Implementation of ATN and AMHS Service between Hong Kong and Macao, China

(Presented by Hong Kong, China)

Sharing of AMHS Implementation Experience of Hong Kong and Macao, China

- Introduction
- Preparation and Arrangements
- Planned ATN/AMHS trials and implementation in 2010

Introduction

- Hong Kong AMHS system commissioned in July 2009
- AMHS conformance test satisfactorily conducted during system acceptance
- ATN/AMHS interoperability tests and pre-operational trial conducted between Hong Kong and Macao, China in Oct and Dec 2009
- HKG-Macao ATN and AMHS service commenced on 29 Dec 2009, with stable and much faster operation
- The HKG-Macao AFTN circuit is retained for 3 months as fallback

Preparation and Arrangements

- AMHS Conformance Tests
- Coordination
- ATN Router Connection Test and AMHS Interoperability Test
- Cutover and Fallback Planning
- Safety and Risk Assessment
- Pre-operational Trial
- Training

AMHS Conformance Tests

- Separately conducted during system acceptance by Hong Kong and Macao
- To ensure AMHS systems are compatible to ICAO standards
- Test conducted in accordance with the test procedures of Annex B of the APAC AMHS Manual
- Special test tools provided by supplier to simulate normal and erroneous message communication to verify proper handling by AMHS
- Save significant time and effort in interoperability tests and implementation, and avoid ah hoc problems after system in operation

Coordination

- Two meetings held between Hong Kong CAD and Macao CAA/ Airport in Q4 of 2009
- 1st meeting to agree on system configuration, arrangements, plans, procedures and coordination for system testing, cutover and fallback
- 2nd meeting held 3 weeks prior to cutover to review the preparation status and readiness of both parties.

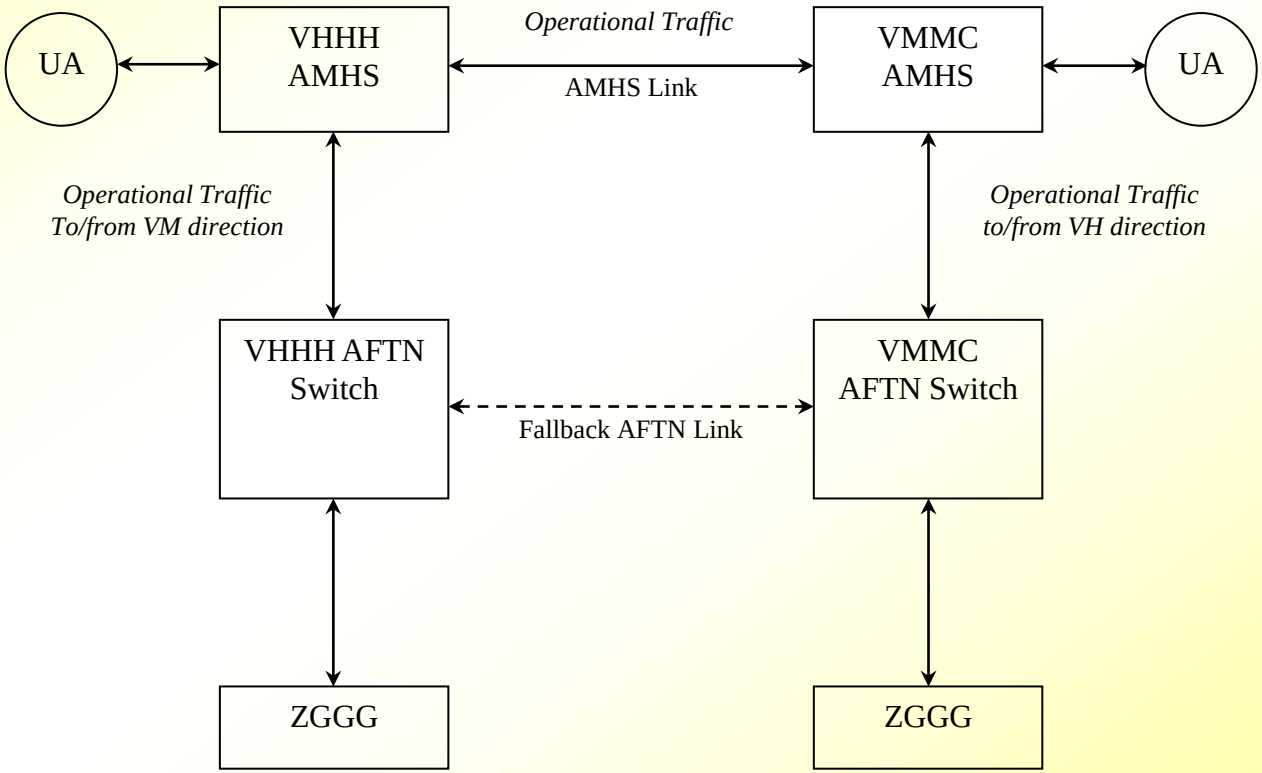
ATN Router Connection Test and AMHS Interoperability Test

- ATN router connection test to ensure no inter-compatibility issues
- Conducted in accordance with Annex C of the APAC AMHS Manual
- AMHS interoperability test to ensure that AMHS systems at both sides can interoperate over the ATN
- Conducted in accordance with Annex E of the APAC AMHS Manual
- The tests can be conducted using VPN over Internet to provide flexibility and save cost as compared to using leased line

