Air Traffic Control Runway Incursion Mitigation Efforts *and* Runway Safety Technology

Presented at:
NTSB Forum on Runway Incursion Safety Issues

By: **Mike Moreau**
Runway Safety Manager
Central Service Area (CSA)

Date: Sept 19, 2017

Presentation Topics

- **ATC Operational Runway Incursion Mitigations**
- **Runway Safety Technologies**
- **ATC *Non-Operational* Runway Incursion Mitigations - Behind the scenes**

Operational Runway Incursion Mitigation Strategies

FAA Order JO 7110.65W - *Air Traffic Control Handbook*

- Purpose: The 7110.65 prescribes Air Traffic Control (ATC) procedures and phraseology for use by personnel providing ATC services. Controllers are required to be familiar with the provisions of this order that pertain to their operational responsibilities and to exercise their best judgment if they encounter situations not covered by it.

FAA Order JO 7210.3Z – *ATC Facility Operation & Admin.*

- Purpose: The 7210.3 provides direction and guidance for the day-to-day operation of facilities and offices under the administrative jurisdiction of the Federal Aviation Administration's Air Traffic Organization. All concerned personnel shall familiarize themselves with the provisions about their responsibilities. When a situation arises that is not adequately covered, exercise good judgment.

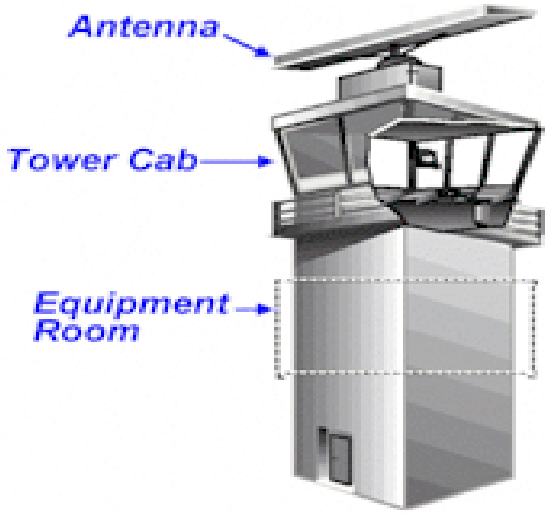
Operational Runway Incursion Mitigation Strategies

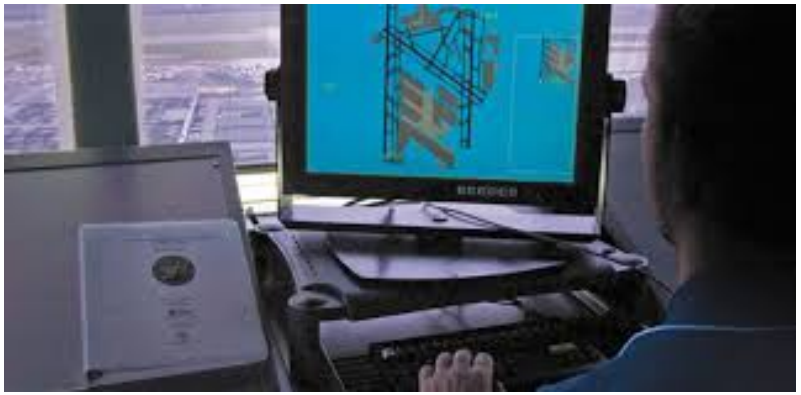
Runway Safety Technologies

- Airport Surface Detection Equipment *(ASDE-X)*
- Airport Surface Surveillance Capability *(ASSC)*
- Airport Movement Area Safety System *(ASDE-3/AMASS)*
- Runway Status Lights *(RWSL)*

