U.S. Department
of Transportation

OFFICE OF THE
GENERAL COUNSEL

1200 New Jersey Ave., S.E.
Washington, D.C. 20590

Office of the Secretary
of Transportation

July 8, 2024

The Honorable Hampton Dellinger
Special Counsel
U.S. Office of Special Counsel
1730 M Street NW, Suite 218
Washington, DC 20036

Re: OSC File No. DI-23-000742

Dear Mr. Dellinger:

By letter dated July 6, 2023, you referred for investigation a whistleblower's allegation that converging runway operations (CRO) at Minneapolis-Saint Paul International Airport (MSP) do not comply with Federal Aviation Administration (FAA) rules and pose a safety hazard. The referral required the U.S. Department of Transportation to investigate whether CRO at MSP comply with aircraft separation requirements established in FAA JO Order 7110.65, and whether MSP leadership improperly implemented CRO at MSP without conducting a study to assess the effects of wake turbulence on multiple simultaneous runway operations.

The Secretary of Transportation has delegated responsibility for matters falling under 5 U.S.C. Section 1213(d) to the General Counsel. The FAA, through its Office of Audit and Evaluation, prepared the Report of Investigation (ROI) in this matter. I enclose the ROI with this letter.

The investigation did not substantiate the allegations. The enclosed ROI details the work performed by FAA to ensure the safety of CRO at MSP. As the ROI explains, that work resulted in compliance with FAA JO Order 7110.65 and the development of standard operating procedures for CRO at MSP that appropriately account for wake turbulence issues.

We have appreciated the opportunity to review this important matter and the whistleblower's diligence in raising concerns.

Sincerely,

Sarah Baker
Principal Deputy General Counsel

Enclosure

Federal Aviation Administration
Report of Investigation
To the Office of the Secretary of Transportation

In response to:
U.S. Office of Special Counsel (OSC)
File: DI-23-000742

Director (A), Office of Audit and Evaluation
Federal Aviation Administration
Washington, D.C.

July 8, 2024

Executive Summary

On July 6, 2023, Special Counsel Henry J. Kerner referred to the Secretary of Transportation a U.S. Office of Special Counsel (OSC) whistleblower disclosure (OSC File No. DI-23-000742) for investigation.

On July 25, 2023, the Acting General Counsel, Office of the Secretary of Transportation, delegated the investigation to the Federal Aviation Administration (FAA). FAA's Office of Audit and Evaluation (AAE) oversaw the investigation and prepared this report. AAE is an independent office with the statutory authority to conduct impartial investigations of aviation-related whistleblower disclosures.

The disclosure alleged that Minneapolis-St. Paul International Airport (MSP) Air Traffic Control Tower (ATCT) leadership has engaged in activity that may constitute a violation of a law, rule, or regulation, gross mismanagement, and a substantial and specific danger to public safety. The whistleblower requested anonymity outside of OSC.

The whistleblower alleged that: (1) Converging runway operations (CRO)[1] implemented at MSP do not comply with aircraft separation requirements in FAA Order JO 7110.65 because they do not include adequate mitigation aids, such as sufficient Arrival-Departure Windows (ADWs)[2] to prevent conflicts between departing and arriving air traffic in the event of a missed approach, and (2) MSP leadership has improperly implemented CRO without conducting a study to assess the effects of wake turbulence and multiple runway simultaneous operations.

The allegations were not substantiated. Rather, the investigation found the ADWs at MSP were developed to meet the FAA standards of having a Target Level of Safety (TLS) of l x10-9, and to do so at the smallest size possible consistent with those standards to ensure the most efficient use of the airspace. ADWs were developed as a mitigation aid for controllers to use in conjunction with the applicable separation requirements of FAA Order JO 7110.65 and their professional judgment.

Background and History

During a 2011 investigation of go-arounds—i.e., where an arriving plane aborts its landing and re-enters the airspace, only to return to the runway—FAA's Air Traffic Organization (ATO) uncovered a latent hazard at facilities where takeoff and landing operations are conducted independently on non-intersecting runways with converging flight paths. Specifically, situations in which the flight path of a go-around converged with that of a departure were found to compromise safety margins. The ATO's findings were subsequently validated through the July 1, 2013, National Transportation Safety Board (NTSB) Recommendation A-13-024. In this Safety Recommendation, the NTSB recommended the FAA establish separation standards between an

[1] FAA Order 7110.65 requires air traffic controllers to apply separation rules for intersecting runways unless the facility uses alternative aids to ensure safe spacing and mitigate risk between arriving and departing aircraft.

