



Dallas/Fort Worth International Airport

Runway Incursion Prevention Plan and Perimeter Taxiway Overview

James M. Crites
Executive Vice President
Airport Operations



DFW Runway Incursion Prevention Policy Statements

- ♣ Continuous Part 139 compliance is best opportunity to create situational awareness thus preventing confusion and disorientation often eliminating runway incursions.
- ♣ DFW Airport believes runway safety is shared commitment; affirms responsibility of FAA; recognizes importance of all stakeholders and challenges them to support efforts to improve runway safety.
- ♣ DFW Airport believes the best way to avoid runway incursions at highly congested, closely spaced parallel runway airports is to eliminate runway crossings through the implementation of perimeter taxiways.



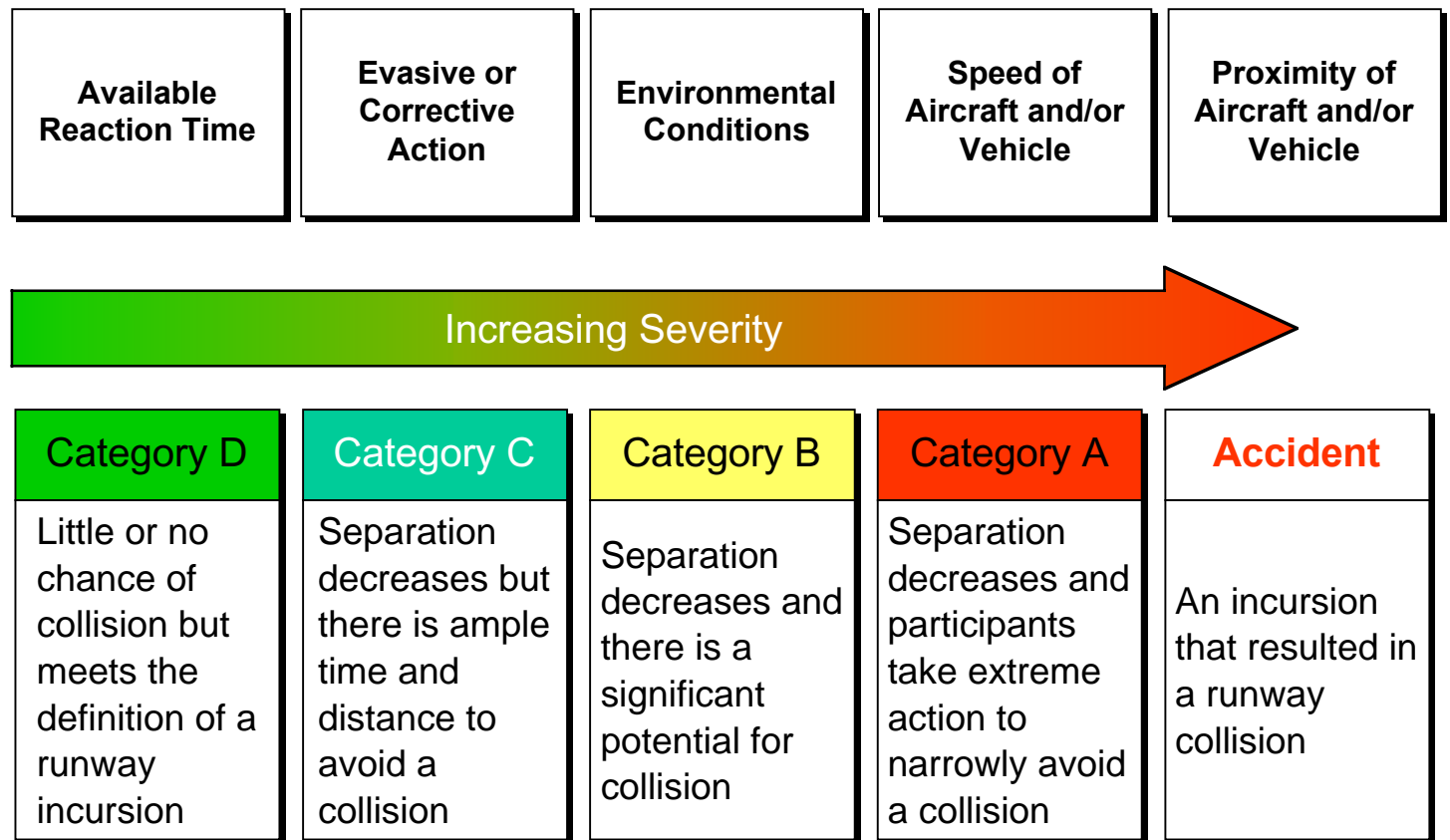
DFW Support of FAA Efforts

- ♣ DFW Airport supports and urges FAA to expand awareness efforts, training, ongoing and planned programs and activities in achieving our shared vision of safer runways. Preventing runway incursions and surface incidents is responsibility of everyone whose actions impact the safety of runway operations.
- ♣ DFW Airport encourages accelerated technological efforts, and the accelerated deployment of AMASS.



DFW Runway Incursion Categories

Runway Incursion Severity





Runway Safety Action Team (RSAT)

- ♣ Meets quarterly to review current viewpoints/issues.
- ♣ Members
 - ♣ Airport (Ops, Public Safety, Planning & Maintenance)
 - ♣ FAA (AT, FS, TOWER, TRACON & AFS)
 - ♣ Airlines (Ops, Safety & Chief Pilots)
 - ♣ Pilot Unions
 - ♣ DFW/FAA Co-Chairmen
- ♣ A special “incident review” meeting is held immediately following an incursion.
- ♣ Developed “Hot Spot” Chart.
 - ♣ Posted in all aviation centers.
- ♣ Distributed to chief pilots and outlying airports.
- ♣ ICAO recommends adoption at all airports.



