# Airport/Terminal Weather Operations

Nick Demetriades Offering Portfolio Manager, Airports Market Segment Vaisala Inc.

FPAW Fall 2014 Meeting



# Vaisala AviCast



#### Vaisala AviCast lightning display Global display







#### Vaisala AviCast lightning display Lightning color-coded by time – Last 2 hours



VAISALA

#### Vaisala AviCast lightning display Lightning color-coded by time – Last 25 minutes





## Vaisala AviCast lightning alert rings





## Vaisala AviCast lightning display

Lightning alerts with new time-based, lightning density feature



VAISALA



## Vaisala AviCast lightning display

#### Email lightning alert example

From: To: Cc:	□ LTG <no-reply@sns.amazonaws.com> Sent: Thu 7/31/2014 ■ Hunt Rodney RDHU</no-reply@sns.amazonaws.com>	11:39
Subject:	Lightning ACTIVE CHS 5nm ALARM	
Vaisala Lig	htning Network indicates: ACTIVE	
at location: CHS 5nm ALARM		
as of time: Thursday, July 31, 2014 1:37:45 PM EDT (2014-07-31T17:37:45Z)		
If you wish to stop receiving notifications from this topic, please click or visit the link below to unsubscribe: <u>https://sns.us-east-1.amazonaws.com/unsubscribe.html?</u> <u>SubscriptionArn=arn:aws:sns:us-east-1:815919319326:Lightning-Alerts-Vaisala- RDHU:cfacbaca-8dc0-44a9-a1ff- 77d2409dab77&amp;Endpoint=rodney.hunt@vaisala.com</u>		
Please do not reply directly to this e-mail. If you have any questions or comments regarding this email, please contact us at <u>https://aws.amazon.com/support</u>		



# Lightning warning studies and considerations



# **Airport lightning warnings**

- Challenge: Keep ground operations personnel safe while minimizing downtime
  - Balancing safety and risk
- Airport sizes and layouts are different
  - A one-size fits all approach to lightning warning distances does not work
- Thunderstorm climatology (initiation, organization, movement) is not the same for every airport
  - Organized, mid-latitude systems (fast movement)
  - Air mass, sea breeze, and orographic (slow movement)
  - Few (≤10%) thunderstorms develop directly overhead of an airport



## **Area of protection statistics**

For a given warning radius, the larger the area of protection, the poorer the probability of detection safety statistic

Airport lightning warning statistics 1997-2009 using CG stroke data Warning radius 8 km



## Warning radius statistics

For a given area of protection radius, the larger the warning radius, the better the probability of detection safety statistic

Airport lightning warning statistics 1997-2009 using CG stroke data Radius of area of protection 0.5 km



## **Warning radius statistics**

For a given area of protection radius, the larger the warning radius, the longer the warning durations

Airport lightning warning statistics 1997-2009 using CG stroke data Radius of area of protection 0.5 km



## **Summary**

- Balance between probability of detection (safety) and warning durations (efficiency)
- Small lightning warning radii (<8 km) should only be used when protecting small areas to ensure safety.
  - This means setting up lighning warnings at multiple terminals, maintenance, and refueling areas at large airports.
- The combination of Vaisala's AviCast offering and lightning warning studies help many airports/airlines manage the cloud-to-ground lightning risk

