

Implementation of MLAT/ADS-B Systems

ICAO/FAA Workshop on ADS-B and Multilateration Implementation

Mexico City – September 6, 2011



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Next-Generation Surveillance.
Delivered. Today.

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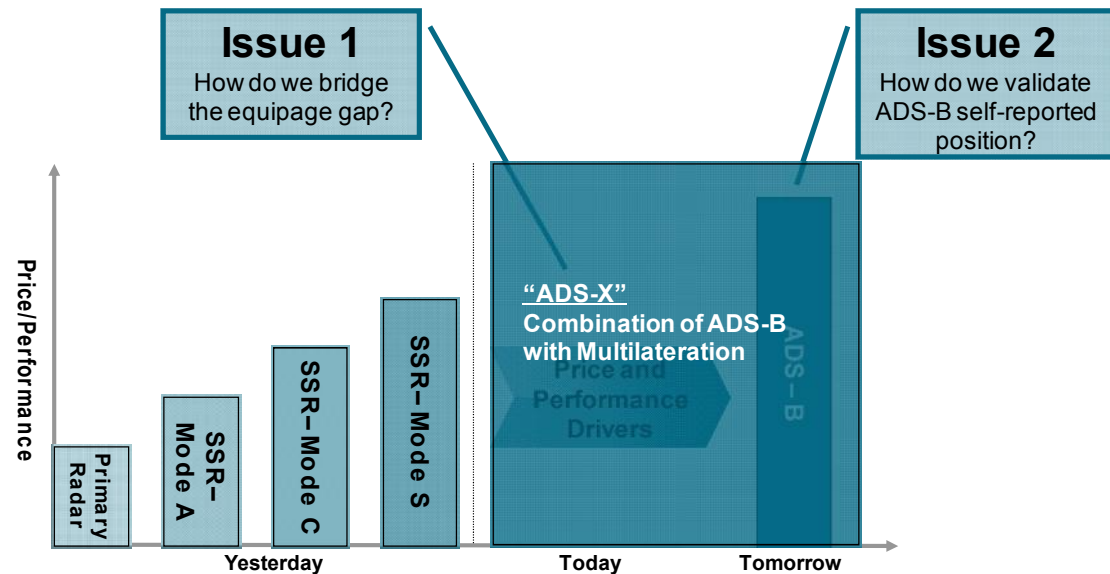


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Proven Multilateration and ADS-B Surveillance Solutions

ADS-B versus Wide Area Multilateration

1. ADS-B Surveillance is gaining a momentum
2. Many leading ANSPs have made strategic decisions to deploy ADS-B
3. However, these deployments are still well ahead of aircraft equipage and this is the main reason why ANSP's should be considering **the accepted migration path through Wide Area Multilateration** either before or simultaneously with any ADS-B surveillance deployment



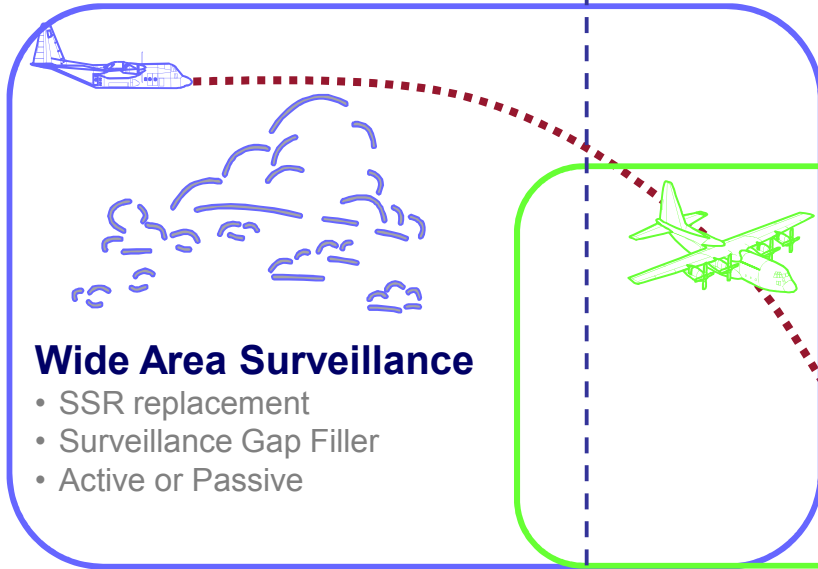
Top5 Reasons for WAM Migration Path

1. **Seamless Integration with current surveillance and ATM systems**
2. **SSR Replacement keeping the same or better performance**
3. **Enhanced Approach Operations such as PRM**
4. **Coverage Gap Filling / Application in Mountains**
5. **ADS-B Augmentation / Integrity Checking**

