Section 2

Introduction to Runway Safety

"We can only improve Runway Safety through the constructive collaboration of the entire aviation community."

- Jane F. Garvey, Administrator FAA

Runway Safety - Not a New Problem

"The airport surface environment is a complex and dynamic place, the dimensions of which are bounded, not only by the physical pavement and its attendant marking, lighting and signage, but also by the capabilities of the many people who must carry out their separate roles on its surface and the equipment and procedures they use to coordinate their actions."

National Blueprint for Runway Safety - October 2000

- National Blueprint for Runway Safety
October 2000

"Many people have a direct and indirect role in runway safety. Understanding who the people are and how they do their jobs is helpful to illustrate those human elements that can lead to errors. Controllers, pilots, and airport personnel directly manage, operate on and monitor conditions of runways. Vehicle operators and pedestrians manage baggage, fuel, catering and other ground handling functions; use taxiways and apron areas; and in some circumstances may be required to cross runways."

Runway Incursion

Any occurrence at an airport involving:

- **an aircraft,**
- **vehicle,**
- **person or object**

on the ground that creates a collision hazard or results in a loss of separation with an aircraft that is taking off, intending to take off, landing or intending to land (within 1 mile).

The following AIRCRAFT COLLISIONS were the result of a Runway Incursion.

Los Rodeos Airport Tenerife, Canary Islands, March 27, 1977

Taxiing aircraft collided with takeoff aircraft on same runway

Day/IFR

Weather - Light Rain

Visibility - Restricted; Fog & Low Clouds

The worst accident in aviation history occurred in 1977 when two 747 aircraft collided on a runway in the Canary Islands killing 583 passengers.

Taipei's Chang Kai Shek International Airport, October 31, 2000

Night/IFR

Weather - Heavy Rain

Visibility - 600 meters

Typhoon in area

Aircraft impacted equipment on closed runway during takeoff

A 747 aircraft took off on a closed runway and collided with construction equipment killing 83 onboard.

Linate Airport, Milan, Italy October 8, 2001

A Citation strayed onto a runway in Milan, Italy and collided with an MD-80 during its takeoff roll. There were 122 fatalities

Day/IFR

Visibility - Restricted; Fog

Mexico City October 31, 1979
Pilot lands on closed runway. There were 79 fatalities.

Between January 1990 and June of 2001 there have been 7 runway collision accidents in the United States that claimed 63 lives and damaged 13 aircraft.

- DOT OIG Report Number AV-2001-066

Dated June 26, 2001

Los Angeles International Airport, November 1991

Commuter aircraft was in position on runway, awaiting clearance, in front of a landing 737. There were 34 fatalities.

Night/IFR

Visibility - Unrestricted

Quincy Regional-Baldwin Field, November 19, 1996

Two aircraft collide at runway intersection at a <u>NON-TOWERED</u> airport resulting in 14 fatalities.

Dusk/VFR

Visibility - 10 mi

Ceiling - Overcast

Bradenton International Airport, March 2000

Two general aviation aircraft collide at a runway intersection killing all four onboard.

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The following "CLOSE CALLS" were the result of a Runway Incursion.

1. Tower cleared aircraft for takeoff on 16L while other aircraft was completing landing rollout on 16R.

Seattle-Tacoma International Airport, January 2001

Night, IFR

"Close Call" involving two commercial aircraft

2. Landing aircraft was instructed to“turn left at taxiway N and hold short of Runway 16L. Aircrew stated “cross Runway 16L”. Incorrect read back was missed by ATC.

Seattle-Tacoma International Airport, January 2001 (con’t)

3. Takeoff aircraft over flew landing aircraft by less than 100 feet.

Seattle-Tacoma International Airport, January 2001 (con't)

Dallas-Fort Worth International Airport, May 2001

Night, VFR

"Close Call" involving a cargo and commercial carrier

1. Taxiing aircraft was directed to cross 18L and turn right on Taxiway F. Read back was verbatim.

Dallas-Fort Worth International Airport, May 2001 (con't)

2. Aircraft continued right turn past 90 degrees onto Taxiway F2 and taxied across hold line for Runway 18L and onto Runway.

Dallas-Fort Worth International Airport, May 2001 (con't)

3. Meanwhile, ATC cleared aircraft holding short Runway 18L for takeoff.

Dallas-Fort Worth International Airport, May 2001 (con't)

4. Takeoff aircraft over flew aircraft on Runway by less than 100 feet.

Here's how a Runway Incursion can occur in the "LANDING PHASE"

Here's how a Runway Incursion can occur in the "TAKEOFF PHASE"

Common Locations of Surface Events Regardless of Airport Size or Level of Operational Activity
•Complex & Confusing Intersections
•Runway/Runway Intersections
•Runway/Taxiway Intersections
•Runway Thresholds

Lambert-St. Louis International Airport

Actual locations of Runway Incursions at STL from January 1997 thru October 2001.

STL controls up to 1800 daily operations and up to 900 runway crossings per day

Don't become a RED DOT! These are where runway incursions have occurred at STL. Listen carefully to your taxi clearance. Readback ALL hold short instructions. Heads up, eyes out and pay attention!

Runway Incursion Severity

Available Reaction Time	Evasive or Corrective Action	Environmental Conditions	Speed of Aircraft and/or Vehicle	Proximity of Aircraft and/or Vehicle

Increasing Severity

Category D	Category C	Category B	Category A	ACCIDENT
Little or no chance of collision but meets the definition of a runway incursion	Separation decreases but there is ample time and distance to avoid a collision	Separation decreases and there is a significant potential for collision	Separation decreases and participants take extreme action to narrowly avoid a collision	An incursion that resulted in a runway collision

The following slide illustrates how a variety of simple taxiing dimensions can dramatically impact the severity of a runway incursion.

Severity Categories

Animated Illustration

Above scenarios are all classified as runway incursions, but with different severity codes.

•In each case the taxiing aircraft penetrated the runway safety area (hold position) AND

•A collision hazard or loss of separation occurred with the landing aircraft.

RUNWAY INCURSIONS DO NOT DISCRIMINATE –

They can happen at any airport at any time to anybody!

Runway incursions can happen between two large commercial aircraft at a towered airport

They can happen between an airport vehicle and a commercial carrier at a towered airport

They can happen between a commuter aircraft and a general aviation aircraft at a non-towered airport.

Although wildlife cannot technically cause a runway incursion, they can significantly damage or destroy an aircraft.
(Lear 60 and deer)

Runway Safety is
Everyone's Responsibility
Be a part of the SOLUTION!
End of Section 2