Flight Tracking: 
Leveraging Existing Technologies and MRO Impact

Len Wicks
Regional Officer Air Traffic Management, 
ICAO Asia/Pacific Regional Office (Bangkok)

Singapore, 4 November 2015
Topics

• Background
• Brief concept description
• Description of provisions
• Next Steps
Vulnerability
Timely identification and location of aircraft in distress
Availability and sharing of valuable information
Effective and regularly trained procedures

Know where aircraft fly
Know when aircraft are in distress
Enhance ability to rescue
Enhance ability to recover
The GAP

Different levels of
- Automation
- Information sharing
- Surveillance
- Training

Alerting and SAR needs
- Instant and accurate information
- Instant cooperation
- Instant action
- Global

Need for a harmonised, consistent system

Maritime example:
- GMDSS: Global Maritime Distress and Safety System;
- LRIT: Long Range Identification and Tracking
Global Aircraft Tracking

March, 2014  Malaysia Airlines Flight MH370 disappeared and remains missing

12-13 May 2014  Multi-disciplinary meeting with States, Industry, Chairs and co-chairs of several panels, and related specialists

Attendees: 207 participants from
  – 44 Member States
  – 19 International Organizations
  – 5 Industry representatives
  – 8 Panel chairs

Outcomes:
  – Consensus that aviation’s near-term priority is to track airline flights, no matter the location or destination
  – Industry to initiate global tracking on a voluntary basis, and establish an Aircraft Tracking Task Force (ATTF) to provide recommendations on best practices
  – 6 Conclusions, 10 Recommendations
Global Aeronautical Distress & Safety System

- Normal Aircraft Tracking
- Abnormal Operations
- Autonomous Distress Tracking
- Retrieval of CVR and FDR Data

- Normal Aircraft Tracking Operations
- AN 11/1.1.29-15/12

- Operator
- ATS/RCC
- SWIM

4 November 2015
EMERGENCY PHASE

Elapsed Time from Incident: 89 min

NO TRACKING

60 minute ATC reporting environment
AOC tries to establish contact

Elapsed Time from Incident: 44 min
Elapsed Time from Incident: 89 min

CURRENT

EMERGENCY PHASE

GADSS CONCEPT

RESCUE COORDINATION CENTER
SARPs Development

Performance-based Standards and Recommended Practices (SARPs) for normal flight tracking

- Initial proposal for industry to voluntarily implement
- Proposed SARPs based on ATTF and GADSS
- Normal Aircraft Tracking Implementation Initiative (NATII)
  - Recommendations for the proposed SARPs
  - Recommendations for complementary SARPs
- ANC took into consideration NATII Recommendations

Timelines

- **January 2015**
  - Preliminary review by ICAO ANC

- **February 2015**
  - HLSC 2015
  - Expedite provisions
  - NATII

- **NATII**
  - Australia ADS-C Trial
  - Com & A/C Tracking SP Workshop
  - Table top Excercise

- **October 2015**
  - Updated SARPs
NATII Trials

- The trial was held in the Asia/Pacific Region
  - Chosen as a representative area
- The implementation initiative was conducted in a multi-national context
  - Led by ICAO with support from States and industry stakeholders
  - NATII steering committee established
  - Over 30 telecoms and 1 meeting over the summer
- The implementation initiative helped craft the SARPs proposal
Started with 10 minute reports (two airlines)

Ended with Australian FIRs using 14 minute reports (to also enable the use of 30NM separation)

New Zealand, Oakland and Anchorage Oceanic FIRs have since implemented the same reports

No observed stress on the system
Table Top Exercise

Legend
- Great Circle Route
- Airports
- FIRS
  - VHF Stations
- VHF Stations Coverage Buffer
- VHF Stations Coverage Fill
- Radar Coverage
- Primary PSR Coverage
- Secondary SSR radar coverage

Source: ICAO, FAA, Other Participating ANSPs,
Normal Aircraft Tracking

“A process, established by the operator that maintains and updates at standardised intervals a ground based record of the four dimensional position of individual aircraft in flight”

The United States noted the report from the Normal Aircraft Tracking Working Group (NATII WG) was made available to the Air Navigation Commission this week.

In the report the United States asked the SARP be delayed 3 years and is concerned if a state begins implementation prematurely they may have to do significant rework later (APANPIRG/26, September 2015).
Normal Aircraft Tracking

Normal Aircraft Tracking SARP

3.3.1 The operator shall establish an aircraft tracking capability to track aeroplanes throughout its area of operations.

3.3.2 Recommendation.— *The operator should track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the inflight operation(s) under the following conditions:*

   *a) the aeroplane has a maximum certificated take-off mass of over 27 000 kg and a seating capacity greater than 19; and*

   *b) where an ATS unit obtains aeroplane position information at greater than 15 minute intervals.*
Normal Aircraft Tracking

Normal Aircraft Tracking SARP

3.3.3 The operator shall track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the inflight operation(s) that is planned in an oceanic area(s) under the following conditions:

a) the aeroplane has a maximum certificated take-off mass of over 45 500 kg and a seating capacity greater than 19; and

b) where an ATS unit obtains aeroplane position information at greater than 15 minute intervals.

3.3.4 The operator shall establish procedures, approved by the State of the Operator, for the retention of aircraft tracking data to assist SAR in determining the last known position of the aircraft.
Normal Aircraft Tracking

- Where doesn’t ATC provide an equivalent tracking service?
Normal Aircraft Tracking

Space-based ADS-B

And the news gets better...

- Global, continuous, low-latency, and high performance surveillance of aircraft via Space-Based ADS-B (Automatic Dependent Surveillance Broadcast) is a new technology.

- The Iridium-NEXT Low Earth Orbit (LEO) satellites will begin launching in the next few months with all 66 operational satellites in their mission orbit by the end of 2017, gradually replacing the current Iridium satellite constellation and enabling global ADS-B surveillance services.
Normal Aircraft Tracking

Space-based ADS-B

• Instead of HF or ADS-C reports on aircraft every 15 minutes for suitably equipped oceanic flights, the Aireon ADS-B service on Iridium NEXT satellites will be capable of supporting continuously global, near real-time surveillance for with an 8 second update interval (UI) greater than or equal to 95% over much of global airspace.

• Precise real-time global position data archival and reporting capabilities will enable a reduction in ATC separation standards and the detection of radar emergency transponder codes in 70% of the Earth’s surface where they are currently undetected, providing a global flight tracking capability and improving SAR response times.
Normal Aircraft Tracking

- ATC notification of operator missed aircraft report
Normal Tracking SARPs (Summary)

Performance-based Standards and recommended practices for normal flight tracking

- No change to ATC procedures
- Not technology-specific
- Establish operator responsibility to track
- Recommendation to track where ATC gets position information at more than every 15 min
- Standard to track in oceanic areas where ATC gets position information at more than every 15 min (Rec. for remote areas)
- Data retention for last aircraft location purposes

Timelines

- **January 2015**
  - Preliminary review by ICAO ANC

- **March 2015**
  - State Letter

- **October 2015**
  - Review of feedback
  - Updated SARPs

- **November 2015**
  - Council expected to adopt

- **November 2018**
  - Expected applicability
Next Steps

• Develop complimentary Provisions addressing:
  – Guidance material (circular & manual)
  – Minimum Equipment List (MEL)
  – Polar areas

• Establish procedures for information sharing
  – ATSU coverage & contact information
  – Operator contact information

• Share experience
Aviation is safe because it has the culture to learn and react

http://www.icao.int/safety/globaltracking