**MAJOR ANSPS HAVE DEPLOYED WIDE AREA
MULTILATERATION OVER LARGE PORTIONS OF THEIR
AIRSPACE**

Era MSS Surveillance Solutions

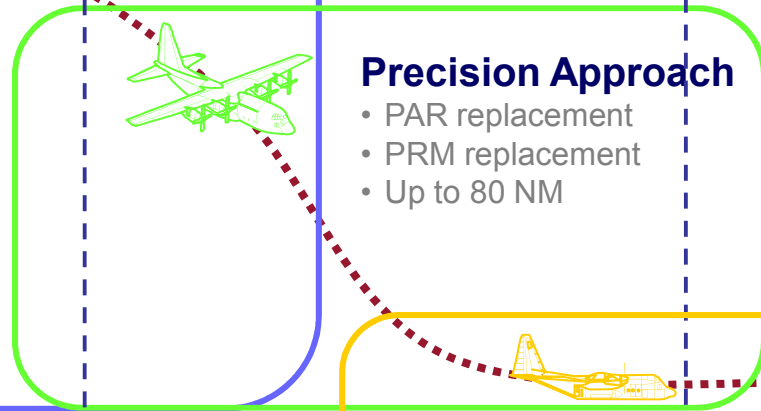
Area Control Center (En-Route Surveillance)



Wide Area Surveillance

- SSR replacement
- Surveillance Gap Filler
- Active or Passive

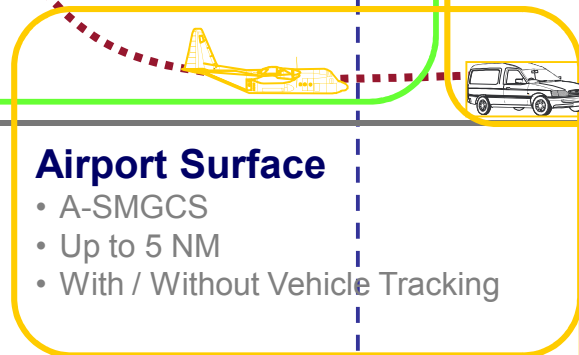
Approach Control (Terminal Manoeuvring Surveillance)



Precision Approach

- PAR replacement
- PRM replacement
- Up to 80 NM

Tower Control / APRON / Gate (Airport Surface Surveillance & Airport Ops)



Airport Surface

- A-SMGCS
- Up to 5 NM
- With / Without Vehicle Tracking

Vehicle Tracking

- SMR complement
- Surface only



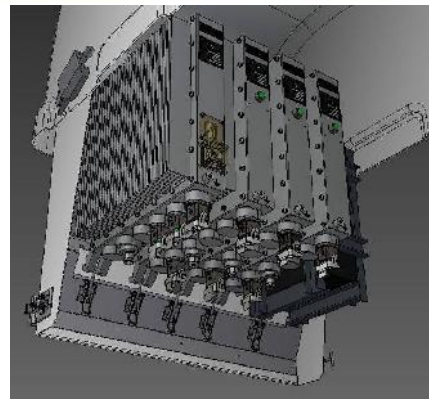
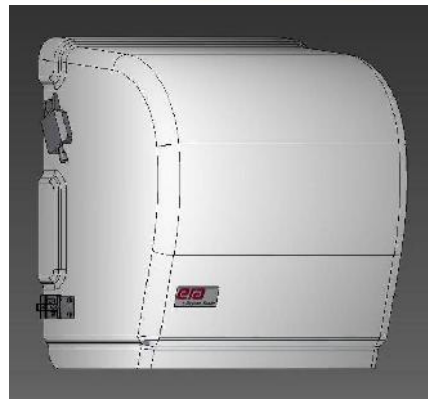
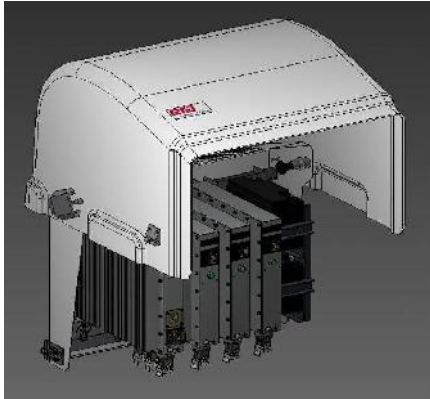
Airport Operations

