

Air Traffic Organization ATO-Safety, Runway Safety

Field Operations Group

Presentation to: **PACIFIC AVIATION
DIRECTORS WORKSHOP**

REPUBLIC OF PALAU

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Program Overview

- Movement Areas – Safety Areas – Obstacle Free Zones
- Technology – Direct Pilot Notification
- Movement Area – Signs & Markings
- Standard Operating Procedures during Taxi Ops
- Surface Incidents 1st Quarter FY 2007 by category & frequency
- Responsibilities



PILOT/DRIVER
EARLY RECOGNITION
and
EARLY MITIGATION
of the Incident

**...Lowers the Collision
Risk Potential**





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Airport Movement Area

- **Defined by Letter of Agreement between Tower and Airport**
 - **MUST have contact with ATCT before entering unless specified in LOA for Airport Ops**
 - **Positive Control Area with separation provided by Air Traffic**
 - **Entry without ATCT authorization is a Surface Incident**
 - **At non-towered airports all aircraft, vehicles, and pedestrians should monitor and announce their intentions over the published Common Traffic Advisory Frequency (CTAF)**



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Runway Safety Area

- Runway Holding Position Marking
- Why is it there?
- Signs – Mandatory Holding Position
 - Location in relationship to Holding Position Marking



Just another Turkey crossing without an ATC clearance!





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Advisory Circulars **120-74/91-73**

- **“PART 121, 125, AND 135 FLIGHTCREW PROCEDURES DURING TAXI OPERATIONS”**
- [Part 91 recommended procedures are the same.] –
- AC 91-73
 - This guidance focuses on the activities occurring within the cockpit – planning, communicating and coordinating



Runway Safety and Operational Services

Advisory Circular 120-74

Change AC 120-74A

09/26/03

- **Summary:**
 - Taxi operations require **constant vigilance** on the part of the entire flightcrew
 - **Sterile cockpit** discipline is always appropriate while taxiing
 - Flightcrews should pay close attention to **readback and hearback** between ATC and other aircraft (CTAF TXs)
 - When clear of an active runway, flightcrews should be prepared to stop in position to resolve any questions about position on the airport or clearance from ATC
 - Safe aircraft operations can be accomplished and incident eliminated if flightcrews are properly trained and correctly accomplish standard taxi operating procedures and practices



Runway Safety and Operational Services

Advisory Circular 120-74

Change AC 120-74A

09/26/03

- Use of **Exterior Aircraft Lights** to make aircraft more conspicuous: (continued):
 - **Entering the departure runway for takeoff or “Position and Hold”** - When entering a runway for takeoff, or when taxiing into “position and hold,” flightcrews should make their aircraft more conspicuous to aircraft on final behind them and to ATC by turning on lights (except for landing lights) that highlight the aircraft’s silhouette.

Strobe lights should not be illuminated if they will adversely affect the vision of other pilots.



Key Revisions to Advisory Circular 120-74A/91-73

- **Turn on landing lights when cleared for takeoff** as a signal that the aircraft is moving
- Suggestion to contact ATC if a takeoff clearance is not received within expected time when on the runway
- More comprehensive use of clearance “Read Back” technique by pilots regarding use of runways



Surface Incident Mitigated by Landing Light Usage

- **B737 -1** landed R/W 24R and was instructed to “exit at the forward, cross R/W 24L, traffic (**B737-2**) in position. Contact Ground point 65”.
- **B737-1** observed Landing Lights at approach end of R/W 24L, and stopped. **B737-1** questioned crossing instructions and was told to “stand-by” on second attempt.
- Tower had cleared TIPH (**B737-2**) traffic for takeoff R/W 24L. **B737-1** holding short R/W 24L had crossed hold line via T/W Z, but did not enter R/W 24L.
- **B737-2** rotated 1,000 feet prior to T/W Z and passed T/W Z at 200 feet vertical.