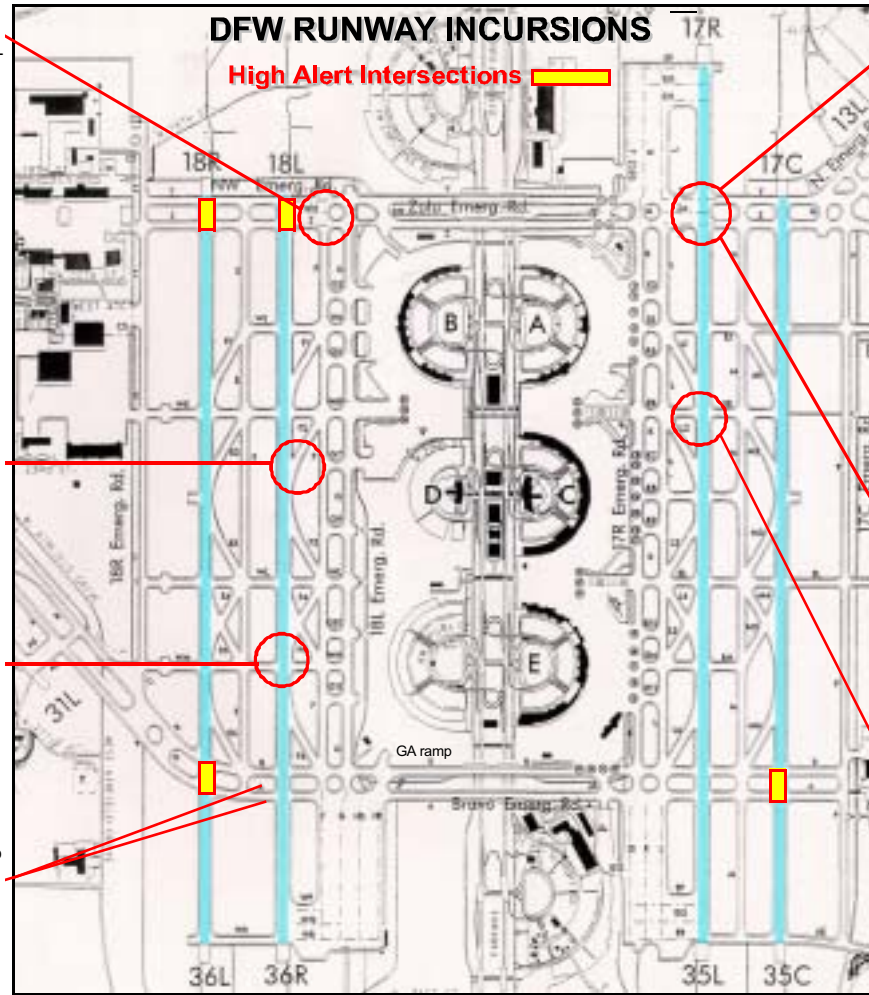
Hot Spot Chart

1. 2017 LCL (night). An aircraft taxied to RWY 18L via TWY G. Just south of TWY Z it was cleared for takeoff on RWY 18L. The pilot read back the clearance correctly but departed TWY F.

2. 2115 LCL (night). Aircraft A taxied from the NW ramp to the GA ramp and was cleared to cross RWY 18R/18L at TWY WK. Aircraft A was instructed to make a 90 degree right turn onto TWY F but instead turned 120 degrees back onto the RWY via the reverse high speed TWY F2. Aircraft B, departing RWY 18L, made an evasive maneuver to avoid Aircraft A.

3. 1601 LCL (day). Tower instructed arrival Aircraft A to hold short of RWY 18L at TWY WM. Tower cleared Aircraft B for takeoff on RWY 18L. Aircraft A proceeded to cross RWY 18L at TWY WM without authorization.

4. 1930 LCL (night). Tower issued instructions for six aircraft to cross RWY 18L. Each aircraft read back crossing clearance. Tower observed two aircraft that did not receive clearance also cross RWY 18L at TWY A and B.



5. 1248 LCL (day). Aircraft A landed RWY 35C and tower instructed it to hold short of RWY 35L at TWY Z. Aircraft A acknowledged. [Unsure of where the aircraft was going to park, tower offered an option]. Aircraft A was asked if it wanted to use TWY Y behind company or TWY Z. Aircraft A responded there was no one in front of them at TWY Z, and they were going in spot XX. Tower acknowledged with "roger." Aircraft A then started to cross RWY 35L. Tower observed Aircraft A and aborted take off of Aircraft B on RWY 35L.