- Environment Monitoring
- Revenue Maximization
- Operations Optimization
- Specialized Applications

Our Customers – Worldwide Deployment

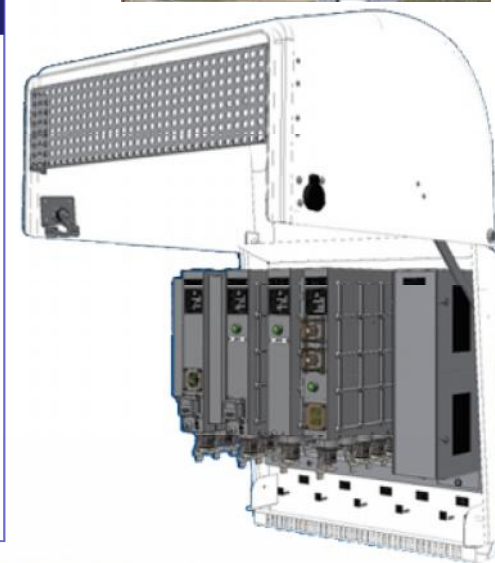


MLAT / ADS-B Ground Stations: Extremely Reliable



Built to IP67 Standards - Rugged

- Lightning strikes
- Gale-force winds
- Torrential rain
- Sand/dust storms
- Heat up to 60° C
- Cold down to -40° C
- Direct force up to 250kg



MLAT WAM systems Implementations



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Proven Multilateration and ADS-B Surveillance Solutions

One Technology Fits Many Applications

- 1. National Wide MLAT/ADS-B system in Namibia**
- 2. WAM MLAT/ADS-B system in Tajikistan**
- 3. Oil Rigs - North Sea low level traffic system**
- 4. TMA and approach surveillance in New Zealand**

Namibia – National Wide Area Multilateration

- **New national ATM system**

- Thales Eurocat fusion and display
- Thales radar in Windhoek
- Era multilateration for national en-route
- ED-142 performance required

- **36 ADS-B/MLAT stations**

- Some very remote, hostile locations
- Builds on regional experience in ATNS
- Covers 800.000km² of airspace, FL >145 and TMA