Operational Error Runway Incursion Risk Cat. D



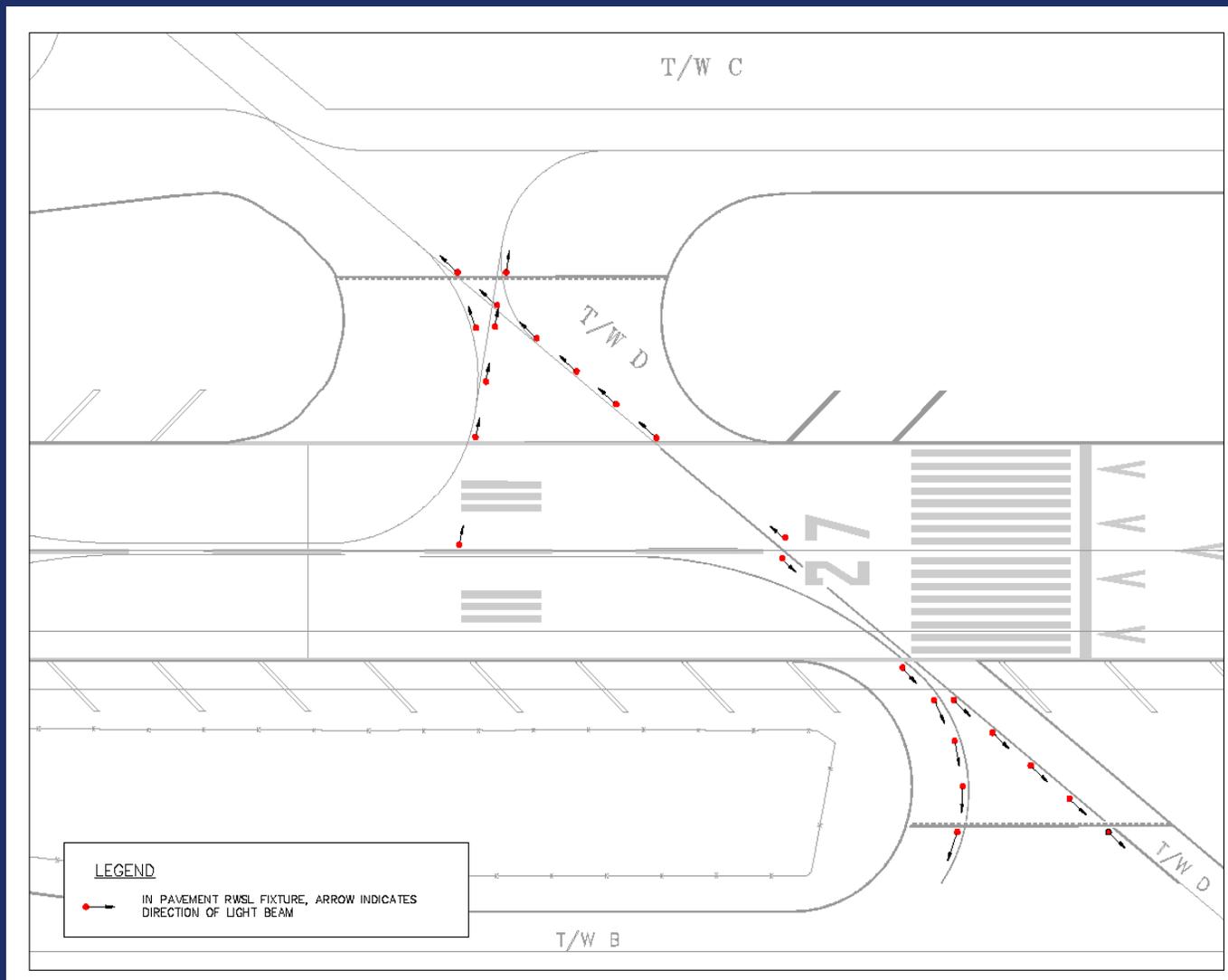
TECHNOLOGY

DIRECT NOTIFICATION TO PILOT TECHNOLOGIES

- FAROS (Flashing PAPI) – LGB
- Runway Status Lights (1st Version) – LGB (Loops Trigger)
- Runway Status Lights – SAN – AMASS activated
DFW/LAX(proposed) – ASDE-X activated
- Double-size, highlighted Holding Position Markings (all Towered Airports)
- Enhanced Holding Position Marking
- Laser Holding Position Enhancement
- Ground Marker System (Voice) – CCR
- ASDE-X, NGATS (Next Generation Air Transportation System),
- Ground TCAS



AMASS RWSL - SAN



Runway Status Lights DFW Operational Evaluation

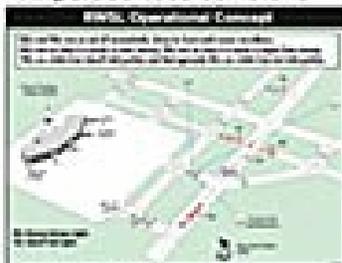
Takeoff Hold Lights on Runway 18L/36R

February 2005 – February 2006



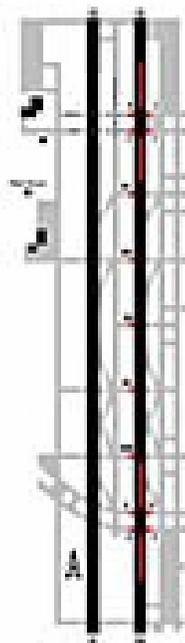
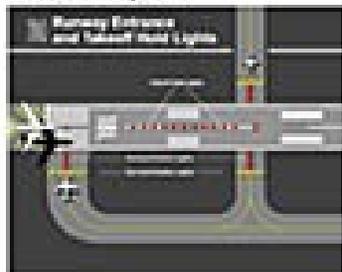
Problem:

- Airport surface collisions



Approach:

- Direct indication of runway status to pilots



SURVEY SAYS...