Cutover and fallback planning

- Cutover and fallback procedures devised in advance and agreed through the coordination meetings and email exchange
- To ensure a fast and orderly cutover to AMHS service, including temporary message diversion to another comm centre (GZH)
- Fast fallback to AFTN operation on critical problem
- Smooth cutover completed within 11 minutes
- Existing AFTN circuit is retained for 3 months as fallback

System Configuration for Cutover/Fallback Arrangement



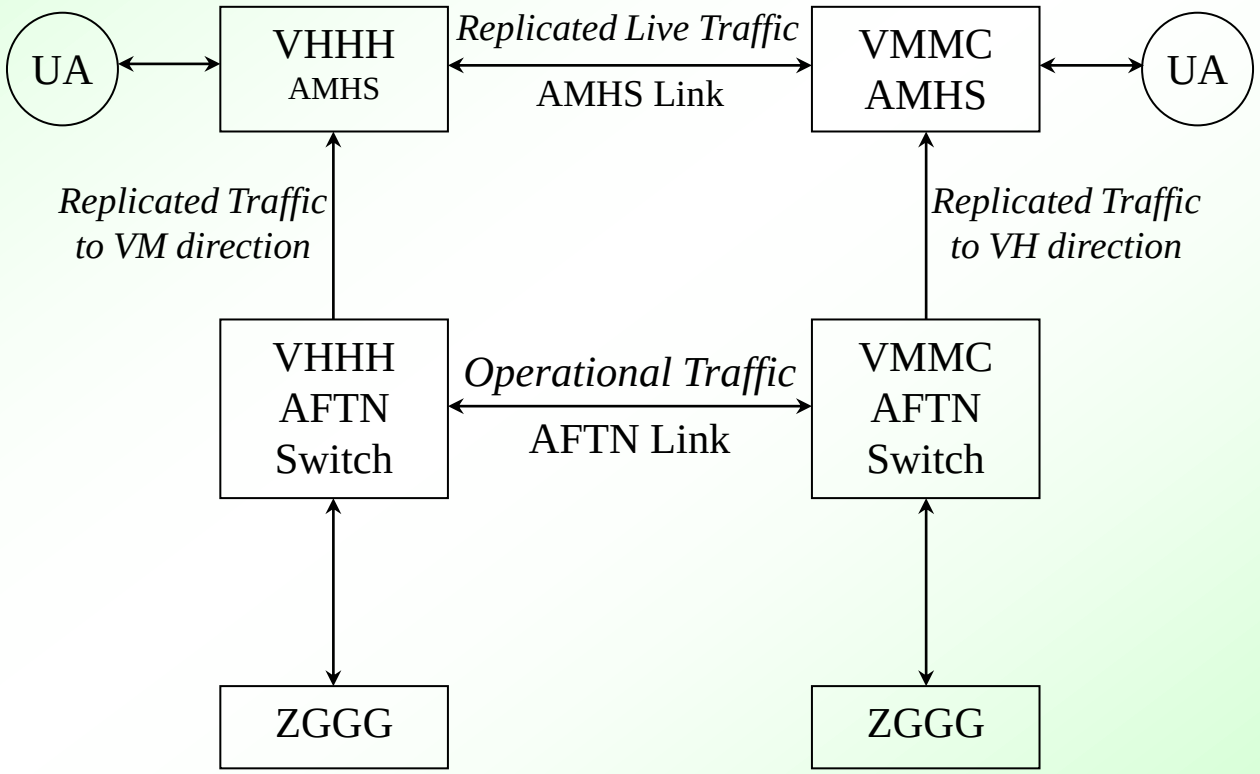
Safety and Risk Assessment

- Safety and risk assessment conducted before launching AMHS service
- A formal procedure in HKCAD to comply with Safety Management System requirements on ATC systems
- Conducted by a team of technical and operational staff in HKCAD
- To identify and assess the risks, hazards and control measures to ensure acceptable level of risks on system and operational change
- Assessment covered aspects on impact to relevant parties, fallback arrangement, training, cyber security etc

Pre-Operational Trial

- Use of leased line intended for AMHS operation
- Live AFTN traffic replicated to feed the AMHS systems at both ends and sent to the other side over ATN
- AMHS messages were exchanged for one month and recorded. An agreed 7 consecutive day's data was used for verification check by both ends
- The following were checked:
  - message loss and corruption by comparing the message counts against the live AFTN traffic and scanning message logs.
  - integrity of ATN/AMHS systems
  - capability of the system to cope with the real message traffic including ill-formatted AFTN messages
  - Inconsistencies in system configuration e.g. errors in routing and address tables

System Configuration for Pre-Operational Trial



Training

- To ensure all operations and maintenance staff are familiar with ATN and AMHS prior to system in operation
- In-depth train-the-trainer training, operator training and technical training provided by manufacturer
- Extensive internal trainings were provided to all operation and maintenance staff for AMHS operation and support
- Supervisor performing operational AMHS duties are required to pass post-training validation checks

Planned ATN/AMHS trials and implementation in 2010

- AMHS interoperability trial with Beijing planned for early 2010
- Tri-partite test between Beijing, Hong Kong and Macao will be conducted after successful completion of Hong Kong and Beijing trials
- AMHS interoperability trial with SLC planned for mid 2010, with a view to implement ATN/AMHS service in mid-late 2010
- AMHS trials with local airlines using web access over private network in mid 2010, after implementation of cyber security measures such as firewalls, and round-the-clock security monitoring and support.
- After successful trials with airlines, gradual migration from AFTN connections to secure AMHS web service


Thank You