ICAO Aviation Safety Seminar:
Runway Safety Area and EMAS Discussion Topics

Presented *to: ICAO (RASG – PA)*
Aviation Safety Seminar - 2014

By: Michael A.P. Meyers
U.S. FAA, Airport Engineering Division
Washington, D.C.

Date: January 15-16, 2014

PART 139 AND RSAs
ITEMS OF DISCUSSION

- **Part 139 Summary**
- **Part 139 Application to Runway Safety Areas (RSAs)**
- **RSA Requirements**
- **RSA Program (2000 – 2015)**
- **Frangibility**
- **Declared Distances**
- **Engineered Materials Arresting Systems (EMAS)**

C.F.R. PART 139 CERTIFICATION OF AIRPORTS

- **Certificate required for airports with:**
  - Scheduled service by aircraft with more than 9 passenger seats
  - Unscheduled service (charter) by aircraft with more than 30 passenger seats
- **Serves to ensure safety in air transportation by complying with geometric, construction and operational requirements**
- **Requires adherence to an airport certification manual (ACM)**

PART 139 - SAFETY AREAS

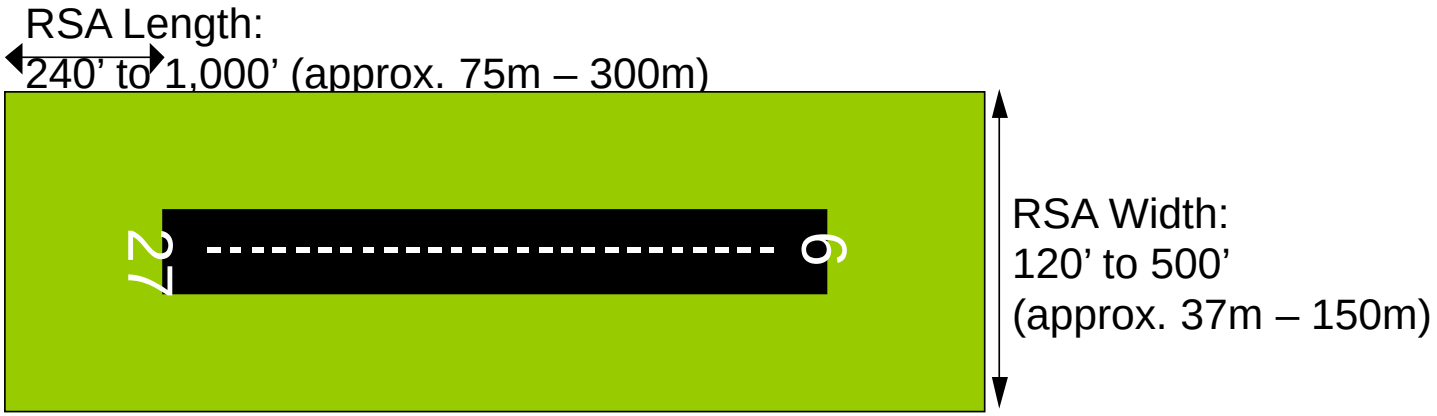
- **139.309 states:** ***In a manner authorized by the administrator, each certificate holder must provide and maintain, for each runway and taxiway that is available for air carrier use, a safety area that:***
  - Is cleared and graded to standards
  - Is capable of drainage to avoid water accumulation
  - Is capable of supporting service equipment (ARFF, snow removal) under dry conditions
  - Must be cleared of objects that are not required to be there based on their function

PART 139 - SAFETY AREAS

A *Runway Safety Area*, as defined by the FAA is the equivalent to a *Runway Strip*, as defined by ICAO.

RUNWAY SAFETY AREA (RSA) REQUIREMENTS

RSA LAYOUT AND DIMENSIONS



- **RSAs for runways that accommodate large aircraft are typically 1000’ x 500’ (75m – 300m)**
  - Must be clear of objects, structures, highways, bodies of water, drainage swales and navigational aides that are **not** fixed-by-function

RUNWAY SAFETY AREA (RSA) IMPROVEMENT PROGRAM

RSA IMPROVEMENT OPTIONS

- **The Required RSA dimensions depend on the following:**
  - The Airplane Design Group (ADG) (Group I – VI)
    - Aircraft wingspan
    - Aircraft tail height
  - Aircraft Approach Category (A-D)
    - Based on stall speed