- **N-1 availability required**

- **Safety Case and operational approval by Austrocontrol, Austria**

- **Ongoing extension program for Walvis Bay and Caprivi strip**

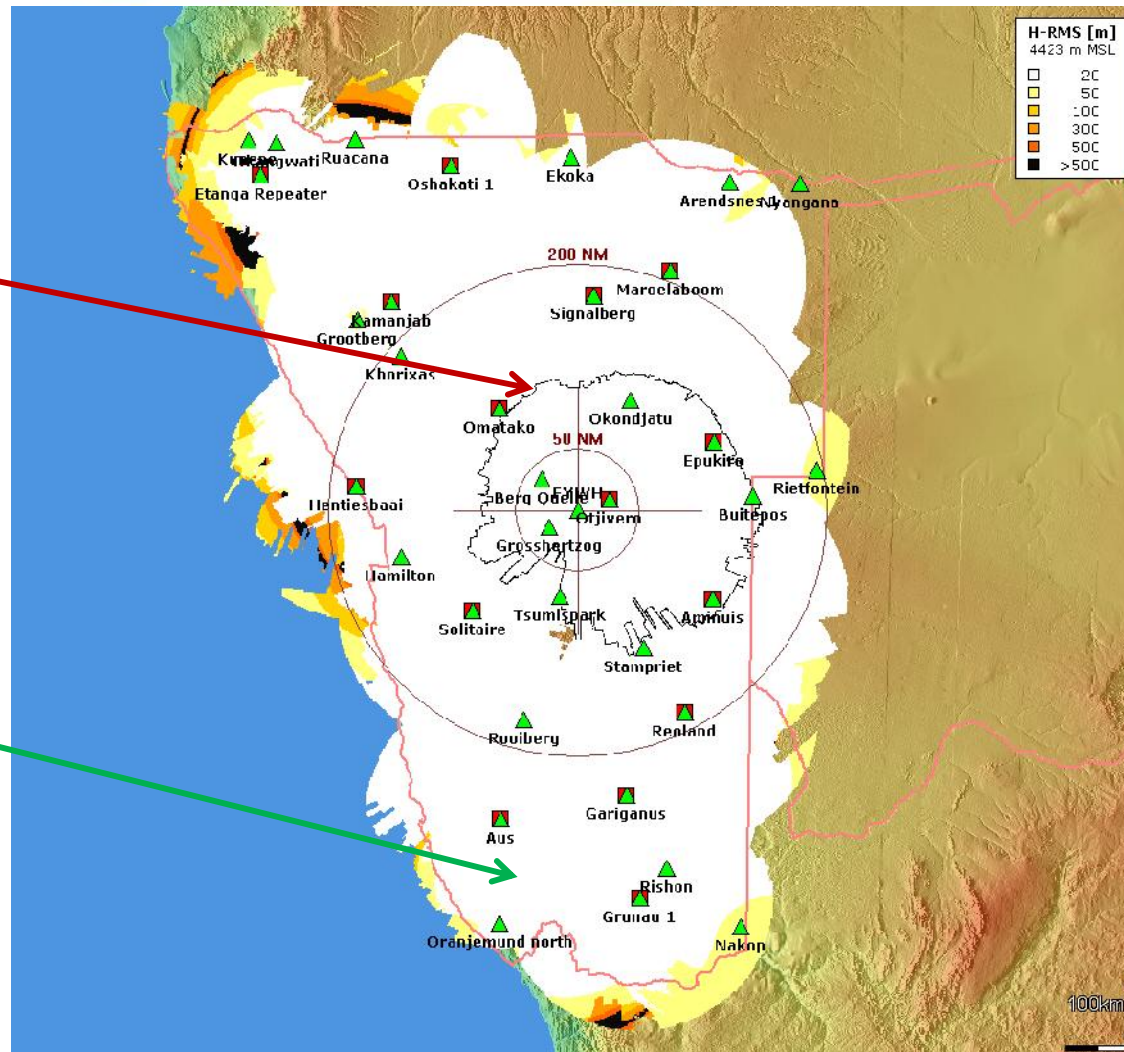
The largest WAM coverage area in the World!



Namibia Wide area multilateration system – MLAT accuracy vs. MSSR at FL 145

**MSSR in
Windhoek
coverage at
FL 145**

**White colour
represents MLAT
coverage with
accuracy of 20m
RMS !!!!**



Namibia Wide area multilateration system – Installation examples



WAM system for Tajikistan

- **Requirements**

- ✈ Reliable detection and processing of signals from Mode A/C/S equipped aircrafts in Northern Tajikistan (120 x 120 NM)
- ✈ Final approach to Khujand
- ✈ MAK Certificate
- ✈ ED-142 Performance

- **System Composition**

- ✈ 8 Ground Stations (5 Receiving Only and 3 Receiving/Transmitting)
- ✈ 1 Central Processing Station in Dushanbe