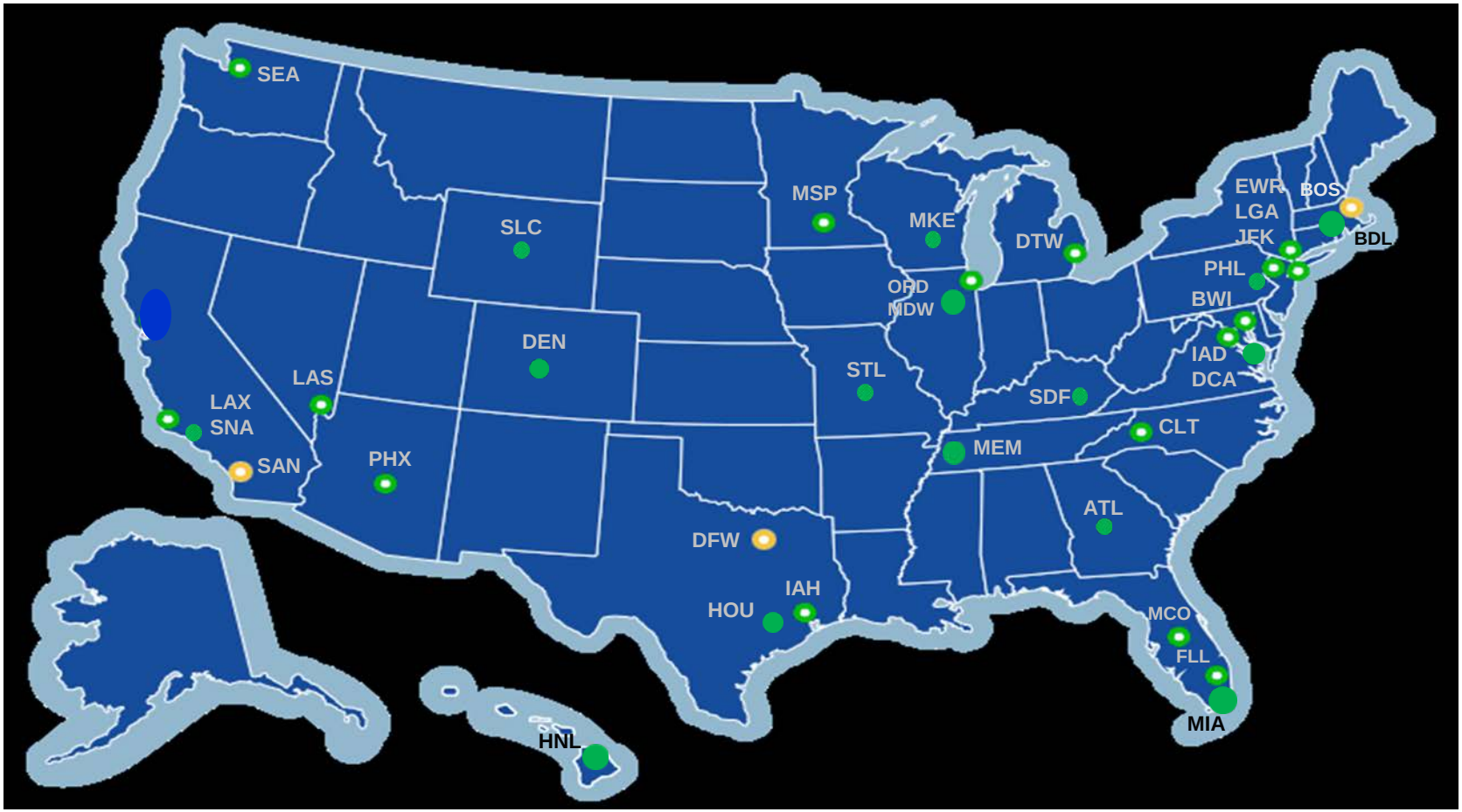
Runway Safety Technologies

- **Airport Surface Detection Equipment *(ASDE-X)***
  - o ASDE-X surveillance system assists controllers in the prevention of potential runway collisions.
  - o ASDE-X installed at 35 airports





