



# AeroMACS – A Global Standard for Airport Surface Communications

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# WiMAX Increasingly Used as Solution for Vertical Markets



Smart Grid

Rural Broadband

High Speed Rail

Aviation

Oil & Gas

Mobile Backhaul

# Global Proliferation of IEEE 802.16 Technology Across Vertical Markets

## North America

- Canadian Utilities using WiMAX for Smart Grid Networks, including BC Hydro
- Inmarsat operates WiMAX network in Gulf of Mexico to connect Oil Platforms and Ships
- City of Houston deploys WiMAX Smart Metering Network, expands use to city government
- Marathon Oil using WiMAX for Smart Field Connectivity
- Northern Michigan University connects students, K-12 and emergency services with WiMAX

## CALA

- WiMAX used for connectivity among ships and workers at the Panama Canal
- WiMAX network used to connect teams at the Heineken Regatta
- WiMAX connecting new Smart Cities projects in Brazil

## Europe

- WiMAX used in massive Smart Field deployments in Russian Oil & Gas companies, including Nizhnevartovsk
- WiGRID deployment in UK for Western Power Distribution
- WiMAX used in select Smart Grid networks

## Middle East / Africa

- WiMAX used in Smart Field deployments for Oil fields in Oman
- WiMAX connecting government applications in Afghanistan, Iraq, etc.
- New Deployments in Cote d'Ivoire, Botswana, more
- WiMAX being used to connect banks and ATMs across the continent

## Asia

- UQ Communications connecting 4M+ subscribers
- UQ Communications trials WiMAX Smart Grid for Kyushu Power and Electric – 7 million smart meters
- KDDI – Building 100K Wi-Fi APs on WiMAX
- YTL Communications – First converged Voice and Data operator nationwide, Connect 10K schools nationwide & over 500k subs
- Global Mobile WiMAX connects 3,000 Wi-Fi APs, 800 connected buses across Taipei
- Vee Time uses WiMAX for High Speed Rail in Taiwan
- WiMAX the #2 broadband technology in Pakistan
- Australian Smart Grid deployments, including SP Ausnet WiMAX to the meter
- WiMAX used for Disaster Recovery, Public Safety, High Speed Rail, Power Plant CCTV, and other uses in Taiwan