[2] ADWs are a decision aid for controllers, to help mitigate the hazard that occurs when there is an unanticipated go-around in the vicinity of a departing aircraft. ADWs are a predetermined section of airspace on the approach path to a runway that is required to be clear of arriving aircraft before a departing aircraft can begin a take-off roll on a converging runway. The window ensures that the arriving and departing aircraft remain at a safe distance from one another, even if the arriving aircraft must discontinue its landing.

arriving aircraft that goes around and any combination of arriving or departing aircraft operating on non-intersecting converging runways where arrival or departure paths may intersect.

After the NTSB issued its safety recommendation, FAA's Flight Standards Service (AFS), working with the MITRE Corporation, developed ADWs for 19 major airports and roughly 40 smaller airports in 2013 and 2014. Development of ADWs occurred by model simulation to assess airborne collision risk. The model ran fast-time simulations, millions of times for each intersecting or converging scenario, to evaluate the risk with flights of different speeds, trajectories, and other factors. The ADWs were developed to meet the FAA's Target Level of Safety (TLS) of 1x10-9.[3] Presently, ten major airports use an ADW to mitigate the identified hazard while in a CRO configuration.

Based upon traffic demand and prevailing winds, MSP ATCT utilizes Runways 35, 30L, and 30R for arriving aircraft and Runways 30L and 30R for departing aircraft. Runway 35 does not physically intersect Runways 30L or 30R; however, the runways are considered non-intersecting converging runways, where the flight paths of aircraft intersect less than one nautical mile (NM) from the departure ends of each runway.

The ADWs for Runways 30L and 30R in connection with the final approach course for Runway 35 are displayed on the MSP ATCT Terminal Display Workstation. These ADWs provide a gap at the intersection points of the extended centerlines of Runways 35, 30L, and 30R to provide a margin of safety between an arrival to Runway 35 that executes a go-around and a departure from either Runway 30L or 30R.

In February 2016, following a request from the facility for an updated analysis of ADWs at MSP ATCT, AFS updated the ADWs for MSP ATCT based on their actual go-around rate of less than one per 1,000 arrivals (0.07%). Following the AFS analysis, the ADW for Runway 35 and Runway 30L remained unchanged, and the ADW for Runways 35 and 30R was reduced, with both ADWs meeting the TLS of 1x10-9.

Detailed Findings

Allegation 1: CRO at MSP does not comply with separation requirements in FAA JO Order 7110.65 because they do not include adequate mitigation aids, such as sufficient ADWs, to prevent conflicts between arriving and departing air traffic in the event of a missed approach.

Findings: Not Substantiated.

The whistleblower asserted that the ADWs at MSP ATCT are insufficient to ensure a safe distance between arriving and departing aircraft, considering aircraft size and performance, including propeller-driven aircraft and wake turbulence concerns. As such, they alleged insufficient spacing between arrivals and departures.

The investigation found that the ADWs at MSP were developed to meet the FAA standards of having a Target Level of Safety (TLS) of l x10-9, while at the smallest size possible consistent with those standards to ensure the most efficient use of the airspace. The ADWs are mitigation

[3]The Target Level of Safety (TLS) is the acceptably low likelihood of a credible hazard (collision risk in this case). The arrival/departure window, defined by an upper and lower bound along the final approach course, represents the area where probability of a collision does not meet the TLS if a departure on the evaluated converging runway begins its takeoff roll while an arriving aircraft is located within the corresponding window.

aids for controllers to use in conjunction with the applicable separation requirements of FAA Order JO 7110.65 and their professional judgment. ADWs were not developed to a specific separation standard. They are designed to mitigate the risk of a mid-air collision, which was identified as a latent hazard when conducting non-intersecting CRO. If an aircraft begins its departure roll while the arrival aircraft is outside of the ADW specific to the runway assigned, the risk of a mid-air collision is reduced to meet the TLS of lx10-9 without controller intervention if the arrival aircraft executes a go-around to a non-intersecting converging runway. Thus, the ADWs comply with FAA Orders.

Additionally, the use of CRO at MSP ATCT was temporarily discontinued in March 2020 due to decreased traffic levels, training limitations, and staffing limitations, then resumed in June 2023. During the discontinuation period, ATO requested the ADW be remodeled to include a more accurate fleet mix, specifically to include propeller-driven aircraft, a task which the FAA's Flight Technologies and Procedure Division completed in early 2022. This remodeling study used the Airspace Simulation and Analysis Tool (ASAT, a fast-time simulation tool) to investigate the risk of a mid-air collision between a missed approach on arrival to Runway 35 and departures from either Runway 30L or Runway 30R. The Flight Research and Analysis Group simulated 8 million aircraft pairs for each runway pair (35/30L and 35/30R) totaling 16 million aircraft pairs. To develop these scenarios, Airport Surface Detection Equipment, Model X (ASDE-X) data was gathered from MSP for arrivals to Runway 35 and departures from Runways 30L and 30R. Weather conditions, wind magnitude, and wind direction were obtained from archived Meteorological Aerodrome Reports (METARs). Data for the fleet mix were sourced from the MITRE Corporation's Center for Advanced Aviation System Development (CAASD) Instrument Flight Procedures (IFP), Operations, and Airspace Analytics (IOAA) Tool.