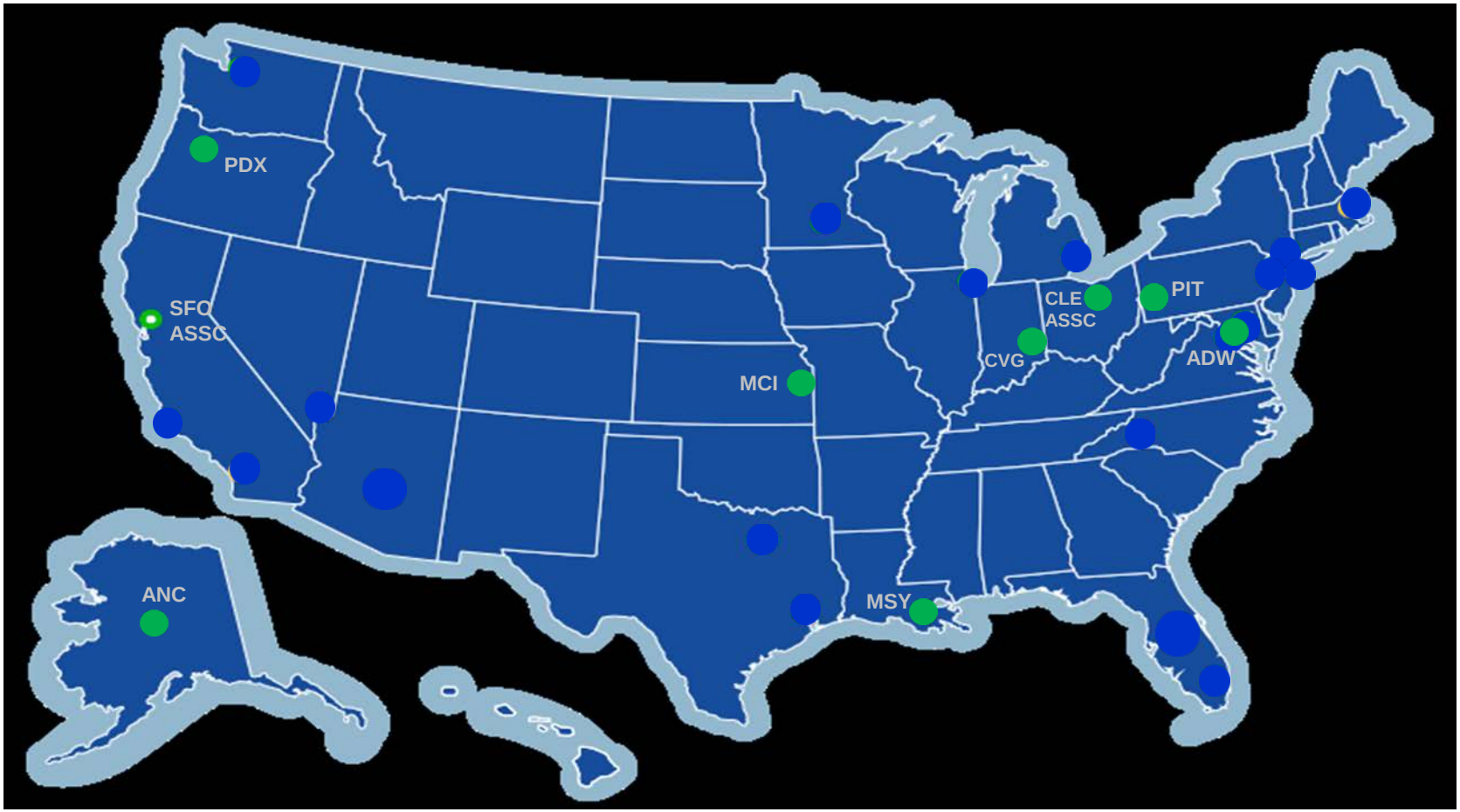
ASDE-X Locations



Runway Safety Technologies
(Continued)