# WiMAX Forum acts as a focal point for industry interest in WiMAX

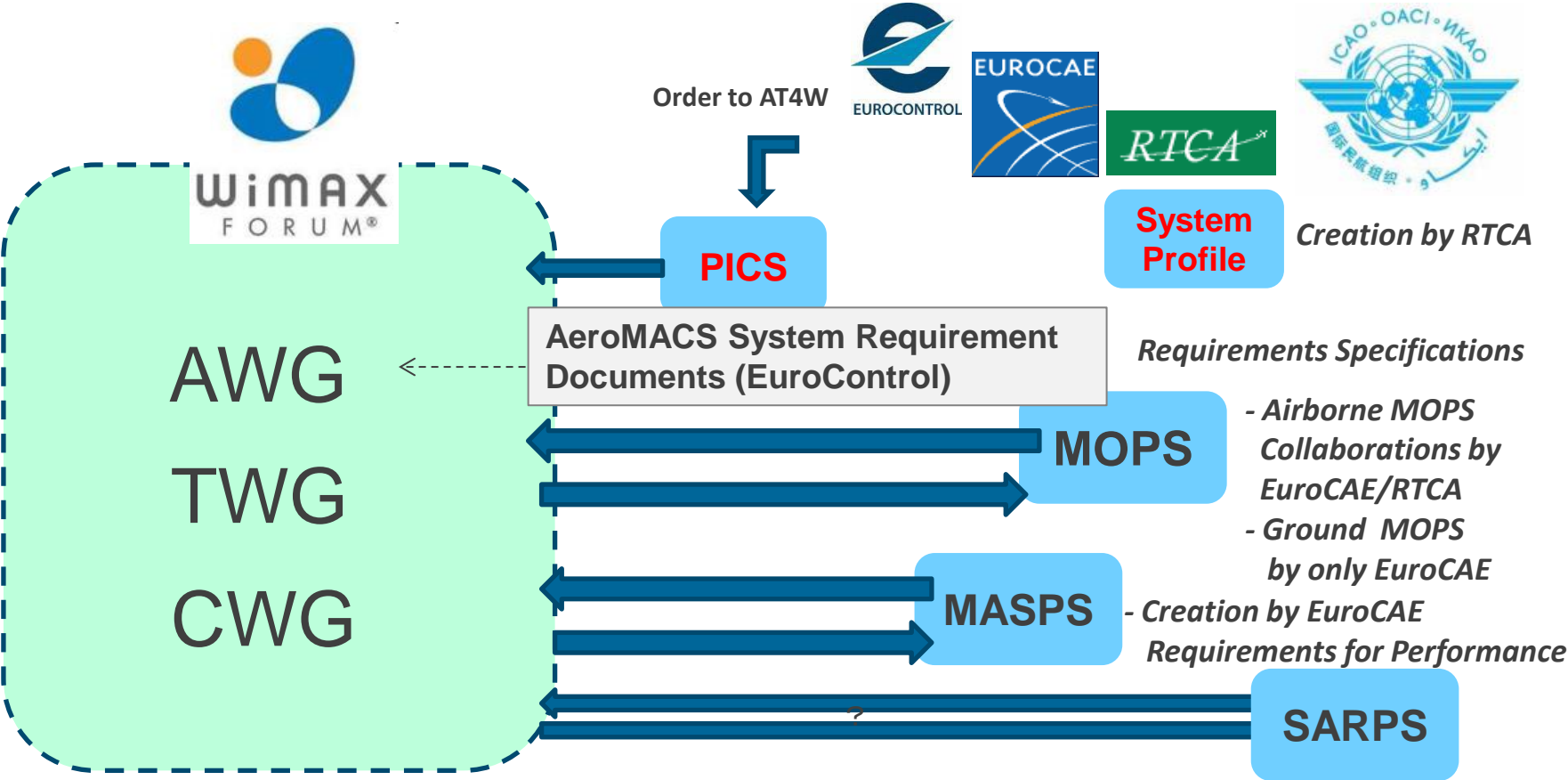


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## WiMAX Forum's Role

- Define requirements and technology profiles that drive network and air interface specifications and certification
- Formal platform for Aviation Industry to collaborate with WiMAX Forum
- Promote WiMAX Technology