RUNWAY SAFETY AREA (RSA) IMPROVEMENT PROGRAM

RSA IMPROVEMENT OPTIONS

- **Construct or expand the RSA**
- **Modify or Relocate the Runway**
- **Remove objects that are not fixed by function**
- **Make fixed by function objects frangible**
- **Implement Declared Distances**
- **Install an EMAS**
- **Any combination of the above**

RUNWAY SAFETY AREA (RSA) IMPROVEMENT PROGRAM

- **Developed in 2000 to Improve Runways that did not meet FAA Design Standards**
- **When the Program Began:**
  - 30% of RSAs met Full FAA Design Standards
  - 55% of RSAs met 90% of the FAA Design Standards
- **Many airports are developed on land with limited space, so RSAs can't be expanded to meet changing standards.**

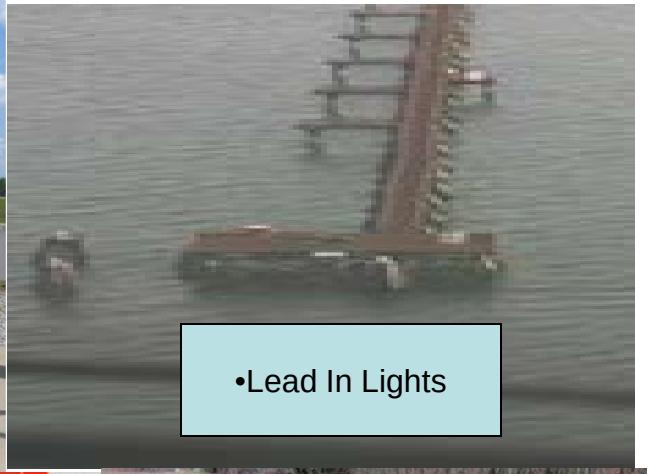
RUNWAY SAFETY AREA (RSA) IMPROVEMENT PROGRAM
CURRENT STATUS FY 2013

- **67% of runways meet FULL standards**
- **93% of runways improved to the extent practicable**
  - Efforts still continue to improve these RSAs to full standards to the extent practicable, even beyond 2015!
  - You touch it, you fix it….

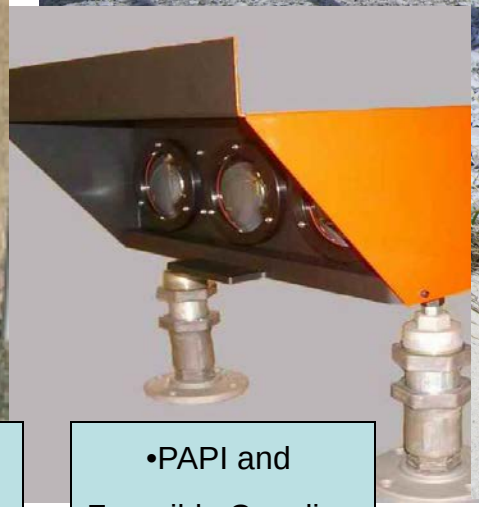
RSA NAVAID Equipment/Ancillary Items

•LIR Pole

•Localizer



•Lead In Lights



•PAPI and
•Frangible Couplings

•Frangible Bolts

•REIL and ICC

Types of Declared Distances

- **Landing Distances Available (LDA):** The runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff; and