6. 1900 LCL (night). Aircraft A was told to cross RWY 35C and hold short of RWY 35L. Aircraft A read back the hold short instruction verbatim. Aircraft B was cleared for takeoff RWY 35L. Aircraft A crossed RWY 35L at TWY Y without authorization in front of Aircraft B.

7. 2034 LCL (night). Aircraft A was instructed to cross RWY 17C and hold short RWY 17R. The read back was garbled. Aircraft B crossed RWY 17R at TWY EK with Aircraft C departing.



Airfield Vehicular Traffic Control Measures



- ♣ Escorts required for all non-airport or non-FAA vehicles on the AOA.
- ♣ Emergency Road system designed to minimize need to cross runways.
- ♣ An Operations person is assigned to provide a listening watch near the approach end of a closed runway to monitor Tower transmissions and observe aircraft movement for runway closures of less than 1 hour.
- ♣ Installing Runway Guard Lights that will be operated 24 hours a day.
- ♣ Installed “Stop” and “Contact Tower” signs at ARFF roads intersecting runways.





Pilot Situational Awareness Measures

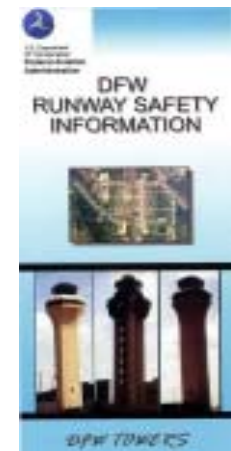
- ♣ Implemented standard taxi routes.
- ♣ Painted ARFF/Service Road markings white instead of yellow.
- ♣ Outlined runway hold position markings in black for conspicuity.
- ♣ Use beaded reflective paint.
- ♣ Installed additional runway hold position signs with yellow strobes at various critical runway/taxiway intersections.
- ♣ Changed HSE taxiway centerline light lens from bi-directional to uni-directional leading off of runways.
- ♣ Implemented Air Traffic procedure to “NOT” taxi any aircraft onto a runway via a High Speed Exit Taxiway.
- ♣ Initiated use of lighted “X” for runway closures over 1 hour (placed on both ends).





