Avitech Presentation to

International Civil Aviation Organization

AIR TRAFFIC MESSAGE HANDLING SERVICE (AMHS) IMPLEMENTATION PLANNING WORKSHOP

Bangkok, Thailand, 27 – 28 January 2010
Avitech AG
Bahnhofplatz 1 / POBox 1430
D-88044 Friedrichshafen
Germany
Phone: +49-7541-282-354
Fax: +49-7541-282-199
E-mail: Norman.Nunn@avitech-ag.com
Web: www.Avitech-ag.com
Avitech History

Origin: ATC business of AEG Telefunken (1963)
Consolidation ATC business Deutsch Aerospace (1991)
Joint Venture  Nortel and Dasa (1995)
Joint venture Nortel Dasa & Frequentis Nachrichtentechnik (1998)
Take-over of 20 % by Avitech GmbH Management  (2000)
Rename  2002: Avitech AG – Ownership restructure

Turnover 2003: €4.1m
Turnover 2006: €6.5m
Turnover 2007: €6.7m
Turnover 2008: €9.4 m
Turnover 2009  €10.1m
New Ownership 2010
An Aviation Product and Systems Company

- **Data Communication Systems**
  - Message Handling Systems – MHS and AFTN/CIDIN AMHS Gateways
  - Turnkey ATC - Network Infrastructure – Countrywide Communication Networks
  - AFTN PC and AMHS UA User Terminals
  - ATN X400 and X500 switching systems - ATN Directory Services

- **Air Traffic Management Systems**
  - Tower Information & Integration Systems - TIMS
  - Turnkey ATM and Tower Solutions
  - ATIS, Tower Communications.

- **Aeronautical Information Services Systems - AIS**
  - Aeronautical Static and Dynamic Database (AIXM) - Web Access
  - Automated NOTAM & OPMET Database
  - Integrated METEROLOGICAL Briefing
  - Flight Plan Database (ICAO, Eurocontrol)
  - Automated AIP and Chart Preparation/Conversion/Publishing
  - Common AIS/AFTN/AMHS User Terminals – AviTerm

- **Service, Maintenance, Training, Design and Consultancy, Data Migration**
Air Traffic Management Systems Group

- Integrated Controller Displays
- Tower Networking
- Airport Weather Information
- Automatic Terminal Information Service (ATIS)
- NOTAM, OPMET, maps, airfield conditions, ...
- Charts and Procedures
- AWOS
- Electronic Flight Strip Systems
- Stand Management
Aeronautical Information Management Group

AIM - Aeronautical Information Management Systems

- Automated NOTAM Database
- FPL Database ICAO/IFPS/CFMU/TACT
- Interface to EAD (AIXM 3.3 & 4.5)
- Integrated Briefing – Met FPL Notam PD
- eAIP - AIP Publications
- eMAP - Chart Production
- eTOD – Obstacle Database
- eSDO - Integrated Aeronautical Static DB
- eFLIP - NATO Publications
- Mission Planning & ASM
- ICAO AICM Database (V4.5 ++) (V5.1)
Based on latest ICAO SARPS standards
- AFTN-CIDIN-AMHS Switches & Gateways
- Integrated User Terminals with AFTN and/or AMHS P3/P7 protocol
- AMHS and Directory User Agents
- ATN /ISP Router Integration
- Turnkey Aeronautical Communication Systems
- ATN National Networking infrastructure design
- Seamless Transition Consultancy from AFTN
Avitech’s MHS products/services compliance

Regulatory provisions

- ICAO ANNEX 10
  - Volume II Communication Procedures …
  - Volume III Communication Systems

Technical Specification (SARPs)

- ICAO Doc 9705- AN/956
  - Edition 2: 1999
  - Edition 3: 2002
  - Edition 4: draft