- **Airport Surface Surveillance Capability *(ASSC)***
  - o ASSC surveillance system, like ASDE-X, assists controllers in the prevention of potential runway collisions.
  - o *Improvements*: Better rain performance; significant reduction in false tracks.
  - o ASSC is already installed (or will be installed) to replace existing Airport Surface Detection Equipment - Model 3/Airport Movement Area Safety System ***(ASDE-3/AMASS)*** at nine airports that did not receive ASDE-X upgrade: **SFO, CLE**, **ANC, ADW, CVG, MCI, MSY, PDX, PIT.**

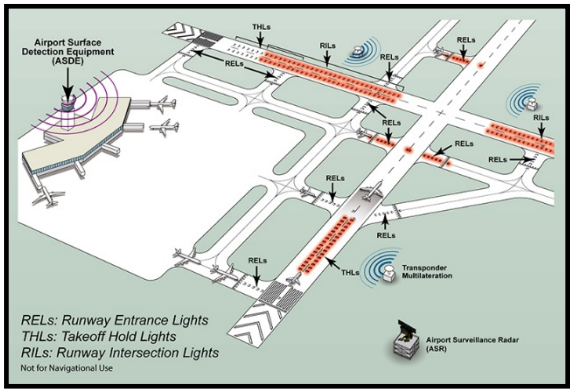
ASSC, ASDE 3/AMASS Locations



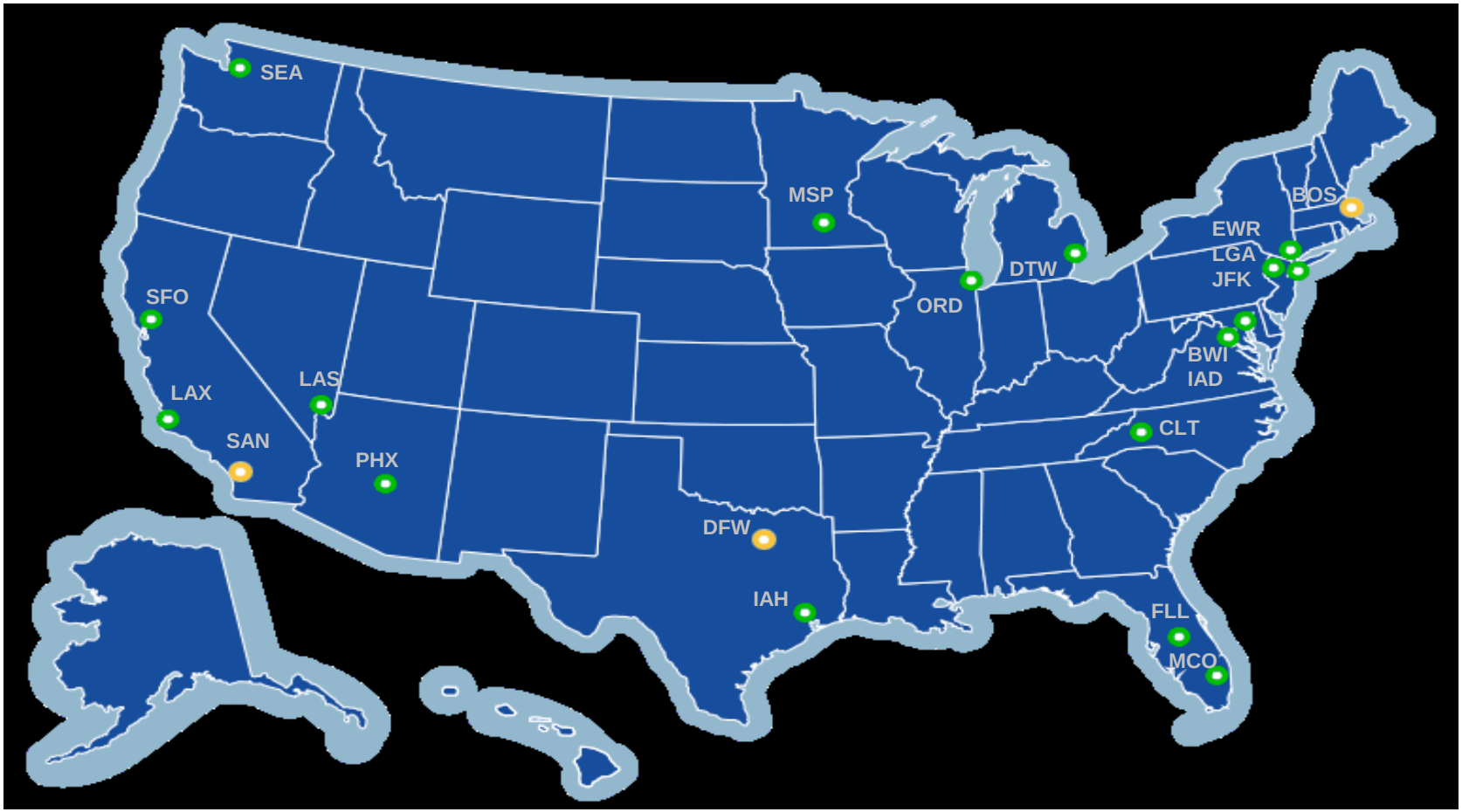
Runway Safety Technologies
(Continued)