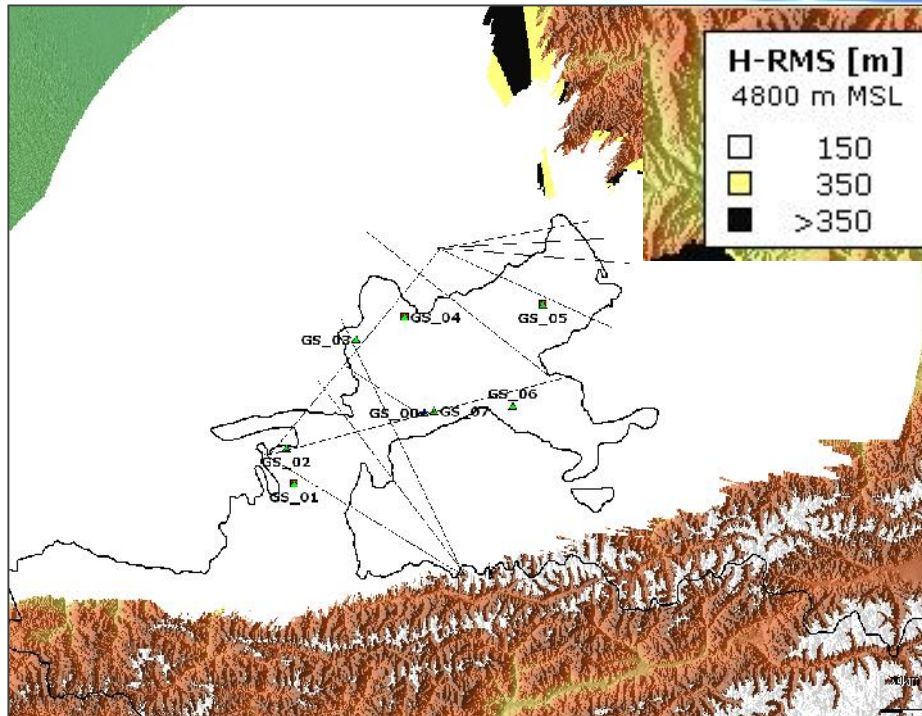
- **Status**

- ✈ Fully operational since May 2011

- **Future Plans**

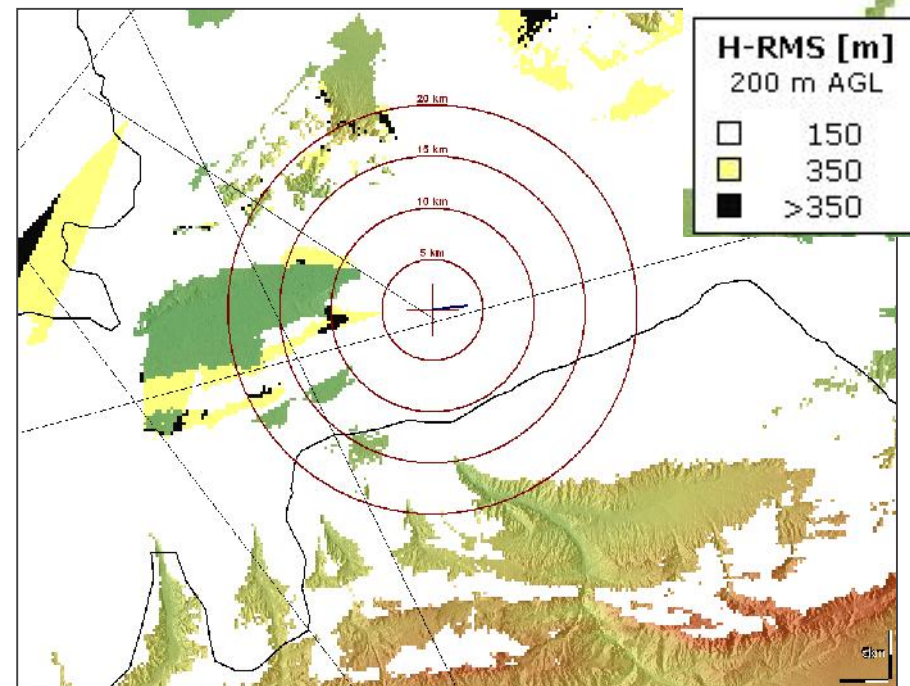
- ✈ Extension to complete the whole country in 2012