- ICAO Doc 9880 – AN/466
  - “advanced unedited”: 01/2009

Guidance Material

- ICAO Doc 9739 - AN/961 (CAMAL)
  - Edition 1: 2000
  - Edition 2: ---

- ATN: Vol. III, Part I, Chapter 3

- AMHS: Doc 9880, Part II B
  - AFTN/AMHS Gateway: Chap. 4

- AMHS: Part III, Section 6

© 2010 Avitech AG
Page 9
Avitech’s MHS products/services compliance

EUR Documents

  - Appx. A: Abbreviations, Glossary and Definitions
  - Appx. B: European ATS Messaging Service Profile
  - Appx. C: AMHS Testing Requirements
  - Appx. D: AMHS Conformance Tests
  - Appx. E: AMHS Interoperability Tests
  - Appx. F: AMHS Pre-Operational Tests


- ICAO EUR Doc 022 - AFS Security Guidelines

AMHS Conformance Test Statement

The following AMHS Implementation Under Test (IUT) has been subjected to the AMHS Conformance Tests:

FSInfoSysBw Reference System
Amt für Flugsicherung der Bundeswehr (AFSBw)
Bundeswehr Air Traffic Services Office (BATSO)
(The system specification of the IUT is detailed at the following page.)

All Conformance Test cases for the Basic ATS Message Service as described in ICAO EUR Doc 020 - EUR AMHS Manual, Version 3.0, Appendix D have been performed with the AMHS Test Suite at

Friedrichshafen (Germany), 29th and 30th of April, 2008

The AMHS Implementation Under Test (IUT) has not been shown by conformance testing to be non-conformant to the specified AMHS SARPs (ICAO Manual of Provisions for the ATN, Doc 9705, Third Edition 2002, including the respective PDR listed in the Test Report) except for the following test cases: CTA11, C7T04, C7T05 and C7T06.

Based on the test results we confirm that no observations which would prevent from interoperability with other AMHS X.400 (1988) implementations have been made.

RECOMMENDATIONS
Based on the analysis of the test results and the analysis of the supplier the following recommendations are made:

Markdorf (Germany), 06th of May, 2008

Rainer Hoffmann (AC-B GmbH)

This AMHS Conformance Test Statement shall not be reproduced except in full without the written permission of the tester (AC-B GmbH) and shall not be quoted out of context.
AMHS Interoperability Test Statement

AMHS Interoperability Tests were carried out on 3rd of August 2009 between the following AMHS Implementations Under Test (IUTs):

Integrated AMHS/AFTN/CIDIN Test Switch
Austro Control COM Centre
Vienna, Austria
Supplier: Thales Air Systems S.A.

and

Integrated AFTN/AMHS Test System
HungaroControl COM Centre
Budapest, Hungary
Supplier: Avitech AG

All test procedures as described in ICAO EUR Doc 020 - EUR AMHS Manual, Version 4.0 dated 02/04/06, Appendix E - except for the optional trilateral test procedures - were performed without any failure or any need for re-test. A detailed Test Report is provided in the document AMHS_INTEROP_RPT_HU-AT_001.

Based on the test results we conclude that the implementations in Vienna and Budapest are interoperable.

Thales & Avitech AMHS
Fully documented test results

ICAO Eur Doc 020 – AMHS Manual Version 4.0 Appendix E
completed 3rd August 2009
No Trilateral Procedures
Full detailed tests completed.
No retest of any function required
Interoperability successfully concluded
Thales & Avitech AMHS
Fully documented test results
Roadmap for AMHS Testing in EUR

During or after SAT: AMHS Conformance Tests
- according to EUR AMHS Manual, Appx. F
- perform once (per release)
- preferably with test system
- success decides about feasibility of Interoperability Tests

After successful Conformance Tests: AMHS Interoperability Tests
- according to EUR AMHS Manual, Appx. E
- perform with each partner
- preferably with test system
- Success decides about feasibility of Pre-operational tests

After successful Interoperability Tests: AMHS Pre-operational Tests
- according to EUR AMHS Manual, Appx. F
- perform with each partner
- with operational systems
- migration to operational use of the AMHS link at the end of successful Pre-operational tests
Germany – AFS Coms network BwB