Driver Training

- ♣ Implemented a video for safe ramp driving criteria with an instructional pamphlet.
- ♣ Implemented Airport News and Training Network (ANTN) testing criteria for Movement Area driver familiarization and training.
- ♣ Implemented training program for aircraft mechanics that taxi aircraft on the airport.
 - * 850 trained for American Airlines
 - * 150 trained for Delta AirLines
- ♣ Implemented ATCT Controller familiarization tours of the airport's Movement Area.





Planned Activities

- ♣ Runway Status Lights (RWSL)
 - ♣ Provides visual indication to pilots if runway unsafe for crossing or takeoff.
 - ♣ Uses accurate Airport Traffic Identification System (ATIDS) -- a multi-lateration radar system.
- ♣ Airport Movement Area Safety System (AMASS)
 - ♣ Provides alarm to Controllers of potential collision on a runway.
 - ♣ Requires corrective actions by controllers.
 - ♣ Uses Airport Surface Detection Equipment (ASDE-III).
- ♣ Vehicle Tracking System
 - ♣ Independent but cooperative surface surveillance system.
 - ♣ Equipping vehicles on the airfield with identification devices compatible with surface surveillance systems.
 - ♣ Provide vehicles with runway incursion alarms.



Support NASA Research

- ♣ Runway Incursion Reduction Program (RIRP)
 - ♣ Demonstrated the fusing of several surveillance systems (ASDE, ATIDS, Loop & ADS-B) into a common display.
 - ♣ Provided target identification.
 - ♣ Provided alerts of potential incursions to Controllers the same as AMASS.
- ♣ Synthetic Vision/RIPS
 - ♣ Supplements visual surveillance and identification.
 - ♣ Provides alerts of deviations and incursions.





Dallas/Fort Worth International Airport

Perimeter Taxiway Overview



Perimeter Taxiway Virtual Demonstration

- ♣ NASA-Ames Research Center “Future Flight Central” (FFC) performed the demonstration from Feb 10-14, 2003.
- ♣ FFC emulated the full-scale real-time East Tower with a B-747 flight simulator linked to the VR scenarios. DFW controllers, pilots, airlines and airport staff participated.
- ♣ Over 20 pilots and controllers and over 25 FAA staff were involved. Eighty total visitors observed the demonstration.





DFW Preliminary Results

- ♣ Pilot-controller communications were reduced 10% for pilots and 21% for controllers.
- ♣ Pilot-controller transmission durations were lowered 17% for pilots and 25% for controllers.
- ♣ Departure rate increased by 30%, a finding not revealed in the fast-time simulations.
- ♣ Pilots and controllers felt that perimeter taxiways significantly improved safety and airfield operations at DFW.



NASA Demonstration

DALLAS/FORT WORTH INTERNATIONAL AIRPORT PERIMETER TAXIWAY (DAPT) DEMONSTRATION

DFW PERIMETER TAXIWAY DEMONSTRATION

FEBRUARY 10 - 13, 2003
REAL-TIME HUMAN-IN-THE-LOOP DEMONSTRATION

The logo of the Federal Aviation Administration (FAA), featuring a globe with a yellow arrow pointing upwards and the text "FEDERAL AVIATION ADMINISTRATION".The logo for Dallas/Fort Worth International Airport (DFW), featuring the letters "DFW" in white on a blue background with white wavy lines and the text "DALLAS/FORT WORTH INTERNATIONAL AIRPORT" below it.The NASA logo, featuring the word "NASA" in white on a blue circular background with a red swoosh and white stars.