRO at Minneapolis St. Paul International Airport

Minneapolis St. Paul International Airport (MSP) has a runway geometry that creates a risk of collision due to CRO under certain conditions: i.e., when the prevailing winds are from a northerly direction, favoring takeoffs and landings on runway 30 Right (30R) and/or runway 30 Left (30L), and landings on runway 35. (Generally, aircraft depart into the wind because it allows pilots to achieve a higher altitude in less time and with less speed, and aircraft land into the wind since it allows for a shorter stopping distance and a reduced speed upon landing.)

Absent mitigation, this configuration presents a risk of a mid-air collision due to CRO. Prior to the ATC rulebook changes, aircraft departing runway 30R and/or runway 30L could conflict with an airplane needing to go around from an aborted approach while trying to land on runway 35. The FAA implements CRO procedures at MSP only when runway 35 is used for arrivals and the prevailing winds are from the North.

One of the new mitigation tools specified by the changes to the ATC rulebook when there is a risk of a CRO-related collision is use of the Arrival/Departure Window (ADW). This tool uses radar to show an aircraft's position relative to a software generated "window" or box displayed

on the air traffic control screen at the extended final centerline of a runway. At MSP, Air Traffic tower controllers use the ADW displayed for runway 35 to determine when a departing aircraft can start its takeoff roll from runway 30L and/or runway 30R. An aircraft cannot start its takeoff roll on runway 30L and/or 30R when an aircraft is inside the runway 35 ADW. A takeoff roll can begin after the aircraft landing on runway 35 has exited the ADW.

While the CRO process has worked well from a safety perspective, it has adversely effected efficiency of the MSP runways 30L, 30R and 35 configuration at the higher traffic levels. Prior to FAA implementation of CRO mitigations, runway 30R and runway 35 configuration was the most efficient for MSP when the winds were from the North. Under those conditions, the FAA was able to achieve landing rates of 75-90 aircraft per hour. Since implementation of CRO requirements in 2014, the efficiency of the runway landings using the runways 30L, 30R and 35 configuration at MSP has decreased to 75-84 aircraft per hour. This is because of the increased spacing between aircraft required to meet the constraints of the ADW. This increased separation has also led to ATC distributing additional arrival traffic that would have landed on runway 35 prior to the CRO mitigations to runway 30L and runway 30R.

The FAA has worked with the MAC to identify possible mitigations that would improve the landing efficiency rates while ensuring the safety of the airspace around MSP. We believe we have achieved optimal utilization given the existing state of technology. In January 2019, the FAA completed a 180-day testing period of a new standardized process to support demand-based CRO. Under the new process, MSP air traffic will only use runway 35 for arrivals (and implement the CRO mitigations) when demand at the airport justifies the use of the runway. Currently there are three, well-defined arrival/departure "banks" at MSP when traffic demand is at its highest points (Monday through Friday at 7AM, 4PM and 6PM), when such a need has been demonstrated.

The results of the 180-day test have been incorporated into Standard Operating Procedure (SOP) in all three of the MSP District ATC facilities (ATCT, TRACON and ARTCC) that control air traffic into and out of the MSP airport. Because the criteria for implementing CRO is demand-based, the times that CRO may be implemented under the SOP can shift as arrival/departure banks shift. Likewise, new periods of CRO may be implemented as demand requires. Many internal processes and controls are in place to ensure that the new CRO mitigation process supports safety, real demand, and arrival and departure efficiency.

The FAA is in the process of evaluating the appropriate level of environmental review to assess and disclose potential adverse impacts of changes in runway use because of the implementation of CRO procedures at MSP. The agency hopes to provide the MSP Noise Oversight Committee (NOC) with an update at the September 2019 NOC meeting.