- **Runway Status Lights *(RWSL)***

  - RWSL is a fully automatic, advisory safety system designed to reduce the number and severity of runway incursions and prevent runway accidents while not interfering with airport operations.
  - The RWSL system improves pilot and vehicle operator situational awareness through accurate and timely indication of runway usage.
  - Runway Status Lights are operational at 17 airports across the US. Three (3) additional airports (BOS, DFW, and SAN) are scheduled to transition from RWSL prototype systems to RWSL production systems over the next few years.



RWSL Locations



Operational Runway Incursion Mitigation Strategies

(Continued)

Memory Aids Toolbox

- Implemented in May 2016
- Purpose:
  - To aid in remembering an ***item***, ***action***, ***place*** or ***sequence***.
  - To assist in maintaining an active role while tasked.
  - To aid in decision-making/situational awareness by an individual or group.

CHARACTERISTICS OF EFFECTIVE MEMORY AIDS*
Face validity; *[will the controller accept and use the technique as relevant to the task]*
In line of sight; within the normal scan; grabs attention without being a distraction;
Reinforces visual, tactile, auditory prompts for memory (recall)
Employs easily understandable properties, e.g. RED = Danger
Ease of use
Repeatable (universally applicable)
Feasible to create
Cost-effective (maintain/build)
Ease of training
Feasible to maintain