Based on analysis from FAA's Flight Technologies and Procedure Division for two converging runway pairs (35/30L and 35/30R), the ADW necessary to meet the overall TLS for runway pair 35/30R was calculated to be 0.32-2.35NM, and for 35/30L the ADW was calculated to be 0.39-2.26 NM. Both ADWs are in reference to Runway 35's arrival threshold. The calculated TLS was within the required parameters and was deemed compliant. The ATO ensures compliance with ADW standards through the Quality Assurance (QA) and Quality Control (QC) processes.[4]

Allegation 2: MSP leadership has improperly implemented CRO without conducting a study to assess the effects of wake turbulence and multiple runway simultaneous operations.

Findings: Not Substantiated.

In the OSC referral, the whistleblower states MSP leadership improperly implemented CRO without conducting a study to assess the effects of wake turbulence and multiple runway simultaneous operations.

[4] The Quality Control Group provides quality control support services for the National Airspace System (NAS) which include facility evaluations, safety risk management, accident and incident information gathering and reporting, and safety initiatives that align with and support FAA safety objectives. The Quality Assurance Group identifies system-wide safety trends, reviews policies and procedures for effectiveness, and evaluates individual events for risk.

The investigation found an ongoing collaboration between MSP ATCT and Minneapolis Terminal Radar Approach Control (M98) surrounding CRO. In June 2023, the facilities initiated a test period for CRO operations at MSP. Before the test period, MSP ATCT and M98 TRACON completed the required Safety Risk Management (SRM) and developed local CRO procedures in test notices MSP/M98 N7110.001 and MSP N7110.002, including specific weather, staffing, coordination, and equipment requirements when the facility is conducting CRO. The investigative team confirmed all required training was completed prior to the implementation of the CRO test in June 2023. The investigative team also reviewed the simulation training provided to the MSP Tower and the M98 TRACON controllers and found the training included compliant CRO standards and utilization of the ADW standards.

In 2022, at ATO's request, FAA's Flight Technologies and Procedure Division analyzed MSP's two converging runway pairs: 35/30L and 35/30R. The ADW necessary to meet the overall TLS for runway pair 35/30R was calculated to be 0.32-2.35NM, and for 35/30L the ADW was calculated to be 0.39-2.26 NM. Both ADWs are in reference to Runway 35's arrival threshold. The criteria for collision risk utilized the minimum distance between the aircraft's airframe centers at 265 feet laterally, and 80 feet vertically. These criteria led to the recommended increases in the ADW listed above.

While not part of this analysis, a wake turbulence study was highly recommended by the manager of the AFS, Flight Technology and Procedures Division prior to implementation of the new ADW standards. The AFS recommendation for a wake turbulence study was in reference to a request from the facility to perform analysis based on the potential use of a new "turn out" before the converging point during the use of CRO and ADWs for Runway 30R. AFS made the recommendation due to the unknown impacts on wake turbulence if a turn was implemented that early in the missed approach segment. Based on the unknown risk of such a turn without a wake turbulence study, however, the facility instead elected not to pursue the early turn option (on which the recommendation was based), and continues to execute the existing missed approach procedures while conducting CRO operations.

The ADW tool is intended to assist the controller in ensuring an arrival that executes a go-around that does not conflict with a departure off the non-intersecting converging runway. The ADW tool serves as a decision support tool to aid controllers in projecting the future location of traffic in the event of a missed approach or go-around. The ADW does not provide wake turbulence separation and does not remove the requirement for the controllers to follow locally developed Standard Operating Procedures (SOP) included in the Facility Directives (see Wake Turbulence mitigations listed below) to ensure required wake turbulence separation. The ADW is a visual cue for the controllers and does not take into account the characteristics or weight classes of every aircraft type. The wake turbulence requirements remain unchanged by the addition of the ADW tool when executing the established missed approach procedures.