German Federal Armed Forces
(Air Force, Army, Navy)

- 30 Airbases
- Integrated AIM MHS terminals
- System Command Centre
- MIL NOTAM-Office
- Flight Planning
- Pilot Briefing
- eAIP, eMAP, eSDO, eODB, eFLIP
- AFTN/AMHS/CIDIN Switch
- COM System to other NATO countries
- COM System to DFS
- First AMHS network world-wide
- In operation since 1998

Frankfurt
CIDIN: Common ICAO Data Interchange Network
DIR: Directory Server
MTA: Message Transfer Agent
MTCU: Message Transfer & Communication Unit (Access Unit)
MTS: Message Transfer System

Germany – AFS– AMHS

Other Networks/Communication Partners

CIDIN
US Army/Germany

CIV COM Centre Frankfurt/Germany

MIL MET COM Centre/Germany

German Armed Forces Managed

MTS
31 MTAs

DIR
MTA
MTCU

MTA
MTCU

AFTN

AFTN

At least 2 WPS at each airbase

30 Airbases/Germany

89 other MIL AFTN Users (TCP/IP)
KAC Korea

Korean CAA

- International AFTN/AMHS message switch
- AFTN/AMHS Gateway (ICAO SARPs compliance)
- First nation-wide AMHS network with fully ICAO SARPs compliance Integrated UA and AFTN terminals
- Meets High National Security Standards
- Off-the-Shelf Hardware, Standard Software and System-Software components to replace AFTN switch
- Implementation without operational disruption
- High Availability dual HP Unix configuration with additional server for development, maintenance and testing
- Technology Transfer Program
- In operation since 2002
Hungary - Budapest COM Centre LHBP

- AMHS/AFTN ICAO COM Center
- 5 International connections
- 80 (existing) national AFTN users (asynch.)
- 4 (existing) ITA-2 (UDC)
- 50 (new) AFTN Stations (TCP/IP)
- 50 (new) AviSuite User Agents
- Stand alone P3
- https to support roaming users
- 4 Monitoring and Control Positions (MCP)
- In operation since 01-Dec-2009
AMHS/AFTN ICAO COM Centre
4 International connections
52 (existing) national AFTN users
20 (existing) ITA-2 (UDC)
40 (new) AFTN Stations (TCP/IP)
4 (new) AMHS UA
3 MCP
TCP/IP router network for new national COM backbone (12 routers)
AMHS Interoperability Tests with neighbours t.b.d.
In operation since 14-Nov-2008
Jordan – Amman COM Centre OJAM

- AMHS/AFTN ICAO COM Centre Amman
- 4 International connections
- ca. 30 (existing) national AFTN users (asynch.)
- 32 (new) AFTN Stations (TCP/IP)
- 32 (new) AMHS User Agents
- 4 Monitoring and Control Positions
- In operation since 05-Dec-2008
- Ready for Interoperability Tests with neighbour COM Centres
Turkey - Ankara COM Centre LTAC

- AMHS/AFTN/CIDIN Centre in Ankara Esenboga
- Directory Server in Ankara Esenboga
- Flight Plan Database in Ankara Esenboga
- Electronic Flight Strip Display at Adana Airport and Gaziantep Airport
- ca. 250 AFTN Subscribers
- ca. AMHS User Agents
- CIDIN Connections to Athens, Rome, Sofia
- AFTN Connections to Bahrain, Tehran, Ercan (Cyprus)
- In operation since August 2009
- Ready for AMHS Interoperability Tests
Avitech are a systems solutions company using all MHS technologies for complex requirements.

Avitech offer common user terminals for AMHS AFTN and AIS functionality.

Avitech deliver systems that are ready for pre operational testing with neighbours.

All systems conform to ICAO requirements and have been tested to comply in accordance with those requirements and have no interoperability issues with other compliant solutions.

This has been proven conclusively by successful interoperability testing that has already taken place.