MEMORY AID TOOLBOX

	OPERATION/S	PURPOSE	EACH MEMORY AID MUST	MEMORY AID
1	Runway Status (CLOSED / INACTIVE)	INDICATES THE STATUS OF THE RWY	INDICATE WHEN THE STATUS OF A SPECIFIC RWY IS CLOSED OR INACTIVE	STRIP BAY, CHIP BOARD OR BOARD STATUS INDICATOR; PAD OF PAPER; FAA APPROVED AND SUPPORTED ELECTRONIC DISPLAY; PLACARD
2	Runway Crossing	INDICATES WHEN VEHICLE/AIRCRAFT HAS CLEARANCE TO CROSS ACTIVE RWY	INDICATE THAT THE RWY IS NOT SAFE FOR ARRIVING OR DEPARTING AIRCRAFT	STRIP BAY, CHIP BOARD OR BOARD STATUS INDICATOR; PAD OF PAPER; FAA APPROVED AND SUPPORTED ELECTRONIC DISPLAY; PLACARD
3	Vehicle, Personnel or Equipment on Active Runway/s	INDICATES THAT A VEHICLE, PERSONNEL AND/OR EQUIPMENT ARE ON AN ACTIVE RWY	INDICATE THAT THE RWY IS NOT SAFE FOR ARRIVING OR DEPARTING AIRCRAFT	STRIP BAY, CHIP BOARD OR BOARD STATUS INDICATOR; PAD OF PAPER; FAA APPROVED AND SUPPORTED ELECTRONIC DISPLAY; PLACARD
	Land and Hold Short Operations (LAHSO)	1. INDICATES THAT LAHSO IS IN EFFECT	1. NOTATE THAT LAHSO IS IN EFFECT	STRIP BAY, CHIP BOARD OR BOARD STATUS INDICATOR; PAD OF PAPER; FAA APPROVED AND SUPPORTED ELECTRONIC DISPLAY; PLACARD
4		2. INDICATES SPECIFIC ARRIVING AIRCRAFT HAVE ACCEPTED LAHSO CLEARANCE	2. INCLUDE CALL SIGN AND NOTATE THAT SPECIFIC ARRIVING AIRCRAFT HAS ACCEPTED LAHSO CLEARANCE	STRIP BAY, CHIP BOARD OR BOARD STATUS INDICATOR; PAD OF PAPER; FAA APPROVED AND SUPPORTED ELECTRONIC DISPLAY; PLACARD
5	Line Up and Wait (LUAW)	1. INDICATES LUAW IS NOT IN EFFECT FOR THOSE FACILITIES THAT ARE AUTHORIZED TO CONDUCT LUAW	1. NOTATE THAT LUAW IS NOT IN EFFECT	STRIP BAY, CHIP BOARD OR BOARD STATUS INDICATOR; PAD OF PAPER; FAA APPROVED AND SUPPORTED ELECTRONIC DISPLAY; PLACARD
		2. INDICATES SPECIFIC DEPARTING AIRCRAFT HAVE ACCEPTED LUAW CLEARANCE	2. INCLUDE CALL SIGN AND NOTATE THAT SPECIFIC DEPARTING AIRCRAFT HAS ACCEPTED LUAW CLEARANCE	STRIP BAY, CHIP BOARD OR BOARD STATUS INDICATOR; PAD OF PAPER; FAA APPROVED AND SUPPORTED ELECTRONIC DISPLAY; PLACARD
6	Landing Clearance (FULL-STOP, TOUCH-AND-GO, STOP-AND-GO, LOW APPROACH, OPTION)	INDICATES CLEARANCE HAS BEEN ACKNOWLEDGED	INCLUDE CALL SIGN AND NOTATE THAT ARRIVING AIRCRAFT HAS ACKNOWLEDGED CLEARANCE	STRIP BAY, CHIP BOARD OR BOARD STATUS INDICATOR; PAD OF PAPER; FAA APPROVED AND SUPPORTED ELECTRONIC DISPLAY; PLACARD

Non-Operational Runway Incursion Mitigation Strategies

Bi-annual Recurrent Training

- July 2017 offering included Instructor-Led Training on *Wrong Surface/Wrong Airport Landings,* and Web-Based Training on *Runway Flyovers*. Both topics were FAA Top 5 Significant Safety Initiatives in FY 2017.
- Past offerings have included topics such as Readback/Hearback, Effective Scanning Techniques and Runway Incursion Prevention.

Surface Risk Analysis Process *(SRAP)*:

- SRAP conducts in-depth analyses of individual occurrences that meet the criteria for a Risk Analysis Event (RAE).
- This process assesses multiple factors to determine the severity and repeatability as well as associated causal and sub-factors for each RAE.
- SRAP is designed to identify risk systemically across the NAS.

Air Traffic Safety Action Program *(ATSAP):*

- ATSAP has established a system for Controllers and other Employees to voluntarily identify and report safety and operational concerns.

Non-Operational Runway Incursion Mitigation Strategies

(Continued)

Runway Safety Action Team (RSAT) Meetings

Purpose:

- Identify and reduce the risk of Runway Incursions and Excursions at a specific airport.
- Provide an opportunity for Local Stakeholders to gather at least once per fiscal year to discuss Surface Safety at their airport.
- Provide an opportunity to take an objective look at an airport.