# Collaborative Standardization Project

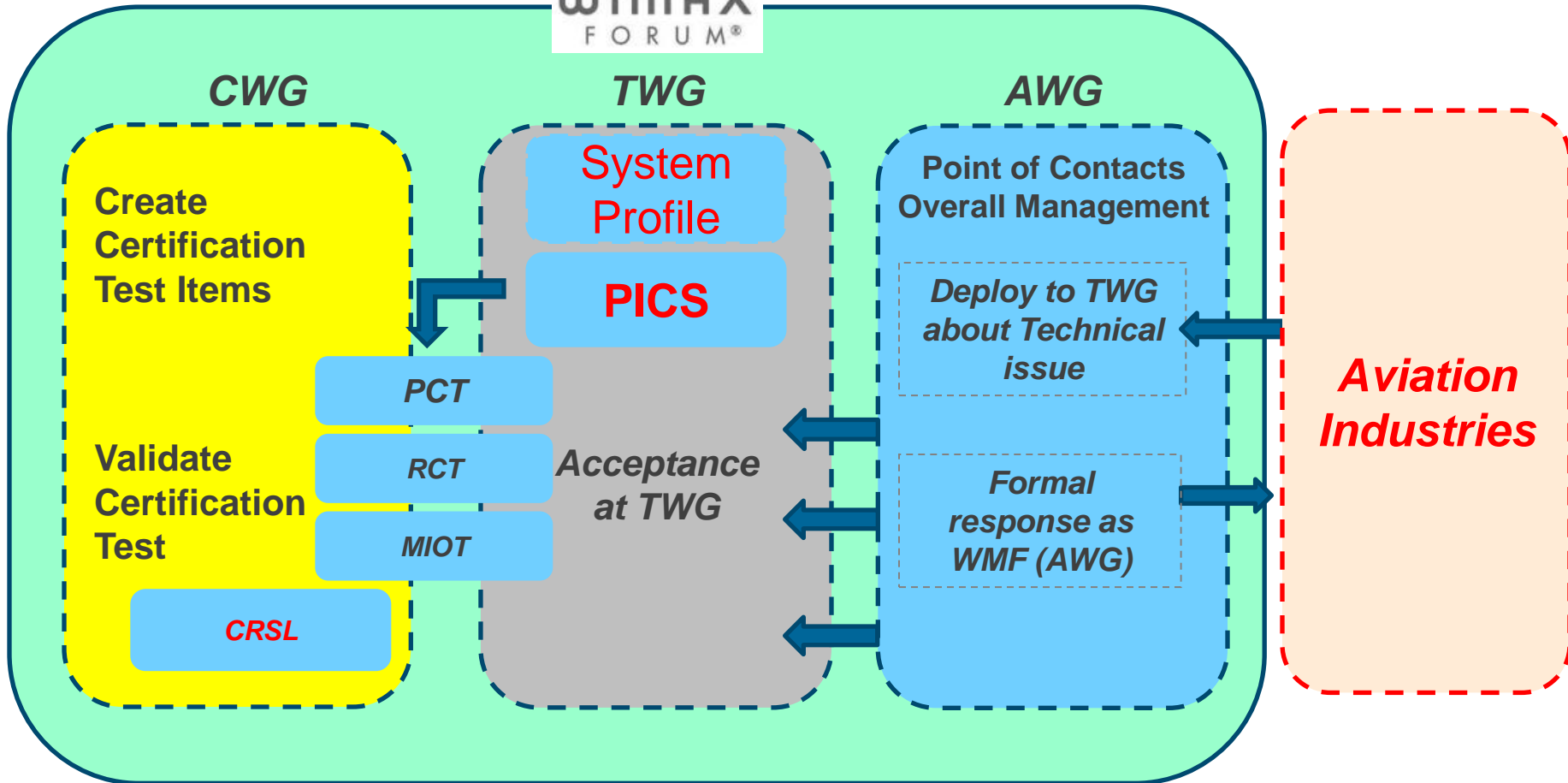


- MOPS = Minimum Operational Performance Specification
- MASPS = Minimum Aviation System Performance Specification
- CRSL = Certification Requirement Status List
- PICS = Protocol Implementation Conformance Statement
- SARPS = Standards and Recommended Practices

# Stewardship of the Standard within WiMAX Forum



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# International Industry Support

	RTCA SC-223	EUROCAE WG-82
ANSPs	FAA	AENA, DSNA, DFS
Industry	HARRIS, ITT-EXELIS, ROCKWELL-COLLINS, HONEYWELL, HITACHI	SELEX, INDRA, AT4WIRELESS, THALES, COBHAM, SAAB
Airframe Manufacturer	BOEING	AIRBUS
International Organisations	EUROCONTROL	EUROCONTROL
Research Institutes	ENRI, MITRE, NASA	DLR

# Standards Development Status

Profile Document	<ul style="list-style-type: none"><li>• Completed and Approved by RTCA PMC Sept 2011.</li><li>• On-going revision to incorporate changes resulting from MOPS Validation – except final release with MOPS in July, 2013.</li></ul>
MOPS	<ul style="list-style-type: none"><li>• Final Draft Completed by RTCA SC-223/EUROCAE WG-82</li><li>• Submitted to RTCA/EUROCAE FRAC April 2013.</li><li>• Final Recommendations and Comments (FRAC) review around the end of June 2013.</li><li>• Program Management Committee (PMC) Approval September 2013.</li></ul>
ICAO SARPS and Technical Manuals	<ul style="list-style-type: none"><li>• Draft SARPS Completed Dec. 2012</li><li>• Final SARPS Scheduled Dec 2013</li><li>• Technical Manual initiated Oct 2013.</li><li>• SARPS/TM Validation at Toulouse AeroMACS Testbed FY13-14.</li></ul>
AEEC Standards Development	<ul style="list-style-type: none"><li>• Airlines Electronic Engineering Committee (AEEC) status pending</li></ul>



# Industry Building Initiative

## Traditional WiMAX Industry



## AeroMACS Industry

## Aviation Industry



# Benefits of Industry Collaboration



- Access to Mature Technology – over a decade in development and service
- COTS Hardware (Broad commercial availability)
- Flexible Standard – already adapted for Smart Grid (WiGRID), Backhaul (P802.16r)
- Certifiable Equipment and Devices
- Ability for industry to develop and achieve global harmonization
- Harmonized 5.1 GHz Spectrum already allocated!

# Why AeroMACS?



Installation



Turnup



Network  
Management

**EASY, FAST AND ECONOMICAL**

Technical Values	Business Values	Certification Values
Broadband : 20Mb/s ~ 75 Mb/s at maximum	No management cost for telephone Number.	Certification program in process
Broad NLoS coverage: 1 ~ 3 km range	Low cost for installation & maintenance	Hardware-based PKI credentialing
Data Oriented Architecture – also supports mobility	Simple mobile station ⇒ Easy airworthiness certificate	Multiple Certification Authorities
Always-on connectivity	Easy IOT due to standardized profile	Revocable and replaceable certificates
Low failure rate (QoS)	No legacy systems	Certificate Hierarchies

# Current AeroMACS Assessments



***Toulouse Airport Network Trial***

- **Cleveland Hopkins Airport** / NASA Glenn Research Center joint project
- **Daytona Airport** – Harris Corporation Trial
- **Melbourne Airport** – Harris Corporation Trial
- **Atlantic City Airport** – FAA Flexible Terminal Sensor Network program prototype network
- Airport Surface Surveillance Capability (ASSC) Program
  - Supported by Sensis Corporation
  - Prototype installed and tested at **Syracuse Hancock International Airport**
  - May 2013 – **SFO Installation**
  - **SFO is 1<sup>st</sup> of 9 sites**
- **Toulouse Airport** – SESAR / Airbus / Indra / EUROCONTROL project

# WiMAX Forum Aviation Summit



Washington, DC – USA

- Tuesday, September 10<sup>th</sup> 2013 in Washington, DC
- Free to Attend
- WiMAX Forum membership not necessary
- Co-located with WiMAX Forum Member Conference
- All-day discussion of *the business* of AeroMACS
- Open to the entire Aviation community
- More information available soon





**Questions?**