TAKEOFF HOLD LIGHTS (THLs)

THLs ABOUT 6" IN HEIGHT...	No/No
THLs EMERGE BY SITUATIONAL AWARENESS...	No/No
THLs MORE CONSISTENT WITH RT CLEARANCE...	No/No

IT ONLY TAKES
A FEW MOMENTS...
SO LET US
HEAR FROM
YOU NOW!

Take The
New THL Survey Now at
www.RWSL.net
(In our paper form at Airline Operations Center)

www.RWSL.net

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Runway Safety and Operational Services

Advisory Circular 120-74

Change AC 120-74A / 91-73

09/26/03

- Use of **Exterior Aircraft Lights** to make aircraft more conspicuous: (continued):
 - **Takeoff.** Turn on **Landing lights** when takeoff clearance is received , or when commencing takeoff roll at an airport without an operating tower.

Note: The SOP of turning on landing lights when takeoff clearance is received is a signal to other pilots, ATC, and ground personnel that the aircraft is moving down the runway for takeoff.





Signs and Markings

CAUTION

**THIS SIGN HAS
SHARP EDGES**

DO NOT TOUCH THE EDGES OF THIS SIGN



ALSO, THE BRIDGE IS OUT AHEAD



SIGNS AND MARKING

- Airport Signs – (movement area)
 - “**White** on **Red**” – **Mandatory** – *Action Required*
 - “**Black** on **Yellow**”-**Information/Direction/Boundary** -*Tells you something*
 - “**Yellow** on **Black**” –**Location**-*Where you’re at*

- Painted Markings – (movement area)
 - Runways – **White**
 - Taxiways- **Yellow** – (*don’t takeoff with a yellow centerline*)
 - Surface Painted Signs – *match sign colors*

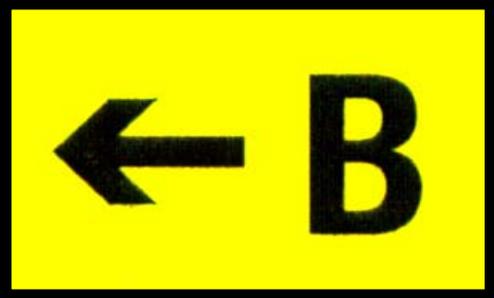




Mandatory Instruction Signs



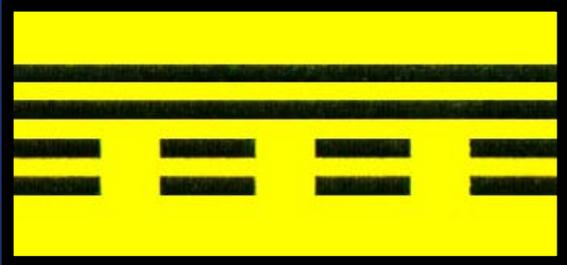
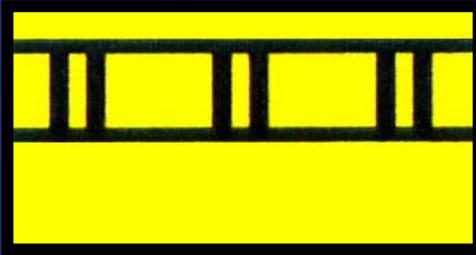
Informational Signs



Destination/
Direction
Signs



Direction
Signs



Boundary
Signs



Direction Signs



Location Signs

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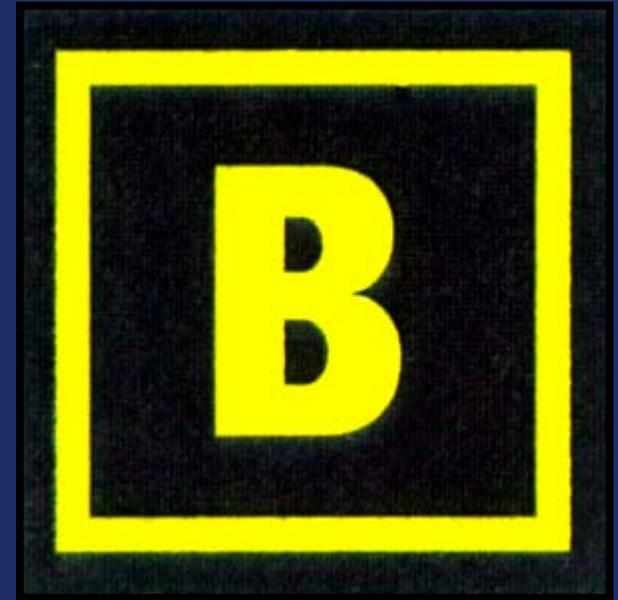
Orientation of signs are from left to right in a clockwise manner. Left turn signs are on the left of the location sign and right turn signs are on the right side of the location sign.

