

Airport Obstructions Standards Committee (AOSC)
Decision Document #06

Approved: June 8, 2005

Dallas / Fort Worth (DFW) End-Around Taxiway System

1) **Introduction**

- a) The Dallas / Fort Worth International Airport (DFW) has proposed the construction and operation of end-around taxiways (EAT) for their north/south runways. As designed, these EATs would provide unrestricted taxi to and from the terminal by both arriving and departing aircraft, eliminating the majority of DFW's 1,700 daily runway crossings and also serving to reduce departure delays.
- b) The results of a joint FAA and NASA study performed in February 2003 indicated that the proposed end-around taxiways would reduce controller-pilot communications by approximately 25%. In addition, an FAA Technical Center report has projected the full DFW EAT system (all four quadrants) would provide a 30% efficiency gain at a cost of approximately \$260M and defer the need for a \$1.3B runway project that was projected in the 2001 Airport Capacity Benchmark Report to improve the airport capacity benchmark by 3% in good weather and by 17% in adverse weather.
- c) Aside from a July 2004 AOSC decision document approving a proposal for EAT operations beyond the end of a single runway at Atlanta, there are currently no other regulatory criteria or standards that specifically govern EAT design and/or operation. The FAA has reviewed the proposed DFW EAT operational concept and conducted several test simulations to address the viability of these proposed EAT operations. It is expected that the results of these simulations and previous studies will contribute to the development of a national EAT standard.
- d) Although DFW's proposal includes both arrivals and departures over the EAT, the departure-only case still achieves a favorable benefit-cost ratio for the project. Given the added complexities of the "arrival over end-around" case, the Agency initially focused on the "departure over end-around" case.

2) **Rationale for Decision**

- a) In August 2004, a proof-of-concept demonstration in level D flight simulators was performed to gather human factors and operational information. In addition, the Flight Standards Service (AFS-420) performed a Terminal Instrument Procedures (TERPS) analysis of the DFW proposal.
- b) From a human factors perspective, the initial AFS report (November 2004) indicated no appreciable increase in physical workload that would lead to a compromise in current levels of safety. There were indications, however, in both the objective and subjective data that it was not easy for pilots to determine whether an aircraft was incurring the runway or safely operating on the EAT. These indicators pointed to the need for specific visual and operational mitigators as well as pilot training that address EAT operations.
- c) In December 2004, the AOSC agreed to pursue efforts to develop a physical visual barrier that would visually mask the aircraft in such a manner that the departing pilot could discriminate between a runway incursion and aircraft operating on the EAT. Subsequent PC-based simulations were used to help develop a more comprehensive level-D simulation to evaluate the effectiveness of various visual barrier options. This level-D simulation was conducted in April 2005. Simulation results, which included associated pilot feedback, indicated that a visual barrier that would mask up to the top of the engines of an aircraft on the EAT is sufficient to provide a masking effect that will optimize aircraft discernability. The William J. Hughes Technical Center has begun work to develop appropriate design specifications for this visual barrier.
- d) The US Standard for Terminal Instrument Approach Procedures (TERPS) requires protection of the 40:1 Obstacle Clearance Surface (OCS) from penetrations by the tails of taxiing aircraft. Analysis of the DFW proposal indicated that aircraft with tail heights up to 65 feet (Group V) can operate in all weather conditions on the EAT without penetrating the 40:1 departure surface. Aircraft with taller tail heights should be controlled so that no overflights of those aircraft occur. Aircraft operators, however, will need to take into account the maximum tail height of aircraft on the end-around taxiway for One-Engine-Inoperative (OEI) surface (62.5:1) considerations.
- e) In July 2004, analysis based on 22 years of incident / accident data showed an acceptable risk level (0.6×10^{-7}) associated with allowing taxiing aircraft in the Runway Protection Zone (RPZ) of runways with length of 9,000 feet or more, as long as the taxiing operations remain outside the 1000-foot x 500-foot Runway Safety Area (RSA). No taxiways in the DFW EAT design are located within the departure RPZ or RSA.

3) AOSC Decision

Since all evaluations to-date have specifically targeted EAT operations in the Southeast quadrant of DFW, the AOSC approves the proposed unrestricted departures over the end-around taxiway for that quadrant at DFW (as depicted on the approved Airport Layout Plan and submitted by DFW as a 15% design), including a visual barrier with an effective height of 13-feet as determined by the analysis completed to date. The outer taxiway will be located 2,650 feet beyond the runway threshold. Taxiway design and usage will be in accordance with standard taxiway requirements and/or limitations, and usage is approved in all weather conditions. The design limits EAT operations to Group V aircraft (65-foot tail height).

4) Action Plan

ARP

- a) Provide conditional approval to DFW for the completion of the design and construction of the proposed EAT (SE quadrant) under the following guidelines:
 - i) A visual barrier must be constructed at least 1,100 feet from the departure end of the runway (DER) for both runways in the quadrant.
 - ii) The effective height of the visual barriers must be 13 feet as measured from the DER elevation and the barriers must extend 350 feet on both sides of the runway centerline.
 - iii) The specific visual barrier design must meet the specifications currently being developed at the William J. Hughes Technical Center and must be reviewed and approved prior to construction start.
- b) ARP (AAS-100) will provide oversight and funding of the ongoing Technical Center study to determine the visual barrier design requirements and provide a draft visual barrier design standard to the AOSC for approval by September 30, 2007. The standard will include, at a minimum, specifications for physical composition, color scheme, recommended lighting, and recommended implementation requirements.

AVS

- a) Provide support to the William J. Hughes Technical Center design study for the visual barrier, primarily providing input regarding operational considerations.
- b) Establish EAT pilot training requirements.

ATO

- a) Provide support to the William J. Hughes Technical Center design study for the visual barrier.

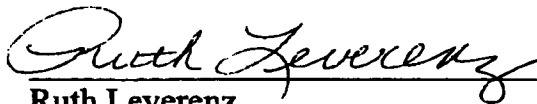
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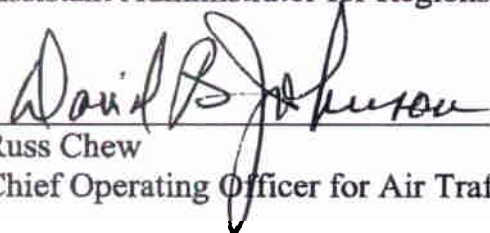
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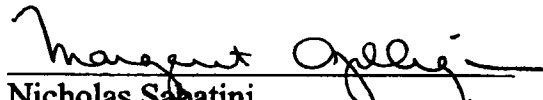
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