WAM system for Tajikistan - Coverage

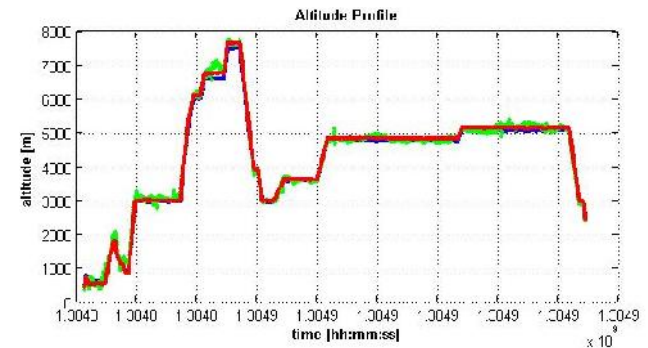
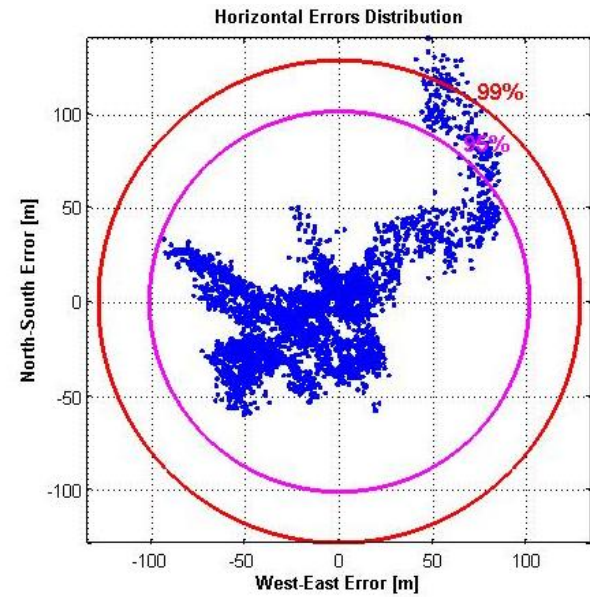
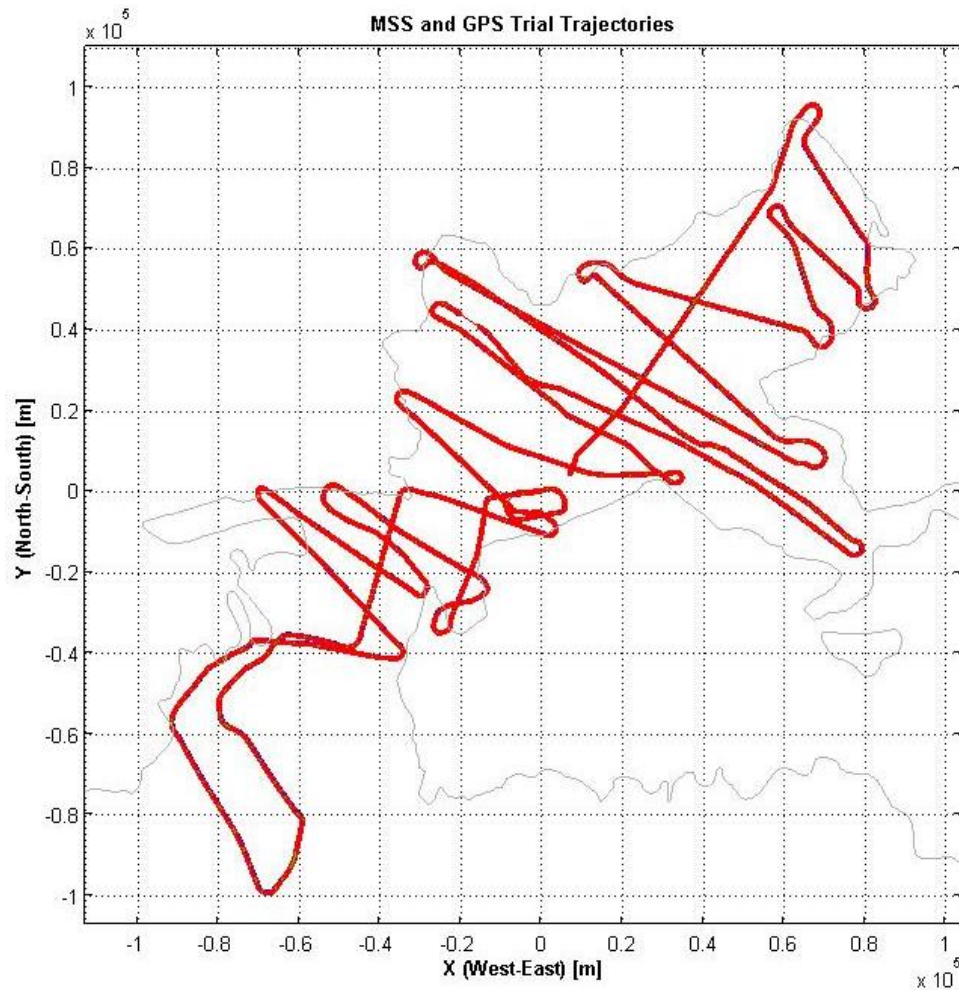