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Location Signs



Crossing Active Runways

Pilots/Drivers should pay particular attention to instructions that include a runway crossing or hold short instruction.

If in doubt of the ATC instruction, verify it.

At non-towered airports make CTAF statement of intention

Use LANDING LIGHT to indicate movement on Runway when crossing

If a pilot receives a clearance to cross an active runway, they should scan the area and proceed without delay.

Inform ATC of any delay on runway when crossing or taking off.





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SURFACE INCIDENTS

Oct-Dec 06 (FY07)

- **RUNWAY INCURSIONS:**

231 Surface Incidents reported

90 Total RUNWAY INCURSIONS (39% of Reported SIs)

29 OE/OD (32%) – 48 PDs (53%) – 13 V/PDs (15%)

OPERATIONAL ERRORS/OPERATIONAL DEVIATIONS:

- 10 - Failure to provide required Arrival/Departure separation for same/intersecting runways, not ensuring runway is clear.
- 7 – Auth an A/C, Vehical, or Ped on, crossing R/W, or holding w/i RSA, then clearing an A/C TO land/depart same R/W.
- 12 – Incorrect coordination in ATCT; Failure to correct incorrect read backs; misidentified A/C in airfield





SURFACE INCIDENTS

Oct-Dec 06 (FY07)

- RUNWAY INCURSIONS:

- Pilot Deviations - 48 PDs (53%)

- 8 – Pilot Entered or Crossed R/W AFTER ACKN
“Hold Short” – (17%)
- 10 – Pilots Crossed HOLD LINE AFTER ACKN
“Hold Short” – (21%)

- 38% of Pilot Deviation RIs occurred after Pilot acknowledged the Instruction to “HOLD SHORT”

- 3 - Taxied wrong route and entered runway
- 9 - Pilots crossed Hold Bars or entered runway w/o authorization
- 6 – Pilots crossed hold line only w/o auth
- 10 – Pilots landed or departed without communications or authorization with ATCT
- 2 – Pilots cleared to land/Take off one runway and landed/took off on another
- 1 – Pilot departed from TIPH w/o clearance
- 5 – landed or departed without communications



SURFACE INCIDENTS

Oct-Dev 06 (FY07)

RUNWAY INCURSIONS:

Vehicle Pedestrian Deviations - 13 VPDs (15%)

- 2 – POV(s)/Pedestrians not auth on airfield and entering/crossing a runway conflicting with an aircraft departing/landing (NOT AUTH on Airfield)
- 5 – airport vehicle/personnel auth on airfield and entered/crossed a runway w/o communications or authorization
- 4 – airport vehicle/personnel instructed to hold short/remain clear of runways and read back hold short but still crossed the hold line before being stopped by ATCT
- 2 – Maintenance taxi of an aircraft by non-pilot who read back hold short instructions





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Aviation Safety System Interdependence

- Continuous Emphasis of Responsibility to recognize errors and mitigate those errors before they progress to Incidents or Accidents (Reduce the Risk of Runway Incursions – FAA Flight Plan Goal)
 - Airport Traffic Control Tower
 - Pilots
 - Airport Operations
 - Vehicle Drivers and Pedestrians who use or have access to the Airport Movement Area
 - Error in any one of these groups must be recognized and mitigated either by the person committing the error or someone in one or more of the other groups



RESPONSIBILITIES

“The best people can make the worst mistakes:

**INATTENTION,
FORGETFULNESS,
PREOCCUPATION,**

...are the LEAST manageable parts of the error sequence.
Managing ERROR PRODUCING SITUATIONS is better”

Dr. James Reason, Manchester University, UK



RESPONSIBILITIES

- **BOYD'S and DITTO'S METHOD:**

OODA LOOP

- **OBSERVE**
- **ORIENT**
- **DECIDE**
- **ACT**



RESPONSIBILITIES

**“THE PILOT IS THE WHOLE
AVIATION SAFETY’S
GOALKEEPER”**

Capt. Dan Maurino, ICAO Flight Safety



RESPONSIBILITIES

**“THE PILOT IS THE WHOLE
AVIATION SAFETY’S
GOALKEEPER”**

*(Substitute ‘Airport Ops’ – ‘Driver’ – ‘ARFF
Firefighter’ – ‘Airport Law Enforcement’ – etc.
for ‘PILOT’)*

Capt. Dan Maurino, ICAO Flight Safety



LAX Runway Incursion





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