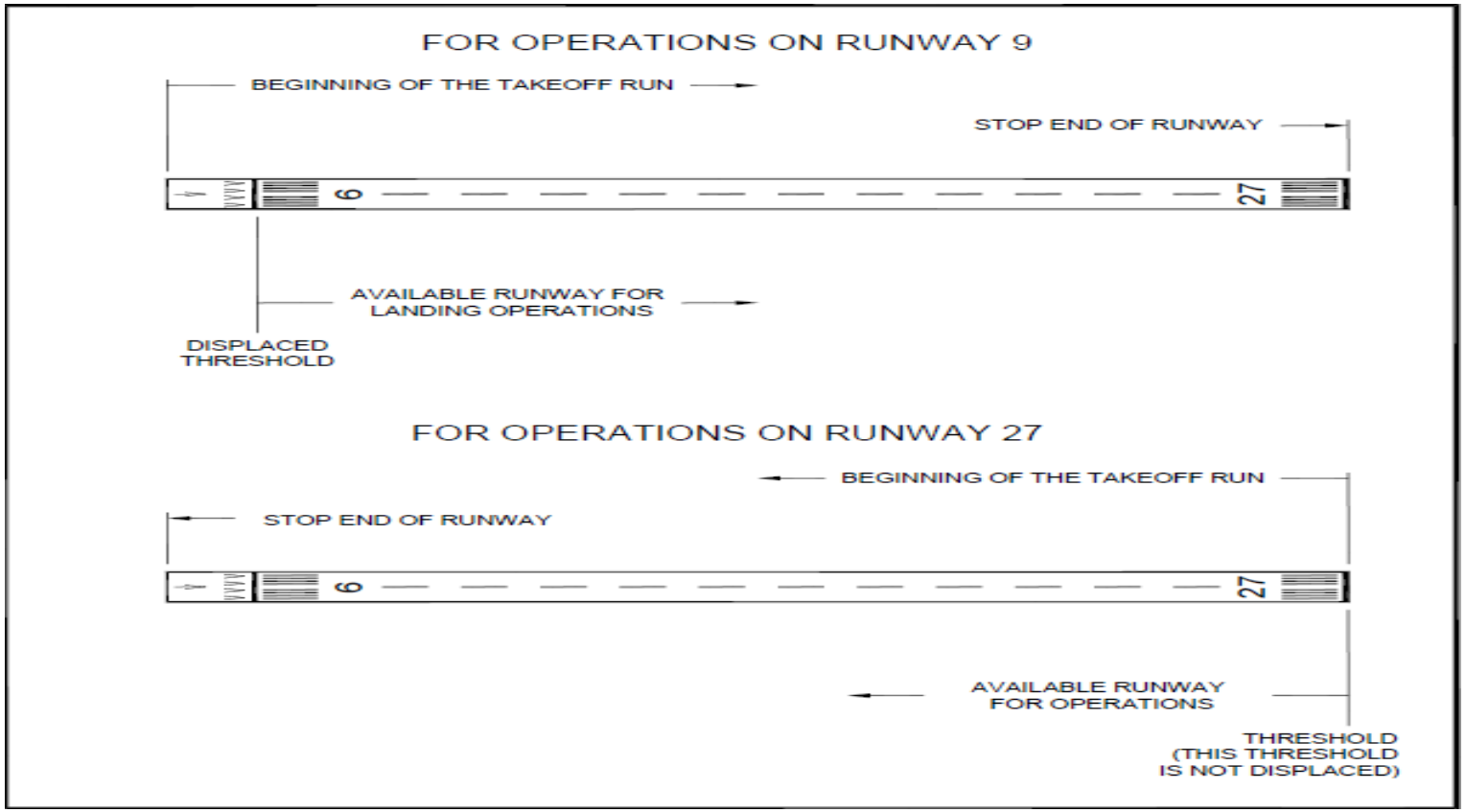
- **Takeoff Run Available (TORA):** The runway length declared available and suitable for the ground run of an aircraft taking off;

- **Takeoff Distance Available (TODA):** The TORA plus the length of any remaining runway or clearway beyond the far end of the TORA; the full length of TODA may need to be reduced because of obstacles in the departure area

- **Accelerated Stop Distance Available (ASDA):** The runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff; and

DECLARED DISTANCES

Examples of Types



- **TODA is generally the entire physical length of the runway**
- **TORA may often be the same as TODA unless there is an obstable beyond the runway that requires the runway's usable length to be shortened**

RUNWAY SAFETY AREA (RSA) IMPROVEMENT PROGRAM
CURRENT EMAS STATUS

- **70 EMAS installations at 46 certificated U.S. airports since 1996**
- **9 aircraft arrests have been made**
  - Latest on October 27, 2013 at Palm Beach Intl.!
- **27 more EMAS installations at 18 airports planned through CY 2015 (Does not include replacements)**

Latest Save…

A Closer Look...

Successful EMAS Capture

Successful EMAS Capture

QUESTIONS?

Michael Meyers, P.E.
Federal Aviation Administration
Office of Airport Safety and Standards
Airport Engineering Division
Washington, D.C., United States of America
1.202.267.8785
Michael.a.meyers@faa.gov