Enroute coverage at FL160

Coverage of the Khujan airport at 200m AGL



WAM system for Tajikistan – Final Results



WAM system for Tajikistan - Installation Examples



North Sea WAM/ADS-B for LVNL

- **Requirements**

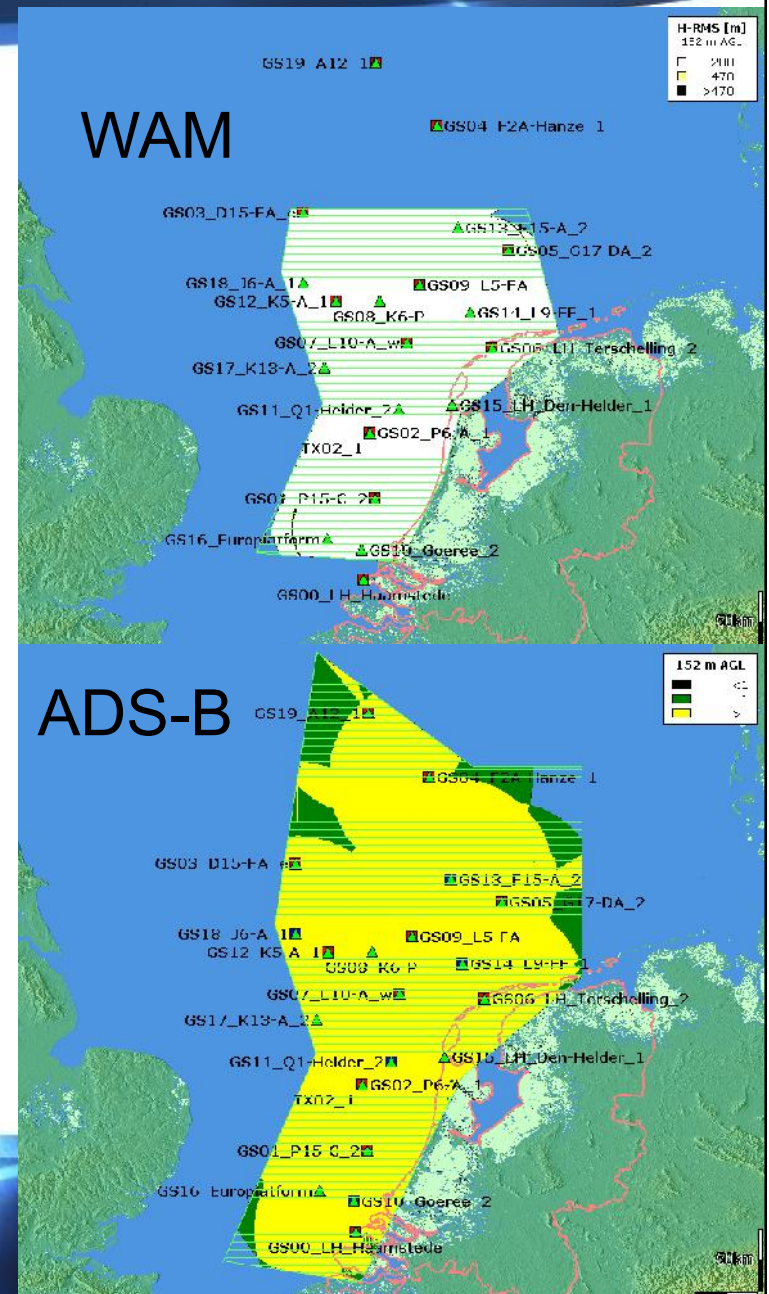
- ✈ Provide surveillance for low level traffic between oilrigs (helicopter traffic)
- ✈ Surveillance of commercial traffic above the North sea
- ✈ Data fused to ARTAS data fusion placed at ACC Amsterdam
- ✈ Requirements according to the ED-142
- ✈ Extreme weather conditions for installation