Non-Operational Runway Incursion Mitigation Strategies

(Continued)

Partnership for Safety *(PFS)* *and* Local Safety Councils *(LSCs)*

- ***The mission of the Partnership for Safety (PFS) Program is to facilitate the identification and mitigation of hazards at the local level. This will be accomplished through the support of collaborative Local Safety Councils (LSC's) comprised of local Union Representatives and FAA Management at all facilities in the National Airspace System (NAS). These councils encourage facilities to mitigate hazards and participate in a lessons-learned method to share Air Traffic Organization (ATO) safety information.***

Non-Operational Runway Incursion Mitigation Strategies

(Continued)

System Service Review (SSR)	

WHO	**Facility managers or other personnel as designated by the facility manager**
WHAT	The intent of an SSR is to **review the air traffic services provided in any situation at any time under any circumstances**. The SSR guides the facility through a process that identifies what's going on in the entire operation and to develop corrective action plans if deemed necessary.
WHEN	**Routinely, randomly, by inquiry, post event, and by request**
WHERE	**Facility Level**
WHY	By reviewing the facility randomly and on a scheduled basis, this ensures **assessment of facility performance outside of negative incidents**.

Questions ?

Mike Moreau

Federal Aviation Administration
Air Traffic Organization
Safety and Technical Training
Manager | CSA Runway Safety
T: 817-222-4529
E: mike.moreau@faa.gov

Back-Up Slides

Airport Surface Surveillance Capability (ASSC)

oAssists controllers in the prevention of potential runway collisions.

oASSC is already or will be installed to replace existing Airport Surface Detection Equipment - Model 3/Airport Movement Area Safety System (ASDE-3/AMASS) at the following nine (9) airports that did not receive an ASDE-X upgrade:

•SFO	**SAN FRAN CISCO INTERNATIONAL**	**INSTALLED**
•CLE	**CLEVELAND HOPKINS**	**INSTALLED**
•ANC	**ANCHORAGE ALASKA**	
•ADW	**ANDREWS**	
•CVG	**CNCINATTI COVINGTON**	
•MCI	**KANSAS CITY INTERNATIONAL**	
•MSY	**LOUIS ARMSTRONG INTERNATIONAL NEW ORLEANS**	
•PDX	**PORTLAND OREGON**	
•PIT	**PITTSBURGH**	

Runway Status Lights (RWSL):

- RWSL is a fully automatic, advisory safety system designed to reduce the number and severity of runway incursions and prevent runway accidents while not interfering with airport operations.

- Runway Status Lights are operational at 17 airports across the US and three additional airports (BOS, DFW, and SAN) are scheduled to transition from RWSL prototype sites to RWSL production systems over the next few years.

BOS	**BOSTON LOGAN (Prototype)**	**LAS**	**LAS VEGAS McCARREN**
BWI	**BALTIMORE WASHINGTON**	**LAX**	**LOS ANGELES INTERNATIONAL**
CLT	**CHARLOTTE DOUUGLAS**	**LGA**	**NEW YORK LAGUARDIA**
DFW	**DALLAS FORT WORTH (Prototype)**	**MCO**	**ORLANDO**
DTW	**DETROIT WAYNE COUNTY METRO**	**MSP**	**MINNEAPOLIS ST. PAUL**
EWR	**NEWARK**	**ORD**	**CHICAGO O'HARE**
FLL	**FORT LAUDERDALE**	**PHX**	**PHOENIX SKY HARBOR**
IAD	**WASHINGTON DULLES**	**SAN**	**SAN DIEGO LINDBERGH (Prototype)**
IAH	**HOUSTON GEORGE BUSH**	**SFO**	**SAN FRAN CISCO INTERNATIONAL**
JFK	**JOHN F. KENNEDY**	**SEA**	**SEATTLE TACOMA**