Inmarsat Aviation safety services update

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Agenda

➢ Overview

➢ Safety Service portfolio
  - Classic Aero
  - SwiftBroadband

➢ Benefits
  - FANS
  - Flight deck IP

➢ Safety Services Evolution
  - Support of ATN in Oceanic and Continental domains
Safety Service portfolio
Classic Aero
SwiftBroadband
2013 - L-band: significant milestones

More Inmarsat ground earth stations

4th Inmarsat I-4 (Alphasat)

Funding for trials phase for continental safety capability

Next generation Safety Services
Inmarsat L-Band services roadmap

**SB Safety network service available for flight tests**

- **SB-S Network implementation**
- **FANS evaluation**
- **SB Oceanic safety operational service**

- SB-S flight test terminals available
- SB-S FANS approval

**SwiftBroadband** (I-4 network)

**Classic Aero H+** (I-3 and I-4 networks)

**Classic Aero I** (Supported to at least until end 2018)

**Swift 64** (Supported at least until end 2018)

**Classic Aero H** (Closure end 2018)

- H Service Sunset following service provider and airline consultation, closure date has been postponed to end 2018

- GES by GES transition

**I-3 GES harmonization**

**I-3 constellation:**
- To end 2018 (estimated)

**I-4 Constellation Est. end-of-life**

Classic Aero Services
I-3 and I-4 GES network harmonization

- New Classic Aero GES’s being deployed now to support Classic Aero network
- Installed at Perth (Australia) and Burum (Netherlands)

Opportunity to:
- Reorganize technically and commercially
- Realize efficiencies in spectrum and operations
- Harmonize performance monitoring, troubleshooting, service notifications and general fault-finding tools

Benefits:
- Simplifies network and network management - uses same GES hardware and interconnects as on I-4
- Consistent network architecture for improved ICAO GOLD performance monitoring
- New GESs will provide backup to I-4 GESs post I-3 satellite constellation EOL
- Aero-H+ users: Managed migration to Classic Aero I-4 network
End State:
Simplified network access to Classic Aero on I-3 and I-4 constellations
Most modern and capable safety network
The following are no longer supported and are being withdrawn per GES ID as each GES ID supported by a new GES goes live:

- PC Data and fax
- Broadcast data (CN50)
- Secure voice (CN11)

Solutions can be found via Swift64 and SwiftBroadband.
SwiftBroadband Oceanic Safety

Overview

- The **SwiftBroadband Oceanic Safety Programme** enhances Inmarsat’s existing SwiftBroadband service to provide safety services for the future
  - Meeting ICAO GOLD RCP240 requirements for support of 30/30 NM operations
  - Meeting the required high service availability and lower message latency
  - Achieving spectrum and cost efficiencies over Classic Aero

The Inmarsat SwiftBroadband Oceanic Safety implementation programme comprises the following activities:

- Implementation of an ACARS Ground Gateways (AGGWs) at the Inmarsat SASs to carry FANS/ACARS safety messages
- Update to voice and data networks, ensuring priority for safety
- System standardisation (RTCA MASPS, ICAO Manual, ARINC-781, MOPS)
- FANS Evaluation flight trials – activity starting now
SwiftBroadband Safety product overview

The customer will have a range of product options to choose from:

- **SwiftBroadband Safety Services**
  - Achieving GOLD RCP240 Performance

- **HGA**
  - (6 MCU)
  - SB/Classic

- **HGA**
  - (2 or 6 MCU)
  - SB Only

- **IGA**
  - (2 or 6 MCU)
  - SB Only

- **E-LGA**
  - (SB200 2 MCU)
  - SB Only

- All classes support the following services to the aircraft cockpit:
  - 2 channels of voice
  - ACARS data
  - Prioritised IP data (for new flight deck applications)
  - EFB IP data
SwiftBroadband Safety trials timeline

Target high level implementation phases

SwiftBroadband Safety system implementation

- Implementation
- Integration and test
- SB Safety network service available
- FANS evaluation (flight trials and evaluations)
- Airline Installation and testing
- Start evaluation AT airline (SB-S)
- FANS 1/A GOLD SSP/CSP bench tests
- FANS 1/A GOLD Airframe Mfg bench tests
- SB Safety operations

Timescales subject to internal approvals and external dependencies

2012
2013
2014
2015

CWG28 CWG29 CWG30 CWG31 CWG32
Benefits
FANS
Flight Deck IP
Benefits: FANS

- New ATM procedures can radically improve fuel efficiency by enabling “User Preferred Routes” – a cornerstone of both SESAR and NextGen

- FANS provides improved navigation performance and higher surveillance reporting rates to enable lower separation minima

- Recent initiatives ASPIRE and INSPIRE demonstrate fuel savings of $500-1000 per flight

- New operational concepts that will allow improved optimisation in the NAT including cruise climbs

- The agenda is simple – use what we have today to get benefits today.
Global flight routes

Visualisations of the 58,000 flight routes illustrate that 90% of commercial air movements remain in terrestrial CNS coverage and only 1% leave our coverage.

Source: BBC
Benefits: SwiftBroadband Safety

▷ Low cost terminals
  • 2 MCU SDU size with enhanced low gain antenna
  • CAPEX, OPEX savings (airtime and weight + drag)

▷ Flight deck communications
  • Target: reduce ACARS data link message times
  • Support for VoIP

▷ New features
  • New ATS/AOC IP-based applications
  • FDR data download
  • Aircraft position reporting and tracking

▷ Flight deck private network - prioritised IP supporting:
  • EFB IP applications
  • Up to 200, 300, or 400 kbps (per antenna type)
Safety Services evolution
Support of ATN in Oceanic and Continental Domains
Inmarsat has received confirmation of a major funding commitment to validate SwiftBroadband Safety as part of the future European air traffic management infrastructure.

A total of €11.5 million (about US$14.6 million) has been approved at the European Space Agency (ESA) 2012 Ministerial Council, with the UK as main contributor, followed by Norway, Ireland and Portugal. Under the ARTES-10 Iris programme, SwiftBroadband will be upgraded to provide a satellite overlay to terrestrial VHF networks through the SESAR (Single European Sky ATM Research) air traffic control modernisation programme.
Continuous descent approach removes stack holding prior to landing

Analysis for A320 aircraft using CDA at Heathrow shows that it is possible to save up to 300kg of fuel per approach*

* Source: Helios

Cruise climb uses automated exchanges between aircraft and ground systems to enable a gradual climb as the weight of the aircraft decreases

Aircraft flying higher flight levels can benefit from lower fuel consumption, less drag and better engine efficiency
Inmarsat Aviation Safety Services
The bedrock of our reputation and reliability

➢ Inmarsat fully committed to safety services
➢ Unmatched portfolio of safety services
➢ Investing to enhance service availability, improve performance and add prioritised IP capability
➢ Driving customer benefits
Thank you
Connectivity in Paradise

Airline Spotlight: Hawaiian Airlines

EFB Applications driving broadband connectivity into the flight deck
Hawaiian Airlines routes: SBB cockpit and cabin

*Illustrative purposes only: Approximate overlay of satellite coverage

ETOPS 180 mins range
SwiftBroadband-Safety trials

- **ACARS**: FANS1/A
  - Validating network, Low costs avionics and VHF-like data performance

- **IP Data**: Electronic Flight Bag connectivity
  - Weight Savings
  - Electronic Manuals
  - Live applications for weather and other opportunities
    - Graphical weather
    - Winds aloft
Profile: Hawaiian Airlines EFB Apps

Mark Spence: Head of Aircraft Dispatch