In the fall of 2022, a combined work group with representation from both Minneapolis Tower and Minneapolis TRACON collaboratively developed revised Standard Operating Procedures (SOP) utilizing the new ADW parameters by the Flight Technologies and Procedure Division. A test of the new SOP and ADW parameters commenced on June 5, 2023. The following parameters were adjusted on ADW:

- The ADW for runway combination 35/30L was increased from .4 - 1.8 NM to .39 - 2.26 NM.

- The ADW for runway combination 35/30R was increased from .2 - 1.7 NM to .32 - 2.35 NM.

The facility Collaborative Workgroup (CWG) considered wake turbulence in developing the revised MSP CRO procedures based on the requirements outlined in FAA JO Order 7110.65, Air Traffic Control, Paragraph 3-10-4, *Intersecting Runway and Intersecting Flight Path Separation*. The facility completed two Safety Risk Management Panels (SRMP) prior to the implementation of the test procedures. During the SRMPs, they considered the safety factors associated with a Runway 35 go-around and a simultaneous Runway 30L or Runway 30R departure. The factors considered included the percentage rate of go-arounds per arrival on each runway and the reduction of go-arounds due to the increased weather minimums and attention to wind shear. They conducted simulations, which found the Converging Runway Decision Aid (CRDA) used for Runways 35, 30L, and 30R, included an offset to the Runway 30L arrival of 1.5SM. The offset consistently provided a minimum distance of one (1) mile between aircraft without intervention from the Air Traffic Controller. The two SRMPs concluded the current MSP CRO procedures provide the separation needed for controllers to take immediate action to resolve unusual situations.

Additionally, the MSP Facility Standard Operating Procedures (SOP) includes the following requirements to mitigate the risk of a wake turbulence encounter for a go-around during CRO operations:

- All Heavy jet and propeller-driven aircraft arrive only on the parallel runways (RWY30L/RWY30R).

- Requesting a “Heavy Jet gap” for a heavy aircraft departure from Runway 30L. The gap will provide approximately seven miles of separation on the converging Runway 35 arrival in the event of a go-around.

- Increased size of the ADW and a 1.5-mile offset of the ghost target used for CRDA to create more separation for all aircraft.

- Increased spacing on all finals from 4SM to 5SM when conducting CRO.

- Increased weather minimums and requirements to suspend CRO for wind shear reports.

A go-around is considered an unusual situation, and the provisions of FAA JO 7110.65 paragraph 3-9-9 for wake turbulence separation are not applicable. When an unusual situation occurs, controllers are required to take immediate action using their best professional judgment to resolve conflicts and re-establish standard separation as soon as practical. All personnel interviewed stated that they were not prohibited from taking immediate action or using their best professional judgment to resolve conflicts. Additionally, facility directives do not prohibit controllers from taking immediate action to resolve unusual situations.

MSP and M98 commenced the test phase for the new CRO procedures in June 2023. The facility's QC department also implemented an auditing program for the new CRO procedures during the test. The QC department provided the results of the nine audits completed since the beginning of the test period. The audits covered the period from June 5, 2023, to July 20, 2023,

during CRO operations and resulted in two Mandatory Occurrence Reports (MOR). In each instance, proper coordination took place for recovery action preventing a loss of separation, and neither of the incidents was a result of the CRO procedures or ADWs. As of May 14, 2024, MSP and M98 still consider themselves in a test phase and the QC department continued to audit all CRO operations. The QC department reported there were no MORs filed in the last 10 months reporting a loss of separation during the use of CRO procedures or ADWs. The Safety and Technical Training QA department reported one violation of the ADW which did not result in a loss of separation.

Investigation Methodology

The investigation was conducted under the authority of the FAA Office of Audit and Evaluation (AAE), pursuant to Title 49 U.S.C. §106(t) and FAA Order 1100.167B, as well as the Acting General Counsel's delegation to the FAA. Two Air Traffic Organization Safety Intelligence and Response Group (AJI-13) Safety Investigators participated in the investigation. The Safety Investigators conducted face-to-face interviews with three Certified Professional Controllers (CPCs), the [redacted] (also a CPC), one MSP Operations Supervisor (OS), one MSP Operations Manager (OM), the [redacted], two M98 Operations Managers (OM), one M98 Operations Supervisor (OS), and the [redacted] for the Minneapolis district. The Office of Special Counsel noted the whistleblower wished to remain anonymous, and it was unknown if any of the interviewees was the whistleblower. The team reviewed documents provided by the interviewees and the facility, including current and prior editions of the facility Standard Operating Practices (SOP), Falcon audio and video replays, Safety Risk Management documents (SRMD), emails, MORs, and training records. The team also observed tower operations and simulations run in the Tower Simulation System (TSS) and TRACON simulation lab.