- **System composition**

- ✈ 19 MLAT/ADS-B Sites

- **Area covered about 350km by 500km**

- **Test bed for EUROCONTROL CASCADE project**



North Sea Wide area multilateration system – for LVNL – Installation examples



Queenstown TMA and Approach WAM/ADS-B

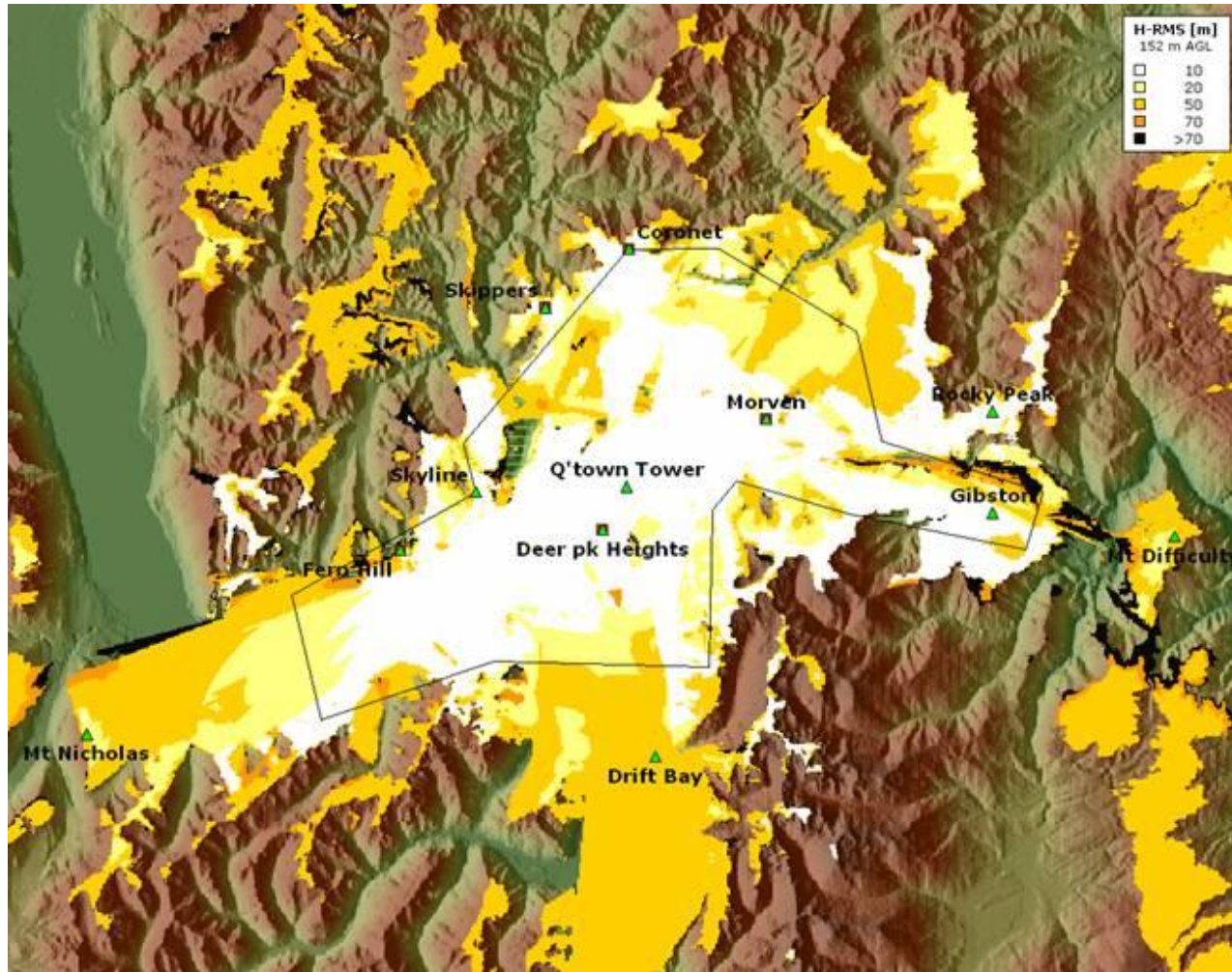
- **Requirements**

- Provide TMA and approach surveillance for Queenstown airport starting from 500ft AGL
- Display system at Queenstown Control Centre.
- MW links used for data communication
- Fused into old Lockheed Martin Skyline Flight data processor (ASTERIX 1 used)
- Extreme weather and terrain conditions for installation

- **System composition**

- 14 MLAT ground stations

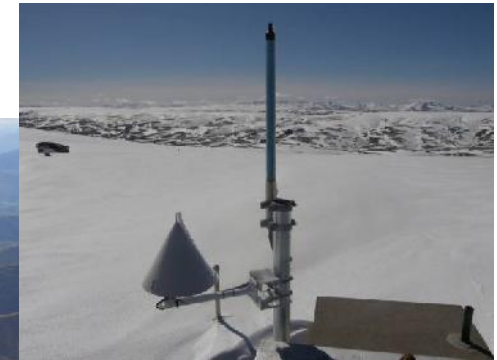
Queenstown Wide area multilateration system – MLAT accuracy at 500 ft AGL



Queenstown Wide area multilateration system – SAT test flight visualisation



Queenstown Wide area multilateration system – Installation examples



Thank You for Your Attention

